Cable support systems

B-Line
by EATON

Powering business worldwide

As a global diversified power management company, we help customers worldwide manage the power needed for buildings, aircraft, trucks, cars, machinery and businesses.

Eaton's innovative technologies help customers manage electrical, hydraulic and mechanical power more reliably, efficiently, safely and sustainably.

EATON
Powering Business Worldwide




We deliver:

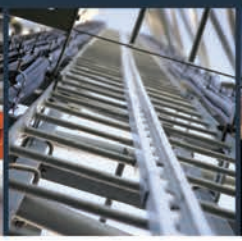
- **Electrical solutions** that use less energy, improve power reliability and make the places we live and work safer and more comfortable
- **Hydraulic and electrical solutions** that enable machines to deliver more productivity without wasting power
- **Aerospace solutions** that make aircraft lighter, safer and less costly to operate, and help airports operate more efficiently
- **Vehicle drivetrain and powertrain solutions** that deliver more power to cars, trucks and buses, while reducing fuel consumption and emissions

We provide integrated solutions that help make energy, in all its forms, more practical and accessible.

With 2012 sales of $16.3 billion, Eaton has approximately 103,000 employees around the world and sells products in more than 175 countries.







Eaton's electrical business

Eaton is a global leader with expertise in:

- Power distribution and circuit protection
- Backup power protection
- Solutions for harsh and hazardous environments
- Lighting and security
- Structural solutions and wiring devices
- Control and automation
- Engineering services

Eaton is positioned through its global solutions to answer today's most critical electrical power management challenges. With 100 years of electrical experience behind us, we're energized by the challenge of powering up a world that demands twice as much energy as today. We're anticipating needs, engineering products, and creating solutions to energize our markets today and in the future.

We are dedicated to ensuring that reliable, efficient and safe power is available when it's needed most.

Eaton.com

Introduction

In 2010, Eaton's B-Line Business opened a 50,000 square foot manufacturing and sales facility in Dammam, Saudi Arabia. At the time of the opening, the facility was reviewed by ARAMCO, which passed the Saudi oil company's detailed quality management assessments and Saudisation provisions. In conjunction with the facility's Aramco-approved status, B-Line has pledged to maintain at least 50% Saudi-employed workforce at the plant, a promise which supports the local job market.

B-Line offers the region a broad line of cable support products, including aluminum, steel, and fiberglass cable ladder, as well as pan cable ladder and Flextray™ wire basket. B-Line also provides its specification engineering services locally, providing both pre- and post-sale engineering and technical support to customers throughout the region. B-Line's presence in this area represents a continuation of the company's investment in the global oil and gas industry, adding the GCC countries to its global coverage area beyond offices in Korea, London, Calgary, and Houston.

في عام 2010 قامت شركة ايتون بي لاين للاعمال بفتح مصنعها البالغ 50,000 قدم مربع بمدينة الدمام المملكة العربية السعودية والذي يضم ايضا اقسام للمبيعات, وقد قامت شركة ارامكو السعودية بمتابعة الافتتاح والتي اجتازت انظمة شركة ارامكو للجودة والمراقبة

لقد تعهدت شركة بي لاين بالمحافظة على سعودة الشركة بما لا يقل عن 50% من مجموع عدد موظفيها في مصنعها والتي تواكب انظمة الدولة

شركة بي لاين تعرض للمنطقة مجموعة عريضة من منتجات حوامل الكيابل بما فيها المصنعة من الالمنيوم, الحديد, الفايبركلاس وكذلك منتجات الحوامل المرنة. شركة بي لاين كذلك توفر خدمات التوصيات والاستشارات الهندسية محليا, وخدمات الدعم الهندسي للعملاء في المنطقة. وبذلك تمثل خطة شركة بي لاين لتوسيع استثماراتها في مجال صناعة الغاز والنفط العالمية لاضافتها للمنطقة بما فيها مصانعها الموجودة في كوريا, لندن,قالاقاري و هيوستون

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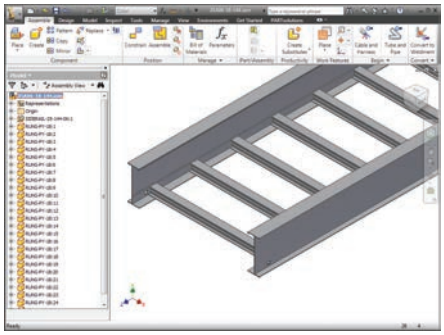
CoSPEC™

CoSPEC, the Specifier Center, is designed to help you easily SELECT, VIEW and DOWNLOAD B-Line product design content in any one of nearly one hundred non-proprietary and proprietary CAD, BIM, PDMS, and graphics formats, which helps speed the integration of the content into your design project.

Features

- Easy integration and configuration
- Comprehensive library of 2D drawings and 3D models for CAD, BIM, PDMS, SP3D, and graphics output
- The most up to date software versions and product data information are always available
- Submittals and specification sheets in PDF format
- Proprietary file format outputs are native to the chosen software



Nearly a Hundred Download Options

- Aveva PDMS and Intergraph SmartPlant SP3D (on select products) content
- Autodesk Revit output available
- Proprietary formats from AutoCAD to SolidWorks to Catia
- Non-proprietary formats like DXF and STEP, and more
- Graphics files in a number of formats including EPS

2D Native

- Allplan 2008
- AutoCAD >=V14
- Cadkey CDL >=V19
- Catia IUA - V4
- HP ME 10 >=V9
- Medusa >=2000i
- Microstation (DGN) >=V8
- SolidEdge >=V17
- VX (Varimetrix) >=V5.0

2D Neutral & Graphics

- BMP (2D & 3D View)
- DWF-ASCII 5.5, Binary 5.5 and Compressed 5.5
- DWG >=V14
- DXF-V12\HPGL-V2
- IGES >=V5.0
- JPEG (2D & 3D Views)
- Metafile 2D-V1, & PS2-V2
- MI >=V8
- PDF Datasheet
- Postscript EPS
- SVG
- TIFF (2D & 3D View)

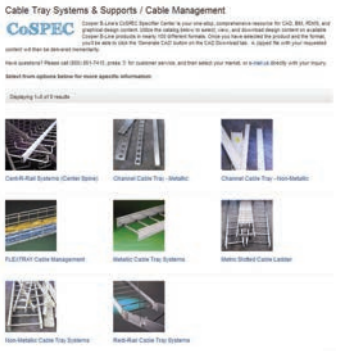
3D Native

- Autodesk 3D Studio MAX
- Allplan = 2008
- AutoCAD >=V14
- AVEVA PDMS/Marine (Equipment Spec)
- Caddy++ via SAT-V4.2
- Catis >=V5 R8 and IUA-V4
- EMS
- Google SketchUp
- Autodesk Inventor >=R5.3, R10, R11
- Mechanical Desktop >=V5
- Nupas/Cadmatic
- One Space Modeling >=2007
- Pro/E Wildfire >=I
- PRO-Desktop
- Autodesk Revit >= 2009* (coming soon)
- SolidEdge >=V17
- SolidWorks >=2001+
- Think3 >=2006.2
- Tribon M3
- Unigraphics >=NX3
- VX (Varimetrix) >=V5

3D Neutral

- CIP
- DWG >=V14
- DXF V14
- IGES
- JT
- Metafile 3D (PS3)-V2
- Parasolid-Binary V15 and Text V15
- PDF 3D-7.01
- SAT - V2.0 through V6.0
- STEP-AP203, AP215a & AP214b
- STL
- U3D (Universal 3D)
- VRML >=V1.0
- XGL

Select



View

Download

Reduce Structural Steel Supports

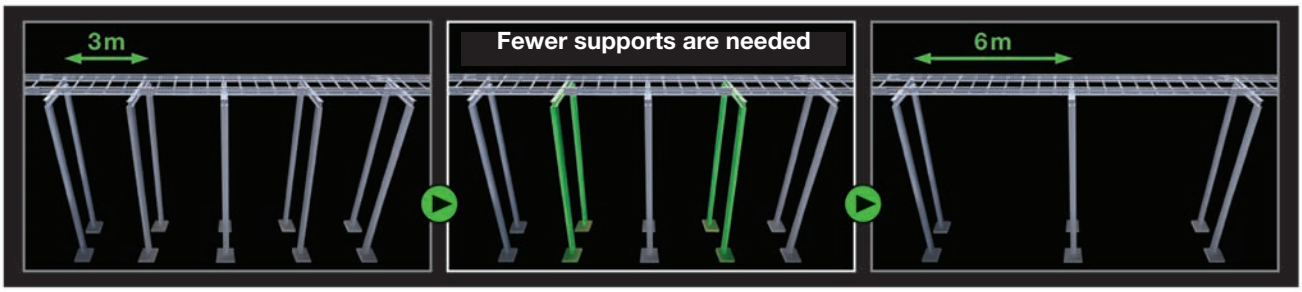
With B-Line cable ladder systems, you can reduce the number of structural steel supports by as much as 66%, all while meeting or exceeding global industry standards.

Resources

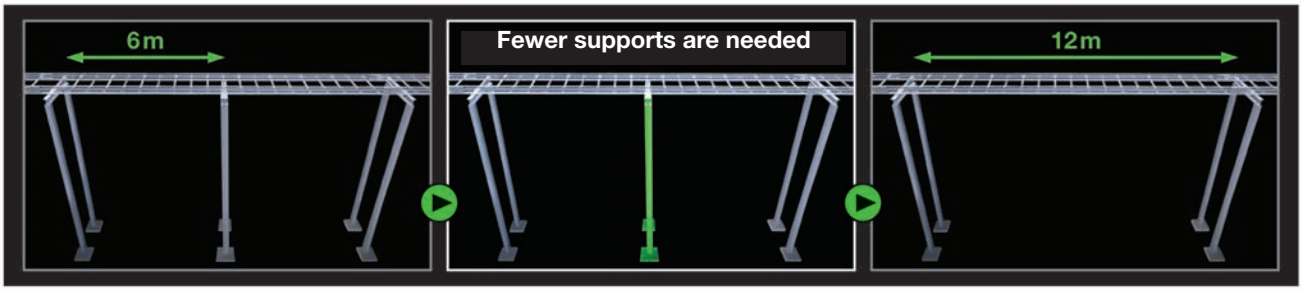
By visiting http://www.cooperbline.com/sss, you can access our library of resources available that demonstrate the ways a B-Line cable ladder system can help reduce engineering complexity and costs. These resources include:

- **Video:** Five minute video showing our key features and support recommendations
- **Support recommendations:** Submittal drawings showing where supports are recommended to be placed
- **Test reports:** Detailed reports highlighting ourproducts' load testing performance in our engineering laboratories
- **Calculator:** A cost savings calculator that estimates potential savings based on user-entered variables

For Steel & Aluminum Cable Ladder



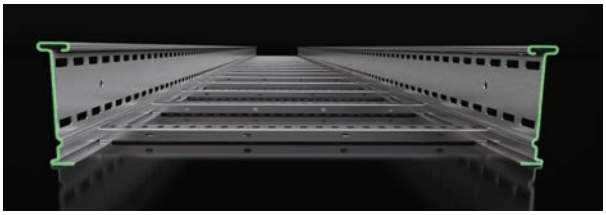
For Aluminum Cable Ladder



Structural Steel Savings

5 Key Product Attributes

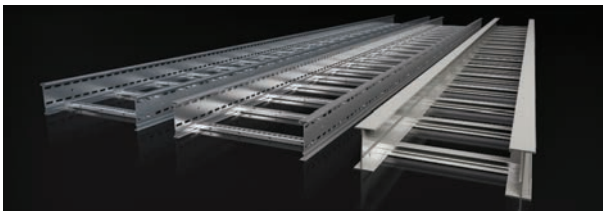
I-Beam Side-Rail Design



I-Beam Design Can Carry up to 2.3 Times More Load than C-Channel

- Maximizes stiffness
- Offers positive rung support
- Enhances clamping options
- Carries load on longer spans, reducing support requirements

Application - Specific Materials



Application Specific Materials Maximize Options

- Hot-dip galvanized steel
- 316 Stainless Steel
- Marine-grade, copper-free aluminum
- Ensures the best material for the application to carry the load over the longest span

Splice Plate Design

Splice Plates Enhance Structural Integrity

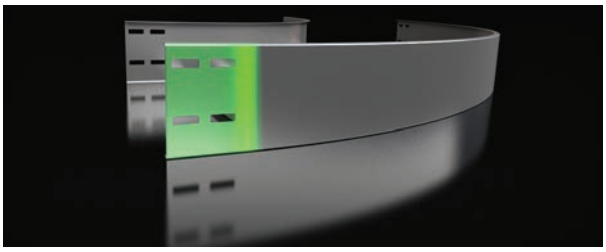
- Enhances the structural integrity and strength of the system, reducing support requirements
- UL Classified as an equipment grounding conductor, eliminating bonding jumpers

Application - Specific Specialty Splices

Specialty Splice Plates Allow Load Transfer

- Patent-pending design
- Designed for thermal expansion and contraction
- Structural integration maintains load carrying capacity, reducing support requirements

Fitting Designs



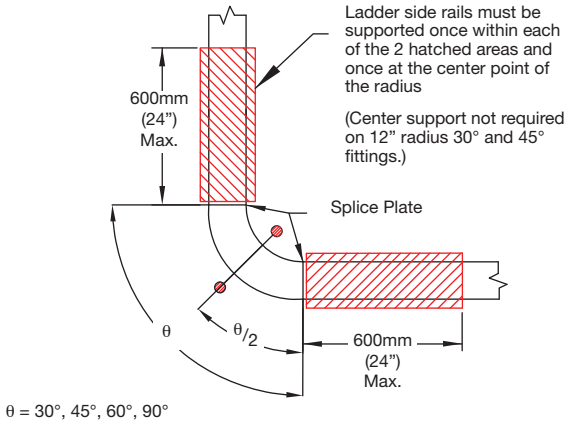
75m or 100mm Tangents

- Industry-leading 75mm to 100mm tangents
- Maximizes strength and load carrying capacity, reducing support requirements

Support Recommendations
Horizontal Bends

NEMA Standard
900mm (36”) Max Radii

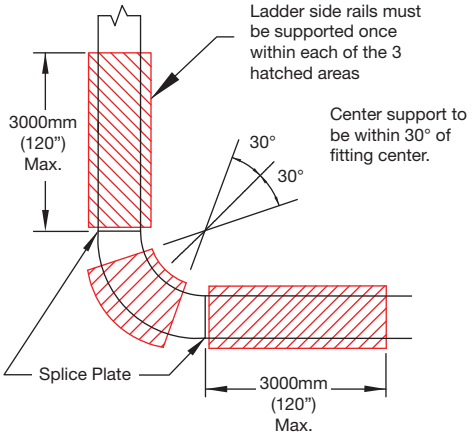
- Attached ladder supported within 600mm of splice
- Fittings supported at radius center pont on both sides
- Three total supports recommended per fitting



B-Line Recommendations

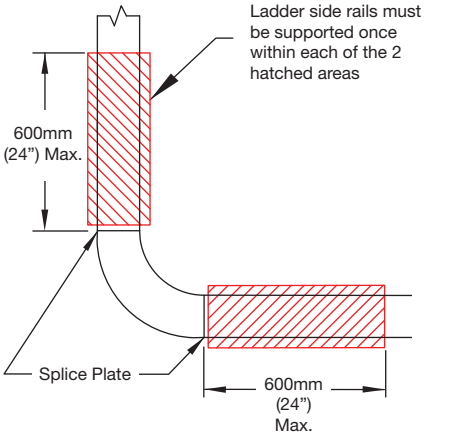
Option 1
900mm (36”) Max Radii

- Attached ladder supported up to half span (3000mm max)
- Fittings supported within 30° of radius center point on both sides
- One support recommended per fitting with flexibility for placement and distance on ladder supports



Option 1
900mm (36”) Max Radii

- Attached ladder supported within 600mm of splice
- Fitting support is eliminated
- Two total supports recommended per fitting

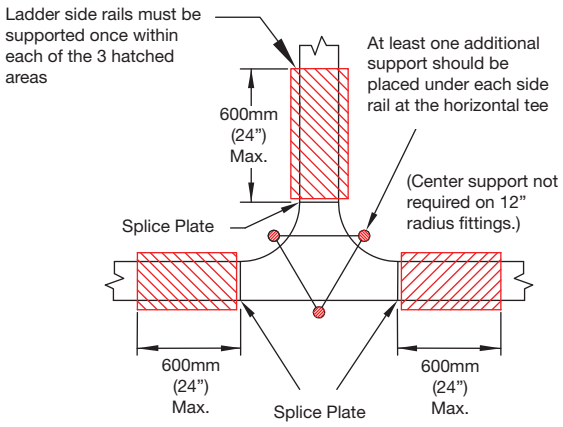


Structural Steel Savings

Support Recommendations
Horizontal Tees

NEMA Standard
900mm (36”) Max Radii

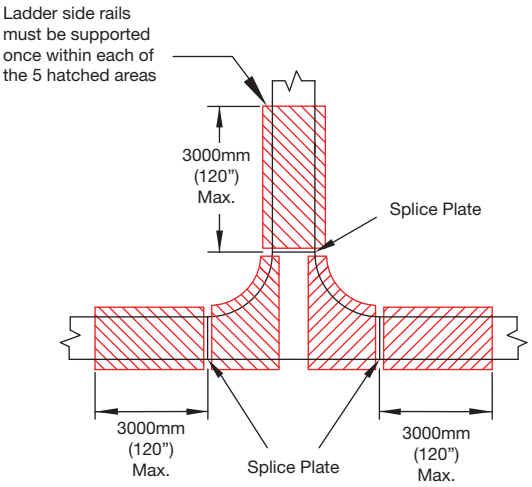
- Attached ladder supported within 600mm of splice
- Fittings supported once on each side rail
- Six total supports recommended per fitting



B-Line Recommendations

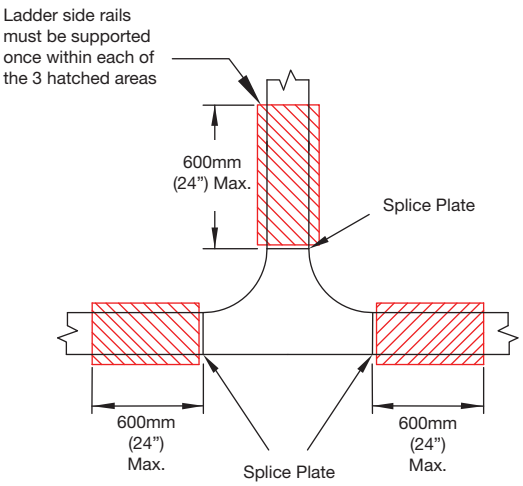
Option 1
900mm (36”) Max Radii

- Attached ladder supported up to half span (3000mm max)
- Fittings supported twice within defined area
- Two supports recommended per fitting with flexibility for placement and distance on ladder supports

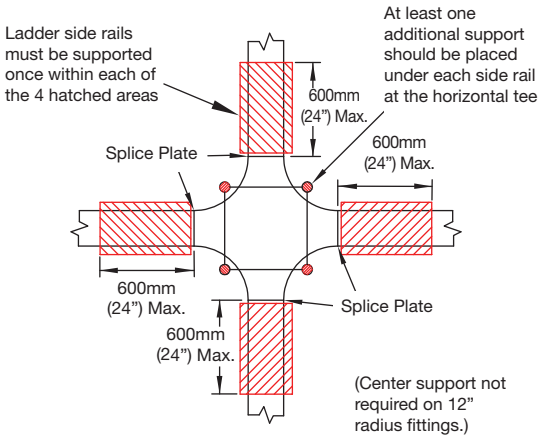


Option 2
900mm (36”) Max Radii

- Attached ladder supported within 600mm of splice
- Fitting supports are eliminated
- Three total supports recommended per fitting



Support Recommendations
Horizontal Crosses



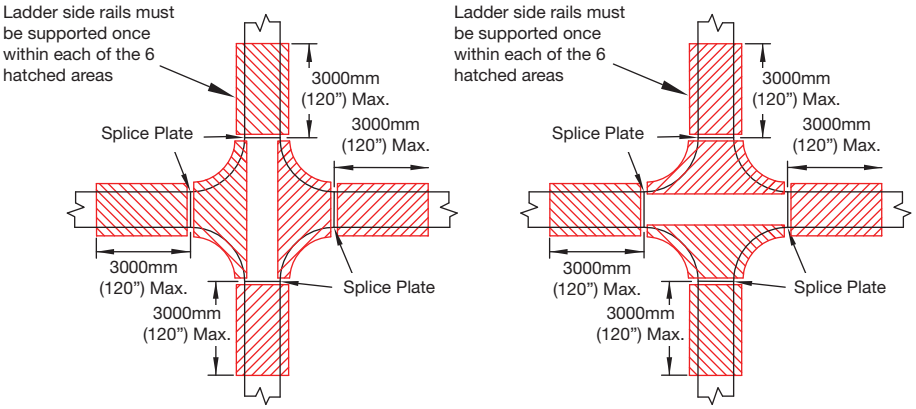
NEMA Standard
900mm (36") Max Radii

- Attached ladder supported within 600mm of splice
- Fittings supported once on each side rail
- Eight total supports recommended per fitting

B-Line Recommendations

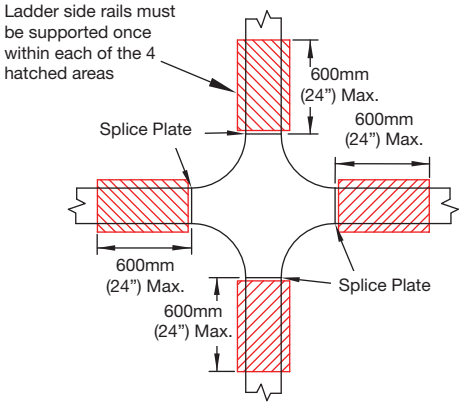
Options 1 & 2
900mm (36") Max Radii

- Attached ladder supported up to half span (3000mm max)
- Fitting supported twice within defined area
- Two supports recommended per fitting with flexibility for placement and distance on ladder supports



Option 3
900mm (36") Max Radii

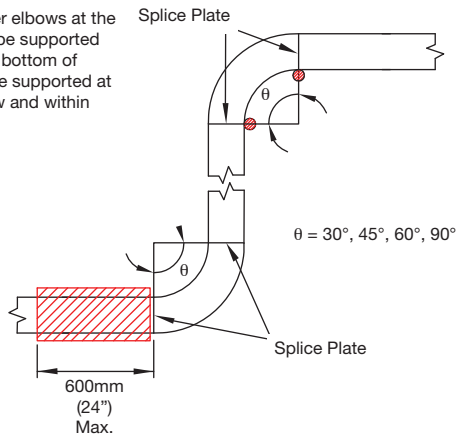
- Attached ladder supported within 600mm of splice
- Fitting supports are eliminated
- Four total supports recommended per fitting



Structural Steel Savings

Support Recommendations
Vertical Inside/Outside Bends

Vertical cable ladder elbows at the top of runs should be supported at each end. At the bottom of runs, they should be supported at the top of the elbow and within the hatch area.



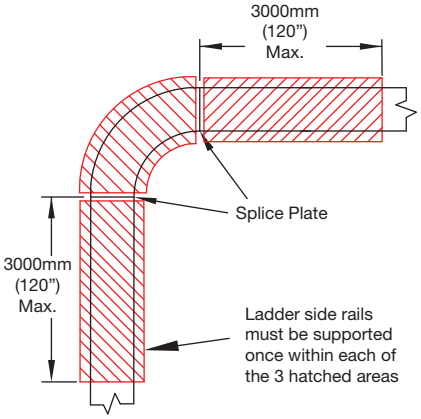
NEMA Standard
900mm (36") Max Radii

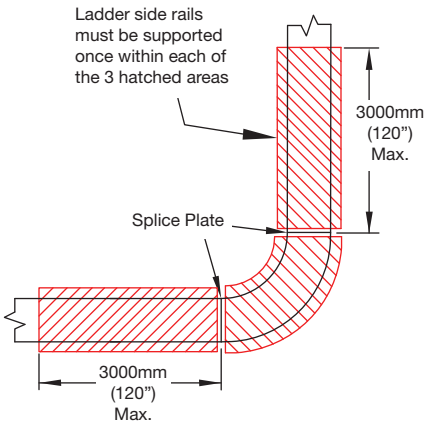
- Attached ladder supported within 600mm of splice
- Fittings supported Twice on each side rail
- Three total supports recommended per fitting

B-Line Recommendations

Options 1 & 2
900mm (36") Max Radii

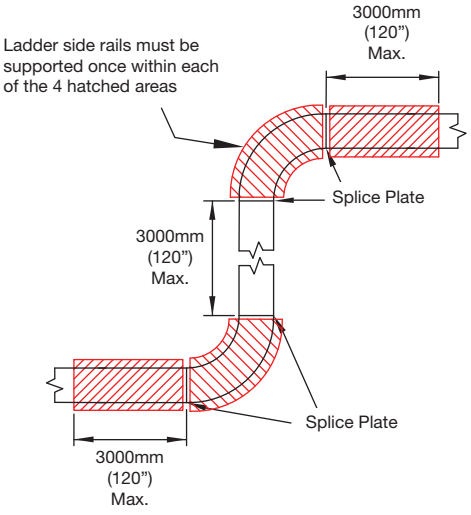
- Attached ladder supported up to half span (3000mm max)
- Fitting supported once on each side rail
- One total support recommended per fitting with flexibility for placement and distance on ladder supports





Option 3
900mm (36") Max Radii

- Attached ladder supported within 300mm of splice and a maxjmum of 3000mm straight section in the transition between the fittings
- Fitting supports once on eachside rail
- One total support recommended per fitting with flexibility for placement and distance on ladder supports



Specifications & Approvals

B-Line's Dammam facility is ISO Certified to ISO 9001:2008 by UKAS

Cable Ladder and FLEXTRAY™ products are UL Classified as noted

AL HOTY

Cable Ladder, FLEXTRAY™ and Pan Cable Tray products shown in this catalog have been tested and witnessed by Al Hoty. Documentation is available upon request.

Cable Ladder shown in this catalog conforms to the requirements of IEC Standard 61537, 2001 Ed.

Cable Ladder and FLEXTRAY products shown in this catalog are CSA Classified as noted

"FA" Fiberglass ladder shown inthis catalog are approved by the American Bureau of Shipping.

Eaton's B-Line Business is a member of the Cable Tray Institute (CTI)

Eaton's B-Line Business is a member of the National Electrical Manufacturer's Association (NEMA)

معلومات القياسات

مصنع بي لاين الدمام حاصل عل شهادة الايزو 9001:2008 من قبل يوكاس

جميع حوامل الكيابل والحوامل المرنة الموجودة ضمن هذا الكتالوج مصنفة ضمن ال يو ال

AL HOTY

ان جميع المنتجات الموجودة هنا في الكتالوج قد اختبرت من قبل شركة الحوطي واصدرت شهادات معتمدة ويمكن الحصول على تلك الشهادات عند الطلب

جميع حوامل الكيابل والحوامل المرنة الموجودة ضمن هذا الكتالوج مصنفة ضمن IEC للقياسات رقم 61537, 2001

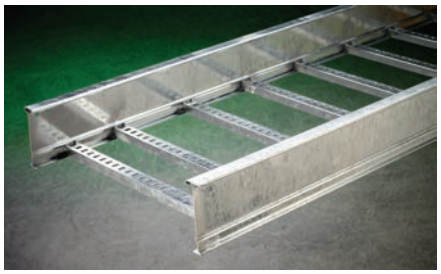
جميع حوامل الكيابل والحوامل المرنة الموجودة ضمن هذا الكتالوج مصنفة ضمن CSA

FA تشير الى حوامل الفايبركلاس معتمدة من قبل المكتب الامريكي للشحن

شركة ايتون بي لاين للاعمال عضو في معهد حوامل الكيابل CTI

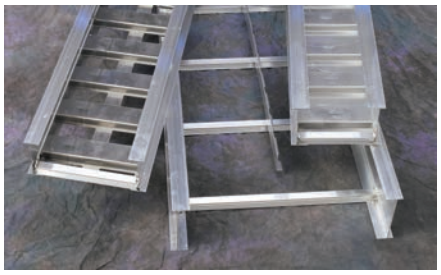
شركة ايتون بي لاين للاعمال عضو في جمعية المصنع الوطني للكهرباء NEMA

Product Overview



Steel Cable Ladder

Light duty steel cable ladders are designed with a top flange for stiffness and a bottom flange to support rungs securely. Heavier duty ladders utilize the B-Line I-Beam siderail profile, the strongest available siderail shape. The I-Beam provides more strength using less material than C-shaped siderails. The added strength means that the ladders are lighter and easier to install. Rungs for all cable ladders support a 200 lbs. concentrated load beyond the cataloged cable load.

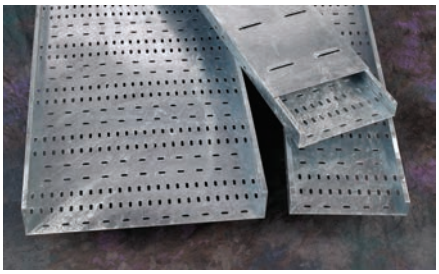


Aluminum Cable Ladder

Ideal for onshore and offshore oil and gas applications, B-Line aluminum cable ladders are manufactured from marine-grade aluminum. Similar to the steel cable ladders, aluminum cable ladders include the I-Beam siderail for added strength. Options are available to minimize the number of supports required for the ladder, including mid-span splice plates and extra-long lengths.

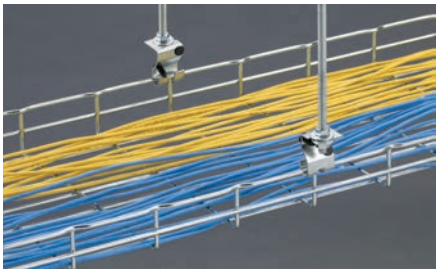
Fiberglass Cable Ladder

B-Line's FRP ladder offering is a non-metallic cable management system that is ideal for hot, hazardous environments. The material is also lightweight, corrosion resistant, and treated with a special surface veil for UV resistance. Rungs are both mechanically attached and bonded with adhesive for a secure connection.



Pan Cable Tray

B-Line Pan Cable Tray is available with or without perforation for cable ventilation. A continuous bottom surface allows for constant cable support with no cable sag, while a full range of radiused cable fittings allow the cables to bend slowly, adhering to cable manufacturer's recommendations. A flange on top of the tray provides added strength.



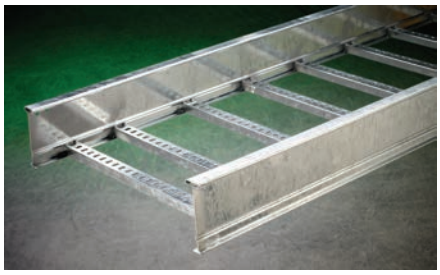
FLEXTRAY™

Ideal for small cable drops to large trunks of cable, FLEXTRAY wire basket tray is a flexible, field-adaptable way to manage cables throughout a project. The tray can be cut and bent on the jobsite to allow cable runs to be adjusted as needed. The safety edge design helps protect both the cable and the installer during cable installation.

Cable Cleats

B-Line cable cleats are designed to support and retain your cables within your cable tray system in everyday conditions. More importantly, they help prevent damage in short circuit conditions. Cable cleats are one of the first lines of defense to help protect your personnel, your cables, and your cable ladder and tray systems.

نظرة عامة على المنتج



الحوامل الحديدة للكيابل

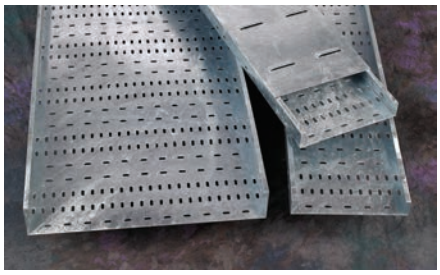
الحوامل الحديدية الخفيفة مصممة مع شفاه علوية لصلابة اكثر وشفاه سفلية لدعم سلالم الدرج بمكانها. اما الحاوامل الحديدية الثقيلة فتستمد قوتها من التصميم المميز لشركة بي لاين على صيغة I-Beam لحوافها والتي تعتبر الاصلب على الاطلاق في مجالها.
ان تصميم I-Beam يعطي صلابة اكثر مع استخدام اقل للمواد ليجعلها اخف وامتن من مثيلاتها التقليدية. ان صلابة الحوامل تعني قدرتها على لحمل الكيابل وخفتها حال التركيب. ان سلالم الحوامل تستطيع تحمل حتى 200 باوند بتمركز

حوامل الكيابل الالمنيومية

تعتبر مثالية في الاماكن داخل البحر وخارجه لصناعة الغاز والنفط, ان حوامل بي لاين الالومنيومية مصنعة من درجات الالومينوم البحرية, كما هو في حال حوامل الكيابل الحديدية فأن الحوامل الالمومنيومية مصنعة على شكل I-Beam لحوفها لاعطائها صلابة اكثر وخفة. كما تتيح التقليل من عدد الدواعم المتطلبة لمساندة الحوامل وكذلك توفر المساندات لتحمل اطول

حوامل الفايبركلاس للكيابل

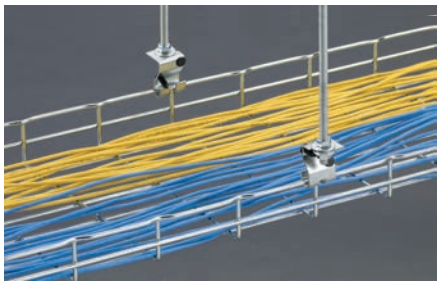
شركة بي لاين للفايبركلاس توفر حوامل غير معدنية للكيابل والتي تعتبر مثالية للاماكن الحارة او المناطق الشديدة الخطورة. ان مواد الفايبركلاس تعتبر خفيفة للغاية وتتحمل وتقاوم عوامل الصدأ, وقد عولجت بمواد لمقاومة اشعة الشمس. ان كلا من سلالم الحوامل وحوافها قد ربطت بمواد صمغية شديدة الفوة



حوامل الكيابل المثقبة Pan Cable Tray

حوامل الكيابل لشركة بي لاين متوفرة مع او بدون الثقوب, ان استمرارية سطحها المعدني تسمح لمساندة دعم الكيابل دون تبلدها كما توفر عددا من التجهيزات لملائمة ثني الكيابل بسهولة والتي تتلائم مع مستوى توصيات شركات الكهرباء, ان وجود الشفاه العلوية تساعد على دعم اكثر للحوامل

معلومات عن المنتجات



الحوامل المرنة FlexTray

منتج مثالي للكيابل الصغيرة والمنصبة لحوامل الكيابل الاكبر, ان الحوامل المرنة تعتبر مرنة جدا في حالة تركيبها وتوجيها بسهولة اثناء التركيب في المشروع. حيث يمكن قصها وطيها في مكان المشروع نفسه حسب الحاجة للسماح لسحب الكيابل. ان النهايات العالية السلامة تسمح لحماية كلا من الكيابل ومركبها خلال التركيب

مرابط الكيابل

مرابط الكيابل لشركة بي لاين مصممة لدعم والمحافظة على الكيابل ضمن الحوامل لجميع الظروف. وبمزايا اكثر يمكنها المحافظة على الكيابل من التلف في حالة المماس الكهربائي. ان المرابط تعتبر العامل الاساس في حماية البشر والكيابل ضمن حوامل الكيابل

Cable Ladder Selection Process

The following factors should be considered when determining the appropriate cable ladder system.

1. Material & Finish

- Standards Available (Pages CLS-2 – CLS-4)
- Corrosion (Pages CLS-5 – CLS-7)
- Thermal Contraction and Expansion (Page CLS-8)
- Installation Considerations and Electrical Grounding Capacity (Page CLS-9)

2. Strength

- Environmental Loads (Pages CLS-10 & CLS-11)
- Concentrated Loads (Page CLS-11)
- Support Span (Page CLS-11)
- Deflection (Page CLS-12)
- Rung/Trough Data (Page CLS-13)
- Load Capacity (NEMA & CSA Classes) (Pags CLS-14 & CLS-15)
- Cable Data (Page CLS-16)

3. Width & Available Loading Depth

- Cable Diameter (Page CLS-16)
- Allowable Cable Fill (Pages CLS-17 - CLS-22)
- Barrier Requirements (Page CLS-23)
- Future Expansion Requirements (Page CLS-23)
- Space Limitations (Page CLS-23)

4. Length

- Lengths Available (Page CLS-24)
- Support Spans (Not to exceed the length of straight sections) (Page CLS-24)
- Space Limitations (Page CLS-24)
- Installation (Page CLS-24)

5. Loading Possibilities

- Power Application (Page CLS-25)
- Data/Communication Cabling (Page CLS-25)
- Other Factors to Consider (Page CLS-25)

6. Bottom Type

- Type of Cable (Page CLS-26)
- Cost vs. Strength (Page CLS-26)
- Cable Exposure (Page CLS-26)
- Cable Attachment (Page CLS-26)

7. Fitting Radius

- Cable Flexibility (Page CLS-26)
- Space Limitations (Page CLS-26)

Standards Available

MATERIAL	MATERIAL SPECIFICATION	ADVANTAGES
Aluminum	6063-T6 (Side rails, Rungs and Splice Plates) 5052-H32 (Trough Bottoms, Covers and Accessories)	• Corrosion Resistance • Easy Field Fabrication & Installation • Excellent Strength to Weight Ratio • Excellent Grounding Conductor
Steel	ASTM A1011 SS Gr. 33 (14 Gauge Plain Steel) ASTM A1008 Gr. 33 Type 2 (16 & 18 Gauge Plain ASTM A653SS Gr. 33 G90 (Pre-Galvanized)	• Electric Shielding • Finish Options • Low Thermal Expansion • Limited Deflection
Stainless Steel	AISI Type 304 or AISI Type 316 ASTM A240	• Superior Corrosion Resistance • Withstands High Temperatures

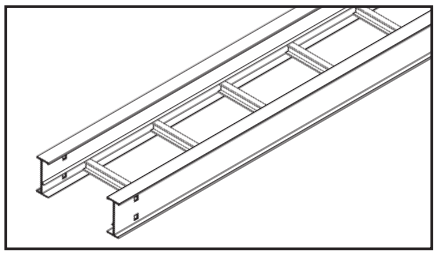
Note: Fiberglass available - see page GRP-5

Aluminum

Aluminum cable ladders are fabricated from structural grade “copper free” (marine grade) aluminum extrusions. Aluminum’s excellent corrosion resistance is due to its ability to form an aluminum oxide film that when scratched or cut reforms the original protective film. Aluminum has excellent resistance to "weathering” in most outdoor applications. Aluminum cable ladder has excellent corrosion resistance in many chemical environments and has been used for over thirty years in petro-chemical plants and paper mills along the gulf coast from Texas to Florida. Typically, aluminum cable ladders can perform indefinitely, with little or no degradation over time, making it ideal for many chemical and marine environments. The resistance to chemicals, indoor and outdoor, can best be determined by tests conducted by the user with exposure to the specific conditions for which it is intended. For further information, contact B-Line or the Aluminum Association.

Some common chemicals which aluminum resists are shown on pages CLS-6 & CLS-7.

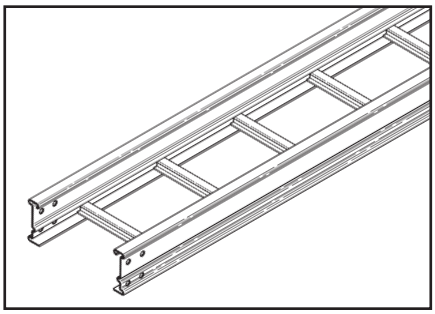
Aluminum Cable Ladder



Steel

Steel cable ladders are fabricated from continuous roll-formed structural quality steel. By roll-forming steel, the mechanical properties are increased allowing the use of a lighter gauge steel to carry the required load. This reduces the dead weight that must be carried by the supports and the installers. Using structural quality steel, B-Line assures that the material will meet the minimum yield and tensile strengths of applicable ASTM standards. All cable ladder side rails, rungs and splice plates are numbered for material traceability. The corrosion resistance of steel varies widely with coating and alloy.

Steel and Stainless Steel Cable Ladder



Note:

For help choosing proper cable ladder material, see B-Line Technical Paper Series.
(bline.com/engineer/Technical.asp)

Stainless Steel

Stainless Steel cable ladders are fabricated from continuous roll-formed AISI Type 304 or AISI Type 316/316L stainless steel. Both are non-magnetic and belong to the group called austenitic stainless steels. Like carbon steel, they exhibit increased strength when cold worked by roll-forming or bending.

Several important conditions could make the use of stainless steel imperative. These include long term maintenance costs, corrosion resistance, appearance and locations where product contamination is undesirable. Stainless steel exhibits stable structural properties such as yield strength and high creep strength at elevated temperatures.

B-Line’s stainless steel cable ladders are welded using stainless steel welding wire to ensure each weldment exhibits the same corrosion resistant characteristic as the base metal. Localized staining in the weld area or heat affected zone may occur in severe environments. Specialized shielding gases and low carbon materials are used to minimize carbon contamination during welding and reduce staining and stress corrosion. Specify passivation after fabrication per ASTM A380 to minimize staining, improve aesthetics and further improve corrosion resistance.

A detailed study of the corrosive environment is recommended when considering a stainless steel design (see pages CLS-6 & CLS-7).

Cable Ladder Selection Process

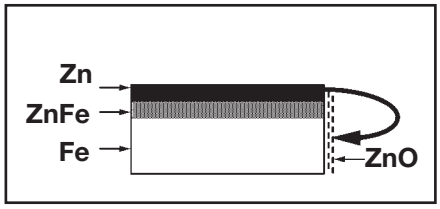
Standards Available

FINISH	SPECIFICATION	RECOMMENDED USE
Electrogalvanized Zinc	ASTM B633 (For Cable Ladder Hardware and Accessories, Alum. and Pre-Galv.) (For Flextray Standard is B633 SC2)	Indoor
Chromium Zinc	ASTM F-1136-88 (Hardware for Hot Dip Galvanized Cable Ladder)	Indoor/Outdoor
Pre-Galvanized Zinc	ASTM A653SS Gr.33 G90 (CSA Type 2) (Steel Cable Ladder and Fittings)	Indoor
Hot Dip Galvanized Zinc After Fabrication	ASTM A123 (CSA Type 1) (Steel Cable Ladder and Fittings)	Indoor/Outdoor
Special Paint	Per Customer Specification (Aluminum or Steel Cable Ladder & Fittings)	Indoor

Zinc Coatings

Zinc protects steel in two ways. First it protects the steel as a coating and second as a sacrificial anode to repair bare areas such as cut edges, scratches, and gouges. The corrosion protection of zinc is directly related to its thickness and the environment. This means a .2 mil coating will last twice as long as a .1 mil coating in the same environment.

Galvanizing also protects cut and drilled edges.



Electrogalvanized Zinc

Electrogalvanized Zinc (also known as zinc plated or electroplated) is the process by which a coating of zinc is deposited on the steel by electrolysis from a bath of zinc salts. This finish is standard for cable ladder hardware and some accessories for aluminum and pre-galvanized systems.

A rating of SC3, B-Line's standard, provides a minimum zinc coating thickness of .5 mils (excluding threaded rod, which is SC1 = .2 mils)

When exposed to air and moisture, zinc forms a tough, adherent, protective film consisting of a mixture of zinc oxides, hydroxides, and carbonates. This film is in itself a barrier coating which slows subsequent corrosive attack on the zinc. This coating is usually recommended for indoor use in relatively dry areas, as it provides ninety-six hours protection in salt spray testing per ASTM B117.

Chromium/ Zinc

Chromium/ Zinc is a corrosion resistant composition, which was developed to protect fasteners and small bulk items for automotive use. The coating applications have since been extended to larger parts and other markets.

Chromium/Zinc composition is an aqueous coating dispersion containing chromium, proprietary organics, and zinc flake.

This finish provides 1000 hours protection in salt spray testing per ASTM B117, exceeding NEMA VE-1 requirements by 300%.

Pre-Galvanized Zinc

(Mill galvanized, hot dip mill galvanized or continuous hot dip galvanized)

Pre-Galvanized steel is produced by coating coils of sheet steel with zinc by continuously rolling the material through molten zinc at the mills. This is also known as mill galvanized or hot dip mill galvanized. These coils are then slit to size and fabricated by roll forming, shearing, punching, or forming to produce B-Line pre-galvanized cable ladder products.

The G90 specification calls for a coating of .90 ounces of zinc per square foot of steel. This results in a coating of .45 ounces per square foot on each side of the sheet. This is important when comparing this finish to hot dip galvanized after fabrication.

During fabrication, cut edges and welded areas are not normally zinc coated; however, the zinc near the uncoated metal becomes a sacrificial anode to protect the bare areas after a short period of time.

To further insure a quality product, B-Line welds all pre-galvanized cable ladders with a silicon bronze welding wire allowing only a small heat affected zone to be exposed. This small area quickly repairs itself by the same process as cut edges.

Hot Dip Galvanized After Fabrication

(Hot dip galvanized or batch hot dip galvanized)

Hot Dip Galvanized After Fabrication cable ladder products are fabricated from steel and then completely immersed in a bath of molten zinc. A metallic bond occurs resulting in a zinc coating that completely coats all surfaces, including edges and welds.

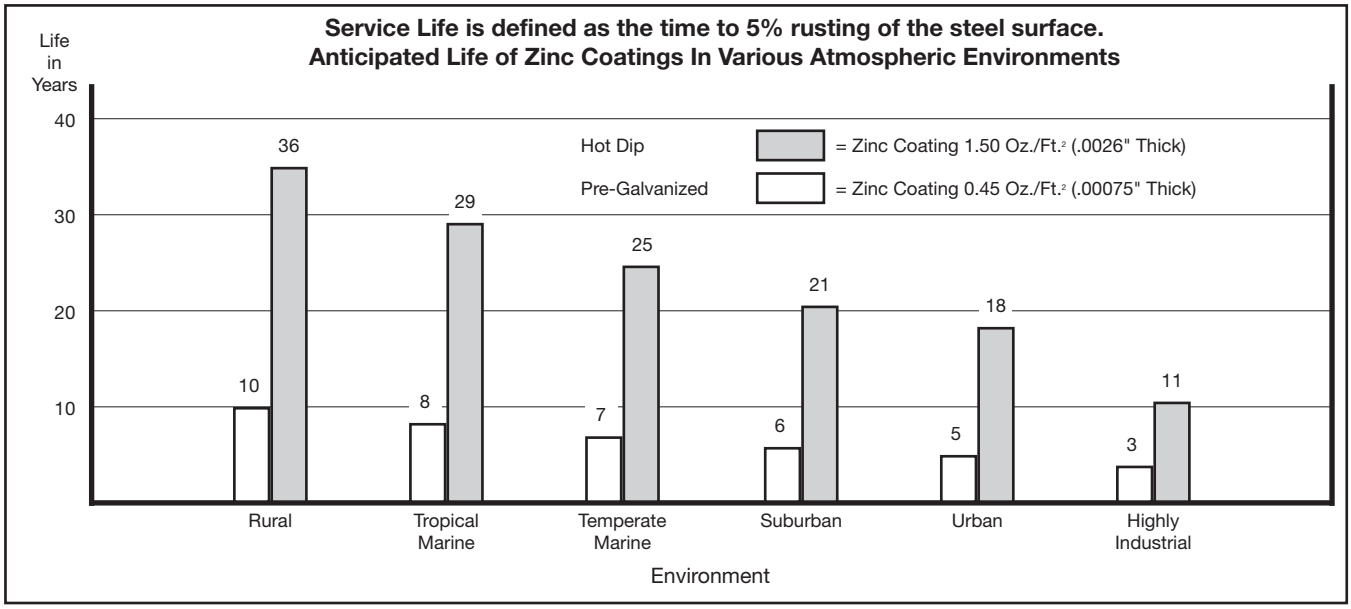
Another advantage of this method is coating thickness. Cable, ladders hot dip galvanized after fabrication, have a minimum thickness of 1.50 ounces per square foot on each side, or a total 3.0 ounces per square foot of steel, according to ASTM A123.

The zinc thickness is controlled by the amount of time each part is immersed in the molten zinc bath as well as the speed at which it is removed. The term "double dipping" refers to parts too large to fit into the galvanizing kettle and, therefore, must be dipped one end at a time. It does not refer to extra coating thickness.

The layer of zinc which bonds to steel provides a dual protection against corrosion. It protects first as an overall barrier coating. If this coating happens to be scratched or gouged, zinc's secondary defense is called upon to protect the steel by galvanic action.

Hot dip galvanized after fabrication is recommended for prolonged outdoor exposure and will protect steel for many years in most outdoor environments and in many aggressive industrial environments (see charts on page CLS-4).

Standards Available



PVC Coating

PVC coating aluminum or steel cable ladder is not recommended and has been removed from B-Line's cable ladder line.

The application of a 15 mil PVC coating to aluminum or steel cable ladder was a somewhat popular finish option 15 or more years ago. The soft PVC coating must be completely intact for the finish to be effective. In a caustic atmosphere, a pinhole in the coating can render it useless and corrode the cable ladder. The shipment of the cable ladder consistently damages the coating, as does installation. The splice hardware, splice plates and ground straps require field removal of the coating to ensure connections. PVC coated cable ladder drastically increases the product's cost and delivery time.

B-Line recommends using fiberglass - See Fiberglass section, or stainless steel cable ladder systems in highly corrosive areas.

Painting Cable Ladder

B-Line offers painted cable ladder to any color specified by the customer. It is important to note that there are key advantages and disadvantages to ordering factory painted cable ladder. B-Line typically does not recommend factory painted cable ladder for most applications.

Painted cable ladder is often used in "open ceiling" applications, where all the overhead equipment and structure is painted the same color. In this type of application, additional painting is often necessary in the field, after installation, to ensure all of the supporting components, such as hanger rods, clamps and attaching hardware have been painted uniformly. Pre-painted cable ladder interferes with common grounding practices, requiring the paint to be removed at splice locations, and/or the addition of bonding jumpers that were otherwise unnecessary. This additional field modification not only increases the installation cost, but causes potential damage to the special painted finish.

It is typically more cost effective to use an Aluminum or Pre-Galvanized Steel cable ladder and paint it after installation, along with the other un-painted building components. Consult painting contractor for proper surface preparation.

Special Paint

B-Line cable ladder and supports can be painted or primed to meet the customers requirements. B-Line has several colors available, consult the factory.

If a non-standard color is required the following information needs to be specified:

1. Type of material preparation (primer, etc.)
2. Type of paint, manufacturer and paint number or type of paint with chip.
3. Dry film thickness.

Material/Finish Prefix Designation Chart

Catalog Number Prefix	Material to be Furnished
A	Aluminum
P	Pre-Galvanized
G	Hot Dip Galvanized
ZN	Zinc Plated
S	Plain Steel
SS4	Type 304 Stainless Steel
SS6	Type 316 Stainless Steel

Corrosion

All metal surfaces are affected by corrosion. Depending on the physical properties of the metal and the environment to which it is exposed, chemical or electromechanical corrosion may occur.

Atmospheric Corrosion

Atmospheric corrosion occurs when metal is exposed to airborne liquids, solids or gases. Some sources of atmospheric corrosion are moisture, salt, dirt and sulphuric acid. This form of corrosion is typically worse outdoors, especially near marine environments.

Chemical Corrosion

Chemical corrosion takes place when metal comes in direct contact with a corrosive solution. Some factors which affect the severity of chemical corrosion include: chemical concentration level, duration of contact, frequency of washing, and operating temperature.

Storage Corrosion

Wet storage stain (White rust) is caused by the entrapment of moisture between surfaces of closely packed and poorly ventilated material for an extended period. Wet storage stain is usually superficial, having no affect on the properties of the metal.
Light staining normally disappears with weathering. Medium to heavy buildup should be removed, in order to allow the formation of normal protective film.
Proper handling and storage will help to assure stain-free material. If product arrives wet, it should be unpacked and dried before storage. Dry material should be stored in a well ventilated “low moisture” environment to avoid condensation formation. Outdoor storage is undesirable, and should be avoided whenever possible.

Galvanic Corrosion

Galvanic corrosion occurs when two or more dissimilar metals are in contacts in the presence of an electrolyte (ie. moisture). An electrolytic cell is created and the metals form an anode or a cathode depending on their relative position on the Galvanic Series Table. The anodic material will be the one to corrode. Whether a material is anodic depends on the relative position of the other material. For example: If zinc and steel are in contact, the zinc acts as the anode and will corrode; the steel acts as the cathode, and will be protected. If steel and copper are in contact, the steel is now the anode and will corrode.
The rate at which galvanic corrosion occurs depends on several factors:

1. The amount and concentration of electrolyte present- An indoor, dry environment will have little or no galvanic corrosion compared to a wet atmosphere.

2. The relative size of the materials- A small amount of anodic material in contact with a large cathodic material will result in greater corrosion. Likewise, a large anode in contact with a small cathode will decrease the rate of attack.

3. The relative position on the Galvanic Series Table - The further apart in the Galvanic Series Table, the greater the potential for corrosion of the anodic material.

Galvanic Series In Sea Water

Anodic End

More Anodic

- Magnesium
- Magnesium Alloys
- **Zinc**
- Beryllium
- Aluminum - Zinc Alloys (7000 series)
- **Aluminum - Magnesium Alloys (5000 series)**
- Aluminum (1000 series)
- Aluminum - Magnesium Alloys (3000 series)
- **Aluminum - Magnesium - Silicon Alloys (6000 series)**
- Cadmium
- Aluminum - Copper Alloys (2000 series)
- Cast Iron, Wrought Iron, **Mild Steel**
- Austenitic Nickel Cast Iron
- Type 410 Stainless Steel (active)
- **Type 316 Stainless Steel (active)**
- **Type 304 Stainless Steel (active)**
- Naval Brass, Yellow Brass, Red Brass
- Tin
- Copper
- Lead-Tin Solders
- Admiralty Brass, Aluminum Brass
- Manganese Bronze
- Silicon Bronze
- Tin Bronze
- Type 410 Stainless Steel (passive)
- Nickel - Silver
- Copper Nickel Alloys
- Lead
- Nickel - Aluminum Bronze
- Silver Solder
- Nickel 200
- Silver
- Type 316 Stainless Steel (passive)
- Type 304 Stainless Steel (passive)
- Incoloy 825
- Hastelloy B
- Titanium
- Hastelloy C
- Platinum
- Graphite

Cathodic End

Corrosion Guide

Chemical	Cable Ladder Material								
	Aluminum			Stainless Type 304			Stainless Type 316		
	Cold	Warm	Hot	Cold	Warm	Hot	Cold	Warm	Hot
Acteone	R	R	R	R	R	R	R	R	R
Aluminum Chloride Solution	NR	NR	NR	NR	--	--	F	--	--
Anhydrous Aluminum Chloride	R	R	R	NR	--	--	F	--	--
Aluminum Sulfate	R	R	R	R	R	R	R	R	R
Ammonium Chloride 10%	F	F	NR	R	R	R	R	R	R
Ammonium Hydroxide	F	F	F	R	R	R	R	R	R
Ammonium Phosphate	F	F	NR	R	--	--	R	--	--
Ammonium Sulfate	F	--	--	R	R	R	R	R	R
Ammonium Thiocyanate	R	R	R	R	--	--	R	R	R
Amyl Acetate	R	R	R	R	R	R	R	R	R
Amyl Alcohol	R	R	R	R	--	--	R	R	R
Arsenic Acid	F	F	F	R	R	--	R	R	R
Barium Chloride	F	F	NR	R	R	R	R	R	R
Barium Sulfate	R	R	R	R	R	--	R	R	--
Barium Sulfide	NR	NR	NR	R	R	--	R	R	--
Benzene	R	R	R	R	R	R	R	R	R
Benzoic Acid	F	F	NR	R	R	R	R	R	R
Boric Acid	R	R	F	R	R	R	R	R	R
Bromine Liquid or Vapor	NR	NR	NR	NR	NR	NR	NR	NR	NR
Butyl Acetate	R	R	R	R	--	--	R	R	R
Butyl Alcohol	R	R	R	R	R	R	R	R	R
Butyric Acid	F	F	F	R	R	R	R	R	R
Calcium Chloride 20%	F	F	NR	R	--	--	R	--	--
Calcium Hydroxide	N	--	--	R	R	F	R	R	R
Calcium Hypochlorite 2 - 3%	F	--	--	R	--	--	R	--	--
Calcium Sulfate	R	R	--	R	R	--	R	R	--
Carbon Monoxide Gas	R	R	R	R	R	R	R	R	R
Carbon Tetrachloride	F	F	NR	F	F	F	R	R	R
Chloroform Dry	R	NR	NR	R	R	--	R	R	--
Chloroform Solution	R	NR	NR	--	--	--	--	--	--
Chromic Acid 10% CP	R	R	--	R	R	F	R	R	R
Citric Acid	F	F	F	R	R	NR	R	R	R
Copper Cyanide	NR	NR	NR	R	R	R	R	R	R
Copper Sulfate 5%	NR	NR	NR	R	R	R	R	R	R
Ethyl Alcohol	R	R	R	R	R	R	R	R	R
Ethylene Glycol	R	R	F	R	R	--	R	R	R
Ferric Chloride	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ferrous Sulfate 10%	R	NR	NR	R	R	--	R	R	--
Formaldehyde 37%	R	R	R	R	R	R	R	R	R
Formic Acid 10%	R	R	--	R	R	NR	R	R	R
Gallic Acid 5%	R	R	NR	R	R	R	R	R	R
Hydrochloride Acid 25%	NR	NR	NR	NR	NR	NR	NR	NR	NR
Hydrofluoric Acid 10%	NR	NR	NR	NR	NR	NR	NR	NR	NR
Hydrogen Peroxide 30%	R	R	R	R	R	R	R	R	R
Hydrogen Sulfide Wet	R	--	--	NR	NR	NR	R	R	R

R = Recommended
F = May be used under some conditions
NR = Not Recommended
-- = Information not available

The corrosion data given in this table is for general comparison only. (Reference Corrosion Resistance Tables, Second Edition)

The presence of contaminates in chemical environments can greatly affect the corrosion rate of any material.

B-Line strongly suggests that field service tests or simulated laboratory tests using actual environmental conditions be conducted in order to determine the proper materials and finishes to be selected.

For questionable environments see Fiberglass Cable Ladder Corrosion Guide (Pages GRP-3 & GRP-4).

Cold = 50 - 80°F Warm = 130 - 170°F Hot = 200 - 212°F

Cable Ladder Selection Process

Corrosion Guide

Chemical	Cable Ladder Material								
	Aluminum			Stainless Type 304			Stainless Type 316		
	Cold	Warm	Hot	Cold	Warm	Hot	Cold	Warm	Hot
Lactic Acid 10%	R	F	NR	R	R	F	R	R	R
Lead Acetate 5%	NR	NR	NR	R	R	R	R	R	R
Magnesium Chloride 1%	NR	NR	NR	R	--	F	R	--	R
Magnesium Hydroxide	R	R	R	R	R	--	R	R	--
Magnesium Nitrate 5%	R	--	--	R	R	R	R	R	R
Nickel Chloride	NR	NR	NR	R	--	--	R	--	--
Nitric Acid 15%	NR	NR	NR	R	R	R	R	R	R
Oleic Acid	R	R	F	R	R	F	R	R	R
Oxalic Acid 10%	R	F	NR	NR	NR	NR	R	R	R
Phenol CP	R	R	R	R	R	R	R	R	R
Phosphoric Acid 50%	NR	NR	NR	R	R	R	R	F	NR
Potassium Bromide 100%	R	F	NR	R	R	--	R	R	R
Potassium Carbonate 100%	F	F	--	R	R	R	R	R	R
Potassium Chloride 5%	R	R	R	R	R	R	R	R	R
Potassium Dichromate	R	R	R	R	R	R	R	R	R
Potassium Hydroxide 50%	NR	NR	NR	R	R	R	R	R	R
Potassium Nitrate 50%	R	R	R	R	R	R	R	R	R
Potassium Sulfate 5%	R	R	R	R	R	R	R	R	R
Propyl Alcohol	R	R	R	R	R	R	R	R	R
Sodium Acetate 20%	R	F	F	R	R	R	R	R	R
Sodium Bisulfate 10%	R	F	F	R	R	R	R	R	R
Sodium Borate	R	F	F	R	R	R	R	R	R
Sodium Carbonate 18%	R	F	F	R	R	R	R	R	R
Sodium Chloride 5%	R	NR	NR	R	R	R	R	R	R
Sodium Hydroxide 50%	NR	NR	NR	R	R	R	R	R	R
Sodium Hypochlorite 5%	R	F	F	F	--	--	R	--	--
Sodium Nitrate 100%	R	R	R	R	R	R	R	R	R
Sodium Nitrite 100%	R	R	R	R	R	R	R	R	R
Sodium Sulfate 100%	R	R	F	R	R	R	R	R	R
Sodium Thiosulfate	R	R	R	R	R	R	R	R	R
Sulfur Dioxide (Dry)	R	R	R	R	R	R	R	R	R
Sulfuric Acid 5%	NR	NR	--	F	NR	NR	R	--	--
Sulfuric Acid 10%	NR	NR	NR	NR	NR	NR	NR	NR	NR
Sulfuric Acid 50%	NR	NR	NR	NR	NR	NR	NR	NR	NR
Sulfuric Acid 75 - 98%	NR	NR	NR	NR	NR	NR	NR	NR	NR
Sulfuric Acid 98 - 100%	NR	NR	--	R	--	--	R	R	F
Tannic Acid 10 & 50%	NR	NR	NR	R	R	R	R	R	R
Tartaric Acid 10 & 50%	F	NR	NR	R	R	R	R	R	R
Vinegar	F	F	F	R	R	R	R	R	R
Zinc Chloride 5 & 20%	F	NR	NR	R	F	NR	R	R	R
Zinc Nitrate	F	NR	NR	R	R	R	R	R	R
Zinc Sulfate	F	NR	NR	R	R	R	R	R	R

R = Recommended
F = May be used under some conditions
NR = Not Recommended
-- = Information not available

The corrosion data given in this table is for general comparison only. (Reference Corrosion Resistance Tables, Second Edition)

The presence of contaminates in chemical environments can greatly affect the corrosion rate of any material.

B-Line strongly suggests that field service tests or simulated laboratory tests using actual environmental conditions be conducted in order to determine the proper materials and finishes to be selected.

For questionable environments see Fiberglass Cable Ladder Corrosion Guide (Pages GRP-3 & GRP-4).

Cold = 50 - 80°F Warm = 130 - 170°F Hot = 200 - 212°F

Thermal Contraction and Expansion

It is important that thermal contraction and expansion be considered when installing cable ladder systems. The length of the straight cable ladder runs and the temperature differential govern the number of expansion splice plates required (see Table 2 below).

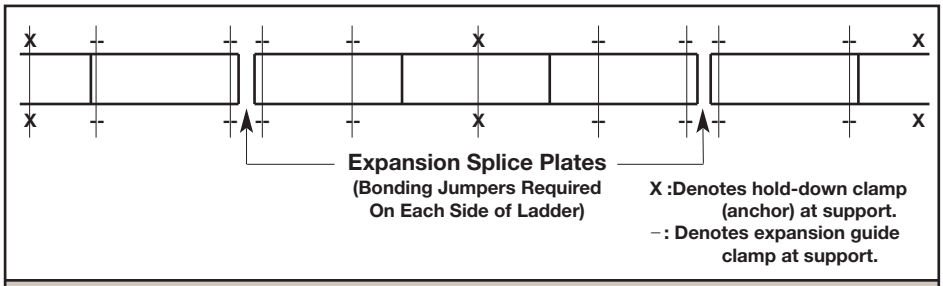
The cable ladder should be anchored at the support nearest to its midpoint between the expansion splice plates and secured by expansion guides at all other support locations (see Figure 1). The cable ladder should be permitted longitudinal movement in both directions from that fixed point. When used, covers should be overlapped at expansion splices.

Accurate gap settings at the time of installation are necessary for the proper operation of the expansion splice plates. The following procedure should assist the installer in determining the correct gap: (see Figure 2)

1. Plot the highest expected metal temperature on the maximum temperature line.
2. Plot the lowest expected metal temperature on the minimum temperature line.
3. Draw a line between the maximum and minimum points.
4. Plot the metal temperature at the time of installation to determine the gap setting.

Refer to page FIB-8 for thermal contraction and expansion of fiberglass cable ladders.

Figure 1



Typical Cable Ladder Installation

Figure 2

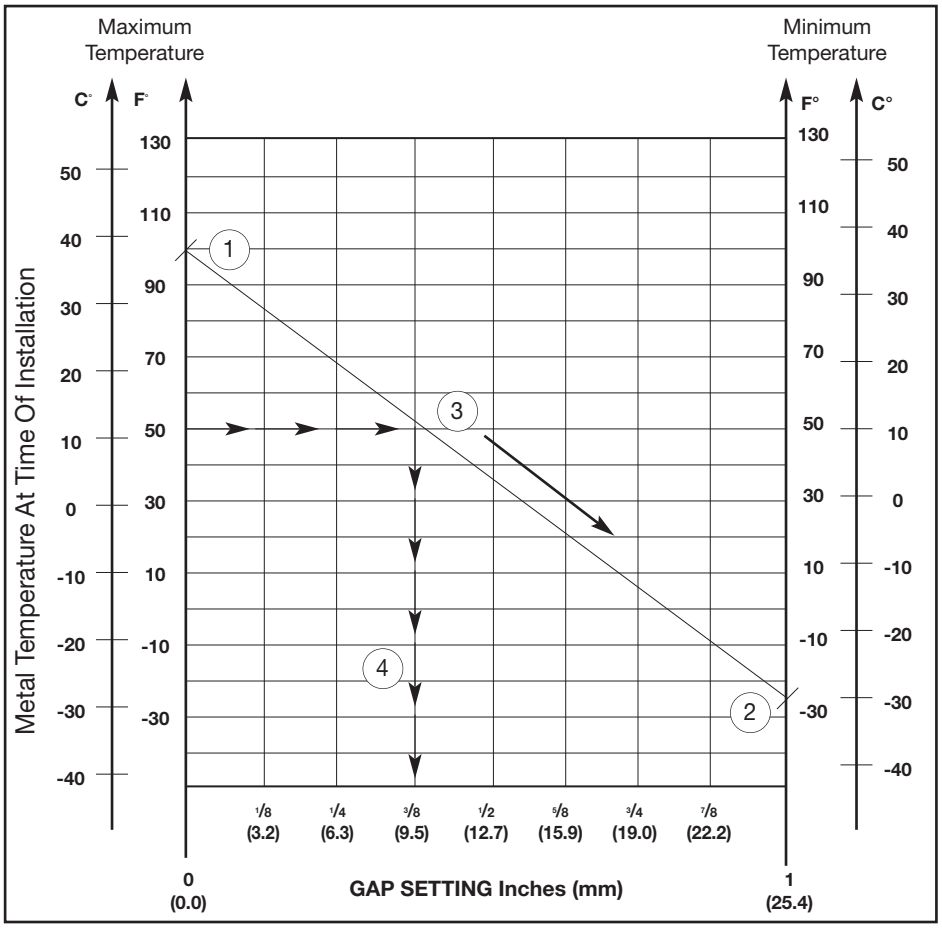


Table 2

Maximum Spacing Between Expansion Joints For 1" Movement									
Temperature Differential		Steel		Aluminum		Stainless Steel 304		Stainless Steel 316	
°F	°C	Feet	m	Feet	m	Feet	m	Feet	m
25	13.9	512	156.0	260	79.2	347	105.7	379	115.5
50	27.8	256	78.0	130	39.6	174	53.0	189	57.6
75	41.7	171	52.1	87	26.5	116	35.4	126	38.4
100	55.6	128	39.0	65	19.8	87	26.5	95	29.0
125	69.4	102	31.1	52	15.8	69	21.0	76	23.2
150	83.3	85	25.9	43	13.1	58	17.7	63	19.2
175	97.2	73	22.2	37	11.3	50	15.2	54	16.4

Note: every pair of expansion splice plates requires two bonding jumpers for grounding continuity.

Installation Considerations

Weight

The weight of an aluminum cable ladder is approximately half that of a comparable steel ladder. Some factors to consider include: shipping costs, material, handling, project weight restrictions and the strength of support members.

Field Modifications

Aluminum cable ladder is easier to cut and drill than steel cable ladder since it is a “softer” material. Similarly, galvanized steel cable ladder is easier to cut and drill than stainless steel cable ladder. B-Line aluminum cable ladder uses a four bolt splice, resulting in half as much drilling and hardware installation as most steel cable ladder, which uses an eight bolt splice. Hot dip galvanized and painted steel cable ladder finishes must be repaired when field cutting or drilling. Failure to repair coatings will impair the cable ladder’s corrosion resistance.

Availability

Aluminum, pre-galvanized, stainless steel and fiberglass cable ladder can normally be shipped from the factory in a short period of time. Hot dip galvanized and painted cable ladder requires an additional coating process, adding several days of preparation before final shipment. Typically, a coated cable ladder will be sent to an outside source for coating, requiring additional packing and shipping.

Electrical Grounding Capacity

The National Electrical Code, Article 392.7 allows cable ladder to be used as an equipment grounding conductor. All B-Line standard steel and aluminum cable ladders are classified by Underwriter’s Laboratories per NEC Table 392.7 based on their cross-sectional area.

The corresponding cross-sectional area for each side rail design (2 side rails) is listed on a fade resistant UV stabilized label (see Figure 3). This cable ladder label is attached to each straight section and fitting that is U.L. classified. U.L. assigned cross-sectional area is also stated in the loading charts in this catalog for each system.

NEMA Installation Guide

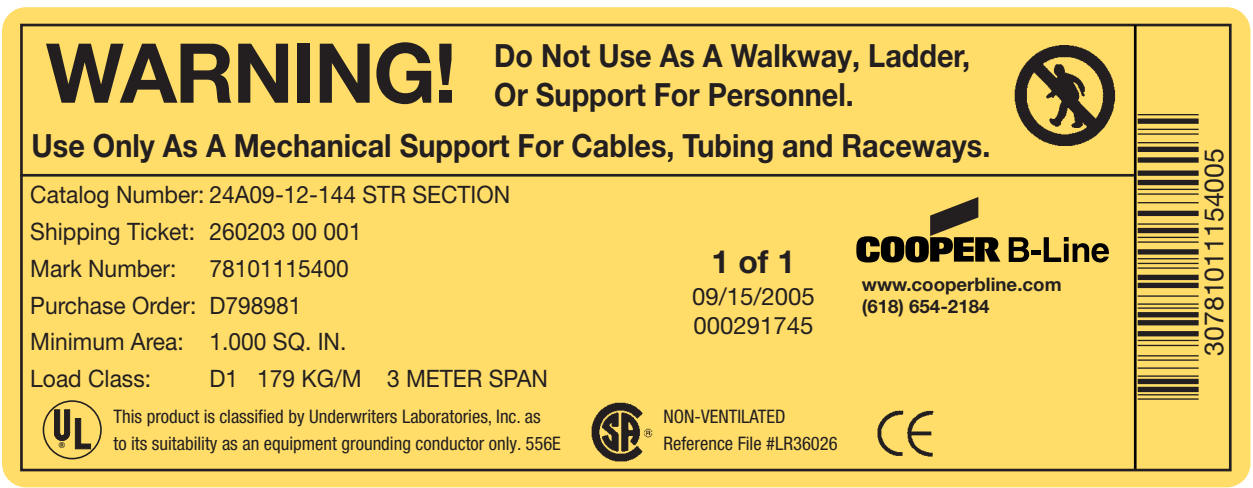
The new NEMA VE 2 is a cable ladder installation guideline and is available from NEMA, CTI or B-Line. For free download see www.cabletrays.com.

Table 392.7(B)(2)
Metal Area Requirements for Cable Ladders Used as Equipment Grounding Conductors

Maximum Fuse Ampere Rating, Circuit Breaker Ampere Trip Setting, or Circuit Breaker Protective Relay Ampere Trip Setting for Ground Fault Protection of any Cable Circuit in the Cable Ladder System	Minimum Cross-Sectional Area of Metal* In Square Inches	
	Steel Cable Ladders	Aluminum Cable Ladders
60	0.20	0.20
100	0.40	0.20
200	0.70	0.20
400	1.00	0.40
600	1.50**	0.40
1000	--	0.60
1200	--	1.00
1600	--	1.50
2000	--	2.00**

For SI units: one square inch = 645 square millimeters.
* Total cross-sectional area of both side rails for ladder or trough-type cable ladders; or the minimum cross-sectional area of metal in channel-type cable ladders or cable ladders of one-piece construction.
** Steel cable ladders shall not be used as equipment grounding conductors for circuits with ground-fault protection above 600 amperes. Aluminum cable ladders shall not be used as equipment grounding conductors for circuits with ground-fault protection above 2000 amperes.
For larger ampere ratings an additional grounding conductor must be used.

Figure 3



Environmental Loads

Wind Loads

Wind loads need to be determined for all outdoor cable ladder installations. Most outdoor cable ladders are ladder type ladders, therefore the most severe loading to be considered is impact pressure normal to the cable ladder side rails (see detail 1).

Detail 1

The impact pressure corresponding to several wind velocities are given below in Table 1.

Table 1
Impact Pressures

V(mph)	P(lbs/ft²)	V(mph)	P(lbs/ft²)
15	0.58	85	18.5
20	1.02	90	20.7
25	1.60	95	23.1
30	2.30	100	25.6
35	3.13	105	28.2
40	4.09	110	30.9
45	5.18	115	33.8
50	6.39	120	36.8
55	7.73	125	40.0
60	9.21	130	43.3
65	10.80	135	46.6
70	12.50	140	50.1
75	14.40	145	53.8
80	16.40	150	57.6

V= Wind Velocity
P= Impact Pressure

Note: These values are for an air density of 0.07651 lbs/ft³ corresponding to a temperature of 60˚ F and barometric pressure of 14.7 lbs/in².

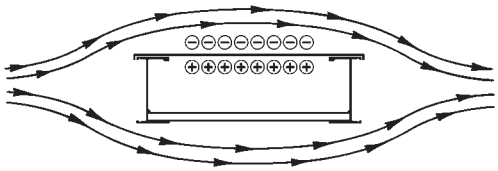
Example Calculation:

Side load for 6" side rail with 100 mph wind

$$\frac{25.6 \times 6}{12} = 12.8 \text{ lbs/ft}$$

When covers are installed on outdoor cable ladders, another factor to be considered is the aerodynamic effect which can produce a lift strong enough to separate a cover from a ladder. Wind moving across a covered ladder (see detail 2) creates a positive pressure inside the ladder and a negative pressure above the cover. This pressure difference can lift the cover off the ladder.

Detail 2



B-Line recommends the use of heavy duty wrap-around cover clamps when covered ladders are installed in an area where strong winds occur.

Special Notice:
Covers on wide cable ladder and/or cable ladder installed at elevations high off the ground may require additional heavy duty clamps or thicker cover material.

Ice Loads

Glaze ice is the most commonly seen form of ice build-up. It is the result of rain or drizzle freezing on impact with an exposed object. Generally, only the top surface (or the cover) and the windward side of a cable ladder system is significantly coated with ice. The maximum design load to be added due to ice should be calculated as follows:

$$L_I = \left(\frac{W \times T_I}{144}\right) \times D_I \text{ where;}$$

L_I= Ice Load (lbs/linear foot)
W= Cable Ladder Width (inches)
T_I= Maximum Ice Thickness (inches)
D_I= Ice Density = 57 lbs/ft³
the maximum ice thickness will vary depending on location. A thickness of 1/2" can be used as a conservative standard.

Example Calculation:
Ice Loads for 24" wide ladder with 1/2" thick ice;

$$\frac{24 \times .5}{144} \times 57 = 4.75 \text{ lbs/ft}$$

Cable Ladder Selection Process

Environmental Loads

Snow Loads

Snow is measured by density and thickness. The density of snow varies almost as much as its thickness. The additional design load from snowfall should be determined using the building codes which apply for each installation.

Seismic Loads

A great deal of seismic testing and evaluation of cable ladder systems, and their supports, has been performed. The conclusions reached from these evaluations is that cable ladder is stronger laterally than vertically, since it acts as a truss in the lateral direction. Other factors that contribute to the stability of cable ladder are the energy dissipating motion of the cables within the ladder, and the high degree of ductility of the cable ladder and the support material.
These factors, working in conjunction with a properly designed cable ladder system, should afford reasonable assurance to withstand even strong motion earthquakes.

When seismic bracing is required for a cable ladder system, it should be applied to the supports and not the cable ladder itself. B-Line's "Seismic Restraints" brochure provides OSHPD approved methods of bracing cable ladder supports using standard B-Line products. Contact B-Line to receive a copy of this brochure.

Concentrated Loads

A concentrated static load represents a static weight applied at a single point between the side rails. Tap boxes, conduit attachments and long cable drops are just some of the many types of concentrated loads. When so specified, these concentrated static loads may be converted to an equivalent, uniform load (We) by using the following formula:

$$We = \frac{2 \times (\text{concentrated Static Load})}{\text{span length}}$$

B-Line's cable ladder side rails, rungs and bottoms will withstand a 200 lb. static load without collapse (series 14 excluded)*. However, it should be noted that per NEMA Standard Publication VE1 cable ladder is designed as a support for power or control cables, or both, and is not intended or designed to be a walkway for personnel. Each section of B-Line Cable Ladder has a label stating the following message:

Warning! Not to be used as a walkway, ladder or support for personnel. To be used only as a mechanical support for cables and raceway.

Support Span

The strength of a cable ladder is largely determined by the strength of its side rails. The strength of a cable ladder side rail is proportionate to the distance between the supports on which it is installed, commonly referred to as the "support span". Therefore, the strength of a cable ladder system can be altered by changing the support span. However, there is a limit to how much the strength of a cable ladder system can be increased by reducing the support span, because the strength of the cable ladder bottom members could become the determining factor of strength.

Once the load requirement of a cable ladder system has been established, the following factors should be considered:

1. Sometimes the location of existing structural beams will dictate the cable ladder support span. This is typical with outdoor installations where adding intermediate supports could be financially prohibitive. For this situation the appropriate cable ladder must be selected to accommodate the existing span.

2. When cable ladder supports are randomly located, the added cost of a higher strength cable ladder system should be compared to the cost of additional supports. Typically, adding supports is more costly than installing a stronger series of cable ladder. The stronger cable ladder series (e.g. from 75 lbs./ft. on 20' span to 100 lbs./ft. on 20' span) will increase the price of the cable ladder system minimally, possibly less than $1/ft., with little or no additional labor cost for installation.
   Alternately, one extra support may cost $100.00 (material and labor) for a simple trapeze. Future cable additions or the capability of supporting equipment, raceways for example, also favor stronger cable ladder systems. ***In summary, upgrading to a stronger cable ladder series is typically more cost-effective than using the recommended additional supports for a lighter duty cable ladder series.***

3. The support span lengths should be equal to or less than unspliced straight section lengths, to ensure that no more than one splice is placed between supports as stated in the NEMA VE 2 Cable Ladder Installation Guideline.

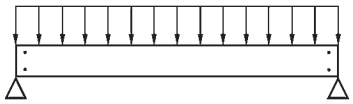
Deflection

Deflection in a cable ladder system is primarily an aesthetic consideration. When a cable ladder system is installed in a prominent location, a maximum simple beam deflection of 1/200 of support span can be used as a guideline to minimize visual deflection.

It is important at this point to mention that there are two typical beam configurations, simple beam and continuous beam, and to clarify the difference.

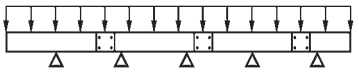
A good example of a simple beam is a single straight section of cable ladder supported, but not fastened at either end. When the ladder is loaded the cable ladder is allowed to flex. Simple beam analysis is used almost universally for beam comparisons even though it is seldom practical in the field installations. The three most prominent reasons for using a simple beam analysis are: calculations are simplified; it represents the worst case loading; and testing is simple and reliable. The published load data in the B-Line cable ladder catalog is based on the simple beam analysis per NEMA & CSA Standards.

Simple Beam



Continuous beam is the beam configuration most commonly used in cable ladder installations. An example of this configuration is where cable ladders are installed across several supports to form a number of spans. The continuous beam possesses traits of both the simple and fixed beams. When equal loads are applied to all spans simultaneously, the counterbalancing effect of the loads on both sides of a support restricts the movement of the cable ladder at the support. The effect is similar to that of a fixed beam. The end spans behave substantially like simple beams. When cable ladders of identical design are compared, the continuous beam installation will typically have approximately half the deflection of a simple beam of the same span. Therefore simple beam data should be used only as a general comparison. The following factors should be considered when addressing cable ladder deflection:

Continuous Beam

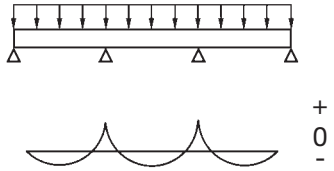


1. Economic consideration must be considered when addressing cable deflection criteria.
2. Deflection in a cable ladder system can be reduced by decreasing the support span, or by using a taller or stronger cable ladder.
3. When comparing cable ladders of equivalent strength, a steel cable ladder will typically exhibit less deflection than an aluminum cable ladder since the modulus of elasticity of steel is nearly three times that of aluminum.
4. The location of splices in a continuous span will affect the deflection of the cable ladder system. The splices should be located at points of minimum stress whenever practical. NEMA Standards VE 1 limits the use of splice plates as follows:

Unspliced straight sections should be used on all simple spans and on end spans of continuous span runs. Straight section lengths should be equal to or greater than the span length to ensure not more than one splice between supports.

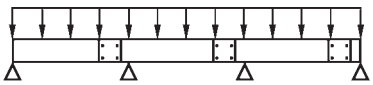
See the figures below for splicing configuration samples.

Typical Continuous Span Configuration

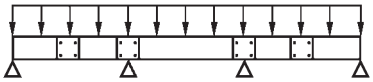


+ Maximum Positive Moment
- Maximum Negative Moment

Preferred Splice Plate Locations



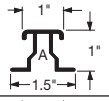
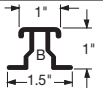
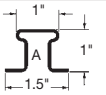
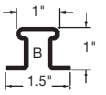
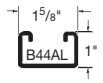
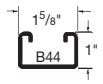
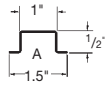
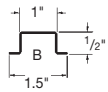
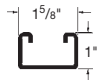
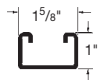
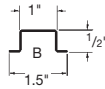
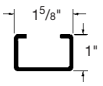
Undesirable Splice Plate Locations



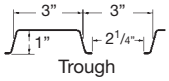
Cable Ladder Selection Process

Load Capacity

Ladder Type Rungs

Rung Type	Design Factors	Material Type	Single Rung Uniform Load Capacity (in Lbs.) with safety factor of 1.5						
			Ladder Width						
			6	9	12	18	24	30	36
	Ix = .0361 in.⁴ Sx = .0707 in.³	Aluminum				766	575		
	Ix = .0432 in.⁴ Sx = .0877 in.³	Aluminum						594	495
	Ix = .0249 in.⁴ Sx = .0528 in.³	Steel	2912	1941	1456	971	728		
	Ix = .0312 in.⁴ Sx = .0661 in.³	Steel						749	624
	Ix = .0450 in.⁴ Sx = .0787 in.³	Aluminum Strut Rung	3328	2219	1664	1109	832	666	555
	Ix = .0445 in.⁴ Sx = .0782 in.³	Steel Strut Rung	5172	3448	2586	1724	1293	1034	862
	Ix = .0039 in.⁴ Sx = .0134 in.³	Steel Series 1	981	654	491	327	245		
	Ix = .0047 in.⁴ Sx = .0164 in.³	Steel Series 1						230	192
	Ix = .0353 in.⁴ Sx = .0708 in.³	Aluminum Marine Rung	2996	1997	1498	999	749	599	499
	Ix = .0347 in.⁴ Sx = .0685 in.³	Steel Marine Rung	4530	3020	2265	1510	1133	906	755
	Ix = .0047 in.⁴ Sx = .0164 in.³	Steel Series 1 Slotted Rung	1104	736	552	368	276	221	184
	Ix = .0304 in.⁴ Sx = .4810 in.³	Steel Heavy Duty Slotted Rung	2784	1856	1392	928	696	557	464

Corrugated Bottoms (Ventilated and Solid)

Bottom Type	Design Factors	Material Type	Single Rung Load Capacity (in Lbs.) with safety factor of 1.5						
			Ladder Width						
			6	9	12	18	24	30	36
	Ix = .0455 in.⁴ Sx = .0898 in.³	Aluminum	3141	2029	1491	970	726	660	594

Load Capacity

Calculate each anticipated load factor, then add them to obtain a total load. (Example: Working Load = Cable + Concentrated + Wind + Snow + Ice Loads). The Working Load should be used, along with the maximum support spacing, to select a span/load class designation from Table 3. Table 4 (page CLS-15) contains the most common load/span class designations per the US and Canadian metallic cable ladder standard, CSA, C22.2 No. 126.1-98 First Addition, NEMA VE 1-1998.

Table 3 - These Loading Classes Are Historical and Supplied For Reference Only

Load Class		Class Designations for lengths of									
lb/ft	kg/m	ft 8	m (2.4)	ft 10	m (3.0)	ft 12	m (3.7)	ft 16	m (4.9)	ft 20	m (6.0)
25	37	––		A		––		––		––	
45	67	––		––		––		––		D	
50	74	8A		––		12A		16A		20A	
65	97	––		C		––		––		––	
75	112	8B		––		12B		16B		E or 20B	
100	149	8C		––		12C		16C		20C	
120	179	––		D		––		––		––	
200	299	––		E		––		––		––	

Note: 8A/B/C, 12A/B/C, 16A/B/C, and 20A/B/C were the traditional NEMA designations. A, C, D, and E were the conventional CSA designations. Actual tested loadings per span will be stated on the product labels.

Cable Ladder Selection Process

Table 4 - B-Line Cable Ladder Load Classes

Aluminum Copper free								Steel HDGAF/Pre-Galvanized							
Series	Load Depth	Load lb/ft	Load (kg/m)	Span ft	Span (m)	Former Classes NEMA	Former Classes CSA	Series	Load Depth	Load lb/ft	Load (kg/m)	Span ft	Span (m)	Former Classes NEMA	Former Classes CSA
RSI04A	2.68	75	(112)	12	(3.7)	12B	C (3m)	148*	3	51	(76)	12	(3.7)	12A	C_1 (3m)
24A	3	126	(187)	12	(3.7)	12C	D_1 (3m)	248*	3	103	(153)	12	(3.7)	12C	D_1 (3m)
34A	3	80	(119)	20	(6.1)	20B	E (6m)	346*	3	63	(94)	20	(6.1)	20A	D_1 (6m)
RSI05A	3.66	83	(123)	12	(3.7)	12B	C (3m)	444*	3	91	(135)	20	(6.1)	20B	E (3m)
25A	4	50	(74)	20	(6.1)	16B	D_1 (6m)	156*	4	76	(113)	12	(3.7)	12B	C_1 (3m)
35A	4	121	(180)	16	(4.9)	20B	E (3m)	258*	4	109	(162)	12	(3.7)	12C	D_1 (3m)
RSI06A	4.64	82	(121)	12	(3.7)	12C	D_1 (3m)	356*	4	69	(103)	20	(6.1)	16C	D_1 (6m)
26A	5	51	(76)	20	(6.1)	20A	D_1 (6m)	358*	4	62	(92)	20	(6.1)	20A	D_1 (6m)
36A	5	84	(125)	20	(6.1)	20B	E (6m)	454*	4	106	(158)	20	(6.1)	20C	E (6m)
46A	5	103	(153)	20	(6.1)	20C	E (6m)	166*	5	77	(115)	12	(3.7)	12B	C_1 (3m)
H46A	5	167	(248)	20	(6.1)	167# @ 20'	131 kg/m (7.6m)	268*	5	110	(164)	12	(3.7)	12C	D_1 (3m)
RSI07A	5.63	122	(182)	12	(3.7)	12C	D_1 (3m)	368†	5	59	(88)	20	(6.1)	20A	D_1 (3m)
37A	6	80	(119)	20	(6.1)	20B		366*	5	75	(112)	20	(6.1)	20B	E (6m)
47A	6	100	(149)	20	(6.1)	20C		464*†	5	123	(183)	20	(6.1)	119# @ 20'	E (6m)
H47A	6	149	(222)	20	(6.1)	149# @ 20'		176*	6	86	(128)	12	(3.7)	12B	137 kg/m (3.7m)
57A	6	102	(152)	30	(9.1)	102# @ 30'	152 kg/m (9.1m)	378*	6	51	(76)	20	(6.1)	20A	D_1 (3m)
S8A	6	161	(240)	30	(9.1)	161# @ 30'	240 kg/m (9.1m)	476*	6	77	(115)	20	(6.1)	20B	D_1 (6m)
								574*	6	130	(193)	20	(6.1)	117# @ 20'	E (6m)
								348†	3	125	(186)	12	(3.7)	12C	C_1 (3m)
								358†	4	62	(92)	20	(6.1)	20A	89 kg/m (6.1m)
								FT1.5X12	1½	11	(16)	8	(2.4)		
								FT2X2	2	20	(30)	8	(2.4)		
								FT2X4	2	27	(40)	8	(2.4)		
								FT2X6	2	27	(40)	8	(2.4)		
Fiberglass								FT2X8	2	27	(40)	8	(2.4)		
								FT2X12	2	27	(40)	8	(2.4)		
13F	2	145	(216)	8	(2.4)	8C		FT2X16	2	27	(40)	8	(2.4)		
24F	3	156	(232)	12	(3.7)			FT2X18	2	27	(40)	8	(2.4)		
36F	5	88	(131)	20	(6.1)			FT2X20	2	27	(40)	8	(2.4)		
46F	5	141	(210)	20	(6.1)			FT2X24	2	27	(40)	8	(2.4)		
H46F	5	152	(226)	20	(6.1)			FT2X30	2	27	(40)	8	(2.4)		
48F	7	125	(187)	20	(6.1)			FT2X36	2	27	(40)	8	(2.4)		
								FT4X4	4	36	(53)	8	(2.4)		
								FT4X6	4	46	(68)	8	(2.4)		
								FT4X8	4	47	(70)	8	(2.4)		
								FT4X12	4	47	(70)	8	(2.4)		
								FT4X16	4	47	(70)	8	(2.4)		
								FT4X18	4	47	(70)	8	(2.4)		
								FT4X20	4	47	(70)	8	(2.4)		
								FT4X24	4	50	(74)	8	(2.4)	8A	
								FT4X30	4	50	(74)	8	(2.4)	8A	
								FT6X8	6	43	(64)	8	(2.4)	8A	
								FT6X12	6	48	(71)	8	(2.4)	8A	
								FT6X16	6	50	(74)	8	(2.4)	8A	
								FT6X18	6	50	(74)	8	(2.4)	8A	
								FT6X20	6	55	(82)	8	(2.4)	8A	
								FT6X24	6	60	(89)	8	(2.4)	8A	

* G denotes CSA Type 1 (HDGAF) or P denotes CSA Type 2 (Mill-Galvanized) † SS4 (Type 304 Stainless) or SS6 (Type 316 Stainless)

Cable Data

The cable load is simply the total weight of all the cables to be placed in the ladder. This load should be expressed in lbs/ft.
The data on this page provides average weights for common cable sizes.

Multiconductor Cable Type TC, 600V with XHHW Conductors, Copper

Size	3 conductors with ground			4 conductors with ground		
	Diameter in.	Area in.²	Weight lbs/ft	Diameter in.	Area in.²	Weight lbs/ft
8	0.66	0.34	0.33	0.72	0.41	0.42
6	0.74	0.43	0.45	0.81	0.52	0.58
4	0.88	0.61	0.66	0.96	0.72	0.84
2	1.00	0.79	0.96	1.10	0.95	1.20
1	1.13	1.00	1.17	1.25	1.23	1.55
1/0	1.22	1.17	1.43	1.35	1.43	1.84
2/0	1.31	1.35	1.72	1.45	1.65	2.20
3/0	1.42	1.58	2.14	1.58	1.96	2.80
4/0	1.55		2.64	1.77		3.46
250	1.76		3.18	1.93		4.04
350	1.98		4.29	2.18		5.48
500	2.26		5.94	2.50		7.64
750	2.71		9.01	3.12		11.40
1000	3.10		11.70			

Multiconductor Cable Type MC, 600V with XHHW Conductors, Copper

Size	3 conductors with ground						4 conductors with ground					
	Diameter (in.)		Area (in.²)		Weight (lbs/ft)		Diameter (in.)		Area (in.²)		Weight (lbs/ft)	
	Without Jacket	With Jacket	Without Jacket	With Jacket	Alum. Armor	Steel Armor	Without Jacket	With Jacket	Without Jacket	With Jacket	Alum. Armor	Steel Armor
8	0.70	0.80	0.38	0.50	0.41	0.57	0.76	0.86	0.45	0.58	0.51	0.68
6	0.78	0.88	0.48	0.61	0.55	0.74	0.85	0.95	0.57	0.71	0.69	0.87
4	0.89	0.99	0.62	0.77	0.74	0.95	0.97	1.07	0.74	0.90	0.93	1.15
2	1.01	1.12	0.80	0.99	1.08	1.32	1.10	1.22	0.95	1.17	1.29	1.56
1	1.16	1.27	1.06	1.27	1.38	1.63	1.25	1.36	1.23	1.45	1.61	1.91
1/0	1.23	1.34	1.19	1.41	1.56	1.86	1.35	1.46	1.43	1.67	1.94	2.27
2/0	1.32	1.43	1.37	1.61	1.85	2.20	1.46	1.56	1.67	1.91	2.36	2.72
3/0	1.46	1.57	1.67	1.94	2.35	2.67	1.58	1.71	1.96	2.30	2.94	3.33
4/0	1.56	1.68			2.82	3.21	1.75	1.88			3.64	3.97
250	1.74	1.86			3.31	3.94	1.92	2.04			4.21	4.64
350	1.96	2.10			4.48	4.97	2.16	2.30			5.71	6.12
500	2.24	2.37			6.08	6.58	2.47	2.63			7.91	8.39
750	2.68	2.84			8.96	9.70	3.03	3.22			11.48	12.17

Single Conductor Cable 600V

Size	XHHW			THHN, THWN			TW, THW			USE, RHH, RHW		
	Diameter in.	Area in.²	Weight lbs/ft	Diameter in.	Area in.²	Weight lbs/ft	Diameter in.	Area in.²	Weight lbs/ft	Diameter in.	Area in.²	Weight lbs/ft
1/0	0.48		0.37	0.50		0.37	0.53		0.39	0.53		0.39
2/0	0.52		0.46	0.54		0.46	0.57		0.48	0.57		0.49
3/0	0.58		0.57	0.60		0.57	0.62		0.60	0.63		0.60
4/0	0.63		0.71	0.66		0.71	0.68		0.74	0.68		0.75
250	0.70	0.38	0.85	0.72	0.41	0.85	0.75	0.44	0.88	0.76	0.45	0.89
300	0.75	0.44	1.02	0.77	0.47	1.02	0.81	0.52	1.04	0.81	0.52	1.05
350	0.80	0.50	1.17	0.83	0.54	1.17	0.86	0.58	1.21	0.86	0.58	1.22
400	0.85	0.57	1.33	0.87	0.59	1.33	0.90	0.64	1.37	0.91	0.65	1.38
500	0.93	0.68	1.64	0.96	0.72	1.64	0.98	0.75	1.69	0.99	0.77	1.70
600	1.04	0.85	2.03	1.06	0.88	2.01	1.09	0.93	2.03	1.10	0.95	2.07
750	1.14	1.02	2.24	1.17	1.08	2.48	1.19	1.11	2.51	1.20	1.13	2.55
1000	1.29		2.52	1.32		3.30	1.34		3.31	1.35		3.33

Cable Ladder Selection Process

Allowable Cable Fill

The following guidelines are based on the 2002 National Electrical Code, Article 392.

I) Number of Multiconductor Cables rated 2000 volts or less in the Cable Ladder

(1) 4/0 or Larger Cables

The ladder cable ladder must have an inside available width equal to or greater than the sum of the diameters (Sd) of the cables, which must be installed in a single layer. When using solid bottom cable ladder, the sum of the cable diameters is not to exceed 90% of the available cable ladder width.

Example: Cable Ladder width is obtained as follows:

List Cable Sizes	(D) List Cable Outside Diameter	(N) List Number of Cables	Multiply (D) x (N) = Subtotal of the Sum of the Cable Diameters
3/C - #500 kcmil	2.26 inches	1	2.26 inches
3/C - #250 kcmil	1.76 inches	2	3.52 inches
3/C - #4/0 AWG	1.55 inches	4	6.20 inches

The sum of the diameters (Sd) of all cables = 2.26 + 3.52 + 6.20 = 11.98 inches; therefore a cable ladder with an available width of at least 12 inches is required.

(2) Cables Smaller Than 4/0

The total sum of the cross-sectional areas of all the cables to be installed in the cable ladder must be equal to or less than the allowable cable area for the ladder width, as indicated in Table 5. When using solid bottom cable ladder, the allowable cable area is reduced by 22%.

Table 5

Inside Width of Cable Ladder inches	Allowable Cable Area square inches
6	7.0
9	10.5
12	14.0
18	21.0
24	28.0

Example: The cable ladder width is obtained as follows:

List Cable Sizes	(A) List Cable Cross Sectional Areas	(N) List Number of Cables	Multiply (A) x (N) + Total of the Cross-Sectional Area for each Size
3/C - #12 AWG	0.167 sq. in.	10	1.67 sq. in.
4/C - #12 AWG	0.190 sq. in.	8	1.52 sq. in.
3/C - # 6 AWG	0.430 sq. in.	6	2.58 sq. in.
3/C - # 2 AWG	0.800 sq. in.	9	7.20 sq. in.

The sum of the total areas is 1.67 + 1.52 + 2.58 + 7.20 = 12.97 inches.
Using Table 4, a 12-inch wide ladder with an allowable cable area of 14 sq. inches should be used.

Note: Increasing the cable ladder loading depth does not permit an increase in allowable cable area for power and lighting cables. The maximum allowable cable area for all cable ladder with a 3 inch or greater loading depth is limited to the allowable cable area for a 3 inch loading depth.

continued on CLS-18

Allowable Cable Fill

(3) 4/0 or Larger Cables Installed with Cables Smaller than 4/0

The ladder cable ladder needs to be divided into two zones (a barrier or divider is not required but one can be used if desired) so that the No. 4/0 and larger cables have a dedicated zone, as they are to be placed in a single layer.

A direct method to determine the correct cable ladder width is to figure the cable ladder widths required for each of the cable combinations per steps (2) & (3).
Then add the widths in order to select the proper cable ladder width.

Example: The cable ladder width is obtained as follows:

Part A- Width required for #4/0 AWG and larger multiconductor cables

List Cable Size	(D) List Cable Outside Diameter	(N) List Number of Cables	Multiply (D) x (N) = Subtotal of the Sum of the Cable Diameters (Sd)
3/C - #500 kcmil	2.26 inches	1	2.26 inches
3/C - #4/0 AGW	1.55 inches	2	3.10 inches

Cable ladder width (inches) required for large cables = 2.26 + 3.10 = 5.36 inches.

Part B- Width required for multiconductor cables smaller than #4/0 AWG

List Cable Sizes	(A) List Cable Cross Sectional Areas	(N) List Number of Cables	Multiply (A) x (N) = Total of the Cross-Sectional Area for each Size
3/C - #12 AWG	0.167 sq. in.	10	1.67 sq. in.
3/C - #6 AWG	0.430 sq. in.	8	3.44 sq. in.
3/C - #2 AWG	0.800 sq. in.	2	1.60 sq. in.

The sum of the total areas (inches) = 1.67 + 3.44 + 1.60 = 6.71 sq. inches.
From Table 5 (page 241), the cable ladder width required for small cables is 6 inches.

The total cable ladder width (inches) = 5.36 + 6.00 = 11.36 inches. A 12-inch wide cable ladder is required.

(4) Multiconductor Control and/or Signal Cables Only

A ladder cable ladder containing only control and/or signal cables, may have 50% of its total available cable area filled with cable. When using solid bottom cable ladder pans, the allowable cable area is reduced from 50% to 40%.

Example: Cable ladder width is obtained as follows:

2/C- #16 AWG instrumentation cable cross sectional area = 0.04 sq. in.
Total cross sectional area for 300 Cables = 12.00 sq. in.
Minimum available cable area needed = 12.00 x 2 = 24.00 sq. in.; therefore the cable ladder width required for 4 inch available loading depth ladder = 24.00/4 = 6 inches.

Cable Ladder Selection Process

Allowable Cable Fill

II) Number of Single Conductor Cables Rated 2000 Volts or Less in the Cable Ladder

All single conductor cables to be installed in the cable ladder must be 1/0 or larger, and are not to be installed with continuous bottom pans.

(1) 1000 KCMIL or Larger Cables

The sum of the diameters (Sd) for all single conductor cables to be installed shall not exceed the cable ladder width. See Table 6.

Table 6

Inside Width of Cable Ladder inches	Allowable Cable Area square inches
6	6.50
9	9.50
12	13.00
18	19.50
24	26.00
30	32.50
36	39.00

(2) 250 KCMIL to 1000 KCMIL Cables

The total sum of the cross-sectional areas of all the single conductor cables to be installed in the cable ladder must be equal to or less than the allowable cable area for the ladder width, as indicated in Table 6 (above). (Reference Table 8, page CLS-20)

(3) 1000 KCMIL or Larger Cables Installed with Cables Smaller Than 1000 KCMIL

The total sum of the cross-sectional areas of all the single conductor cables to be installed in the cable ladder must be equal to or less than the allowable cable area for the ladder width, as indicated in Table 7.

Table 7

Inside Width of Cable Ladder inches	Allowable Cable Area square inches
6	6.50 - (1.1 Sd)
9	9.50 - (1.1 Sd)
12	13.00 - (1.1 Sd)
18	19.50 - (1.1 Sd)
24	26.00 - (1.1 Sd)
30	32.50 - (1.1 Sd)
36	39.00 - (1.1 Sd)

Allowable Cable Fill

(4) Single Conductor Cables 1/0 through 4/0

These single conductors must be installed in a single layer. See Table 8.

Note: It is the opinion of some that this practice may cause problems with unbalanced voltages. To avoid these potential problems, the individual conductors for this type of cable ladder wiring system should be bundled with ties. The bundle should contain all of the three-phase conductors for the circuit, plus the neutral if used. The single conductor cables bundle should be firmly tied to the cable ladder assembly at least every 6 feet.

Table 8

Number of 600 Volt Single Conductor Cables That May Be Installed in Ladder Cable Ladder

Single Conductor Size	Outside Diameter in.	Area sq. in.	Cable Ladder Width 6 in.	9 in.	12 in.	18 in.	24 in.
1/0	0.58	-	10	15	20	31	41
2/0	0.62	-	9	14	19	29	38
3/0	0.68	-	8	13	17	26	35
4/0	0.73	-	8	12	16	24	32
250 Kcmil	0.84	.55	11	18	24	35	47
350 Kcmil	0.94	.69	9	14	19	28	38
500 Kcmil	1.07	.90	7	11	14	22	29
750 Kcmil	1.28	1.29	5	8	10	15	20
1000 Kcmil	1.45	-	4	6	8	12	16

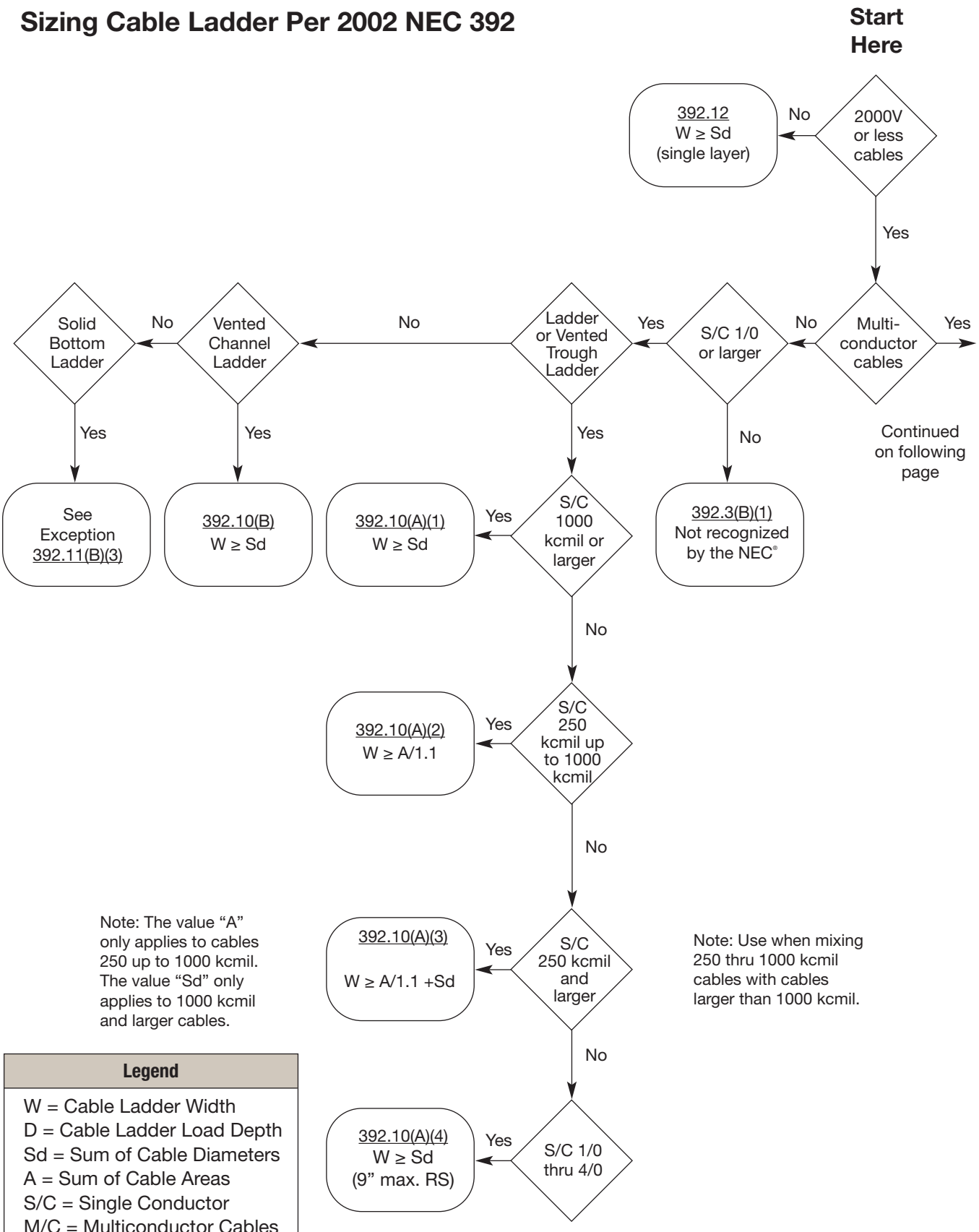
Cable diameters used are those for Oknite-Okolon 600 volt single conductor power cables.

III) Number of Type MV and MC Cables Rated 2001 Volts or Over in the Cable Ladder

The sum of the diameters (Sd) of all cables, rated 2001 volts or over, is not to exceed the cable ladder width.

Cable Ladder Selection Process

Sizing Cable Ladder Per 2002 NEC 392



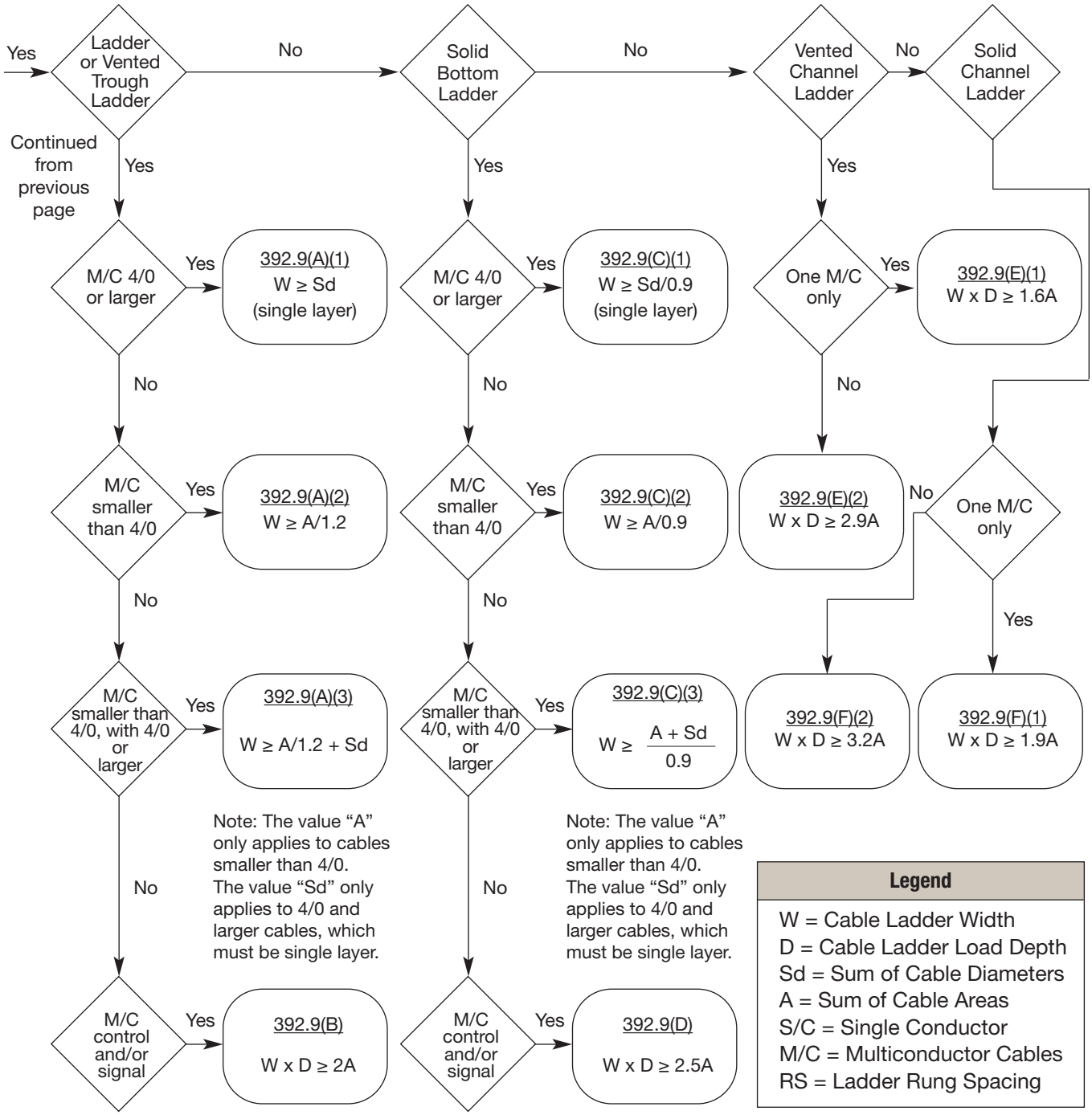
Note: The value "A" only applies to cables 250 up to 1000 kcmil. The value "Sd" only applies to 1000 kcmil and larger cables.

Note: Use when mixing 250 thru 1000 kcmil cables with cables larger than 1000 kcmil.

Legend

W = Cable Ladder Width
D = Cable Ladder Load Depth
Sd = Sum of Cable Diameters
A = Sum of Cable Areas
S/C = Single Conductor
M/C = Multiconductor Cables
RS = Ladder Rung Spacing

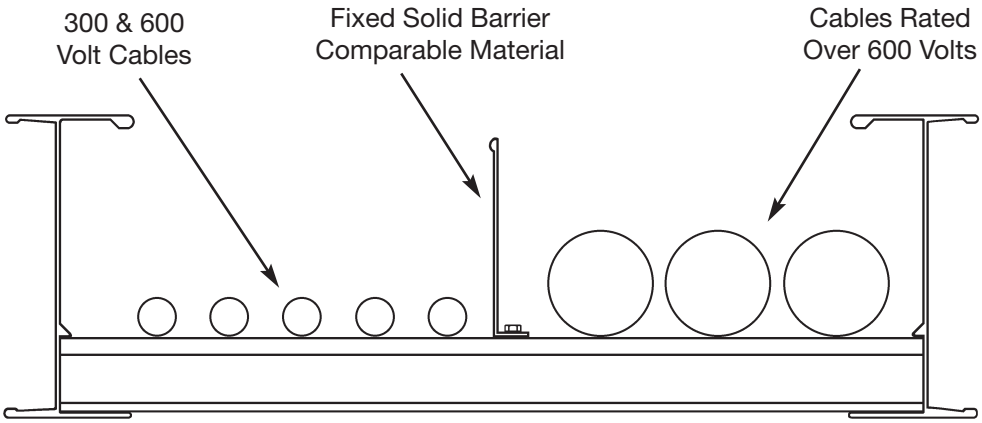
Note: See National Electrical Code for additional information regarding cable ampacity and hazardous (classified) location requirements which might affect the cable ladder sizing flow chart.



Cable Ladder Selection Process

Barrier Requirements

Barrier strips are used to separate cable systems, such as when cables above and below 600 volts per NEC 392.6(F) are installed in the same cable ladder. However, when MC type cables rated over 600 volts are installed in the same cable ladder with cables rated 600 volts or less, no barriers are required. The barriers should be made of the same material type as the cable ladder. When ordering the barrier, the height must match the ***loading depth*** of the cable ladder into which it is being installed.



Future Expansion Requirements

One of the many features of cable ladder is the ease of adding cables to an existing system. Future expansion should always be considered when selecting a cable ladder, and allowance should be made for additional ***fill area*** and ***load capacity***. A minimum of 50% expansion allowance is recommended.

Space Limitations

Any obstacles which could interfere with a cable ladder installation should be considered when selecting a cable ladder width and height. Adequate clearances should be allowed for installation of supports and for cable accessibility.
Note: The overall cable ladder dimensions typically exceed the nominal ladder width and loading depth.

Lengths Available

The current Cable Ladder Standard, NEMA VE 1 and C22.2 No. 126.1-98, lists typical lengths as 3000 mm (10 ft), 3660 mm (12 ft), 6000 mm (20 ft), and 7320 mm (24 ft). It is impractical to manufacture either lighter systems in the longer lengths or heavier systems in the shorter lengths. For that reason, B-Line has introduced a primary and secondary length for each system. These straight section lengths were selected to direct the user to lengths that best suit support span demands and practical loading requirements. The primary length is the one that is the most appropriate for the strength of the system and that will provide the fastest service levels. The secondary lengths will be made available to service additional requirements. Special lengths are available with extended lead times.

For additional information please review the information contained on the B-Line website at www.cooperbline.com/me

Support Span

Per the NEMA VE 2, the support span on which a cable ladder is installed should not exceed the length of the unspliced straight section. Thus installations with support spans greater than 12 feet should use 240" (20 feet) or 288" (24 feet) cable ladder lengths.

Space Limitations

Consideration should be given to the space available for moving the cable ladder from delivery to it's final installation location. Obviously, shorter cable ladder allows for more maneuverability in tight spaces.

Installation

Shorter cable ladder lengths are typically easier to maneuver on the job site during installation. Two people may be needed to manipulate longer cable ladder sections, while shorter sections might be handled by one person. Although longer cable ladder lengths are more difficult to maneuver, they can reduce installation time due to the fact that there are fewer splice connections. This trade-off should be evaluated for each set of job site restrictions.

Cable Ladder Selection Process

Power Application:

Power application can create the heaviest loading. The heaviest cable combination found was for large diameter cables (i.e. steel armor, 600V, 4 conductor 750 kcmil). The cables weigh less than 3.8 lbs. per inch width of cable ladder. As power cables are installed in a single layer, the width of the cable affects the possible loading.

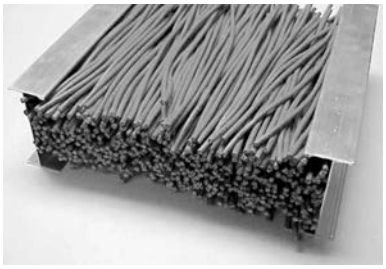
36" Wide	30" Wide	24" Wide	18" Wide	12" Wide	9" Wide	6" Wide
140 lbs/ft	115 lbs/ft	90 lbs/ft	70 lbs/ft	45 lbs/ft	35 lbs/ft	23 lbs/ft

Data/Communication Cabling:

Low voltage cables can be stacked as there is no heat generation problems. The NEC employs a calculation of the total cross sectional area of the cables not exceeding 50% of the fill area of the cable ladder. As the cable fill area of the cable ladder system affects the possible loading, both the loading depth and width of the systems must be considered. For this example 4UTP category 5 cable (O.D. = .21, .026 lbs./ft.) were used.

Calculated Cable Weight in Lbs/Ft

	36" Wide	30" Wide	24" Wide	18" Wide	12" Wide	9" Wide	6" Wide
6" Fill	81	64	52	41	27	20	14
5" Fill	68	53	43	34	23	17	12
4" Fill	54	43	35	27	18	13	9
3" Fill	41	32	26	21	14	10	7



The picture shows a 12" cable ladder with a 3" load depth. The ladder contains 520 4 UTP Category 5 cables with a .21" diameter.

The National Electrical Code allows for 50% fill of ventilated and ladder cable ladder for control or signal wiring (Article 392.9(B)). ANSI/EIA/TIA 569-A Section 4.5* also requires that the fill ratio of cable ladder is not to exceed 50%.

Calculation Example:
Ladder Area = 12 in. x 3 in. = 36 sq. in.
50% Fill = 36 sq. in. x .5 = 18 sq. in.
Cable Area = $(.21 \text{ in.})^2$ x 3.14/4 = .0346 sq. in.
Number of Cables = 18 sq. in. / .0346 sq. in. = 520 cables

*Section 4.5 is currently under review.

Other Factors To Consider

- **Support Span -** The distance between the supports affects the loading capabilities exponentially. To calculate loading values not cataloged use:

$W_1 L_1^2 = W_2 L^2_2$
W_1 - tested loading
L_1 - span in feet, a tested span
W_2 - loading in question
L_2 - known span for new loading

- **Other Loads -** Ice, wind, snow for outdoor systems see page 26 and 27 for information. A 200 lb. concentrated load for industrial systems. The affect of a concentrated load can be calculated as follows

$$\frac{2 \times (\text{concentrated static load})}{\text{span in feet}}$$

When considering concentrated loads the rung strength should be considered.

- **Length Of The Straight Sections:**
The VE 2, Cable Ladder Installation Guide, states that the support span shall not be greater than the straight section length. If a 20C system is manufactured in 12 foot sections the greatest span for supports would be 12 feet. This dramatically affects the loading of the system.

$W_1 L_1^2 = W_2 L^2_2$
$100 (20^2) = W_2 (12^2)$
$40{,}000 = 144 W_2$
$W_2 = 277$ lbs. per foot

Type of Cable

According to NEC Article 392, multiconductor ladder cable may be installed in any standard cable ladder bottom type. According to the 2005 NEC Article 392.11(8)(3), single conductor ladder cable may be installed in any standard cable ladder bottom type. Solid bottom cable ladders are not allowed to be installed in Class II, Division 2 locations (2002 NEC Section 502.4(B)). In general, small, highly flexible cables should be installed in solid bottom, vented bottom or 6" rung spacing ladder type cable ladders. Sensitive cables (e.g. fiberoptic) are typically installed in flat, solid bottom cable ladders, instead of corrugated trough bottoms. Larger, less flexible cables are typically installed in ladder type cable ladders having 9" or 12" rung spacing. Ladder type cable ladders having 18" rung spacing should be used for large, stiff cables to reduce cost and facilitate cable drop-outs.

Cost vs Strength

Often more than one bottom type is acceptable. In this case the economic difference should be considered. Ladder cable ladders have a lower cost than either non-ventilated or ventilated bottom configurations. Typically, the cost of ladder type cable ladder decreases as rung spacing increases. However, the effect of rung spacing on load capacity for ladder type cable ladders with 18" rung spacing should be evaluated, since NEMA published load capacities are based on 12" rung spacing. Rung spacing can affect individual rung and side rail loading as well as system load capacity. Rung loads applied during cable installation should also be considered.
(See page CLS-13 for B-Line rung load capacities)

Cable Exposure

Ladder cables are manufactured to withstand the environment without additional protection, favoring the use of the ladder type cable ladder. Some areas may benefit from the limited exposure of solid or vented bottom cable ladder. Solid Bottom metal cable ladder with solid metal covers can be utilized in other spaces used for environmental air to support non plenum rated ladder cables (2002 NEC® 300.22(C)(1))

Cable Attachment

The major advantage of ladder type cable ladder is the freedom of entry and exit of the cables. Another advantage of ladder type cable ladder is the ability to secure cables in the cable ladder. With standard rungs the cables may be attached with either cable ties or cable clamps. The ladder type cable ladder is also available with special purpose, slotted marine or strut rungs to facilitate banding or clamping cables. Cable attachment is particularly important on vertical runs or when the ladder is installed on its side. Ladder rung spacing should be chosen to provide adequate cable attachment points while allowing the cables to exit the system.

Cable Ladder Selection - Fitting Radius

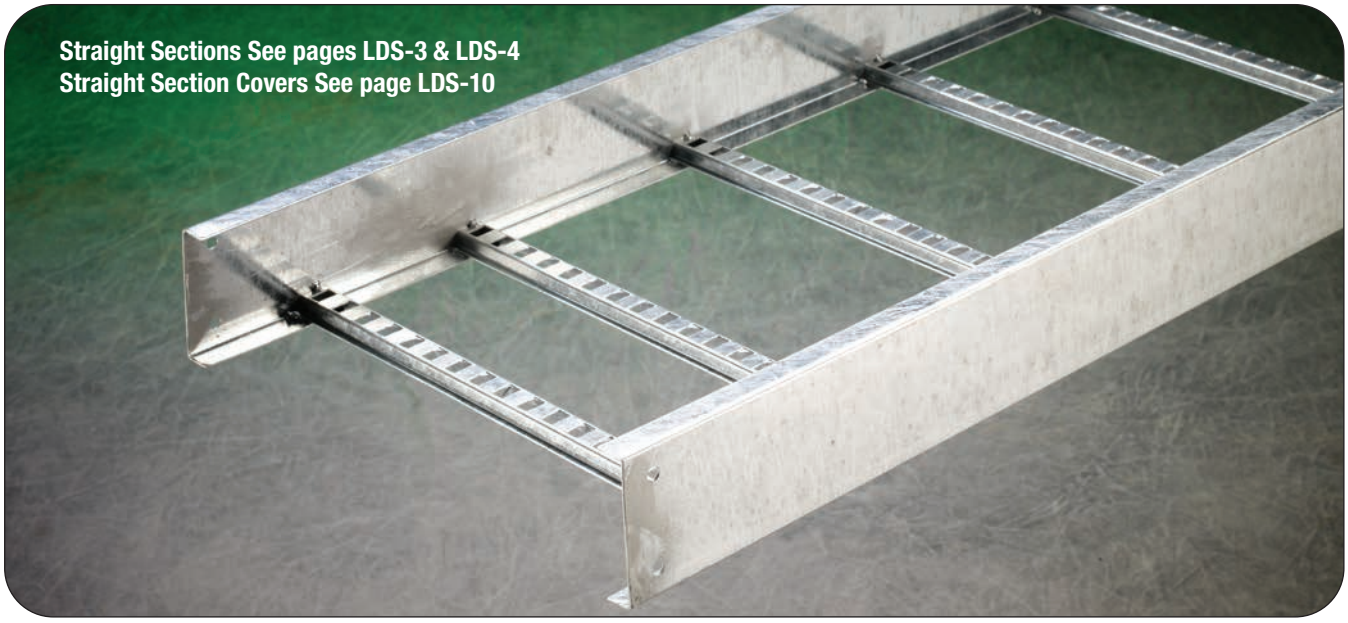
Cable Flexibility

The proper bend radius for cable ladder fittings is usually determined by the bend radius and stiffness of the ladder cables to be installed. Typically, the ladder cable manufacturer will recommend a minimum bend allowance for each cable. The fitting radius should be equal to or larger than the minimum bend radius of the largest cable which may ever be installed in the system. When several cables are to be installed in the same cable ladder, a larger bend radius may be desirable to ease cable installation.

Space Limitations

The overall dimensions for a cable ladder fitting will increase as the bend radius increases. Size and cost make the smallest acceptable fitting radius most desirable. When large radius fittings are required, the system layout must be designed to allow adequate space.

Series 1 Steel Cable Ladder



Straight Sections See pages LDS-3 & LDS-4
Straight Section Covers See page LDS-10

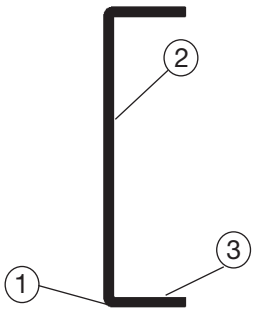
Accessories
See pages LDS-5 - LDS-9

Fittings See pages LDS-11 - LDS-17
Fitting Covers See page LDS-10

Steel Cable Ladder, Series 1

Side Rails

B-Line C-Shape Side Rail - designed for lighter loads

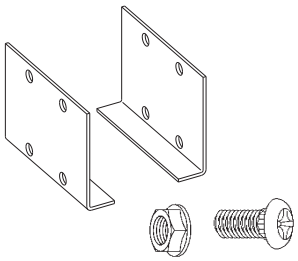


1. **Roll formed for extra strength**
2. **Structural grade traceable steel**
3. **Positive Rung Support**

Side rails and rungs are stamped every 18" with:

- **Company Name**
- **Part Number**
- **Material**
- **Heat Trace Number**

Splices -- providing system integrity



Splices -- the engineered connection:
- High strength twelve gauge steel
- Four bolt connection to maintain strength and save labor
- Finish and hardware options

Hot Dip Galvanized After Fabrication (HDGAF) -- providing system integrity

- ASTM A123/CSA Type I
- In plant post-dip inspection and deburr
- ASTM F-1136-88 Grade 3 Splice hardware exceeds NEMA requirements.
- ASTM A123 Covers available - system compatibility

Pre-Galvanized- Hot Dip Mill Galvanized -- providing system integrity

- ASTM A653SS Gr.33 G90/ CSA Type II
- Anti-corrosive silicon bronze welds eliminate cosmetic painting

Reliable time-tested products
- 200 lb. Concentrated Load- side rail and rungs
- Splice integrity - 3" fitting tangents

Series 1 Steel Cable Ladder

3" (76mm) NEMA VE 1 Loading Depth - Series 148
Actual Side Rail Height - 3.625" (92mm)

4" (101mm) NEMA VE 1 Loading Depth - Series 156
Actual Side Rail Height - 4.188" (106mm)

5" (127mm) NEMA VE 1 Loading Depth - Series 166
Actual Side Rail Height - 5.188" (132mm)

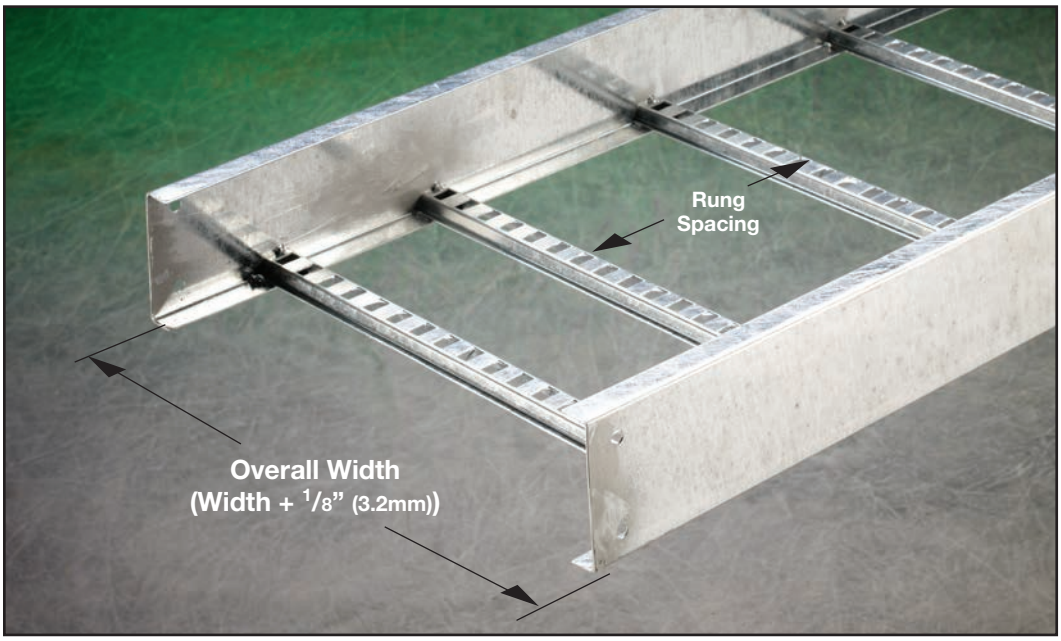
6" (152mm) NEMA VE 1 Loading Depth - Series 166
Actual Side Rail Height - 6.188" (158mm)

Straight Section Part Numbering

Example: **156 P 09 SL - 24 - 144**

Series	Material	Rung Spacing	Rung Type	Width	Length
148	**P** = Pre-Galvanized Steel	**Ladder** **06** = 6" (152) **09** = 9" (228) **12** = 12" (305)	**SL** - Slotted	**06** = 6" (152) **09** = 9" (228) **12** = 12" (305) **18** = 18" (457) **24** = 24" (609) **30** = 30" (762) **36** = 36" (914)	①**144** = 12 ft. (3.7m) ②120 = 10 ft. (3.0m)
156	**G** = Hot Dip Galvanized After Fabrication Steel				
166		**Trough** **04** = Ventilated Bottom **SB** = Non-Ventilated Bottom			
176					

①Primary Length.
②Secondary Length.

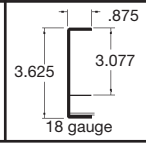


Dimensions in parentheses are in millimeters unless otherwise specified.

Dimensional & Loading Information

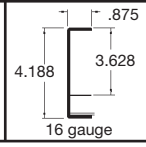
Values are based on simple beam tests per NEMA VE 1 on 36" (914mm) wide cable ladder with rungs spaced on 12" (305mm) centers. The published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply the published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable ladder being installed. When ladders are used in continuous spans, the deflection of the ladder is reduced by as much as 50%.

Series 148 - 3" (76mm) Loading Depth

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
148		NEMA: 12A, 8C	6	1.8	204*	304*	0.0011	0.019	Area=0.51 in²	Area=3.29 cm²
		CSA: C1-3m	8	2.4	115	171	0.0036	0.061	Sx=0.48 in³	Sx=7.87 cm³
		UL Cross-Sectional	10	3.0	73	109	0.0087	0.149	Ix=0.89 in⁴	Ix=37.04 cm⁴
		Area: 0.40 in²	12	3.7	51	76	0.0181	0.309		

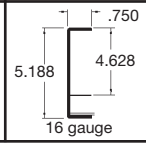
*When using 12" (305mm) rung spacing load capacity is limited to 195 lbs/ft (290.16 kg/m) for 36" (914mm) ladder width.

Series 156 - 4" (101mm) Loading Depth

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
156		NEMA: 12B, 8C	6	1.8	304*	452*	0.0007	0.011	Area=0.68 in²	Area=4.39 cm²
		CSA: C1-3m	8	2.4	171	254	0.0021	0.036	Sx=0.724 in³	Sx=11.86 cm³
		UL Cross-Sectional	10	3.0	109	163	0.0051	0.087	Ix=1.517 in⁴	Ix=63.14 cm⁴
		Area: 0.40 in²	12	3.7	76	113	0.0110	0.181		

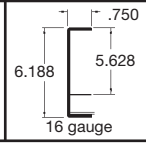
Cable ladder will support without collapse a 200 lb. (90.7 kg) concentrated load over and above the published loads.
*When using 12" (305mm) rung spacing, load capacity is limited to 234 lbs/ft (348.192 kg/m) for 30" (762mm) ladder width and 195 lbs/ft (290.16 kg/m) for 36" (914mm) ladder width.

Series 166 - 5" (127mm) Loading Depth

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
166		NEMA: 12B, 8C	6	1.8	308*	458*	0.0004	0.007	Area=0.77 in²	Area=4.97 cm²
		CSA: C1-3m	8	2.4	173	258	0.0013	0.033	Sx=0.93 in³	Sx=15.24 cm³
		UL Cross-Sectional	10	3.0	111	165	0.0032	0.055	Ix=2.40 in⁴	Ix=99.90 cm⁴
		Area: 0.70 in²	12	3.7	77	115	0.0067	0.114		

Cable ladder will support without collapse a 200 lb. (90.7 kg) concentrated load over and above the published loads.
*When using 12" (305mm) rung spacing, load capacity is limited to 234 lbs/ft (348.192 kg/m) for 30" (762mm) ladder width and 195 lbs/ft (290.16 kg/m) for 36" (914mm) ladder width.

Series 176 - 6" (152mm) Loading Depth

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
176		NEMA: 12B, 8C	8	2.4	194	288	0.0008	0.014	Area=0.89 in²	Area=5.74 cm²
		CSA: C1-3m	10	3.0	124	184	0.0020	0.035	Sx=1.23 in³	Sx=20.16 cm³
		UL Cross-Sectional	12	3.7	86	128	0.0042	0.072	Ix=3.80 in⁴	Ix=158.20 cm⁴
		Area: 0.70 in²								

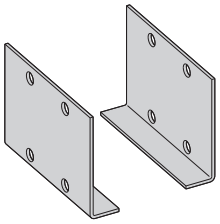
Cable ladder will support without collapse a 200 lb. (90.7 kg) concentrated load over and above the published loads.

Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

Series 1 Steel Cable Ladder

Standard (L-Shaped) Splice Plates

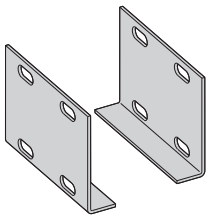
- One pair including hardware provided with each ladder section.
- Furnished in pairs with hardware.
- Prepackaged in pairs in a plastic bag, with hardware.
- 4-hole pattern L-shaped splice plates.
- L-shaped lay-in design.
- (*) Insert ZN or G



Ladder Series	Catalog No.
148	**9(*)-4004**
156	**9(*)-4005**
166	**9(*)-4006**
176	**9(*)-4007**

Expansion (L-Shaped) Splice Plates

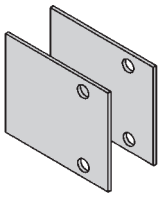
- Expansion plates allow for one inch expansion or contraction of the cable ladder, or where expansion joints occur in the supporting structure.
- **Bonding Jumpers are required. Part # 99-N1. Order Separately.**
- L-shaped lay-in design.
- Furnished in pairs with hardware.
- (*) Insert ZN or G



Ladder Series	Catalog No.
148	**9(*)-4014**
156	**9(*)-4015**
166	**9(*)-4016**
176	**9(*)-4017**

Universal Splice Plates

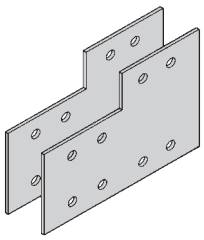
- Used to splice to existing cable ladder systems.
- Furnished in pairs with hardware.
- (*) Insert P or G



Ladder Series	Catalog No.
148	**9(*)-2004-1/2**
156	**9(*)-2005-1/2**
166	**9(*)-2006-1/2**
176	**9(*)-2007-1/2**

Step Down Splice Plates

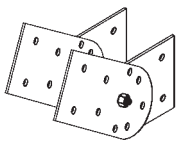
- These splice plates are offered for connecting cable ladder sections having side rails of different heights.
- Furnished in pairs with hardware.
- (*) Insert ZN or G



Ladder Series	Catalog No.
156 to 148	**9(*)-8004**
166 to 156 or 148	**9(*)-8045**
176 to 156 or 148	**9(*)-8046**
176 to 166	**9(*)-8060**

Vertical Adjustable Splice Plates

- These plates provide for changes in elevation that do not conform to standard vertical fittings.
- Furnished in pairs with hardware.
- (*) Insert ZN or G



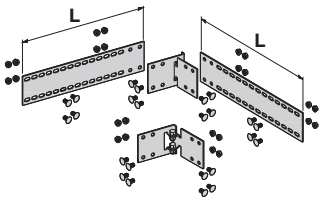
Requires supports within 24” on both sides, per NEMA VE 2.

Ladder Series	Catalog No.
148	**9(*)-7024**
156	**9(*)-8024**
166	**9(*)-8025**
176	**9(*)-8026**

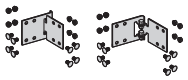
Horizontal Adjustable Splice Plates

- Offered to adjust a cable ladder run for changes in direction in a horizontal plane that do not conform to standard horizontal fittings.
- Furnished in pairs with hardware.
- New design bonding jumpers **not** required.
- (*) Insert ZN or G
- (X) Insert 4 for series 148 or 156
  5 for series 166
  6 for series 176

9(*)-803(X)-12 or 9(*)-803(X)-36
One pair splice plates with extensions.



9(*)-803(X)
Splices only

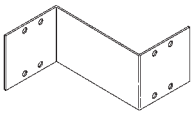


Catalog No.	Ladder End Cut	Ladder Width	'L'
9(*)-803(X)	Mitered	Thru 36" (914)	N/A
9(*)-803(X)-12	Not mitered	Thru 12" (305)	16" (406)
9(*)-803(X)-36	Not mitered	Thru 36" (914)	41" (1041)

Requires supports within 24” (609mm) on both sides, per NEMA VE 2.

Offset Reducing Splice Plate

- This plate is used for joining cable ladders having different widths. When used in pairs they form a straight reduction; when used with a standard splice plate they form an offset reduction.
- Furnished as one plate with hardware.
- (‡) Insert reduction
- (*) Insert P or G



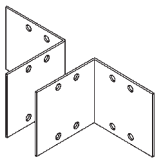
Ladder Series	Catalog No.
148	**9(*)-8064-(‡)**
156	**9(*)-8064-(‡)**
166	**9(*)-8065-(‡)**
176	**9(*)-8066-(‡)**

One offset reducing splice plate and one standard splice plate

Two offset reducing splice plates

Ladder to Box Splice Plates

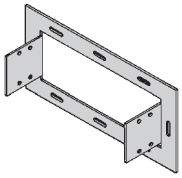
- Used to attach the end of a cable ladder run to a distribution box or control panel.
- Furnished in pairs with hardware.
- (*) Insert P or G



Ladder Series	Catalog No.
148	**9(*)-8054**
156	**9(*)-8054**
166	**9(*)-8055**
176	**9(*)-8056**

Frame Type Box Connector

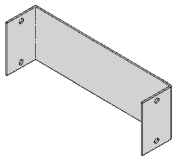
- Designed to attach the end of a cable ladder run to a distribution cabinet or control center to help reinforce the box at the point of entry.
- Furnished with ladder connection hardware.
- (‡) Insert ladder width
- (*) Insert P or G



Ladder Series	Catalog No.
148	**9(*)-8074-(‡)**
156	**9(*)-8074-(‡)**
166	**9(*)-8075-(‡)**
176	**9(*)-8076-(‡)**

Blind End

- This plate forms a closure for a dead end cable ladder.
- Furnished as one plate with hardware.
- (‡) Insert ladder width
- (*) Insert P or G



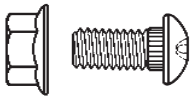
Ladder Series	Catalog No.
148	**9(*)-8084-(‡)**
156	**9(*)-8084-(‡)**
166	**9(*)-8085-(‡)**
176	**9(*)-8086-(‡)**

Ladder Hardware

Pre-Galvanized Ladder Hardware

Catalog No. **RNCB 3/8"-16 x 3/4" ZNPLT**
Ribbed Neck Carriage Bolt ASTM A307 Grade A

Catalog No. **SFHN 3/8"-16 ZNPLT**
Serrated Flange Hex Nut ASTM A563 Grade A



Finish: Zinc Plated ASTM B633, SC1

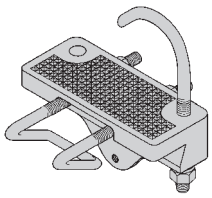
Hot Dip Galvanized Ladder Hardware

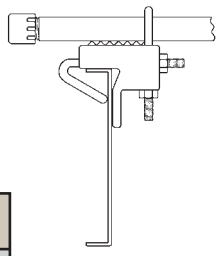
Catalog No. **RNCB 3/8"-16 x 3/4" CZ** Ribbed Neck Carriage Bolt Chromium Zinc ASTM F-1136-88

Catalog No. **SFHN 3/8"-16 CZ** Serrated Flange Hex Nut Chromium Zinc ASTM F-1136-88

Conduit to Ladder Adaptor

- For easy attachment of conduit terminating at a cable ladder.
- Use on aluminum or steel cable ladders.





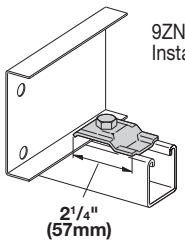
Catalog No.	Conduit Size in.	Conduit Size mm
9G-1158-1/2, 3/4	1/2, 3/4	15, 20
9G-1158-1, 1 1/4	1, 1 1/4	25, 32
9G-1158-1 1/2, 2	1 1/2, 2	40, 50
9G-1158-2 1/2, 3	2 1/2, 3	65, 80
9G-1158-3 1/2, 4	3 1/2, 4	90, 100

Dimensions in parentheses are in millimeters unless otherwise specified.

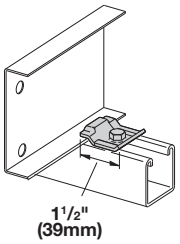
Series 1 Steel Cable Ladder

Cable Ladder Clamp/Guide

- Features a no-twist design.
- Has four times the strength of the traditional design.
- Each side is labeled to ensure proper installation.
- Furnished in pairs, with or without hardware.



9ZN-1208 shown.
Installed as a clamp.



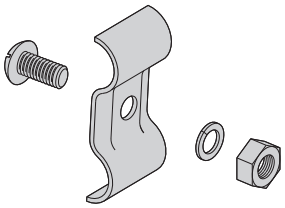
9ZN-1204 shown.
Installed as a guide.

Patent # RE35479

Catalog No.		Overall Length		Hardware Size	Finish
Without Hardware	With Hardware	in.	mm		
9ZN-1204	9ZN-1204NB	1½	38	¼"	ZNPLT
9ZN-1208	9ZN-1208NB	2¼	57	⅜"	ZNPLT

Ground Clamp

- Mechanically attaches grounding cables to cable ladder.
- Hardware included.
- (*) Insert ZN or SS4

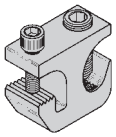


Catalog No.	Cable Size
9(*)-2351	#1 thru 2/0
9(*)-2352	3/0 thru 250 MCM

Grounding Clamp

B-Line Cable Ladder is UL® classified as to its suitability as an equipment grounding conductor. If a separate conductor for additional grounding capability is desired, B-Line offers this clamp for bolting the conductor at least once to each ladder section.

- Accepts #6 AWG to 250 MCM.

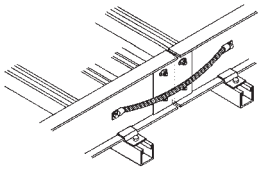


Catalog No.	Material	Item
9A-2130	Tin Plated Aluminum	Grounding Clamp

Bonding Jumper

Use at each expansion splice and where the cable ladder is not mechanically/electrically continuous to ground.
Sold individually.

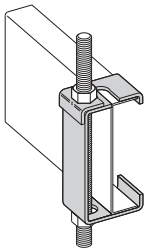
- Hardware included.
- See table 392.7(B)(2) on page CLS-9 for amperage ratings required to match the UL cross-sectional area of the ladder.
- 600 amp rating.
- Bonding jumper is 16" (406) long.



Catalog No.	Cross-Sectional Area	Ampacity
99-N1	0.40 Square inches	600

Hanger Rod Clamp

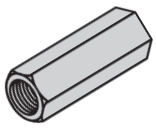
- For ½" ATR.
- Furnished in pairs.
- Order ATR and hex nuts separately.
- Two piece "J"-hanger design.
- 9ZN-1113 has 275 lbs. (1.22kN)/pair safety factor 3 capacity.
- 9ZN-532(X) has 1500 lbs. (6.67kN)/pair capacity safety factor 3.

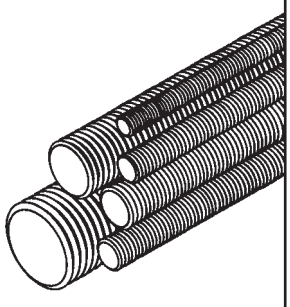


Ladder Series	Catalog No.
148	9ZN-1113
156	9ZN-5324
166	9ZN-5325
176	9ZN-5326

Threaded Rod (ATR) & Rod Coupling

Loading based on safety factor 5.
Standard Finish: Zinc plated

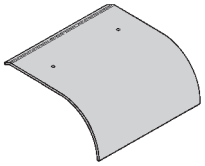


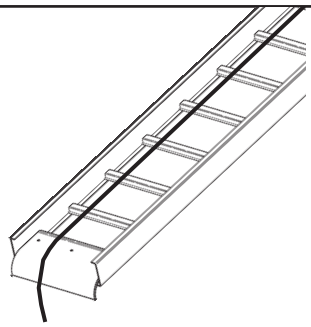


Size	Loading lbs. (kN)	Catalog No.	Available Lengths	Coupling Cat. No.
⅜-16	730 (3.24)	ATR ⅜ x Length	36" (914), 72" (1829), 120" (3048), 144" (3657)	B655-⅜
½-13	1350 (6.00)	ATR ½ x Length	36" (914), 72" (1829), 120" (3048), 144" (3657)	B655-½

Ladder Drop-Out

- This specially designed, easy to install drop-out provides a 4" (101.6 mm) radius to protect cables exiting the cable ladder from damage.
- Attaches to a ladder rung.
- Hardware included.
- (*) Insert P or G
- (‡) Insert ladder width



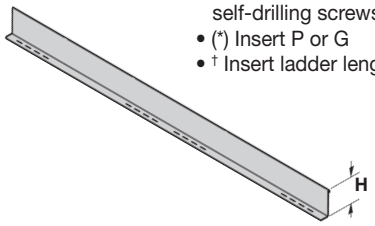


Catalog No.	9(*)-1104T-(‡)

Barriers

Straight Section

- Standard length: 120" (3m) 144" (12 ft.).
- Order catalog number based on loading depth.
- Furnished with four #10 x 1/2" plated self-drilling screws and a 99-9982 splice.
- (*) Insert P or G
- † Insert ladder length of 120 or 144

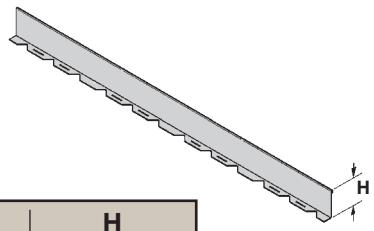


Ladder Series	Catalog No.	H in.	H mm
148	72(*)-Length†	2.8	58
156	737(*)-Length†	3.4	70
166	747(*)-Length†	4.4	91
176	757(*)-Length†	5.4	112

Length =
144 for 12'
or
120 for 10'

Horizontal Bend

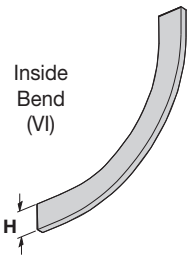
- Horizontal Bend Barriers are flexible in order to conform to any horizontal fitting radius. Cut to length.
- Order catalog number based on loading depth.
- Furnished with three #10 x 1/2" zinc plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- Standard length is 72" (1828mm) (6 ft.), sold individually.
- (*) Insert P or G

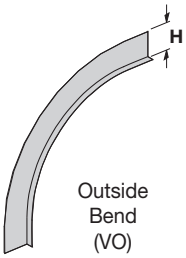


Ladder Series	Catalog No.	H in.	H mm
148	72(*)-90HBFL	2.8	58
156	737(*)-90HBFL	3.4	70
166	747(*)-90HBFL	4.4	91
176	757(*)-90HBFL	5.4	112

Vertical Bend Barriers

- Vertical Bend Barriers are preformed to conform to a specific vertical fitting.
- Furnished with three #10 x 1/2" plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- (*) Insert P or G
- (**) Insert 30, 45, 60 or 90 for degrees
- (†) Insert 12 or 24 for radius

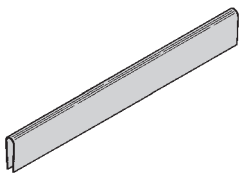


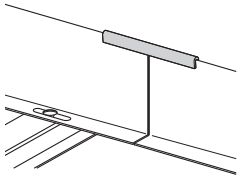


Ladder Series	Catalog No. Inside Bend	Catalog No. Outside Bend	H in.	H mm
148	72(*)-(**)VI(†)	72(*)-(**)VO(†)	2.8	58
156	737(*)-(**)VI(†)	737(*)-(**)VO(†)	3.4	70
166	747(*)-(**)VI(†)	747(*)-(**)VO(†)	4.4	91
176	757(*)-(**)VI(†)	757(*)-(**)VO(†)	5.4	112

Barrier Strip Splice

- Plastic splice holds adjoining barrier strips in straight alignment.





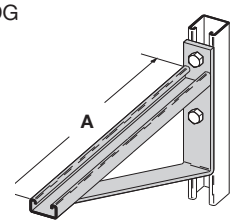
Catalog No.	99-9982

Dimensions in parentheses are in millimeters unless otherwise specified.

Series 1 Steel Cable Ladder

Cantilever Bracket

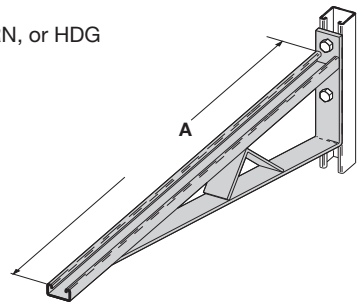
- Finishes available: ZN, GRN, or HDG
- Safety Load Factor 2.5



Catalog No.	Uniform Load lbs	Uniform Load kN	Ladder Width in.	Ladder Width mm	'A' in.	'A' mm
B494-12	1580	7.02	6 & 9	152 & 229	12	305
B494-18	1000	4.45	12	305	18	457
B494-24	996	4.43	18	457	24	610

Cantilever Bracket

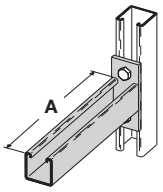
- Finishes available: ZN, GRN, or HDG
- Safety Load Factor 2.5



Catalog No.	Uniform Load lbs	Uniform Load kN	Ladder Width in.	Ladder Width mm	'A' in.	'A' mm
B494-30	924	4.11	24	610	30	762
B494-36	864	3.84	30	762	36	914
B494-42	580	2.58	36	914	42	1067

Cantilever Bracket

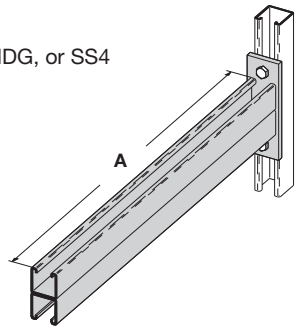
- Finishes available: ZN, GRN, HDG, SS4. or SS6
- Safety Load Factor 2.5



Catalog No.	Uniform Load lbs	Uniform Load kN	Ladder Width in.	Ladder Width mm	'A' in.	'A' mm
B409-12	960	4.27	6 & 9	152 & 229	12	305
B409-18	640	2.84	12	305	18	457
B409-24	480	2.13	18	457	24	610

Cantilever Bracket

- Finishes available: ZN, GRN, HDG, or SS4
- Safety Load Factor 2.5



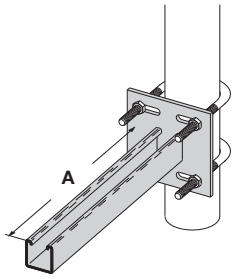
Catalog No.	Uniform Load lbs	Uniform Load kN	Ladder Width in.	Ladder Width mm	'A' in.	'A' mm
B297-30	665	2.95	24	610	30	762
B297-36	550	2.44	30	762	36	914
B297-42	465	2.06	36	914	42	1067

Underfloor Support (U-Bolts not included)

- Finish available: ZN
- Safety Load Factor 2.5.

U-Bolt Size	Fits Pipe O.D.
B501-3/4	.841 - 1.050
B501-1	1.051 - 1.315
B501-1 1/4	1.316 - 1.660
B501-1 1/2	1.661 - 1.900
B501-2	1.901 - 2.375
B501-2 1/2	2.376 - 2.875

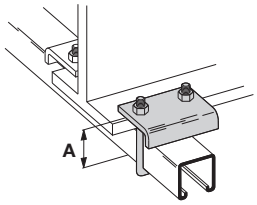
- Order properly sized U-Bolts separately.



Catalog No.	Uniform Load lbs	Uniform Load kN	Ladder Width in.	Ladder Width mm	'A' in.	'A' mm
B409UF-12	800	3.55	6 & 9	152 & 229	12	305
B409UF-21	450	2.00	12 & 18	305 & 457	21	533

Beam Clamp

- Finishes available: ZN or HDG
- Sold in pieces with hardware.
- Design load when used in pairs. Safety Load Factor 5.0



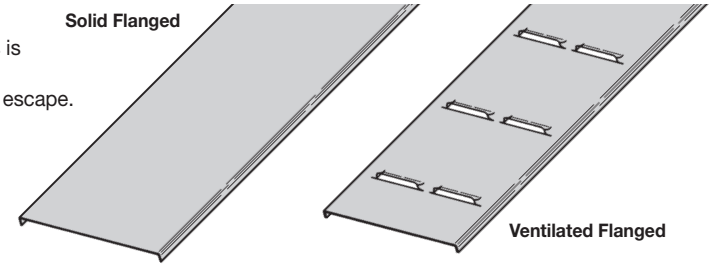
Catalog No.	Design Load* lbs	Design Load* kN	'A' in.	'A' mm
B441-22	1200	5.34	3 3/8	86
B441-22A	1200	5.34	5	127

Dimensions in parentheses are in millimeters unless otherwise specified.

Covers

Solid covers should be used when maximum enclosure of the cables is desired and no accumulation of heat is expected.
Ventilated covers provide an overhead cable shield yet allow heat to escape.

B-Line recommends that covers on vertical cable ladder runs to a height of 6 ft. (1.83 m) to 8 ft. (2.44 m) above the floor to isolate both cables and personnel.
Flanged covers have a .30 in. (7.6 mm) flange. Cover clamps are not included with the cover and must be ordered separately.



Covers Part Numbering

Prefix

Example: **80 1 P - 20 - 24 - 144**

Cover Type	Detail	Material	Material Thickness	Ladder Width	Item Description
80 = Solid 81 = Ventilated	1 = Flanged	P = Pre-Galvanized G = HDGAF	20 = 20 Ga. Steel for Pre-Galvanized 18 = 18 Ga. Steel for HDGAF	06 = 6" (152) 09 = 9" (228) 12 = 12" (305) 18 = 18" (457) 24 = 24" (609) 30 = 30" (762) 36 = 36" (914)	For Straight Section Cover: **Pre-Galvanized Only:** 144 = 12 ft. (3.66 m) 120 = 10 ft. (3.05 m) **Pre-Galvanized & HDGAF** 72 = 6 ft. (1.83 m) 60 = 5 ft. (1.52 m) For fitting covers: Insert suffix of fitting to be covered. See example below.

Covers 30" and 36" wide have reinforcing ridges.

Example of Catalog Number for Fitting Cover:

Vertical Bend Cover

Prefix / Suffix

80 1 P 20 - 24 - 90 VO 24 - 4*

- 4* — Side Rail* Height
- 24 — Radius
- 90 VO — Fitting Angle
- 24 — Width
- 20 — Material Thickness
- P — Material
- 1 — Detail
- 80 — Cover Type

* Required for VO fittings only.

Quantity of Standard Cover Clamps Required

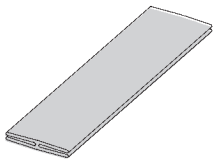
Straight Section 60" (1.52m) or 72" (1.83m)	4 pcs.
Straight Section 120" (3.05m) or 144" (3.66m)	6 pcs.
Horizontal/Vertical Bends	4 pcs.
Tees	6 pcs.
Crosses	8 pcs.

Note: When using the Heavy Duty Cover Clamp, only one-half the number of clamps stated above is required.

Cover Joint Strip

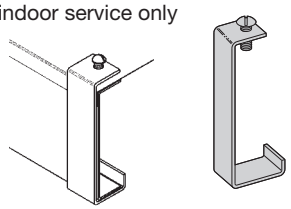
- Used to join covers
- Plastic
- (‡) Insert ladder width

Cat. No.	99-9980-(‡)



Standard Cover Clamp

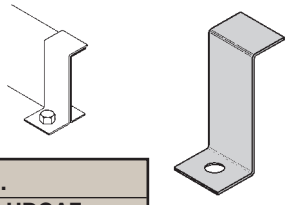
- Sold per piece
- For indoor service only



Ladder Series	Catalog No.	
	Znplt	HDGAF
148	9ZN-9019	9G-9019
156	9ZN-9014	9G-9014
166	9ZN-9015	9G-9015
176	9ZN-9016	9G-9016

Combination Hold Down & Cover Clamp

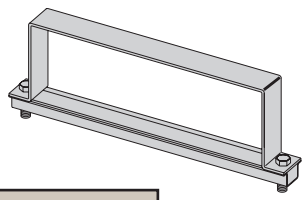
- Sold per piece
- For indoor service only



Ladder Series	Catalog No.	
	Znplt/Pre-Galv.	HDGAF
148	9ZN-9243	9G-9243
156	9P-9043	9G-9043
166	9P-9053	9G-9053
176	9P-9063	9G-9063

Heavy Duty Cover Clamp

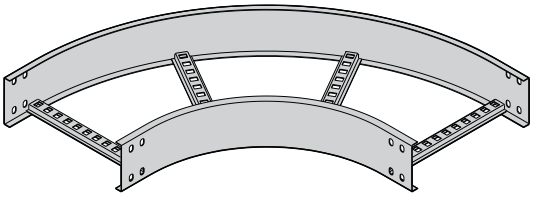
- (‡) Insert ladder width

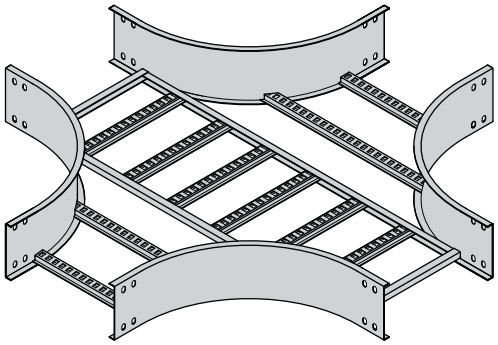


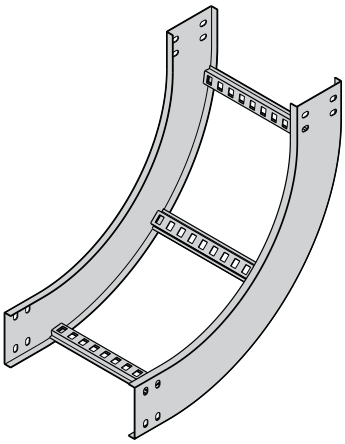
Ladder Series	Catalog No.	
	Znplt/Pre-Galv.	HDGAF
148	9P-(‡)-9040	9G-(‡)-9040
156	9P-(‡)-9044	9G-(‡)-9044
166	9P-(‡)-9054	9G-(‡)-9054
176	9P-(‡)-9064	9G-(‡)-9064

Dimensions in parentheses are in millimeters unless otherwise specified.

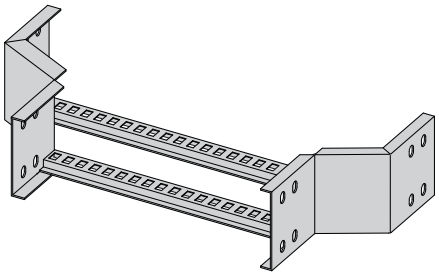
Series 1 Steel Cable Ladder







Fittings engineered with 3" (76mm) tangents for splicing integrity.



Fittings Part Numbering

Prefix

Example: **1 4 P SL - 24 - 90 HB 24** (9" rung spacing is standard)

Series	Height	Material	Rung Type	Width	Angle	Type	Radius
1	4 = 148 5 = 156 6 = 166 7 = 176	P = Pre-Galvanized G = HDGAF	SL = Slotted Rung	06 = 6" (152) 09 = 9" (228) 12 = 12" (305) 18 = 18" (457) 24 = 24" (609) 30 = 30" (762) 36 = 36" (914)	30 = 30° 45 = 45° 60 = 60° 90 = 90°	HB = Horizontal Bend HT = Horizontal Tee HX = Horizontal Cross VI = Vertical Inside Bend VO = Vertical Outside Bend LR = Left Reducer RR = Right Reducer SR = Straight Reducer	12 = 12" (305) 24 = 24" (609) 36 = 36" (914)

For steel 4", 5", 6", 7" vented or non-ventilated add 04 or SB as shown below.

Prefix

15P04 - 24 - 90HB24

Vented Bottom

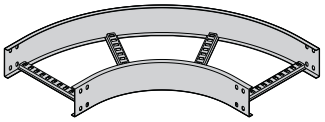
Prefix

15PSB - 24 - 90HB24

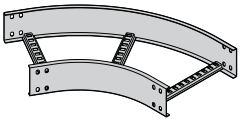
Non-Ventilated

Horizontal Bends 90° 60° 45° 30° (HB)

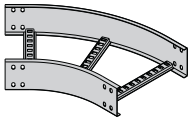
1 pair splice plates with hardware included.



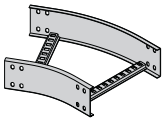
90° Horizontal Bend



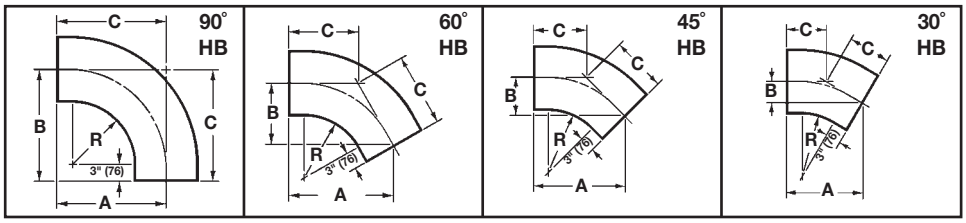
60° Horizontal Bend



45° Horizontal Bend



30° Horizontal Bend



Bend Radius R		Ladder Width		90° Horizontal Bend Dimensions								60° Horizontal Bend Dimensions							
				Catalog No.	A		B		C			Catalog No.	A		B		C		
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm			in.	mm	in.	mm	in.	mm	
12	305	6	152	(Pre)-06-90HB12	18	450	18	450	18	450		(Pre)-06-60HB12	17 1/2	445	10 1/8	257	11 11/16	297	
		9	228	(Pre)-09-90HB12	19 1/2	495	19 1/2	495	19 1/2	495		(Pre)-09-60HB12	18 13/16	478	10 7/8	276	12 1/2	318	
		12	305	(Pre)-12-90HB12	21	533	21	533	21	533		(Pre)-12-60HB12	20 1/16	510	11 5/8	295	13 3/8	340	
		18	457	(Pre)-18-90HB12	24	600	24	600	24	600		(Pre)-18-60HB12	22 11/16	576	13 1/8	333	15 1/8	384	
		24	609	(Pre)-24-90HB12	27	686	27	686	27	686		(Pre)-24-60HB12	25 5/16	643	14 5/8	372	16 7/8	429	
		30	762	(Pre)-30-90HB12	30	750	30	750	30	750		(Pre)-30-60HB12	27 7/8	708	16 1/8	410	18 9/16	472	
		36	914	(Pre)-36-90HB12	33	838	33	838	33	838		(Pre)-36-60HB12	30 1/2	775	17 5/8	448	20 5/16	516	
24	609	6	152	(Pre)-06-90HB24	30	750	30	750	30	750		(Pre)-06-60HB24	27 7/8	708	16 1/8	410	18 9/16	472	
		9	228	(Pre)-09-90HB24	31 1/2	800	31 1/2	800	31 1/2	800		(Pre)-09-60HB24	29 3/16	741	16 7/8	429	19 7/16	494	
		12	305	(Pre)-12-90HB24	33	838	33	838	33	838		(Pre)-12-60HB24	30 1/2	775	17 5/8	448	20 5/16	516	
		18	457	(Pre)-18-90HB24	36	914	36	914	36	914		(Pre)-18-60HB24	33 1/16	840	19 1/8	486	22 1/16	560	
		24	609	(Pre)-24-90HB24	39	991	39	991	39	991		(Pre)-24-60HB24	35 11/16	907	20 5/8	524	23 13/16	605	
		30	762	(Pre)-30-90HB24	42	1067	42	1067	42	1067		(Pre)-30-60HB24	38 1/4	972	22 1/8	562	25 1/2	648	
		36	914	(Pre)-36-90HB24	45	1143	45	1143	45	1143		(Pre)-36-60HB24	40 7/8	1038	23 5/8	600	27 1/4	692	

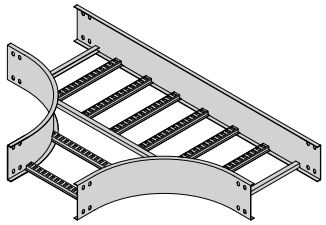
45° Horizontal Bend											30° Horizontal Bend						
12	305	6	152	(Pre)-06-45HB12	15 3/4	400	6 1/2	165	9 3/16	233	(Pre)-06-30HB12	13 1/8	333	3 1/2	89	7	175
		9	228	(Pre)-09-45HB12	16 13/16	427	6 15/16	176	9 13/16	249	(Pre)-09-30HB12	13 7/8	352	3 11/16	94	7 7/16	189
		12	305	(Pre)-12-45HB12	17 7/8	454	7 3/8	187	10 7/16	265	(Pre)-12-30HB12	14 5/8	372	3 15/16	100	7 13/16	198
		18	457	(Pre)-18-45HB12	20	500	8 1/4	210	11 11/16	297	(Pre)-18-30HB12	16 1/8	410	4 5/16	135	8 5/8	219
		24	609	(Pre)-24-45HB12	22 1/16	560	9 1/8	232	12 15/16	329	(Pre)-24-30HB12	17 5/8	448	4 11/16	119	9 7/16	240
		30	762	(Pre)-30-45HB12	24 3/16	614	10	250	14 3/16	360	(Pre)-30-30HB12	19 1/8	486	5 1/8	130	10 1/4	260
		36	914	(Pre)-36-45HB12	26 5/16	668	10 15/16	278	15 7/16	392	(Pre)-36-30HB12	20 5/8	524	5 1/2	140	11 1/16	281
24	609	6	152	(Pre)-06-45HB24	24 3/16	614	10	250	14 3/16	360	(Pre)-06-30HB24	19 1/8	486	5 1/8	130	10 1/4	260
		9	228	(Pre)-09-45HB24	25 1/4	641	10 1/2	267	14 13/16	376	(Pre)-09-30HB24	19 7/8	505	5 5/16	135	10 5/8	270
		12	305	(Pre)-12-45HB24	26 5/16	668	10 15/16	278	15 7/16	392	(Pre)-12-30HB24	20 5/8	524	5 1/2	140	11 1/16	281
		18	457	(Pre)-18-45HB24	28 7/16	722	11 13/16	300	16 11/16	424	(Pre)-18-30HB24	22 1/8	562	5 15/16	151	11 13/16	300
		24	609	(Pre)-24-45HB24	30 9/16	776	12 11/16	322	17 15/16	456	(Pre)-24-30HB24	23 5/8	600	6 5/16	160	12 5/8	321
		30	762	(Pre)-30-45HB24	32 11/16	830	13 9/16	345	19 1/8	486	(Pre)-30-30HB24	25 1/8	638	6 3/4	172	13 7/16	341
		36	914	(Pre)-36-45HB24	34 13/16	884	14 7/16	367	20 3/8	518	(Pre)-36-30HB24	26 5/8	676	7 1/8	181	14 1/4	362

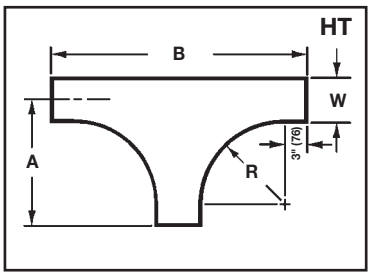
(Pre) See page LDS-11 for catalog number prefix.
Width dimensions are to inside wall. Manufacturing tolerances apply to all dimensions.

Horizontal Tee (HT)

2 pair splice plates with hardware included.

Bend Radius R		Ladder Width		Horizontal Tee Dimensions				
				Catalog No.	A		B	
in.	mm	in.	mm		in.	mm	in.	mm
12	305	6	152	(Prefix)-06-HT12	18	457	36	914
		9	228	(Prefix)-09-HT12	19½	495	39	991
		12	305	(Prefix)-12-HT12	21	533	42	1067
		18	457	(Prefix)-18-HT12	24	610	48	1219
		24	609	(Prefix)-24-HT12	27	686	54	1372
		30	762	(Prefix)-30-HT12	30	762	60	1524
		36	914	(Prefix)-36-HT12	33	838	66	1676
24	609	6	152	(Prefix)-06-HT24	30	762	60	1524
		9	228	(Prefix)-09-HT24	31½	800	63	1600
		12	305	(Prefix)-12-HT24	33	838	66	1676
		18	457	(Prefix)-18-HT24	36	914	72	1829
		24	609	(Prefix)-24-HT24	39	991	78	1981
		30	762	(Prefix)-30-HT24	42	1067	84	2134
		36	914	(Prefix)-36-HT24	45	1143	90	2286



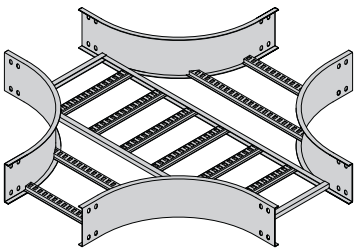


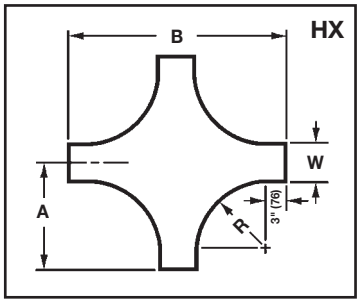
(Prefix) See page LDS-11 for catalog number prefix.

Horizontal Cross (HX)

3 pair splice plates with hardware included.

Bend Radius R		Ladder Width		Horizontal Cross Dimensions				
				Catalog No.	A		B	
in.	mm	in.	mm		in.	mm	in.	mm
12	305	6	152	(Prefix)-06-HX12	18	457	36	914
		9	228	(Prefix)-09-HX12	19½	495	39	991
		12	305	(Prefix)-12-HX12	21	533	42	1067
		18	457	(Prefix)-18-HX12	24	610	48	1219
		24	609	(Prefix)-24-HX12	27	686	54	1372
		30	762	(Prefix)-30-HX12	30	762	60	1524
		36	914	(Prefix)-36-HX12	33	838	66	1676
24	609	6	152	(Prefix)-06-HX24	30	762	60	1524
		9	228	(Prefix)-09-HX24	31½	800	63	1600
		12	305	(Prefix)-12-HX24	33	838	66	1676
		18	457	(Prefix)-18-HX24	36	914	72	1829
		24	609	(Prefix)-24-HX24	39	991	78	1981
		30	762	(Prefix)-30-HX24	42	1067	84	2134
		36	914	(Prefix)-36-HX24	45	1143	90	2286





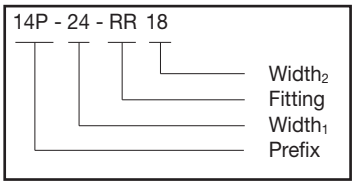
(Prefix) See page LDS-11 for catalog number prefix.

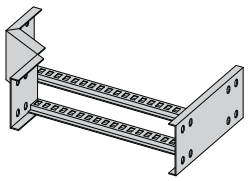
Width dimensions are to inside wall. Manufacturing tolerances apply to all dimensions.

Reducers (LR, SR, RR)

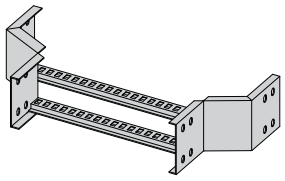
1 pair splice plates with hardware included.

Reducer Part Numbering

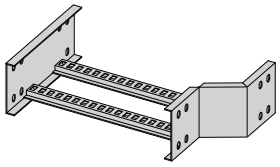




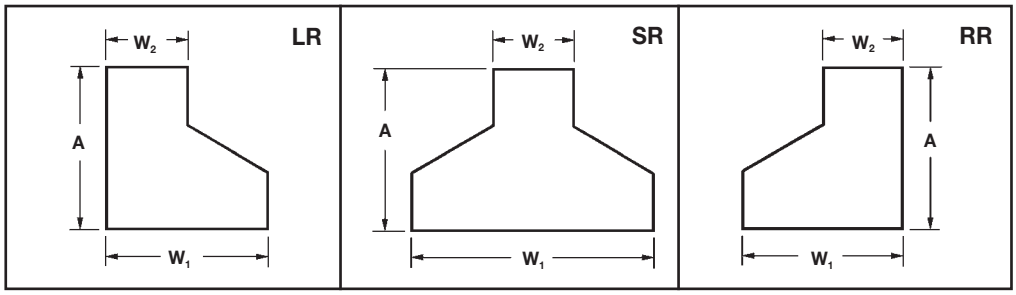
Left Reducer



Straight Reducer



Right Reducer



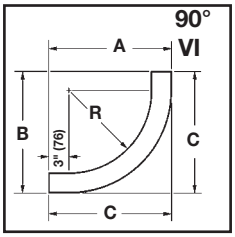
Ladder Width				Left Hand Reducer			Straight Reducer			Right Hand Reducer		
W_1		W_2		Catalog No.	A		Catalog No.	A		Catalog No.	A	
in.	mm	in.	mm		in.	mm		in.	mm		in.	mm
9	228	6	152	(Prefix)-09-LR06	9 3/4	248	(Prefix)-09-SR06	8 7/8	225	(Prefix)-09-RR06	9 3/4	248
12	305	6	152	(Prefix)-12-LR06	11 1/2	292	(Prefix)-12-SR06	9 3/4	248	(Prefix)-12-RR06	11 1/2	292
		9	228	(Prefix)-12-LR09	9 3/4	248	(Prefix)-12-SR09	8 7/8	225	(Prefix)-12-RR09	9 3/4	248
18	457	6	152	(Prefix)-18-LR06	14 15/16	379	(Prefix)-18-SR06	11 1/2	292	(Prefix)-18-RR06	14 15/16	379
		9	228	(Prefix)-18-LR09	13 3/16	340	(Prefix)-18-SR09	10 5/8	270	(Prefix)-18-RR09	13 3/16	340
		12	305	(Prefix)-18-LR12	11 1/2	292	(Prefix)-18-SR12	9 3/4	248	(Prefix)-18-RR12	11 1/2	292
24	609	6	152	(Prefix)-24-LR06	18 3/8	467	(Prefix)-24-SR06	13 3/16	340	(Prefix)-24-RR06	18 3/8	467
		9	228	(Prefix)-24-LR09	16 11/16	424	(Prefix)-24-SR09	12 3/8	314	(Prefix)-24-RR09	16 11/16	424
		12	305	(Prefix)-24-LR12	14 15/16	379	(Prefix)-24-SR12	11 1/2	292	(Prefix)-24-RR12	14 15/16	379
		18	457	(Prefix)-24-LR18	11 1/2	292	(Prefix)-24-SR18	9 3/4	248	(Prefix)-24-RR18	11 1/2	292
30	762	6	152	(Prefix)-30-LR06	21 7/8	555	(Prefix)-30-SR06	14 15/16	380	(Prefix)-30-RR06	21 7/8	555
		9	228	(Prefix)-30-LR09	20 1/8	511	(Prefix)-30-SR09	14 1/16	358	(Prefix)-30-RR09	20 1/8	511
		12	305	(Prefix)-30-LR12	18 3/8	462	(Prefix)-30-SR12	13 3/16	335	(Prefix)-30-RR12	18 3/8	462
		18	459	(Prefix)-30-LR18	14 15/16	380	(Prefix)-30-SR18	11 1/2	292	(Prefix)-30-RR18	14 15/16	380
		24	609	(Prefix)-30-LR24	11 1/2	292	(Prefix)-30-SR24	9 3/4	248	(Prefix)-30-RR24	11 1/2	292
36	914	6	152	(Prefix)-36-LR06	25 5/16	643	(Prefix)-36-SR06	16 11/16	424	(Prefix)-36-RR06	25 5/16	643
		9	228	(Prefix)-36-LR09	23 9/16	598	(Prefix)-36-SR09	15 13/16	402	(Prefix)-36-RR09	23 9/16	598
		12	305	(Prefix)-36-LR12	21 7/8	555	(Prefix)-36-SR12	14 15/16	380	(Prefix)-36-RR12	21 7/8	555
		18	457	(Prefix)-36-LR18	18 3/8	462	(Prefix)-36-SR18	13 3/16	335	(Prefix)-36-RR18	18 3/8	462
		24	609	(Prefix)-36-LR24	14 15/16	380	(Prefix)-36-SR24	11 1/2	292	(Prefix)-36-RR24	14 15/16	380
		30	762	(Prefix)-36-LR30	11 1/2	292	(Prefix)-36-SR30	9 3/4	248	(Prefix)-36-RR30	11 1/2	292

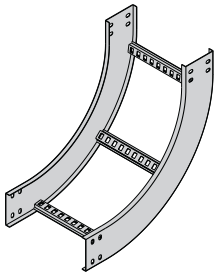
(Prefix) See page LDS-11 for catalog number prefix.

Width dimensions are to inside wall. Manufacturing tolerances apply to all dimensions.

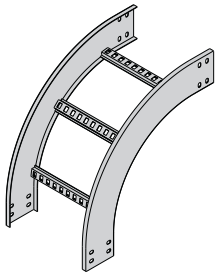
Vertical Bend 90° (VO, VI)

1 pair splice plates with hardware included.

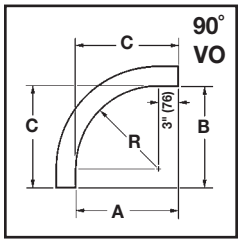




90° Vertical Inside



90° Vertical Outside



90° Vertical Outside Bend

Bend Radius R in.	Bend Radius R mm	Ladder Width in.	Ladder Width mm	Catalog No.	VO Dimensions All Series Heights A	B	C
12	300	6	152	(Pre)-06-90VO12	15" (381)	15" (381)	15" (381)
		9	228	(Pre)-09-90VO12			
		12	305	(Pre)-12-90VO12			
		18	457	(Pre)-18-90VO12			
		24	609	(Pre)-24-90VO12			
		30	762	(Pre)-30-90VO12			
		36	914	(Pre)-36-90VO12			
24	600	2	152	(Pre)-06-90VO24	27" (686)	27" (686)	27" (686)
		9	228	(Pre)-09-90VO24			
		12	305	(Pre)-12-90VO24			
		18	457	(Pre)-18-90VO24			
		24	609	(Pre)-24-90VO24			
		30	762	(Pre)-30-90VO24			
		36	914	(Pre)-36-90VO24			

(Pre) See page LDS-11 for catalog number prefix.

90° Vertical Inside Bend

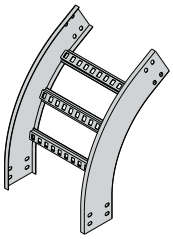
Bend Radius R in.	Bend Radius R mm	Ladder Width in.	Ladder Width mm	Catalog No.	VI Dimensions Series 14 Steel A	B	C	Series 15 Steel A	B	C	Series 16 Steel A	B	C	Series 17 Steel A	B	C
12	305	6	152	(Pre)-06-90VI12	$18^{7}/_{16}$" (468)	$18^{7}/_{16}$" (468)	$18^{7}/_{16}$" (468)	$19^{3}/_{16}$" (487)	$19^{3}/_{16}$" (487)	$19^{3}/_{16}$" (487)	$20^{3}/_{16}$" (513)	$20^{3}/_{16}$" (513)	$20^{3}/_{16}$" (513	$21^{3}/_{16}$" (538)	$21^{3}/_{16}$" (538)	$21^{3}/_{16}$" (538)
		9	228	(Pre)-09-90VI12												
		12	305	(Pre)-12-90VI12												
		18	457	(Pre)-18-90VI12												
		24	609	(Pre)-24-90VI12												
		30	762	(Pre)-30-90VI12												
		36	914	(Pre)-36-90VI12												
24	609	6	152	(Pre)-06-90VI24	$30^{7}/_{16}$" (773)	$30^{7}/_{16}$" (773)	$30^{7}/_{16}$" (773)	$31^{3}/_{16}$" (792)	$31^{3}/_{16}$" (792)	$31^{3}/_{16}$" (792)	$32^{3}/_{16}$" (817)	$32^{3}/_{16}$" (817)	$32^{3}/_{16}$" (817)	$33^{3}/_{16}$" (843)	$33^{3}/_{16}$" (843)	$33^{3}/_{16}$" (843)
		9	228	(Pre)-09-90VI24												
		12	305	(Pre)-12-90VI24												
		18	457	(Pre)-18-90VI24												
		24	609	(Pre)-24-90VI24												
		30	762	(Pre)-30-90VI24												
		36	914	(Pre)-36-90VI24												

(Pre) See page LDS-11 for catalog number prefix.

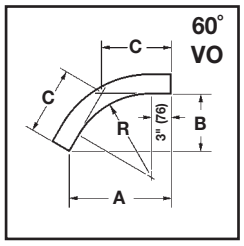
All dimensions in parentheses are millimeters unless otherwise specified.
Manufacturing tolerances apply to all dimensions.

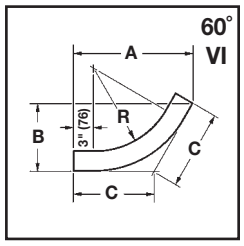
Vertical Bend 60° (VO, VI)

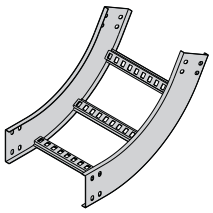
1 pair splice plates with hardware included.



60° Vertical Outside







60° Vertical Inside

60° Vertical Outside Bend

Bend Radius R in.	Bend Radius R mm	Ladder Width in.	Ladder Width mm	Catalog No.	VO Dimensions All Series Heights A	B	C
12	300	6	152	(Pre)-06-60VO12	$14^{7}/_{8}$" (378)	$8^{5}/_{8}$" (219)	$9^{15}/_{16}$" (252)
		9	228	(Pre)-09-60VO12			
		12	305	(Pre)-12-60VO12			
		18	457	(Pre)-18-60VO12			
		24	609	(Pre)-24-60VO12			
		30	762	(Pre)-30-60VO12			
		36	914	(Pre)-36-60VO12			
24	600	2	152	(Pre)-06-60VO24	$25^{5}/_{16}$" (643)	$14^{5}/_{8}$" (371)	$16^{7}/_{8}$" (428)
		9	228	(Pre)-09-60VO24			
		12	305	(Pre)-12-60VO24			
		18	457	(Pre)-18-60VO24			
		24	609	(Pre)-24-60VO24			
		30	762	(Pre)-30-60VO24			
		36	914	(Pre)-36-60VO24			

(Pre) See page LDS-11 for catalog number prefix.

60° Vertical Inside Bend

Bend Radius R in.	Bend Radius R mm	Ladder Width in.	Ladder Width mm	Catalog No.	VI Dimensions Series 14 Steel A	B	C	Series 15 Steel A	B	C	Series 16 Steel A	B	C	Series 17 Steel A	B	C
12	305	6	152	(Pre)-06-60VI12	$18^{1}/_{16}$" (459)	$10^{7}/_{16}$" (265)	12" (305)	$18^{1}/_{2}$" (470)	$10^{11}/_{16}$" (271)	$12^{3}/_{8}$" (314)	$19^{3}/_{8}$" (492)	$11^{3}/_{16}$" (284)	$12^{15}/_{16}$" (328)	$20^{1}/_{4}$" (514)	$11^{11}/_{16}$" (297)	$13^{1}/_{2}$" (343)
		9	228	(Pre)-09-60VI12												
		12	305	(Pre)-12-60VI12												
		18	457	(Pre)-18-60VI12												
		24	609	(Pre)-24-60VI12												
		30	762	(Pre)-30-60VI12												
		36	914	(Pre)-36-60VI12												
24	609	6	152	(Pre)-06-60VI24	$28^{7}/_{16}$" (722)	$16^{7}/_{16}$" (417)	$18^{15}/_{16}$" (481)	$28^{15}/_{16}$" (735)	$16^{11}/_{16}$" (424)	$19^{1}/_{4}$" (489)	$29^{3}/_{4}$" (755)	$17^{3}/_{16}$" (436)	$19^{7}/_{8}$" (505)	$30^{5}/_{8}$" (778)	$17^{11}/_{16}$" (449)	$20^{7}/_{16}$" (519)
		9	228	(Pre)-09-60VI24												
		12	305	(Pre)-12-60VI24												
		18	457	(Pre)-18-60VI24												
		24	609	(Pre)-24-60VI24												
		30	762	(Pre)-30-60VI24												
		36	914	(Pre)-36-60VI24												

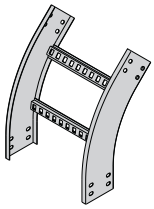
(Pre) See page LDS-11 for catalog number prefix.

Manufacturing tolerances apply to all dimensions.

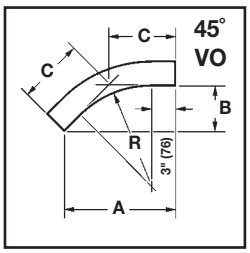
Dimensions in parentheses are in millimeters unless otherwise specified.

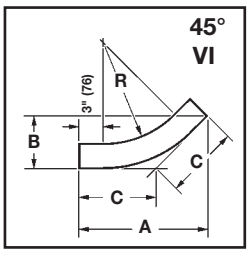
Vertical Bend 45° (VO, VI)

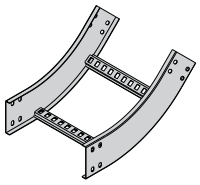
1 pair splice plates with hardware included.



45° Vertical Outside







45° Vertical Inside

45° Vertical Outside Bend

Bend Radius R in.	Bend Radius R mm	Ladder Width in.	Ladder Width mm	Catalog No.	VO Dimensions All Series Heights A	B	C
12	300	6	152	(Pre)-06-45VO12	$13^{5}/_{8}$" (346)	$5^{5}/_{8}$" (143)	8" (203)
		9	228	(Pre)-09-45VO12			
		12	305	(Pre)-12-45VO12			
		18	457	(Pre)-18-45VO12			
		24	609	(Pre)-24-45VO12			
		30	762	(Pre)-30-45VO12			
		36	914	(Pre)-36-45VO12			
24	600	2	152	(Pre)-06-45VO24	$22^{1}/_{16}$" (560)	$9^{1}/_{8}$" (232)	$12^{15}/_{16}$" (328)
		9	228	(Pre)-09-45VO24			
		12	305	(Pre)-12-45VO24			
		18	457	(Pre)-18-45VO24			
		24	609	(Pre)-24-45VO24			
		30	762	(Pre)-30-45VO24			
		36	914	(Pre)-36-45VO24			

(Pre) See page LDS-11 for catalog number prefix.

45° Vertical Inside Bend

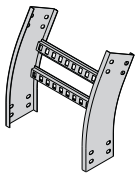
Bend Radius R in.	Bend Radius R mm	Ladder Width in.	Ladder Width mm	Catalog No.	VI Dimensions Series 14 Steel A	B	C	Series 15 Steel A	B	C	Series 16 Steel A	B	C	Series 17 Steel A	B	C
12	305	6	152	(Pre)-06-45VI12	$16^{3}/_{16}$" (411)	$6^{11}/_{16}$" (170)	$9^{1}/_{2}$" (241)	$16^{9}/_{16}$" (420)	$6^{7}/_{8}$" (174)	$9^{11}/_{16}$" (246	$17^{1}/_{4}$" (438)	$7^{3}/_{16}$" (182)	$10^{1}/_{8}$" (257)	18" (457)	$7^{7}/_{16}$" (189)	$10^{9}/_{16}$" (268)
		9	228	(Pre)-09-45VI12												
		12	305	(Pre)-12-45VI12												
		18	457	(Pre)-18-45VI12												
		24	609	(Pre)-24-45VI12												
		30	762	(Pre)-30-45VI12												
		36	914	(Pre)-36-45VI12												
24	609	6	152	(Pre)-06-45VI24	$24^{11}/_{16}$" (627)	$10^{3}/_{16}$" (259)	$14^{7}/_{16}$" (367)	$25^{1}/_{16}$" (662)	$10^{3}/_{8}$" (263)	$11^{11}/_{16}$" (373)	$25^{3}/_{4}$" (654)	$10^{11}/_{16}$" (271)	$15^{1}/_{16}$" (382)	$26^{1}/_{2}$" (673)	11" (279)	$15^{1}/_{2}$" (394)
		9	228	(Pre)-09-45VI24												
		12	305	(Pre)-12-45VI24												
		18	457	(Pre)-18-45VI24												
		24	609	(Pre)-24-45VI24												
		30	762	(Pre)-30-45VI24												
		36	914	(Pre)-36-45VI24												

(Pre) See page LDS-11 for catalog number prefix.

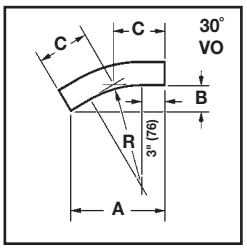
Manufacturing tolerances apply to all dimensions.

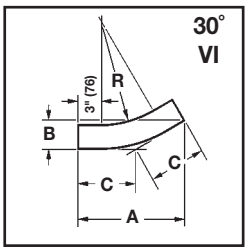
Vertical Bend 30° (VO, VI)

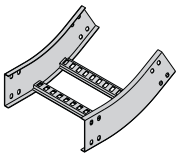
1 pair splice plates with hardware included.



30° Vertical Outside







30° Vertical Inside

30° Vertical Outside Bend

Bend Radius R in.	Bend Radius R mm	Ladder Width in.	Ladder Width mm	Catalog No.	VO Dimensions All Series Heights A	B	C
12	300	6	152	(Pre)-06-30VO12	$11^{5}/_{8}$" (295)	$3^{1}/_{8}$" (79)	$6^{3}/_{16}$" (157)
		9	228	(Pre)-09-30VO12			
		12	305	(Pre)-12-30VO12			
		18	457	(Pre)-18-30VO12			
		24	609	(Pre)-24-30VO12			
		30	762	(Pre)-30-30VO12			
		36	914	(Pre)-36-30VO12			
24	600	2	152	(Pre)-06-30VO24	$17^{5}/_{8}$" (448)	$4^{11}/_{16}$" (110)	$9^{7}/_{16}$" (240)
		9	228	(Pre)-09-30VO24			
		12	305	(Pre)-12-30VO24			
		18	457	(Pre)-18-30VO24			
		24	609	(Pre)-24-30VO24			
		30	762	(Pre)-30-30VO24			
		36	914	(Pre)-36-30VO24			

(Pre) See page LDS-11 for catalog number prefix.

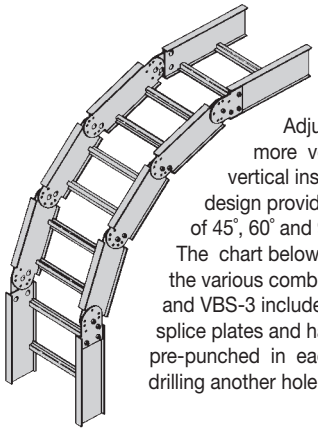
30° Vertical Inside Bend

Bend Radius R in.	Bend Radius R mm	Ladder Width in.	Ladder Width mm	Catalog No.	VI Dimensions Series 14 Steel A	B	C	Series 15 Steel A	B	C	Series 16 Steel A	B	C	Series 17 Steel A	B	C
12	305	6	152	(Pre)-06-30VI12	$13^{7}/_{16}$" (341)	$3^{5}/_{8}$" (92)	$7^{3}/_{16}$" (182)	$13^{11}/_{16}$" (347)	$3^{11}/_{16}$" (93)	$7^{5}/_{16}$" (186)	$14^{3}/_{16}$" (360)	$3^{13}/_{16}$" (97)	$7^{5}/_{8}$" (193)	$14^{11}/_{16}$" (373)	$3^{15}/_{16}$" (100)	$7^{7}/_{8}$" (200)
		9	228	(Pre)-09-30VI12												
		12	305	(Pre)-12-30VI12												
		18	457	(Pre)-18-30VI12												
		24	609	(Pre)-24-30VI12												
		30	762	(Pre)-30-30VI12												
		36	914	(Pre)-36-30VI12												
24	609	6	152	(Pre)-06-30VI24	$19^{7}/_{16}$" (494)	$5^{3}/_{16}$" (132)	$10^{7}/_{16}$" (265)	$19^{11}/_{16}$" (500)	$5^{5}/_{16}$" (135)	$10^{10}/_{16}$" (268)	$20^{3}/_{16}$" (513)	$5^{7}/_{16}$" (138)	$10^{13}/_{16}$" (274)	$20^{11}/_{16}$" (525)	$5^{9}/_{16}$" (141)	$11^{1}/_{16}$" (281)
		9	228	(Pre)-09-30VI24												
		12	305	(Pre)-12-30VI24												
		18	457	(Pre)-18-30VI24												
		24	609	(Pre)-24-30VI24												
		30	762	(Pre)-30-30VI24												
		36	914	(Pre)-36-30VI24												

(Pre) See page LDS-11 for catalog number prefix.

Manufacturing tolerances apply to all dimensions.

Vertical Bend Segments (VBS)



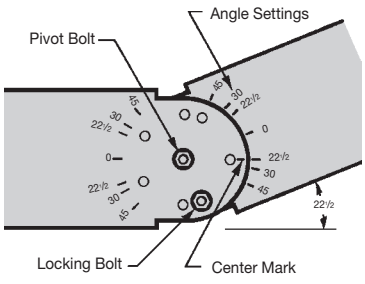
Adjustable Vertical Bends are made up of one or more vertical bend segments and can be used as a vertical inside (VI) or vertical outside (VO) bend. This design provides for vertical changes in direction with angles of 45˚, 60˚ and 90˚ for 12" (305 mm) or 24" (609 mm) radius. The chart below shows the number of segments required for the various combinations of angles and radii. The VBS-1, VBS-2 and VBS-3 include one, two or three segments respectively with splice plates and hardware. Holes for setting standard angles are pre-punched in each segment. Other angles can be set by field drilling another hole for the locking bolt.

Available for 148P and 148G only.

Nominal Bend Radius		Catalog No.	Dimensions											
			VO						VI					
			A		B		R		A		B		R	
in.	(mm)		in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
90˚ Vertical Inside or Outside														
12	305	14(*)†-(‡)-VBS-1	8¼	210	8¼	210	6½	165	12⅛	303	12⅛	303	10½	267
24	609	14(*)†-(‡)-VBS-3	24	610	24	610	22¼	565	27⅞	708	27⅞	708	26¼	667
60˚ Vertical Inside or Outside														
12	305	14(*)†-(‡)-VBS-1	11¾	298	6½	165	12	305	14¾	375	8½	216	16	406
24	609	14(*)†-(‡)-VBS-2	11¾	298	6½	165	12	305	14¾	375	8½	216	16	406
45˚ Vertical Inside or Outside														
12	305	14(*)†-(‡)-VBS-1	12¾	324	5¼	133	17⅛	435	15½	394	6⅞	175	21	540
24	609	14(*)†-(‡)-VBS-1	12¾	324	5¼	133	17⅛	435	15½	394	6⅞	175	21	540

Notes:
1. (*) Insert material type: P=Pre Galvanized, G=HDGAF
2. (†) Contact home office for information on Ventilated Trough and Solid Trough availability
3. (‡) Insert width 6, 9, 12, 18, 24, 30, 36

Fitting Hole Pattern



Setting the Angle

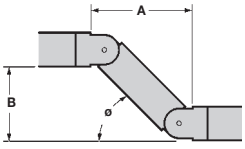
To find correct angle setting, divide angle of offset by the number of segments plus one. The result is equal to the angle setting stamped on the vertical bend segment and the splice plate. After inserting center pivot bolt, align the mark at the end of the segment or splice plate with the angle and insert locking bolt in the pre-punched hole.

Example: 90˚ bend, 24" radius requires 3 segments
3 segments + 1 = 4
90˚ divided by 4 = 22½˚
Set all vertical segments at 22½˚

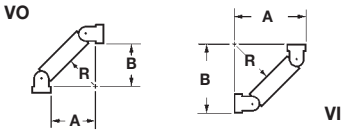
Offset Dimensions

One vertical bend segment can be used to complete a vertical offset. Offset dimensions are shown.

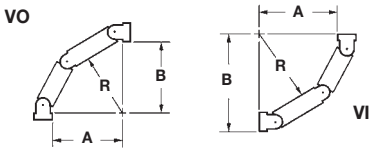
Angle ø	A		B	
	in.	(mm)	in.	(mm)
45˚	12	305	8½	216
30˚	14	355	5¾	146
22½˚	14¼	362	5	127



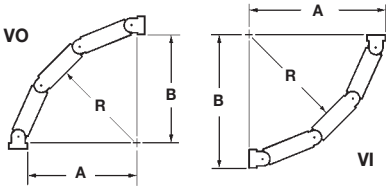
VBS-1 (1 Segment)



VBS-2 (2 Segments)

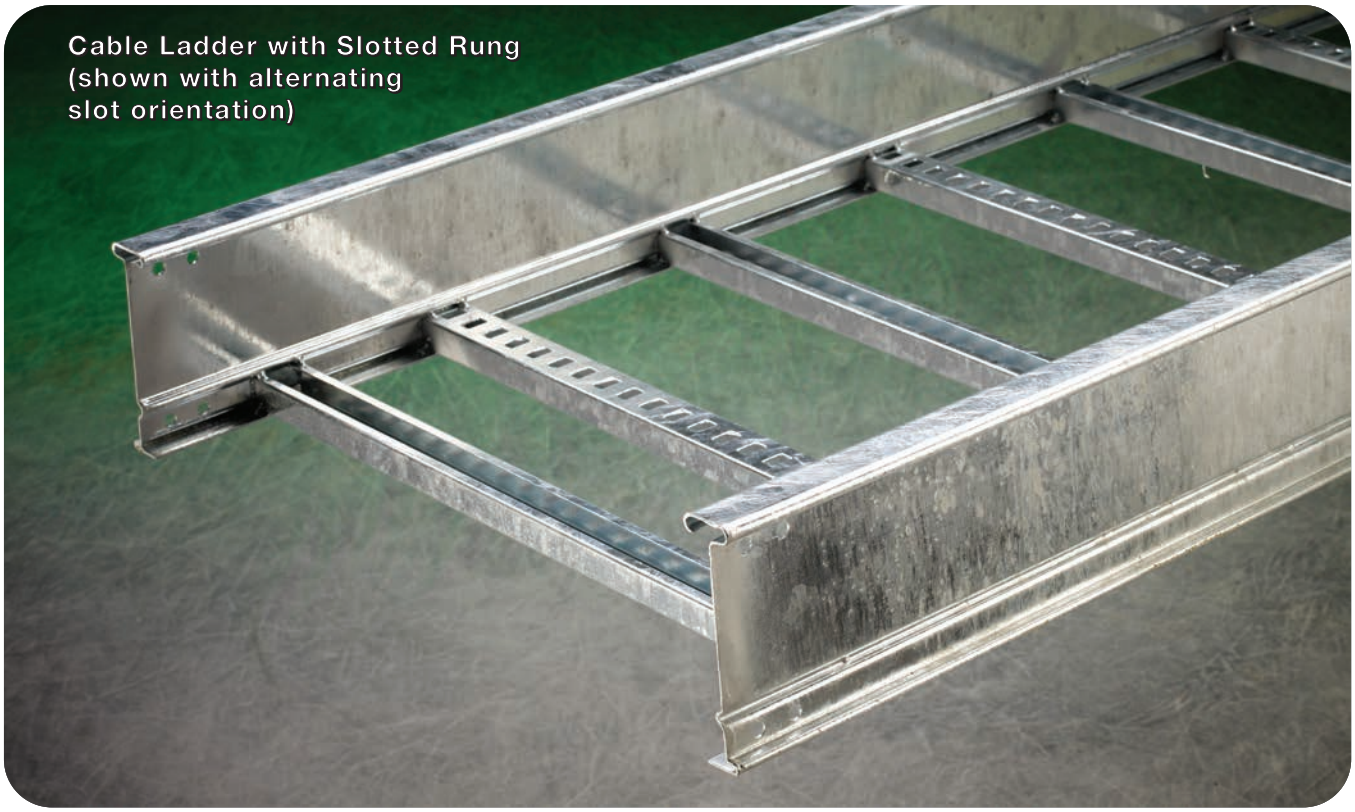


VBS-3 (3 Segments)

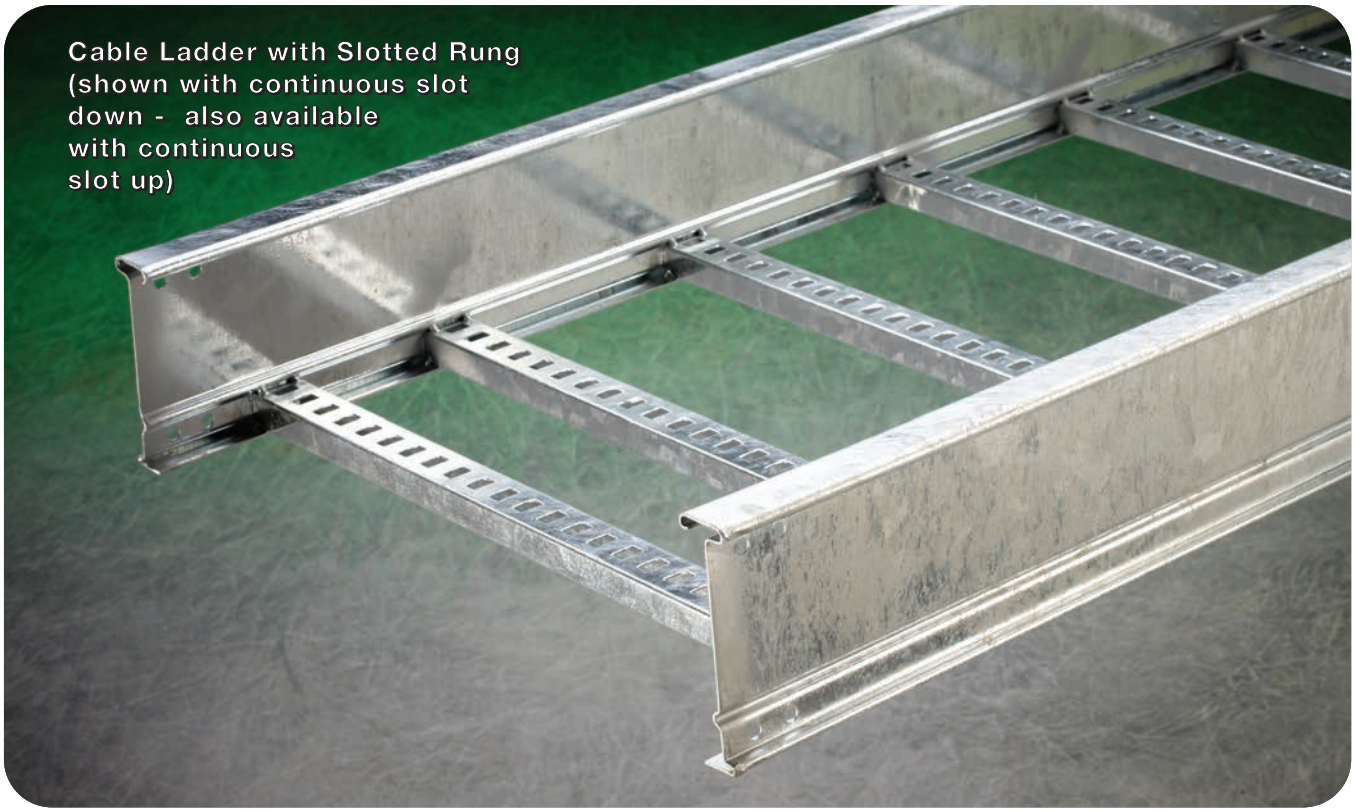


Dimensions in parentheses are in millimeters unless otherwise specified.

Series 2, 3, 4 Steel Cable Ladder



Cable Ladder with Slotted Rung (shown with alternating slot orientation)

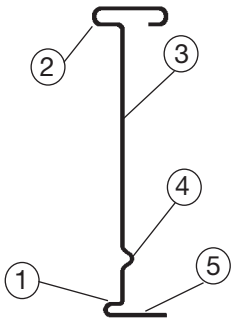


Cable Ladder with Slotted Rung (shown with continuous slot down - also available with continuous slot up)

Steel Cable Ladder, Series 2, 3, 4 & 5

Side Rails

B-Line I-Beam -- the most efficient structural shape

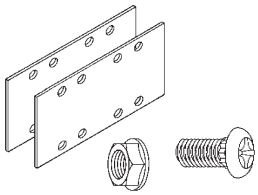


1. **Roll formed for extra strength**
2. **Enlarged top flange for stiffness**
3. **Structural grade traceable steel**
4. **Rung top lock**
5. **Positive Rung Support**

Side rails and rungs are stamped every 18" with:

- **Company Name**
- **Part Number**
- **Material**
- **Heat Trace Number**

Splices -- providing system integrity



Splices -- the engineered connection:
- High strength eleven gauge steel
- Eight bolt connection for required strength
- Finish and hardware options

Hot Dip Galvanized After Fabrication (HDGAF) -- providing system integrity

- ASTM A123/CSA Type I
- In plant post-dip inspection and deburr
- ASTM F-1136-88 Grade 3 Splice hardware exceeds NEMA requirements.
- ASTM A123 Covers available - system compatibility

Pre-Galvanized- Hot Dip Mill Galvanized -- providing system integrity

- ASTM A653SS Gr.33 G90/ CSA Type II
- Anti-corrosive silicon bronze welds eliminate cosmetic painting

Reliable time-tested products

- 200 lb. Concentrated Load- side rail and rungs
- Splice integrity - 3" fitting tangents

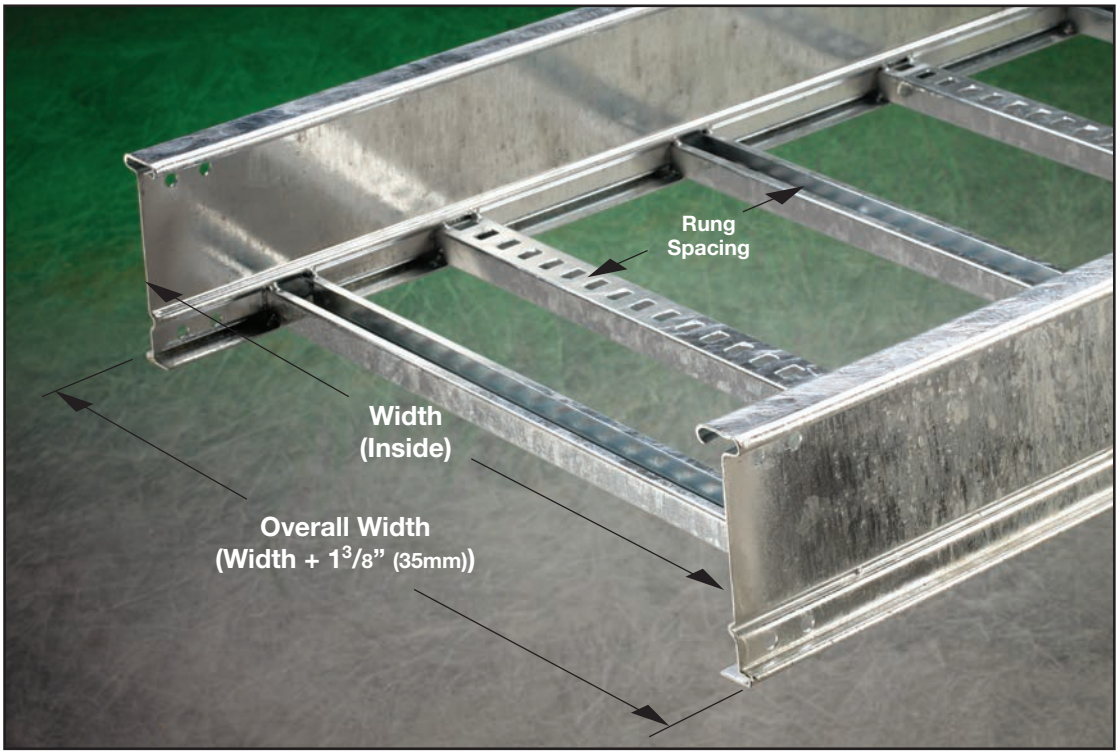
4" (101mm) NEMA VE 1 Loading Depth
5" (127mm) Side Rail Height

Straight Section Part Numbering

Example: **356 P 09 SL DN - 24 - 144**

Series	Material	Rung Spacing	Rung Type	Rung Orientation	Width	Length
356	**P** = Pre-Galv. Steel	**06** = 6" (152)	**SL** = Slotted	**Blank** - Slots alternate up & down (as shown below)	**06** = 6" (152)	①**240** = 20 ft. (6.1m) 356
		09 = 9" (228)			**09** = 9" (228)	②144 = 12 ft. (3.7m)
454	**G** = Hot Dip Galvanized After Fabrication Steel	**12** = 12" (305)		**DN** = Continuous slot down	**12** = 12" (305)	①**240** = 20 ft. (6.1m) 454
				UP = Continuous slot up	**18** = 18" (457)	②288 = 24 ft. (7.3m)
					24 = 24" (609)	
					30 = 30" (762)	
					36 = 36" (914)	

①Primary Length.
②Secondary Length.



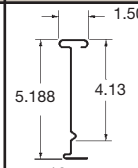
4" (101mm) NEMA VE 1 Loading Depth
5" (127mm) Side Rail Height

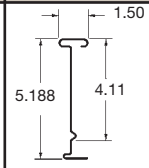
Dimensional & Loading Information

Values are based on simple beam tests per NEMA VE 1 on 36" (914mm) wide cable ladder with rungs spaced on 12" (305mm) centers. Cable ladders will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5.

To convert 1.5 safety factor to 2.0, multiply published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable ladder being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
356		NEMA: 20A, 16C CSA: D1-6m UL Cross-Sectional Area: 0.70 in²	10	3.0	276	411	0.0021	0.036	Area=1.00 in² Sx=1.31 in³ Ix=3.73 in⁴	Area=6.45 cm² Sx=21.47 cm³ Ix=155.25 cm⁴
			12	3.7	192	285	0.0043	0.074		
			14	4.3	141	210	0.0080	0.136		
			16	4.9	108	160	0.0140	0.233		
			18	5.5	85	127	0.0220	0.373		
			20	6.1	69	103	0.0330	0.568		

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
454		NEMA: 20C CSA: E-6m UL Cross-Sectional Area: 1.00 in²	12	3.7	294	438	0.0022	0.055	Area=1.34 in² Sx=1.75 in³ Ix=4.96 in⁴	Area=8.65 cm² Sx=28.68 cm³ Ix=206.45 cm⁴
			16	4.9	166	246	0.0100	0.175		
			18	5.5	131	195	0.0160	0.280		
			20	6.1	106	158	0.0250	0.427		
			22	6.7	88	130	0.0370	0.625		
			24	7.3	74	110	0.0520	0.886		

When cable ladders are used in continuous spans, the deflection of the cable ladder is reduced by as much as 50%.

Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

Dimensions in parentheses are in millimeters unless otherwise specified.

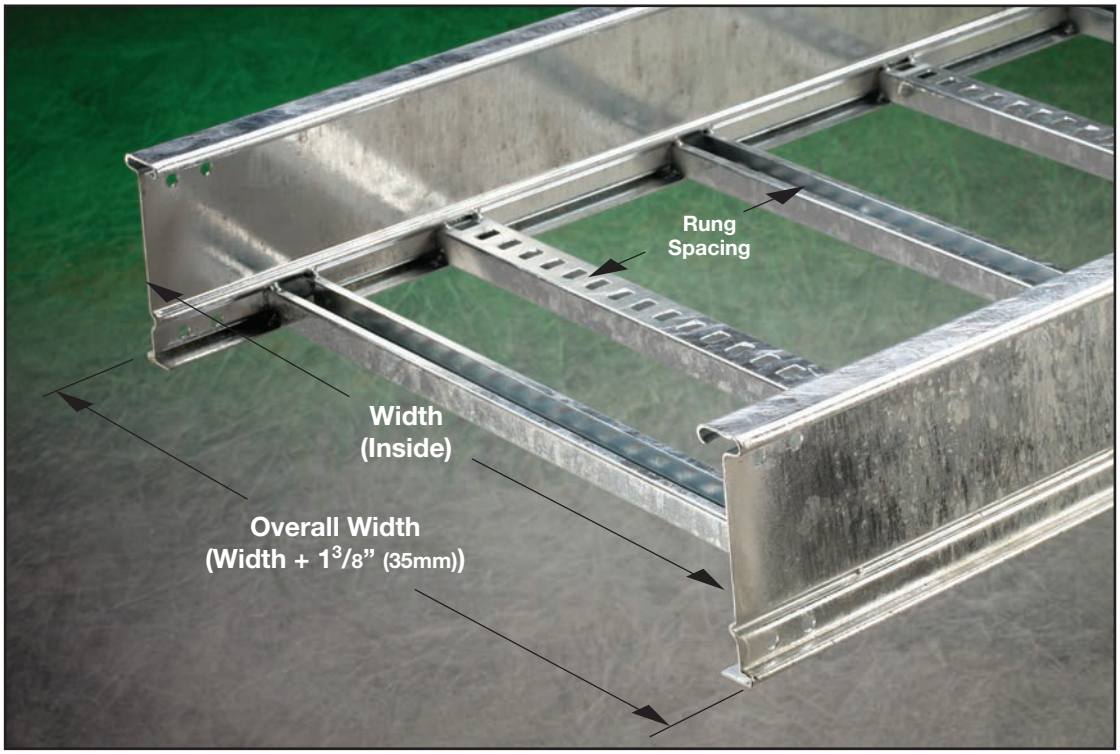
5" (127mm) NEMA VE 1 Loading Depth
6" (152mm) Side Rail Height

Straight Section Part Numbering

Example: **366 P 09 SL DN - 24 - 144**

Series	Material	Rung Spacing	Rung Type	Rung Orientation	Width	Length
366	**P** = Pre-Galv. Steel	**06** = 6" (152)	**SL** = Slotted	**Blank** - Slots alternate up & down (as shown below)	**06** = 6" (152)	①**240** = 20 ft. (6.1m) 366
		09 = 9" (228)			**09** = 9" (228)	②144 = 12 ft. (3.7m)
464	**G** = Hot Dip Galvanized After Fabrication Steel	**12** = 12" (305)		**DN** = Continuous slot down	**12** = 12" (305)	①**240** = 20 ft. (6.1m) 464
				UP = Continuous slot up	**18** = 18" (457)	②288 = 24 ft. (7.3m)
					24 = 24" (609)	
					30 = 30" (762)	
					36 = 36" (914)	

①Primary Length.
②Secondary Length.



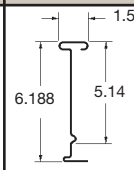
5" (127mm) NEMA VE 1 Loading Depth
6" (152mm) Side Rail Height

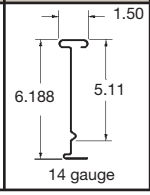
Dimensional & Loading Information

Values are based on simple beam tests per NEMA VE 1 on 36" (914mm) wide cable ladder with rungs spaced on 12" (305mm) centers. Cable ladders will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5.

To convert 1.5 safety factor to 2.0, multiply published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable ladder being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
366		NEMA: 20B, 16C CSA: E-6m UL Cross-Sectional Area: 1.00 in²	10	3.0	300	446	0.0014	0.023	Area=1.11 in² Sx=1.71 in³ Ix=5.74 in⁴	Area=7.16 cm² Sx=28.02 cm³ Ix=238.92 cm⁴
			12	3.7	208	310	0.0028	0.048		
			14	4.3	153	228	0.0052	0.089		
			16	4.9	117	174	0.0089	0.151		
			18	5.5	93	138	0.0140	0.242		
			20	6.1	75	112	0.0220	0.369		

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
464		NEMA: 20C CSA: E-6m UL Cross-Sectional Area: 1.00 in²	12	3.7	342	508	0.0020	0.036	Area=1.49 in² Sx=2.28 in³ Ix=7.65 in⁴	Area=9.61 cm² Sx=37.36 cm³ Ix=318.42 cm⁴
			16	4.9	192	286	0.0070	0.113		
			18	5.5	152	226	0.0110	0.182		
			20	6.1	123	183	0.0160	0.277		
			22	6.7	102	151	0.0240	0.406		
			24	7.3	85	127	0.0340	0.574		

When cable ladders are used in continuous spans, the deflection of the cable ladder is reduced by as much as 50%.
Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

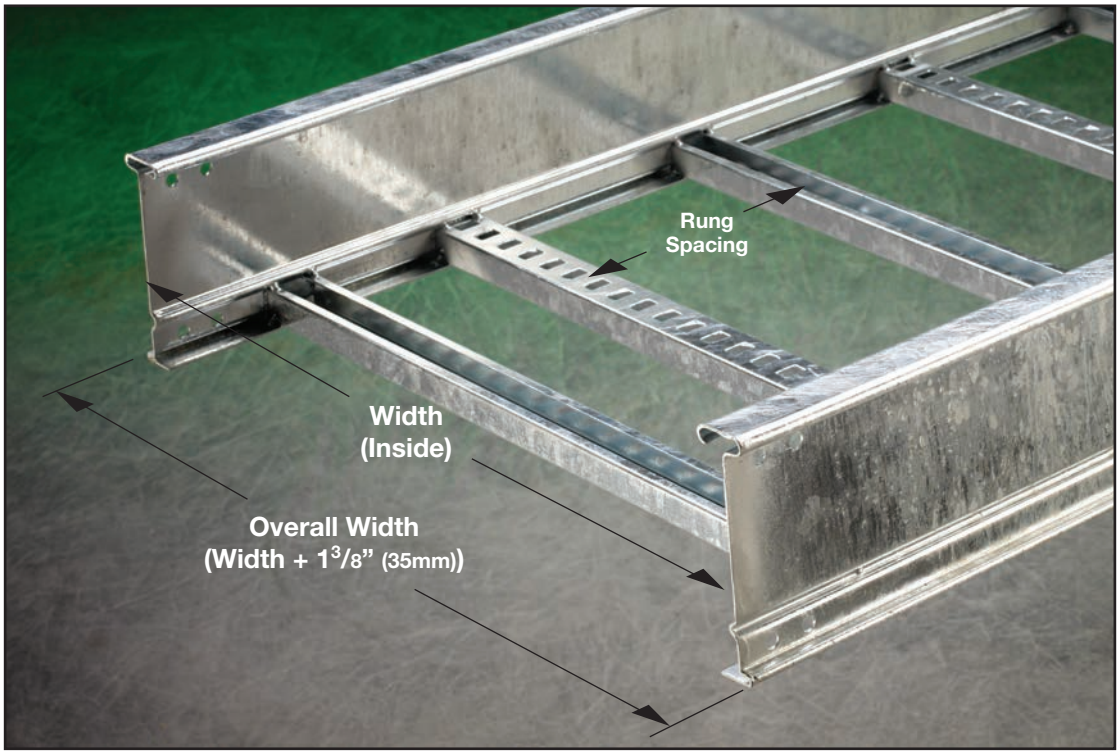
6" (152mm) NEMA VE 1 Loading Depth
7" (178mm) Side Rail Height

Straight Section Part Numbering

Example: **476 P 09 SL DN - 24 - 144**

Series	Material	Rung Spacing	Rung Type	Rung Orientation	Width	Length
476	**P** = Pre-Galv. Steel	**06** = 6" (152)	**SL** = Slotted	**Blank** - Slots alternate up & down (as shown below)	**06** = 6" (152)	①**240** = 20 ft. (6.1m) ②144 = 12 ft. (3.7m) — 476
574	**G** = Hot Dip Galvanized After Fabrication Steel	**09** = 9" (228)		**DN** = Continuous slot down	**09** = 9" (228)	①**240** = 20 ft. (6.1m) ②288 = 24 ft. (7.3m) — 574
		12 = 12" (305)		**UP** = Continuous slot up	**12** = 12" (305)	
					18 = 18" (457)	
					24 = 24" (609)	
					30 = 30" (762)	
					36 = 36" (914)	

①Primary Length.
②Secondary Length.



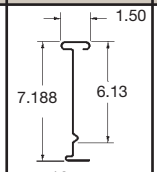
6" (152mm) NEMA VE 1 Loading Depth
7" (178mm) Side Rail Height

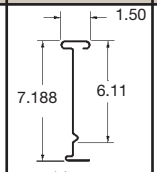
Dimensional & Loading Information

Values are based on simple beam tests per NEMA VE 1 on 36" (914mm) wide cable ladder with rungs spaced on 12" (305mm) centers. Cable ladders will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5.

To convert 1.5 safety factor to 2.0, multiply published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable laffer must be supported on spans shorter than or equal to the length of the cable ladder being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
476		NEMA: 20B, 16C CSA: D1-6m UL Cross-Sectional Area: 1.00 in²	12	3.7	214	318	0.0019	0.033	Area=1.22 in² Sx=2.14 in³ Ix=8.30 in⁴	Area=7.87 cm² Sx=35.07 cm³ Ix=345.47 cm⁴
			16	4.9	100	179	0.0062	0.105		
			18	5.5	95	141	0.0100	0.168		
			20	6.1	77	115	0.0150	0.255		
			22	6.7	64	95	0.0220	0.374		
			24	7.3	53	80	0.0310	0.529		

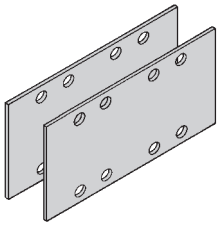
B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
574		NEMA: 20C CSA: E-6m UL Cross-Sectional Area: 1.50 in²	12	3.7	361	537	0.0014	0.025	Area=1.64 in² Sx=2.87 in³ Ix=11.10 in⁴	Area=10.58 cm² Sx=47.03 cm³ Ix=462.02 cm⁴
			16	4.9	203	302	0.0046	0.078		
			18	5.5	160	239	0.0073	0.125		
			20	6.1	130	193	0.0110	0.191		
			22	6.7	107	160	0.0160	0.280		
			24	7.3	90	134	0.0230	0.396		

When cable ladders are used in continuous spans, the deflection of the cable ladder is reduced by as much as 50%.
Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

Series 2, 3, 4 Steel Cable Ladder

Splice Plates

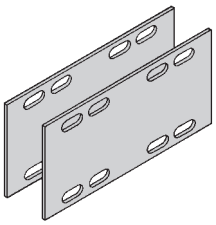
- Standard 8-hole pattern for all steel splice plates.
- Furnished in pairs with hardware.
- One pair including hardware provided with straight section.
- Boxed in pairs with hardware.
- (*) Insert ZN or G



Catalog No.	Height	
	in.	mm
9(*)-8004	4	101
9(*)-8005	5	127
9(*)-8006	6	152
9(*)-8007	7	178

Expansion Splice Plates

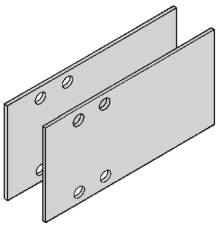
- Expansion plates allow for one inch expansion or contraction of the cable ladder, or where expansion joints occur in the support structure.
- Furnished in pairs with hardware.
- **Bonding Jumpers are required on each siderail. Part. # 99-N1. Order Separately.**
- (*) Insert ZN or G



Catalog No.	Height	
	in.	mm
9(*)-8014	4	101
9(*)-8015	5	127
9(*)-8016	6	152
9(*)-8017	7	178

Universal Splice Plates

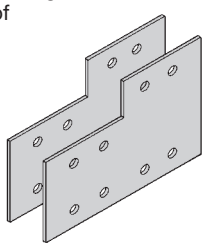
- Used to splice to existing cable ladder systems.
- Furnished in pairs with hardware.
- (*) Insert ZN or G



Catalog No.	Height	
	in.	mm
9(*)-8004-1/2	4	101
9(*)-8005-1/2	5	127
9(*)-8006-1/2	6	152
9(*)-8007-1/2	7	178

Step Down Splice Plates

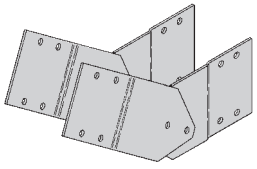
- These splice plates are offered for connecting cable ladder sections having side rails of different heights.
- Furnished in pairs with hardware.
- (*) Insert ZN or G



Catalog No.	Height	
	in.	mm
9(*)-8045	5 to 4	127 to 101
9(*)-8046	6 to 4	152 to 101
9(*)-8060	6 to 5	152 to 127
9(*)-8047	7 to 4	178 to 101
9(*)-8061	7 to 5	178 to 127
9(*)-8062	7 to 6	178 to 152

Vertical Adjustable Splice Plates

- These plates provide for changes in elevation that do not conform to standard vertical fittings.
- Furnished in pairs with hardware.
- **Bonding Jumpers not required.**
- (*) Insert G or P



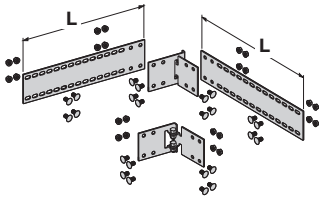
Requires supports within 24" (609mm) on both sides, per NEMA VE 2.

Catalog No.	Height	
	in.	mm
9(*)-8024	4	101
9(*)-8025	5	127
9(*)-8026	6	152
9(*)-8027	7	178

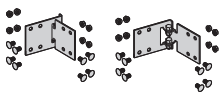
Horizontal Adjustable Splice Plates

- Offered to adjust a cable ladder run for changes in direction in a horizontal plane that do not conform to standard horizontal fittings.
- Furnished in pairs with hardware.
- New design bonding jumpers **not** required.
- (*) Insert ZN or G
- (X) Insert 5, 6 or 7 for side rail height.

9(*)-803(X)-12 or 9(*)-803(X)-36
One pair splice plates with extensions.



9(*)-803(X)
Splice only



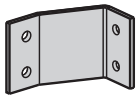
Requires supports within 24" (609mm) on both sides, per NEMA VE 2.

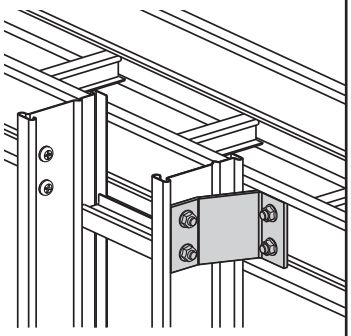
Catalog No.	Cable Ladder End Cut	Ladder Width	'L'
9(*)-803(X)	Mitered	Thru 36" (914)	N/A
9(*)-803(X)-12	Not Mitered	Thru 12" (305)	16" (406)
9(*)-803(X)-36	Not Mitered	Thru 36" (914)	41" (1041)

Dimensions in parentheses are in millimeters unless otherwise specified.

Cross Connector Bracket

- For field connecting crossing section.
- Furnished in pairs with 3/8" hardware.
- (*) Insert ZN or G

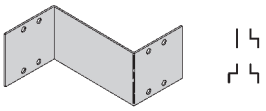




Catalog No.	9(*)-1240

Offset Reducing Splice Plate

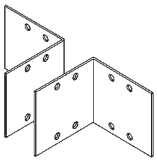
- This plate is used for joining cable ladders having different widths. When used in pairs they form a straight reduction; when used singly with a standard splice plate, they form an offset reduction.
- Furnished as one plate with hardware.
- (‡) Insert reduction
- (*) Insert G or P



Catalog No.	Height	
	in.	mm
9(*)-8064-(‡)	4	101
9(*)-8065-(‡)	5	127
9(*)-8066-(‡)	6	152
9(*)-8067-(‡)	7	178

Ladder to Box Splice Plates

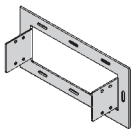
- Used to attach the end of a cable ladder run to a distribution box or control panel.
- Furnished in pairs with hardware.
- (*) Insert G or P



Catalog No.	Height	
	in.	mm
9(*)-8054	4	101
9(*)-8055	5	127
9(*)-8056	6	152
9(*)-8057	7	178

Frame Type Box Connector

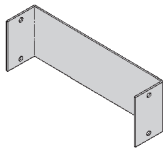
- Designed to attach the end of a cable ladder run to a distribution cabinet or control center to help reinforce the box at the point of entry.
- Furnished with ladder connection hardware.
- (*) Insert ZN or G
- (‡) Insert ladder width



Catalog No.	Height	
	in.	mm
9(*)-8074-(‡)	4	101
9(*)-8075-(‡)	5	127
9(*)-8076-(‡)	6	152
9(*)-8077-(‡)	7	178

Blind End

- This plate forms a closure for a dead end cable ladder.
- Furnished as one plate with hardware.
- (*) Insert G or P
- (‡) Insert ladder width



Catalog No.	Height	
	in.	mm
9(*)-8084-(‡)	4	101
9(*)-8085-(‡)	5	127
9(*)-8086-(‡)	6	152
9(*)-8087-(‡)	7	178

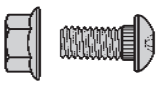
Ladder Hardware

Pre-Galvanized Ladder Hardware

Catalog No. **RNCB 3/8"-16 x 3/4" Znplt** Ribbed Neck ZN Carriage Bolt ASTM A307 Grade A

Catalog No. **SFHN 3/8"-16 Znplt** Serrated Flange Hex Nut ZN ASTM A563 Grade A

Finish: Zinc Plated ASTM B633, SC1



Hot Dip Galvanized Ladder Hardware

Standard: **Catalog No.** **RNCB 3/8"-16 x 3/4" CZ** Ribbed Neck Carriage Bolt ASTM F1136-88 Grade 3 Chromium Zinc

Catalog No. **SFHN 3/8"-16 CZ** Serrated Flange Hex Nut ASTM F1136-88 Grade A Chromium Zinc

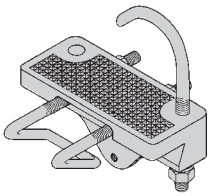
Optional: **Catalog No.** **RNCB 3/8"-16 x 3/4" SS6** AISI Stainless Steel

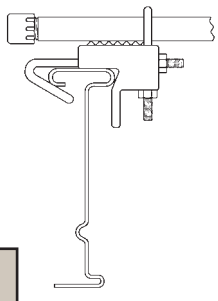
Catalog No. **SFHN 3/8"-16 SS6** AISI 316 Stainless Steel

Example: 9G-8004SS6

Conduit to Ladder Adaptor

- For easy attachment of conduit terminating at a cable ladder.
- Use on aluminum or steel cable ladders.





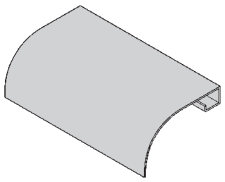
Catalog No.	Conduit Size	
	in.	mm
9G-1158-1/2, 3/4	1/2, 3/4	15, 20
9G-1158-1, 1 1/4	1, 1 1/4	25, 32
9G-1158-1 1/2, 2	1 1/2, 2	40, 50
9G-1158-2 1/2, 3	2 1/2, 3	65, 80
9G-1158-3 1/2, 4	3 1/2, 4	90, 100

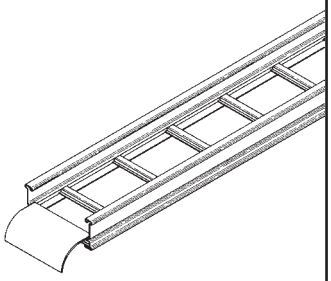
Dimensions in parentheses are in millimeters unless otherwise specified.

Series 2, 3, 4 Steel Cable Ladder

Ladder Drop-Out

- Specially-designed Ladder Drop-Outs provide a rounded surface with 4" (101 mm) radius to protect cable as it exits from the cable ladder, preventing damage to insulation. The drop-out will attach to any desired rung.
- (*) Insert P or G
- (‡) Insert ladder width



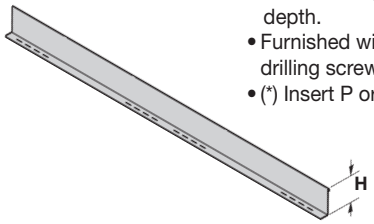


Catalog No.	9(*)-1104-(‡)

Barriers

Straight Section

- Standard length: 120" (3.05m) 144" (3.66m).
- Order catalog number based on loading depth.
- Furnished with four #10 x ½" plated self-drilling screws and a 99-9982 splice.
- (*) Insert P or G

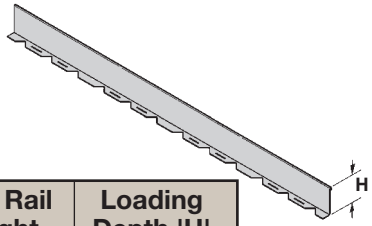


Catalog No.	Side Rail Height in.	Side Rail Height mm	Loading Depth 'H' in.	Loading Depth 'H' mm
73(*)-Length	4	101	3	76
74(*)-Length	5	127	4	101
75(*)-Length	6	152	5	127
76(*)-Length	7	178	6	152

Length = 144 for 12' (3.66m) or 120 for 10' (3.05m)

Horizontal Bend

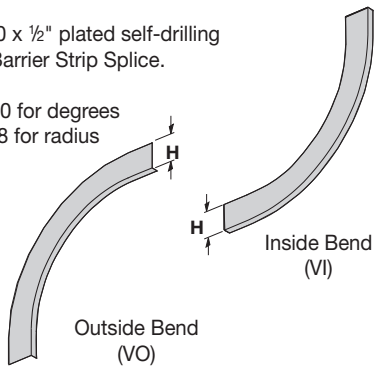
- Horizontal Bend Barriers are flexible in order to conform to any horizontal fitting radius. Cut to length.
- Order catalog number based on loading depth.
- Furnished with three #10 x ½" zinc plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- Standard length is 72" (1828mm) (6 ft.), sold individually.
- (*) Insert P or G



Catalog No.	Side Rail Height in.	Side Rail Height mm	Loading Depth 'H' in.	Loading Depth 'H' mm
73(*)-90HBFL	4	101	3	76
74(*)-90HBFL	5	127	4	101
75(*)-90HBFL	6	152	5	127
76(*)-90HBFL	7	178	6	152

Vertical Bend Barriers

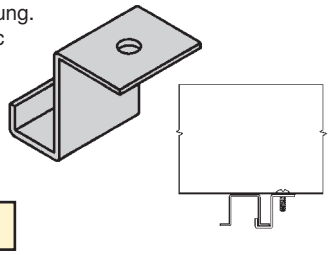
- Vertical Bend Barriers are preformed to conform to a specific vertical fitting.
- Furnished with three #10 x ½" plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- (*) Insert P or G
- (**) Insert 30, 45, 60 or 90 for degrees
- (†) Insert 12, 24, 36 or 48 for radius



Inside Bend Catalog No.	Outside Bend Catalog No.	Side Rail Height in.	Side Rail Height mm	Loading Depth 'H' in.	Loading Depth 'H' mm
73(*)-(**)VI(†)	73(*)-(**)VO(†)	4	101	3	76
74(*)-(**)VI(†)	74(*)-(**)VO(†)	5	127	4	101
75(*)-(**)VI(†)	75(*)-(**)VO(†)	6	152	5	127
76(*)-(**)VI(†)	76(*)-(**)VO(†)	7	178	6	152

Barrier Strip Clip

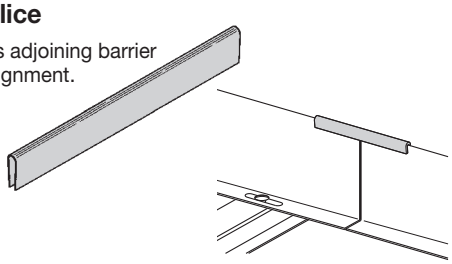
- Zinc plated steel barrier clip fastens to either aluminum or steel ladder rung.
- Furnished with one #10 x ½" zinc plated self-drilling screw.



Catalog No.	9ZN-9002

Barrier Strip Splice

- Plastic splice holds adjoining barrier strips in straight alignment.

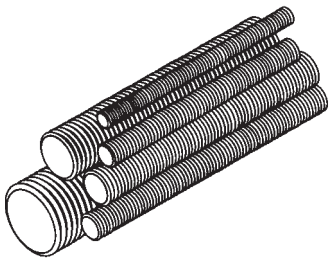


Catalog No.	99-9982

Dimensions in parentheses are in millimeters unless otherwise specified.

Threaded Rod

Loading based on safety factor 5.
Standard Finish: Zinc Plated.

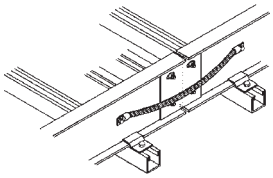


Size	Loading lbs. (kN)	Catalog No.	Available Lengths in. (mm)
3/8-16	730 (3.25)	ATR 3/8 x Length	36" (914), 72" (1829), 120" (3048), 144" (3657)
1/2-13	1350 (6.00)	ATR 1/2 x Length	36" (914), 72" (1829), 120" (3048), 144" (3657)

Bonding Jumper

Use at each expansion splice and where the cable ladder is not mechanically/electrically continuous to ground.
Sold individually.

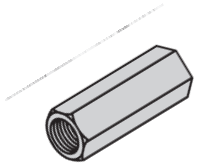
- Hardware included.
- See table 392.7(B)(2) on page CLS-9 for amperage ratings required to match the UL cross-sectional area of the ladder.
- See ladder loading chart for UL cross-sectional area.
- Bonding jumper is 16" (406) long.



Catalog No.	Cross-Sectional Area	Ampacity
99-N1	1.5 Square inches	600

Rod Couplers

Loading based on safety factor 5.
Standard Finish: Zinc Plated.

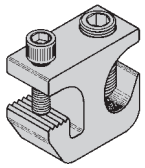


Size	Coupling Cat. No.
3/8-16	B655-3/8
1/2-13	B655-1/2

Grounding Clamp

B-Line Cable Ladder is UL classified as to its suitability as an equipment grounding conductor. If a separate conductor for additional grounding capability is desired, B-Line offers this clamp for bolting the conductor at least once to each cable ladder section.

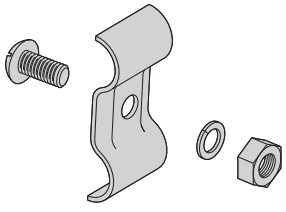
- Accepts #6 AWG to 250 MCM.



Item	Material	Catalog No.
Grounding Clamp	Tin Plated Aluminum	9A-2130

Ground Clamp

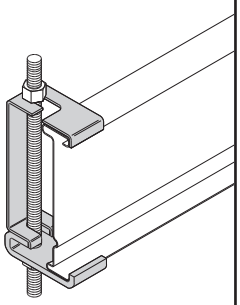
- Mechanically attaches grounding cables to cable ladder.
- Hardware included.
- (*) Insert ZN or SS4



Catalog No.	Cable Size
9(*)-2351	#1 thru 2/0
9(*)-2352	3/0 thru 250 MCM

Hanger Rod Clamp

- For 1/2" ATR.
- Furnished in pairs.
- Order ATR and hex nuts separately.
- Two-piece “J”-hanger design.
- (*) Insert ZN or G
- 1500 lbs./pair capacity safety factor 3.



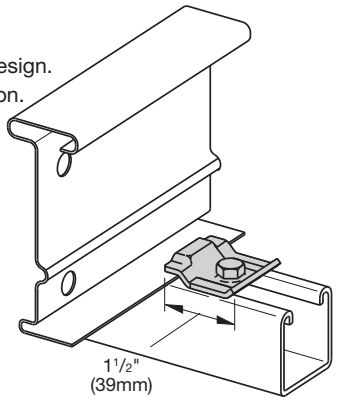
Catalog No.	Height in.	Height mm
9(*)-5324	4	101
9(*)-5325	5	127
9(*)-5326	6	152
9(*)-5327	7	178

Dimensions in parentheses are in millimeters unless otherwise specified.

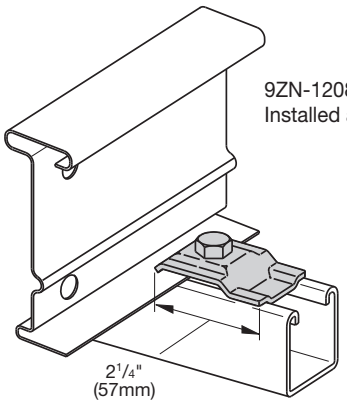
Series 2, 3, 4 Steel Cable Ladder

Cable Ladder Clamp/Guide

- Features a no-twist design.
- Has four times the strength of the traditional design.
- Each side is labeled to ensure proper installation.
- Furnished in pairs, with or without hardware.



9ZN-1204 shown.
Installed as a guide.



9ZN-1208 shown.
Installed as a clamp.

Catalog No.		Overall Length		Hardware Size	Finish
Without Hardware	With Hardware	in.	mm		
9ZN-1204	9ZN-1204NB	1 1/2	38	1/4"	Znplt
9ZN-1208	9ZN-1208NB	2 1/4	57	3/8"	Znplt
9A-1205	9A-1205NB	2 1/4	57	1/2"	Alum.
9G-1205	9G-1205NB	2 1/4	57	1/2"	HDGAF
9SS6-1205	9SS6-1205NB	2 1/4	57	1/2"	316SS
9ZN-1205	9ZN-1205NB	2 1/4	57	1/2"	Znplt

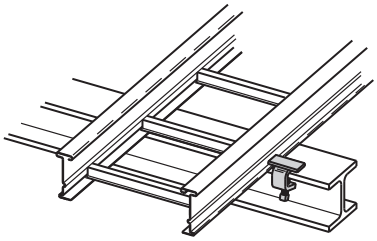
Patent # RE35479

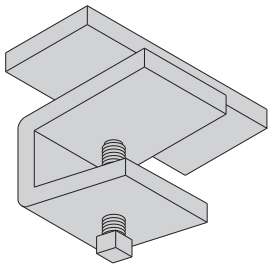
Note: For heavy duty or vertical applications see 9(*)-1241 or 9(*)-1242 page HDS-16.

When installing this device as an expansion guide on the outside flange of *Steel Side Rail*, use the Catalog No. **B202** Square Washer in order to properly elevate the guide.

Cable Ladder Guide

- Expansion guide for single or double cable ladder runs.
- Guide allows for longitudinal movement of the cable ladder.
- No field drilling of support I-beam or channel is required.
- Guides are required on both sides of cable ladder to prevent lateral movement - can be placed on either the inside or outside flange of cable ladder.
- Guides are sold in pieces - two guides are required per ladder.
- Maximum flange thickness 1 1/8" (28.58 mm).

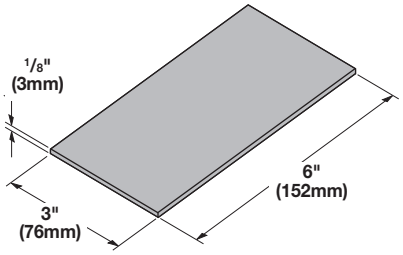




Catalog No.	Finish
9ZN-1249	Zinc Plated
9G-1249	HDGAF

Nylon Pad

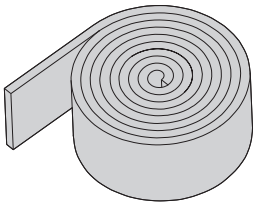
- Use for friction reduction.
- Hardness: Shore D80.
- Low friction coefficient.
- UV resistant (black).
- Excellent weatherability.
- UL-94HB.



Catalog No.	99-PE36

Neoprene Roll

- Used for material isolation.
- 1/8" x 2" x 20' roll.
- Hardness: Shore A60.
- Good weatherability.



Catalog No.	99-NP300

Dimensions in parentheses are in millimeters unless otherwise specified.

Trapeze Support Kit

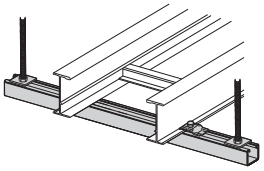
B-Line's trapeze kits provide the components required for a single trapeze support in one package. These kits are available in pre-galvanized steel with zinc-plated hardware or hot dip galvanized steel with 316 stainless steel hardware.

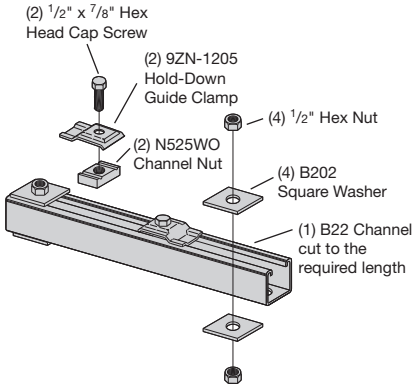
The SH channel provides the convenience of pre-punched slots, which eliminate the need for field drilling.

The illustrated hardware is sealed in a plastic bag and boxed with the channel,which is pre-cut to the appropriate length as shown in the chart.

Designed for use with 1/2" threaded rod. Order rod separately.

Catalog No.	Ladder Width		Channel Length		Uniform Load	
	in.	mm	in.	mm	lbs	kN
9P-5506-22SH(†)	6	152	16	406	1600	7.11
9P-5509-22SH(†)	9	229	18	457	1250	5.56
9P-5512-22SH(†)	12	305	22	559	1125	5.00
9P-5518-22SH(†)	18	457	28	711	865	3.85
9P-5524-22SH(†)	24	610	34	864	700	3.11
9P-5530-22SH(†)	30	762	40	1016	590	2.62
9P-5536-22SH(†)	36	914	46	1168	510	2.27
9P-5542-22SH(†)	42	1067	52	1321	450	2.00





• (†) Insert 3/8 for 3/8" threaded rod hardware.

Safety factor of 3.0 on all loads.

Heavy Duty Trapeze Support Kit

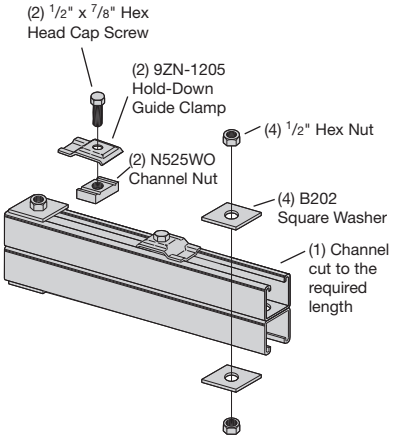
B-Line's trapeze kits provide the components required for a single trapeze support in one package. These kits are available in DURA-GREEN™ epoxy coated steel with zinc-plated hardware or hot dip galvanized steel with 316 stainless steel hardware.

The SH channel provides the convenience of pre-punched slots, which eliminates the need for field drilling.

The illustrated hardware is sealed in a plastic bag and boxed with the channel, which is pre-cut to the appropriate length as shown in the chart.

Designed for use with 1/2" threaded rod. Order rod separately.

Catalog No.	Ladder Width		Channel Length		Uniform Load	
	in.	mm	in.	mm	lbs	kN
9(*)-5506-22SHA	6	152	16	406	1350	6.01
9(*)-5509-22SHA	9	229	18	457	1350	6.01
9(*)-5512-22SHA	12	305	22	559	1350	6.01
9(*)-5518-22SHA	18	457	28	711	1350	6.01
9(*)-5524-22SHA	24	610	34	864	1350	6.01
9(*)-5530-22SHA	30	762	40	1016	1350	6.01
9(*)-5536-22SHA	36	914	46	1168	1350	6.01
9(*)-5542-22SHA	42	1067	52	1321	1350	6.01

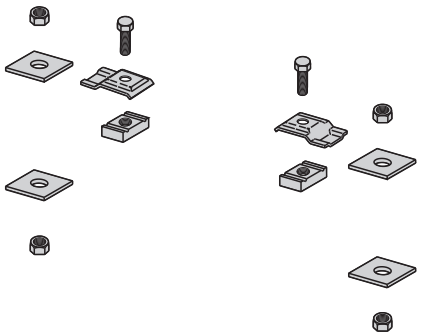


• (*) Insert GRN or G

Safety factor of 3.0 on all loads.

Trapeze Hardware Kit

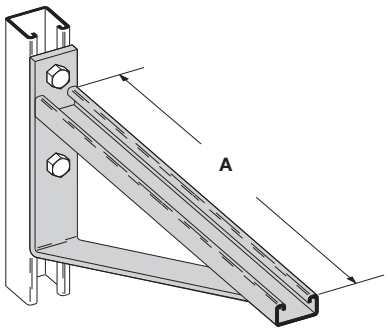
Catalog No. (plastic bagged)	
9ZN-5500-1/2	9G-5500-1/2
1 pr. 9ZN-1205 2 HHC Screw 1/2 x 7/8 ZN 2 N525 WO ZN 4 B202 ZN 1/2" sq washer 4 HN 1/2 ZN	1 pr. 9G-1205 2 HHC Screw 1/2 x 7/8 SS6 2 N525 WO SS6 4 B202 HDG 1/2" sq washer 4 HN 1/2 SS6



Dimensions in parentheses are in millimeters unless otherwise specified.

Cantilever Bracket

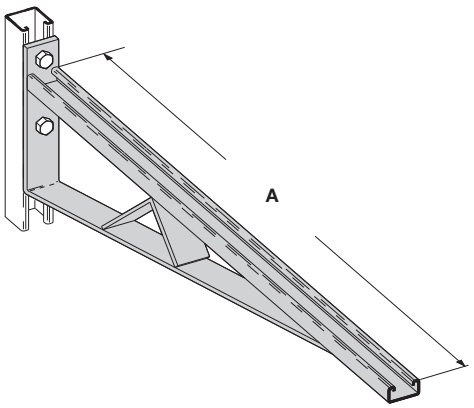
Finishes available: ZN, GRN, or HDG
Safety Load Factor 2.5



Catalog No.	Uniform Load		Ladder Width		'A'	
	lbs	kN	in.	mm	in.	mm
B494-12	1580	7.02	6 & 9	152 & 229	12	305
B494-18	1000	4.45	12	305	18	457
B494-24	996	4.43	18	457	24	610

Cantilever Bracket

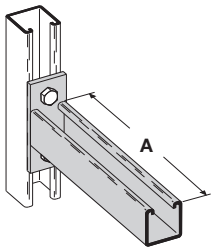
Finishes available: ZN, GRN, or HDG
Safety Load Factor 2.5



Catalog No.	Uniform Load		Ladder Width		'A'	
	lbs	kN	in.	mm	in.	mm
B494-30	924	4.11	24	610	30	762
B494-36	864	3.84	30	762	36	914
B494-42	580	2.58	36	914	42	1067
B494-48	500	2.22	42	1067	48	1219

Cantilever Bracket

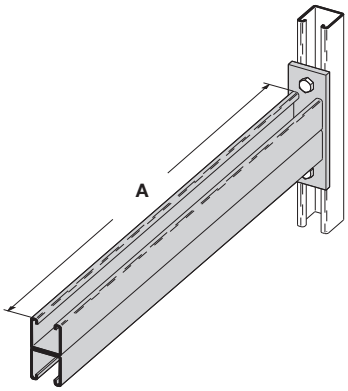
Finishes available: ZN, GRN, or HDG
Safety Load Factor 2.5



Catalog No.	Uniform Load		Ladder Width		'A'	
	lbs	kN	in.	mm	in.	mm
B409-12	980	4.27	6 & 9	152 & 229	12	305
B409-18	640	2.84	12	305	18	457
B409-24	480	2.13	18	457	24	610

Cantilever Bracket

Finishes available: ZN, GRN, or HDG
Safety Load Factor 2.5

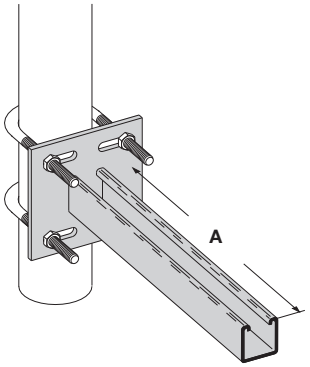


Catalog No.	Uniform Load		Ladder Width		'A'	
	lbs	kN	in.	mm	in.	mm
B297-12	1660	7.37	6 & 9	152 & 229	12	305
B297-18	1100	4.88	12	305	18	457
B297-24	836	3.71	18	457	24	610
B297-30	625	2.78	24	610	30	762
B297-36	550	2.44	30	762	36	914
B297-42	465	2.06	36	914	42	1067

Dimensions in parentheses are in millimeters unless otherwise specified.

Underfloor Support (U-Bolts not included)

- Finish available: ZN
- Safety Load Factor 2.5



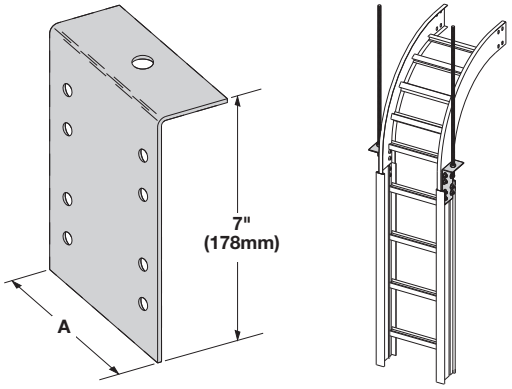
U-Bolt Size	Fits Pipe O.D.
B501-3/4	.841 - 1.050
B501-1	1.051 - 1.315
B501-1 1/4	1.316 - 1.660
B501-1 1/2	1.661 - 1.900
B501-2	1.901 - 2.375
B501-2 1/2	2.376 - 2.875

- Order properly sized U-Bolts separately.

Catalog No.	Uniform Load lbs	Uniform Load kN	Ladder Width in.	Ladder Width mm	'A' in.	'A' mm
B409UF-12	800	3.55	6 & 9	152 & 229	12	305
B409UF-21	450	2.00	12 & 18	305 & 457	21	533

Vertical Hanger Splice Plates

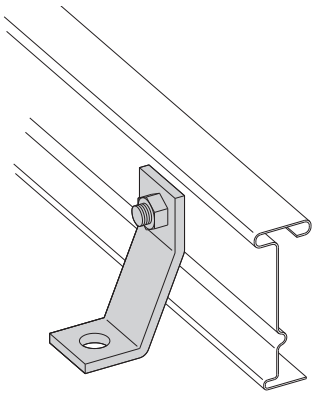
- (*) Insert ZN or G
- Design load is 1500 lbs/pair. Safety Factor of 2.5
- Furnished in pairs with hardware.



Catalog No.	Outside Cable Ladder Ht.	'A' in.	'A' mm
9(*)-8224	4"	2.84	85
9(*)-8225	5"	3.73	111
9(*)-8226	6"	4.84	136
9(*)-8227	7"	5.84	161

Heavy Duty Hold-Down Bracket

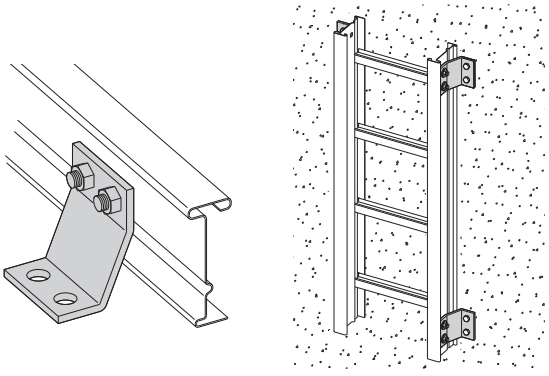
- Design load is 2000 lbs/pair.
- Two bolt design.
- Sold in pairs.
- 3/8" cable ladder attachment hardware provided.
- 1/2" support attachment hardware **not** provided.
- (*) Insert ZN or G



Catalog No.	9(*)-1241

Heavy Duty Hold-Down Bracket

- Design load is 4000 lbs/pair.
- Four bolt design.
- Sold in pairs.
- 3/8" cable ladder attachment hardware provided
- 1/2" support attachment hardware **not** provided.
- (*) Insert ZN or G



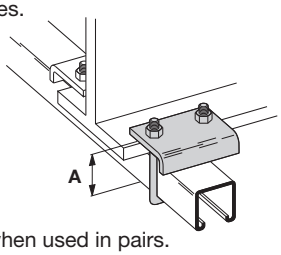
Catalog No.	9(*)-1242

Dimensions in parentheses are in millimeters unless otherwise specified.

Series 2, 3, 4 Steel Cable Ladder

Beam Clamp

- Finishes available: Insert ZN or HDG
- Sold in pieces.

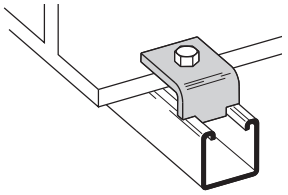


Design load when used in pairs.
Safety Load Factor 5.0

Catalog No.	Design Load* lbs	Design Load* kN	'A' in.	'A' mm
B441-22	1200	5.34	3 3/8	86
B441-22A	1200	5.34	5	127

Beam Clamp

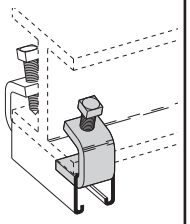
- Finishes available: ZN, GRN, HDG, or SS4
- Sold in pieces.
- Design load is 1200 lbs. (5.34kN) when used in pairs.
- Safety Load Factor 5.0
- Order HHCS and Channel Nuts separately.



Catalog No.	B355

Beam Clamp

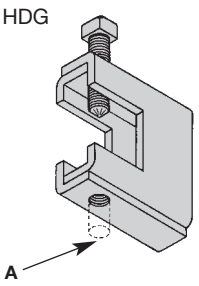
- Finishes available: ZN, GRN, or HDG
- Sold in pieces.
- Design load when used in pairs.
- B212-3/8 = 600 lbs. (2.67kN)
- Safety Load Factor 5.0

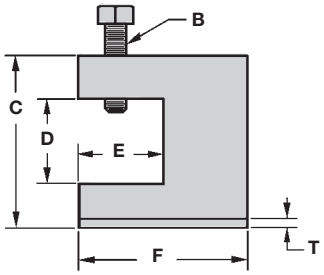


Cat. No.	B212-1/4		B212-3/8	
Design Load *	600 lbs.	2.67 kN	1000 lbs.	4.45kN
Max. Flange Thick	3/4"	19 mm	1 1/8"	28.6mm
Mat'l. Thickness	1/4"	6.3 mm	3/8"	9.5 mm

B305 Thru B308 & B321 Series Beam Clamps

- Finishes available: ZN or HDG
- Setscrew included.
- Safety Load Factor 5.0

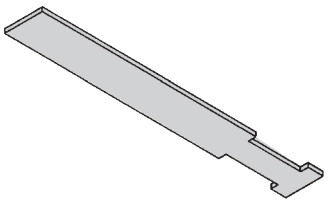




Cat. No.	Rod Size A	B	C	D	E	F	T	Design Load lbs	Design Load kN
B305	3/8"-16	3/8"-16	2 5/16"	7/8"	1 1/8"	2 1/2"	11 Ga.	600	2.67
B306	3/8"-16	1/2"-13	2 7/16"	7/8"	1 1/8"	2 1/2"	7 Ga.	1100	4.90
B307	1/2"-13	1/2"-13	2 7/16"	7/8"	1 1/8"	2 1/2"	7 Ga.	1100	4.90
B308	1/2"-13	1/2"-13	2 9/16"	7/8"	1 1/8"	2 1/2"	1/4"	1500	6.68
B321-1	3/8"-16	1/2"-13	3 9/16"	1 11/16"	1 5/8"	3 1/4"	1/4"	1300	5.79
B321-2	1/2"-13	1/2"-13	3 9/16"	1 11/16"	1 5/8"	3 1/4"	1/4"	1400	6.23

B312 Anchor Strap

- Finish available: ZN
- For a maximum beam thickness of 3/4" (19).
- For thicker beams, step up one flange width size.

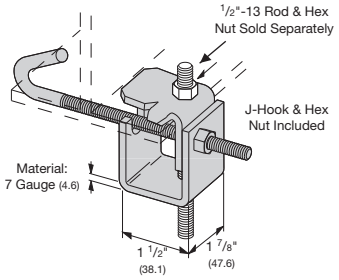


Cat. No.	Flange Width
B312-6	Up to 6"
B312-9	6" - 9"
B312-12	9" - 12"

Beam Clamp

Catalog No.	For Flange Width in.	For Flange Width mm	Wt./C lbs	Wt./C kg
B750-J4	3"- 6"	76.2 - 152.4	109	49.4
B750-J6	5"- 9"	127.0 - 288.6	124	56.2
B750-J9	8"- 12"	203.2 - 304.8	135	61.2
B750-J12	11"- 15"	279.4 - 381.0	147	66.7

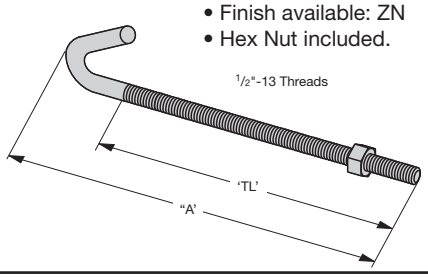
- Finish available: ZN
- Design Load 500 lbs. (2.22 kN)
- Safety Load Factor 5.0
- Recommended torque: 'J'-Hook Nut 125 In.-Lbs. (14.1 kN/m)
- Maximum flange thickness of 3/4" (19)



Beam Clamp J-Hook

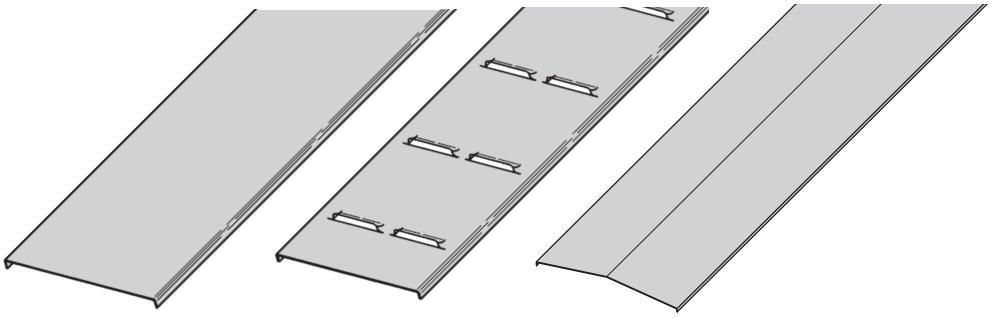
Catalog No.	'A' in.	'A' mm	Thread Length 'TL' in.	Thread Length 'TL' mm	Wt./C lbs	Wt./C kg
B700-J4	8 1/2"	215.9	5"	127.0	44	19.9
B700-J6	11 1/2"	292.1	6"	152.4	53	24.0
B700-J9	12 1/4"	368.3	6"	152.4	63	28.6
B700-J12	17 1/2"	444.5	6"	152.4	78	35.4

- Finish available: ZN
- Hex Nut included.



Dimensions in parentheses are in millimeters unless otherwise specified.

Covers



Solid Flanged | Ventilated Flanged | Peaked Flanged

A full range of covers is available for straight sections and fittings.

Solid covers should be used when maximum enclosure of the cable is desired and no accumulation of heat is expected.
Ventilated covers provide an overhead cable shield yet allow heat to escape.

B-Line recommends that covers be placed on vertical cable ladder runs to a height of 6 ft. (1.83 m) to 8 ft. (2.44 m) above the floor to isolate both cables and personnel. **Flanged covers** have a 1/2 in. (13 mm) flange. Cover clamps are not included with the cover and must be ordered separately. All **peaked covers** are flanged. Standard peaked covers have 1/2" (13 mm) peak.

Steel Cover Part Numbering

Prefix

Example: **80 2 P 20 - 24 - 144**

Cover Type	Detail	Material	Material Thickness	Ladder Width	Item Description
80 = Solid 81 = Ventilated 82 = Peaked	2= Flanged Steel (All fittings) 3= Flanged Steel (All straight sections)	P = Pre-Galvanized G = HDGAF	20 = 20 Pre-Galv 18 = 18 HDGAF	06 = 6" (152) 09 = 9" (228) 12 = 12" (305) 18 = 18" (457) 24 = 24" (609) 30 = 30" (762) 36 = 36" (914)	For Straight Section Covers: **Pre-Galvanized Only:** 144 = 12 ft. (3.66 m) 120 = 10 ft. (3.05 m) **Pre-Galvanized & HDGAF** 72 = 6 ft. (1.83 m) 60 = 5 ft. (1.52 m) For fitting covers: Insert suffix of fitting to be covered. See example below.

Covers 30" (762) and 36" (914) wide have reinforcing ridges.

Examples of Catalog Numbers for Fitting Covers:

Horizontal Bend Cover

Prefix | Suffix

80 2 P 20 - 18 - 90 HB 24

- 24 — Radius
- HB — Fitting
- 90 — Angle
- 18 — Width
- 20 — Material Thickness
- P — Material
- 2 — Detail
- 80 — Cover Type

Vertical Bend Cover

Prefix | Suffix

80 2 G 18 - 24 - 90 VO 24 - 4*

- 4* — Side Rail* Height
- 24 — Radius
- VO — Fitting
- 90 — Angle
- 24 — Width
- 18 — Material Thickness
- G — Material
- 2 — Detail
- 80 — Cover Type

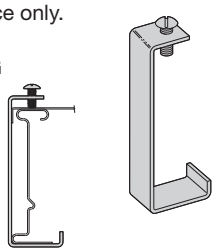
* Required for VO fittings only

Dimensions in parentheses are in millimeters unless otherwise specified.

Series 2, 3, 4 Steel Cable Ladder

Standard Cover Clamp

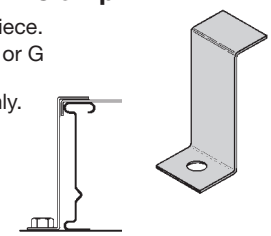
- For indoor service only.
- Sold per piece.
- (*) Insert ZN or G



Ladder Type	Side Rail Height in.	mm	Catalog No.
Steel	4	101	9(*)-9014
	5	127	9(*)-9015
	6	152	9(*)-9016
	7	178	9(*)-9017

Combination Cover and Hold-Down Clamp

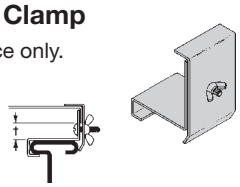
- Sold per piece.
- (*) Insert P or G
- For indoor service only.



Ladder Type	Side Rail Height in.	mm	Catalog No.
Steel	4	101	9(*)-9043
	5	127	9(*)-9053
	6	152	9(*)-9063
	7	178	9(*)-9073

Raised Cover Clamp

- For indoor service only.
- For use with flanged covers only.



† Specify gap of 1", 2", 3" or 4"

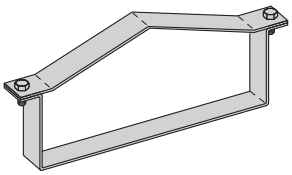
Ladder Type	Catalog No.
Series 3 & 4 Steel Straight Section	9ZN-9115-†
All Steel Fittings	9ZN-910†

Heavy Duty Cover Clamp

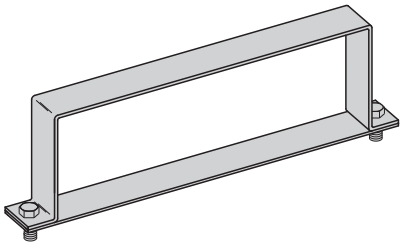
- Recommended for outdoor service.
- (*) Insert P or G

(‡) Insert ladder width
† Add P to Catalog No. for 1/2" (13mm) peaked cover clamp.

Peaked Cover Clamp



Side Rail Height in.	mm	Catalog No.
4	101	9(*)-9044-(‡)
5	127	9(*)-9054-(‡)
6	152	9(*)-9064-(‡)
7	178	9(*)-9074-(‡)



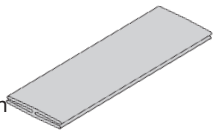
Quantity of Standard Cover Clamps Required

Straight Section 60" (1.52m) or 72" (1.83m) .....4 pcs.
Straight Section 120" (3.05m) or 144" (3.66m).....6 pcs.
Horizontal/Vertical Bends.....4 pcs.
Tees.....6 pcs.
Crosses .....8 pcs.

Note: When using the Heavy Duty Cover Clamp, only one-half the number of clamps stated above is required.

Cover Joint Strip

- Used to join covers
- Plastic
- (‡) Insert ladder width

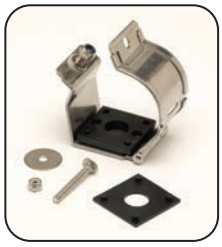


Catalog No.	99-9980-(‡)

Cable Cleats

(See pages CC-1 - CC-5)

Trefoil Cable Cleats



Cable Cleats

Section 1- Acceptable Manufacturers

1.01 Manufacturer: Subject to compliance with these specifications, cable ladder systems shall be as manufactured by B-Line.

Section 2- Cable Ladder Sections and Components

2.01 General: Except as otherwise indicated, provide metal cable ladders, of types, classes and sizes indicated; with splice plates, bolts, nuts and washers for connecting units. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additional construction features. Cable ladder shall be installed according to the latest revision of NEMA VE 2.

2.02 Pre-Galvanized Steel: Straight sections, fitting side rails, rungs, and covers shall be made from structural quality steel meeting the minimum mechanical properties and mill galvanized in accordance with ASTM A653 SS, Grade 33, coating designation G90. Hardware finish shall be electrogalvanized zinc per ASTM B633.

2.03 Hot Dip Galvanized Steel: All side rails, covers, splice plates, and rungs shall be made from structural quality steel meeting the minimum mechanical properties of ASTM A1011 SS, Grade 33 for 14 gauge and heavier, ASTM A1008, Grade 33 Type 2 for 16 gauge and lighter, and shall be hot dip galvanized after fabrication in accordance with ASTM A123. Mill galvanized covers are not acceptable for hot dip galvanized cable ladder. Hardware finish shall be chromium zinc per ASTM F-1136-88.

2.04 Ladder Cable Ladders shall consist of two longitudinal members (side rails) with transverse members (rungs) welded to the side rails. Rungs shall be spaced [6] [9] [12] inches on center. Rung spacing in radiused fittings shall be industry standard 9" and measured at the center of the ladder's width. No portion of the rungs shall protrude below the bottom plane of the side rails. Each rung must be capable of supporting a 200 lb. concentrated load at the center of the cable ladder over and above the cable load with a safety factor of 1.5.

2.05 Ventilated Trough Cable Ladders shall consist of two longitudinal members (side rails) with a corrugated bottom welded to the side rails or rungs spaced 4" on center. The peaks of the corrugated bottom shall have a minimum flat cable bearing surface of $2^{3}/_{4}$" and shall be spaced on 6" centers. To provide ventilation in the ladder, the valleys of the corrugated bottom shall have $2^{1}/_{4}$" x 4" rectangular holes punched along the width of the bottom.

2.06 Non-Ventilated Bottom Trough Cable Ladders shall consist of two longitudinal members (side rails) with a corrugated bottom welded to the side rails or a solid sheet over rungs. The peaks of the corrugated bottom shall have a minimum flat cable bearing surface of $2^{3}/_{4}$" and shall be spaced on 6" centers.

2.07 Cable ladder loading depth shall be [3] [4] [5] [6] inches per NEMA VE 1.

2.08 Straight sections shall have side rails fabricated as I-beams. Straight sections shall be supplied in standard [12 foot] [24 foot] [10 foot (3 m)] [20 foot (6 m)] lengths.

2.09 Cable ladder widths shall be [6] [9] [12] [18] [24] [30] [36] inches or as shown on drawings.

2.10 Splice plates shall be manufactured of high strength steel, meeting the minimum mechanical properties of ASTM A1011 HSLAS, Grade 50, Class 1 and be secured with 8 nuts and bolts per plate. The resistance of fixed splice connections between an adjacent section of ladder shall not exceed 0.00033 ohm.

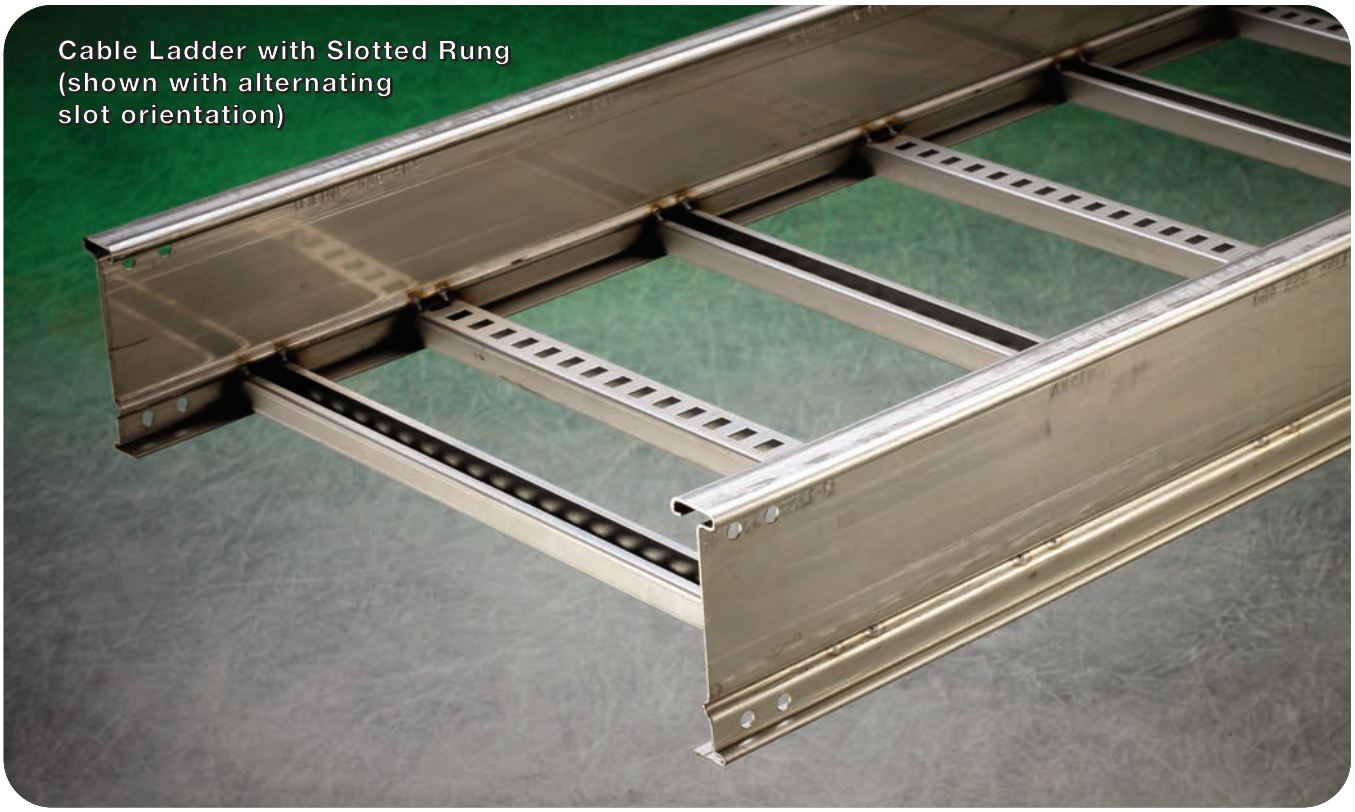
2.11 All fittings must have a minimum radius of [12] [24] [36] [48] inches.

Section 3- Loading Capacities and Testing

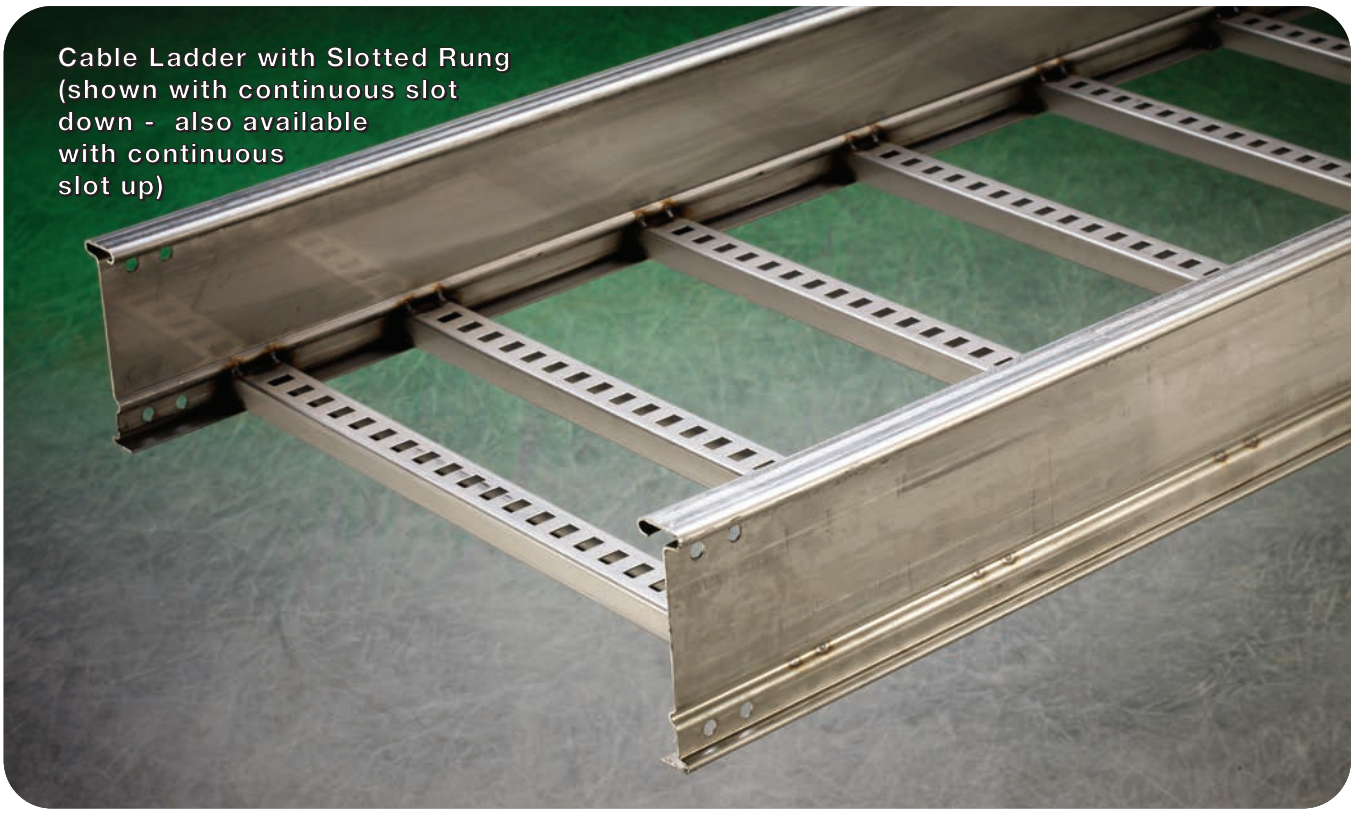
3.01 Cable ladder shall be capable of carrying a uniformly distributed load of _____ lbs./ft. on a _____ ft. support span with a safety factor of 1.5 when supported as a simple span and tested per NEMA VE 1 5.2. In addition to the uniformly distributed load the cable ladder shall support 200 lbs. concentrated load at mid-point of span. Load and safety factors specified are applicable to both the side rails and rung capacities. Cable ladder shall be made to manufacturing tolerances as specified by NEMA.

3.02 Upon request, manufacturer shall provide test reports in accordance with the latest revision of NEMA VE 1 or CSA C22.2 No. 126.

Stainless Steel Cable Ladder



Cable Ladder with Slotted Rung (shown with alternating slot orientation)

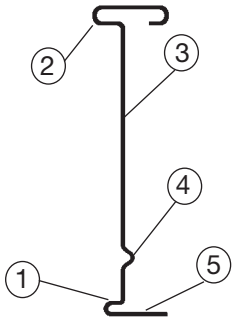


Cable Ladder with Slotted Rung (shown with continuous slot down - also available with continuous slot up)

Stainless Steel Cable Ladder, Series 3, & 4

Side Rails

Our I-Beam -- the most efficient structural shape

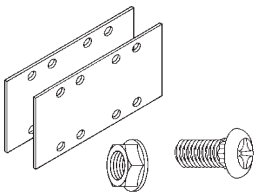


1. **Roll formed for extra strength**
2. **Enlarged top flange for stiffness**
3. **Structural grade traceable steel**
4. **Rung top lock**
5. **Positive Rung Support**

Side rails and rungs are stamped every 18" with:

- **Company Name**
- **Part Number**
- **Material**
- **Heat Trace Number**

Splices -- provide system integrity



The Splices -- the engineered connection:
- High strength eleven gauge steel
- Eight bolt connection for required strength
- Finish and hardware options

Hot Dip Galvanized After Fabrication (HDGAF) -- providing system integrity

- ASTM A123/CSA Type I
- In plant post-dip inspection and deburr
- ASTM F-1136-88 Grade 3 Splice hardware exceeds NEMA requirements.
- ASTM A123 Covers available - system compatibility

Pre-Galvanized- Hot Dip Mill Galvanized -- providing system integrity

- ASTM A653SS Gr.33 G90/ CSA Type II
- Anti-corrosive silicon bronze welds eliminate cosmetic painting

Reliable time-tested products. A system that works.
- 200 lb. Concentrated Load- side rail and rungs
- Splice integrity - 3" fitting tangents

3" (76mm) NEMA VE 1 Loading Depth - 4" (101mm) Side Rail Height - Series 348
Actual Loading Depth = 3.13" (79mm)

4" (101mm) NEMA VE 1 Loading Depth - 5" (127mm) Side Rail Height - Series 358
Actual Loading Depth = 4.13" (105mm)

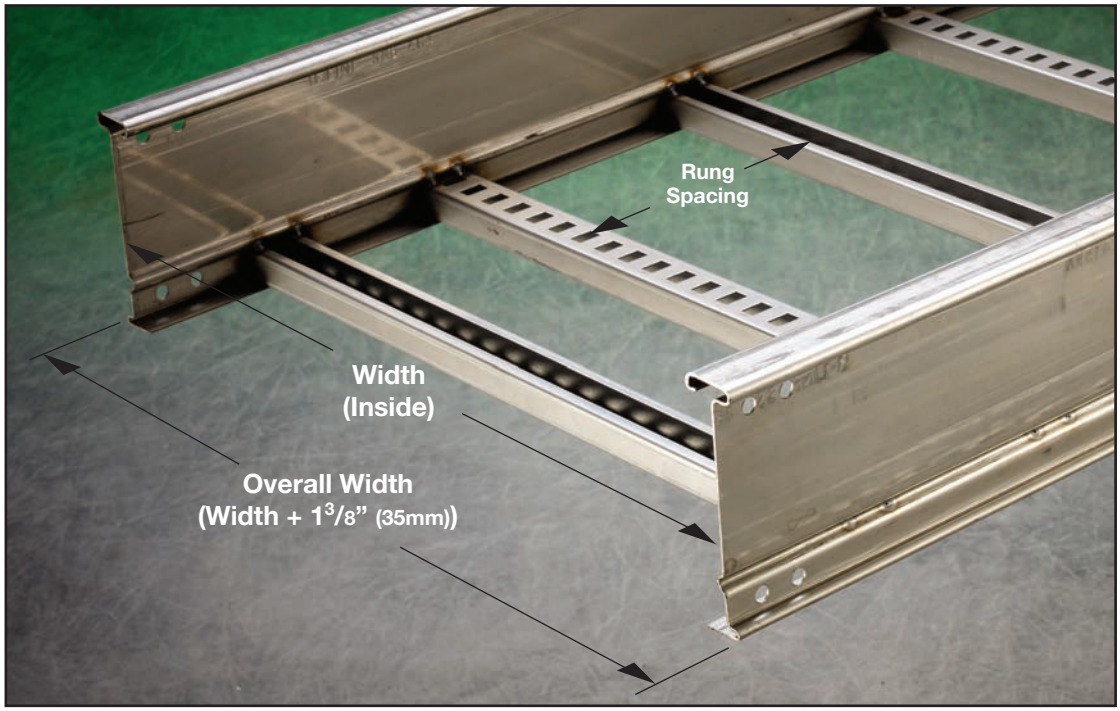
5" (127mm) NEMA VE 1 Loading Depth - 6" (152mm) Side Rail Height - Series 368 Series 464
Actual Loading Depth = 5.11" (130mm)

Straight Section Part Numbering

Example: **358 SS6 09 SL DN - 24 - 144**

Series	Material	Rung Spacing	Rung Type	Rung Orientation	Width	Length	
348	**SS4** = 304 Stainless Steel	**Ladder** **06** = 6" (152) **09** = 9" (228) **12** = 12" (305) **Trough** 6" and wider **04** = Vented Bottom **SB** = Non-Vented Bottom	**SL** - Slotted	**Blank** - Slots alternate up & down (as shown below) **DN** - Continuous slot down **UP** - Continuous slot up	**06** = 6" (152) **09** = 9" (228) **12** = 12" (305) **18** = 18" (457) **24** = 24" (609) **30** = 30" (762) **36** = 36" (914)	①**144** = 12 ft. (3.7m) ②120 = 10 ft. (3.0m)	348
358	**SS6** = 316 Stainless Steel					①**144** = 12 ft. (3.7m) ②240 = 20 ft. (6.1m)	358
368						①**240** = 20 ft. (6.1m) ②288 = 24 ft. (7.3m)	368
464						①**240** = 20 ft. (6.1m) ②288 = 24 ft. (7.3m)	464

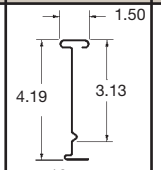
①Primary Length.
②Secondary Length.



Dimensional & Loading Information

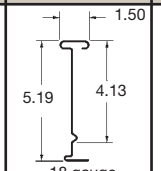
Values are based on simple beam tests per NEMA VE 1 on 36" (914mm) wide cable ladder rungs spaced on 12" (305mm) centers. Cable ladders will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable being installed.

Series 348 - 3" (76mm) Loading Depth

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
348 SS†		NEMA: 16A, 12C CSA: C1-3m UL Cross-Sectional Area: 0.40 in²	10	3.0	180	268	0.0042	0.072	Area=0.79 in² Sx=0.79 in³ Ix=1.85 in⁴	Area=4.77 cm² Sx=12.95 cm³ Ix=77.00 cm⁴
			12	3.7	125	186	0.0090	0.148		
			14	4.3	92	137	0.0160	0.275		
			16	4.9	70	105	0.0270	0.469		
			18	5.5	56	83	0.0440	0.752		
			20	6.1	45	67	0.0670	1.145		

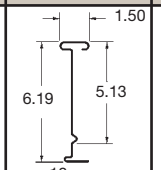
When cable ladders are used in continuous spans, the deflection of the cable ladder is reduced by as much as 50%.
Design factors: Ix = Moment of Inertia, Sx = Section Modulus. † Insert 4 for 304 stainless steel or 6 for 316 stainless steel.

Series 358 - 4" (101mm) Loading Depth

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
358 SS†		NEMA: 20A, 16B CSA: 89 kg/m-6.1m UL Cross-Sectional Area: 0.70 in²	10	3.0	248	369	0.0025	0.043	Area=0.83 in² Sx=1.09 in³ Ix=3.10 in⁴	Area=5.35 cm² Sx=17.86 cm³ Ix=129.03 cm⁴
			12	3.7	172	256	0.0062	0.089		
			14	4.3	127	188	0.0100	0.164		
			16	4.9	97	144	0.0160	0.280		
			18	5.5	77	114	0.0260	0.448		
			20	6.1	62	92	0.0400	0.684		

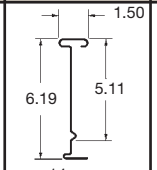
When cable ladders are used in continuous spans, the deflection of the cable ladder is reduced by as much as 50%.
Design factors: Ix = Moment of Inertia, Sx = Section Modulus. † Insert 4 for 304 stainless steel or 6 for 316 stainless steel.

Series 358 - 5" (127mm) Loading Depth

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
368 SS†		NEMA: 20A, 16B CSA: D1-3m UL Cross-Sectional Area: 0.70 in²	10	3.0	236	351	0.0016	0.028	Area=0.92 in² Sx=1.41 in³ Ix=4.77 in⁴	Area=5.94 cm² Sx=23.11 cm³ Ix=198.54 cm⁴
			12	3.7	164	244	0.0034	0.058		
			14	4.3	120	179	0.0062	0.107		
			16	4.9	92	137	0.0110	0.182		
			18	5.5	73	108	0.0170	0.291		
			20	6.1	59	88	0.0260	0.444		

When cable ladders are used in continuous spans, the deflection of the cable ladder is reduced by as much as 50%.
Design factors: Ix = Moment of Inertia, Sx = Section Modulus. † Insert 4 for 304 stainless steel or 6 for 316 stainless steel.

Series 464 - 5" (127mm) Loading Depth

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Span meters	Load lbs/ft	Load kg/m	Deflection Multiplier		Design Factors for Two Rails	
464 SS†		NEMA: 20A, 16C CSA: D1-6m UL Cross-Sectional Area: 0.70 in²	12	3.7	342	508	0.0020	0.036	Area=1.49 in² Sx=2.28 in³ Ix=7.65 in⁴	Area=9.61 cm² Sx=37.36 cm³ Ix=318.42 cm⁴
			14	4.3	192	286	0.0070	0.113		
			16	4.9	152	226	0.0110	0.182		
			18	5.5	123	183	0.0160	0.277		
			20	6.1	102	151	0.0240	0.406		
			24	7.3	85	127	0.0340	0.574		

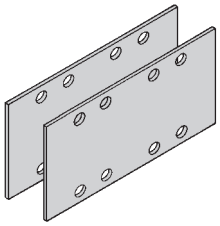
When cable ladders are used in continuous spans, the deflection of the cable ladder is reduced by as much as 50%.
Design factors: Ix = Moment of Inertia, Sx = Section Modulus. † Insert 4 for 304 stainless steel or 6 for 316 stainless steel.

Dimensions in parentheses are in millimeters unless otherwise specified.

Stainless Steel Cable Ladder

Splice Plates

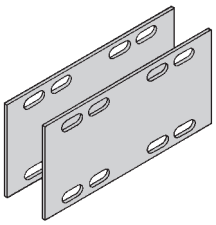
- Standard 8-hole pattern for all steel splice plates.
- Furnished in pairs with hardware.
- One pair including hardware provided with straight section.
- Boxed in pairs with hardware.
- (*) Insert SS4 or SS6



Catalog No.	Height	
	in.	mm
9(*)-8004	4	101
9(*)-8005	5	127
9(*)-8006	6	152

Expansion Splice Plates

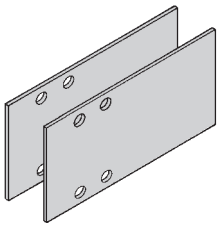
- Expansion plates allow for one inch expansion or contraction of the cable ladder, or where expansion joints occur in the support structure.
- Furnished in pairs with hardware.
- **Bonding Jumpers are require on each siderail. Order Separately.**
- (*) Insert SS4 or SS6



Catalog No.	Height	
	in.	mm
9(*)-8014	4	101
9(*)-8015	5	127
9(*)-8016	6	152

Universal Splice Plates

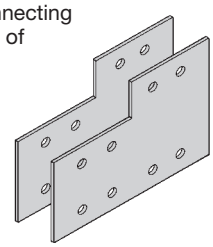
- Used to splice to existing cable ladder systems.
- Furnished in pairs with hardware.
- (*) Insert SS4 or SS6



Catalog No.	Height	
	in.	mm
9(*)-8004-1/2	4	101
9(*)-8005-1/2	5	127
9(*)-8006-1/2	6	152

Step Down Splice Plates

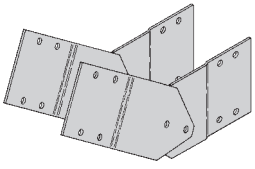
- These splice plates are offered for connecting cable ladder sections having side rails of different heights.
- Furnished in pairs with hardware.
- (*) Insert SS4 or SS6



Catalog No.	Height	
	in.	mm
9(*)-8045	5 to 4	127 to 101
9(*)-8046	6 to 4	152 to 101
9(*)-8060	6 to 5	152 to 127

Vertical Adjustable Splice Plates

- These plates provide for changes in elevation that do not conform to standard vertical fittings.
- Furnished in pairs with hardware.
- **Bonding Jumpers not required.**
- (*) Insert SS4 or SS6



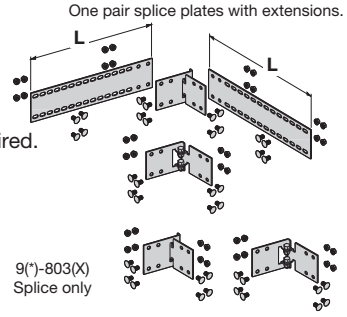
Catalog No.	Height	
	in.	mm
9(*)-8024	4	101
9(*)-8025	5	127
9(*)-8026	6	152

Requires supports within 24" on both sides, per NEMA VE 2.

Horizontal Adjustable Splice Plates

- Offered to adjust a cable ladder run for changes in direction in a horizontal plane that do not conform to standard horizontal fittings.
- Furnished in pairs with hardware.
- New design bonding jumpers **not** required.
- (*) Insert SS4 or SS6
- (X) Insert 4, 5, or 6 for side rail height.

9(*)-803(X)-12 or 9(*)-803(X)-36
One pair splice plates with extensions.



9(*)-803(X)
Splice only

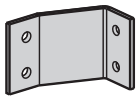
Catalog No.	Ladder End Cut	Ladder Width	'L'
9(*)-803(X)	Mitered	Thru 36"	N/A
9(*)-803(X)-12	Not mitered	Thru 12"	16"
9(*)-803(X)-36	Not mitered	Thru 36"	41"

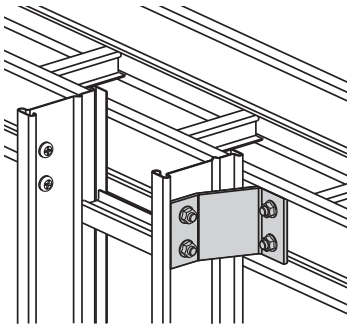
Requires supports within 24" on both sides, per NEMA VE 2.

Stainless Steel

Cross Connector Bracket

- For field connecting crossing section.
- Furnished in pairs with 3/8" hardware.
- (*) Insert SS4 or SS6

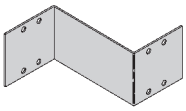




Catalog No.	9(*)-1240

Offset Reducing Splice Plate

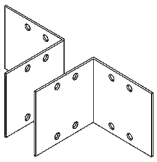
- This plate is used for joining cable ladders having different widths. When used in pairs they form a straight reduction; when used singly with a standard splice plate, they form an offset reduction.
- Furnished as one plate with hardware.
- (‡) Insert reduction
- (*) Insert SS4 or SS6



Catalog No.	Height	
	in.	mm
9(*)-8064-(‡)	4	101
9(*)-8065-(‡)	5	127
9(*)-8066-(‡)	6	152

Ladder to Box Splice Plates

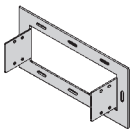
- Used to attach the end of a cable ladder run to a distribution box or control panel.
- Furnished in pairs with hardware.
- (*) Insert SS4 or SS6



Catalog No.	Height	
	in.	mm
9(*)-8054	4	101
9(*)-8055	5	127
9(*)-8056	6	152

Frame Type Box Connector

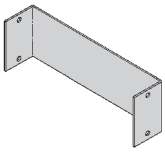
- Designed to attach the end of a cable ladder run to a distribution cabinet or control center to help reinforce the box at the point of entry.
- Furnished with ladder connection hardware.
- (*) Insert SS4 or SS6
- (‡) Insert ladder width



Catalog No.	Height	
	in.	mm
9(*)-8074-(‡)	4	101
9(*)-8075-(‡)	5	127
9(*)-8076-(‡)	6	152

Blind End

- This plate forms a closure for a dead end cable ladder.
- Furnished as one plate with hardware.
- (*) Insert SS4 or SS6
- (‡) Insert ladder width

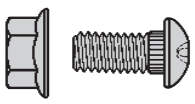


Catalog No.	Height	
	in.	mm
9(*)-8084-(‡)	4	101
9(*)-8085-(‡)	5	127
9(*)-8086-(‡)	6	152

Type 316 Ladder Hardware

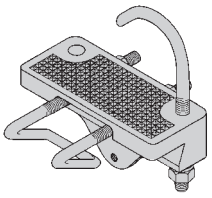
Catalog No. **RNCB 3/8"-16 x 3/4" SS6**
Ribbed Neck Carriage Bolt - 316 Stainless Steel

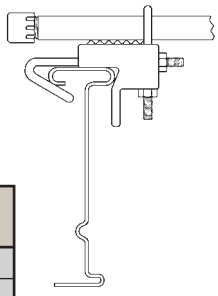
Catalog No. **SFHN 3/8"-16 SS6**
Hex Nut - 316 Stainless Steel



Conduit to Ladder Adaptor

- For easy attachment of conduit terminating at a cable ladder.
- Use on aluminum or steel cable ladders.





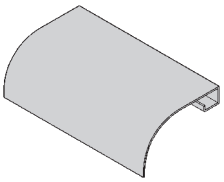
Steel I-Beam

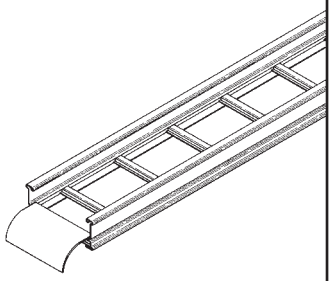
Catalog No.	Conduit Size	
	in.	mm
9G-1158-1/2, 3/4	1/2, 3/4	15, 20
9G-1158-1, 1 1/4	1, 1 1/4	25, 32
9G-1158-1 1/2, 2	1 1/2, 2	40, 50
9G-1158-2 1/2, 3	2 1/2, 3	65, 80
9G-1158-3 1/2, 4	3 1/2, 4	90, 100

Dimensions in parentheses are in millimeters unless otherwise specified.

Ladder Drop-Out

- Specially-designed Ladder Drop-Outs provide a rounded surface with 4" (101 mm) radius to protect cable as it exits from the cable ladder, preventing damage to insulation. The drop-out will attach to any desired rung.
- (*) Insert SS4 or SS6
- (‡) Insert ladder width



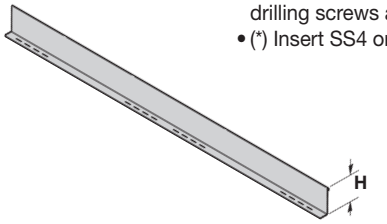


Catalog No.	9(*)-1104-(‡)

Barriers

Straight Section

- Standard length: 120" (3.05m) 144" (3.66m).
- Order catalog number based on loading depth.
- Furnished with four #10 x 1/2" plated self-drilling screws and a 99-9982 splice.
- (*) Insert SS4 or SS6

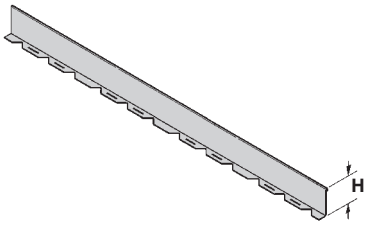


Catalog No.	Side Rail Height		Loading Depth 'H'	
	in.	mm	in.	mm
73(*)-Length	4	101	3	76
74(*)-Length	5	127	4	101
75(*)-Length	6	152	5	127

Length = 144 for 12' (3.66m) or 120 for 10' (3.05m)

Horizontal Bend

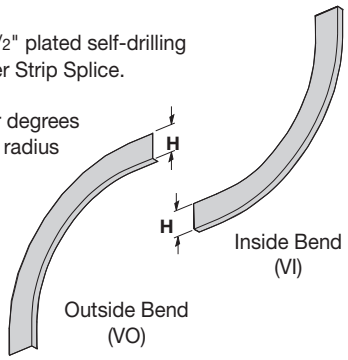
- Horizontal Bend Barriers are flexible in order to conform to any horizontal fitting radius. Cut to length.
- Order catalog number based on loading depth.
- Furnished with three #10 x 1/2" zinc plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- Standard length is 72" (1828mm) (6 ft.), sold individually.
- (*) Insert SS4 or SS6



Catalog No.	Side Rail Height		Loading Depth 'H'	
	in.	mm	in.	mm
73(*)-90HBFL	4	101	3	76
74(*)-90HBFL	5	127	4	101
75(*)-90HBFL	6	152	5	127

Vertical Bend Barriers

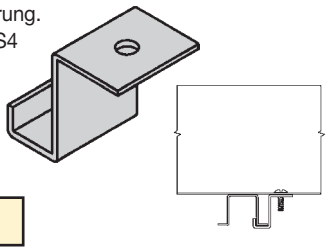
- Vertical Bend Barriers are preformed to conform to a specific vertical fitting.
- Furnished with three #10 x 1/2" plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- (*) Insert SS4 or SS6
- (**) Insert 30, 45, 60 or 90 for degrees
- (†) Insert 12, 24, 36 or 48 for radius



Inside Bend Catalog No.	Outside Bend Catalog No.	Side Rail Height		Loading Depth 'H'	
		in.	mm	in.	mm
73(*)-(**)VI(†)	73(*)-(**)VO(†)	4	101	3	76
74(*)-(**)VI(†)	74(*)-(**)VO(†)	5	127	4	101
75(*)-(**)VI(†)	75(*)-(**)VO(†)	6	152	5	127

Barrier Strip Clip

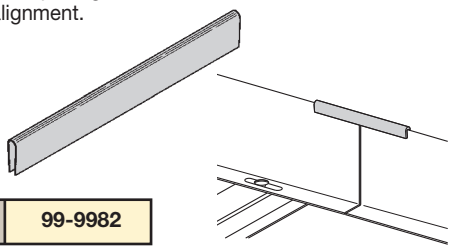
- Zinc plated steel barrier clip fastens to either aluminum or steel ladder rung.
- Furnished with one #10 x 1/2" SS4 plated self-drilling screw.
- (*) Insert SS4 or SS6



Catalog No.	9(*)-9002

Barrier Strip Splice

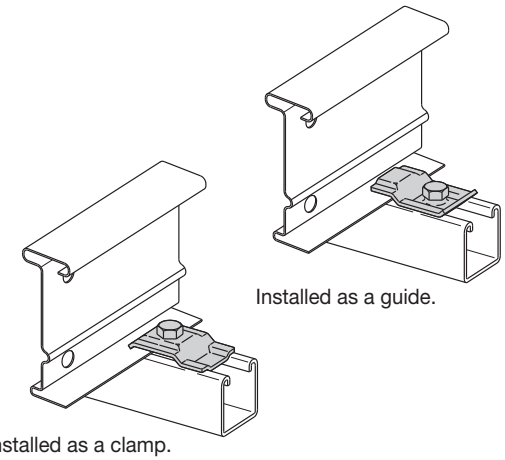
- Plastic splice holds adjoining barrier strips in straight alignment.



Catalog No.	99-9982

Cable Ladder Clamp/Guide

- Features a no-twist design.
- Has four times the strength of the traditional design.
- Each side is labeled to ensure proper installation.
- Furnished in pairs, with or without hardware.



Installed as a guide.

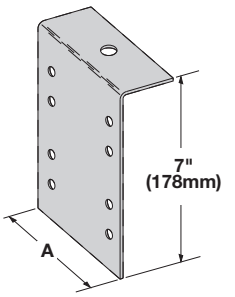
Installed as a clamp.

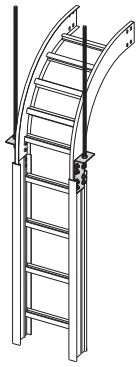
Catalog No.	9SS6-1205

Patent # RE35479

Vertical Ladder Hanger

- (*) Insert SS4 or SS6
- Design load 1500 lbs/pair (6.67kN). Safety Factor of 2.5
- Furnished in pairs with hardware.

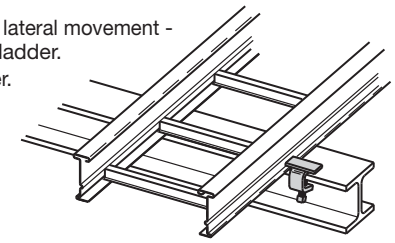


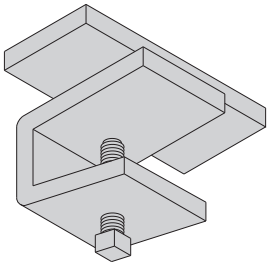


Catalog No.	Outside Cable Ladder Ht.	'A' in.	'A' mm
9(*)-8224	4"	3.36	85.34
9(*)-8225	5"	4.36	110.74
9(*)-8226	6"	5.36	136.14

Cable Ladder Guide

- Expansion guide for single or double cable ladder runs.
- Guide allows for longitudinal movement of the cable ladder.
- No field drilling of support I-beam or channel is required.
- Guides are required on both sides of cable ladder to prevent lateral movement - can be placed on either the inside or outside flange of cable ladder.
- Guides are sold in pieces - two guides are required per ladder.
- Maximum flange thickness $1^{1}/_{8}$" (28.58 mm).



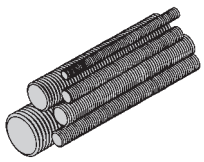


Catalog No.	Finish
9G-1249	HDGAF

Threaded Rod (ATR) & Rod Coupling

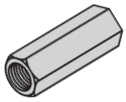
Loading based on safety factor 5.

Standard Finish: (*) Insert SS4 or SS6



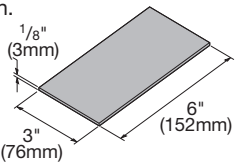
Size	Loading lbs	Catalog No.	Available Lengths
$^{3}/_{8}$-16	730	ATR $^{3}/_{8}$ x Length (*)	36", 72", 144"
$^{1}/_{2}$-13	1350	ATR $^{1}/_{2}$ x Length (*)	36", 72", 144"

Size	Coupling Cat No.
$^{3}/_{8}$-16	B655-$^{3}/_{8}$ (*)
$^{1}/_{2}$-13	B655-$^{1}/_{2}$ (*)



Nylon Pad

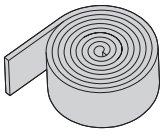
- Use for friction reduction.
- Hardness: Shore D80.
- Low friction coefficient.
- UV resistant (black).
- Excellent weatherability.
- UL - 94HB.



Catalog No.	99-PE36

Neoprene Roll

- Use for material isolation.
- $^{1}/_{8}$" x 2" x 20' roll.
- Hardness: Shore A60.
- Good weatherability.



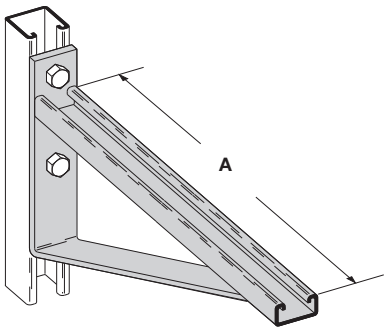
Catalog No.	99-NP300

Stainless Steel

Dimensions in parentheses are in millimeters unless otherwise specified.

Cantilever Bracket

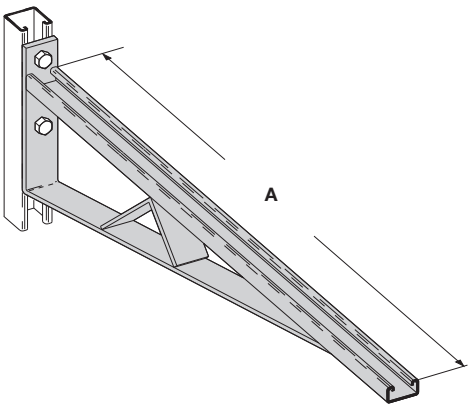
Finishes available: SS4 or SS6
Safety Load Factor 2.5



Catalog No.	Uniform Load		Ladder Width		'A'	
	lbs	kN	in.	mm	in.	mm
B494-12	1580	7.02	6 & 9	152 & 229	12	305
B494-18	1000	4.45	12	305	18	457
B494-24	996	4.43	18	457	24	610

Cantilever Bracket

Finishes available: SS4 or SS6
Safety Load Factor 2.5

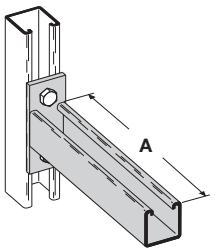


Catalog No.	Uniform Load		Ladder Width		'A'	
	lbs	kN	in.	mm	in.	mm
B494-30	924	4.11	24	610	30	762
B494-36	864	3.84	30	762	36	914
B494-42	580	2.58	36	914	42	1067
B494-48	500	2.22	42	1067	48	1219

Stainless Steel

Cantilever Bracket

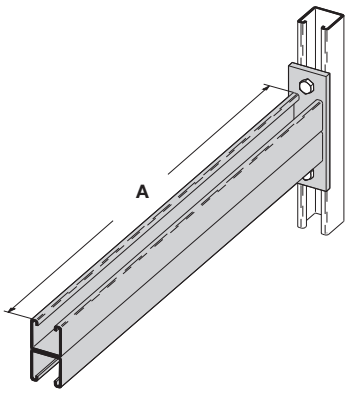
Finishes available: SS4 or SS6
Safety Load Factor 2.5



Catalog No.	Uniform Load		Ladder Width		'A'	
	lbs	kN	in.	mm	in.	mm
B409-12	980	4.27	6 & 9	152 & 229	12	305
B409-18	640	2.84	12	305	18	457
B409-24	480	2.13	18	457	24	610

Cantilever Bracket

Finishes available: SS4 or SS6
Safety Load Factor 2.5

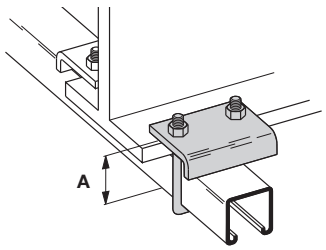


Catalog No.	Uniform Load		Ladder Width		'A'	
	lbs	kN	in.	mm	in.	mm
B297-12	1660	7.37	6 & 9	152 & 229	12	305
B297-18	1100	4.88	12	305	18	457
B297-24	836	3.71	18	457	24	610
B297-30	625	2.78	24	610	30	762
B297-36	550	2.44	30	762	36	914
B297-42	465	2.06	36	914	42	1067

Dimensions in parentheses are in millimeters unless otherwise specified.

Beam Clamp

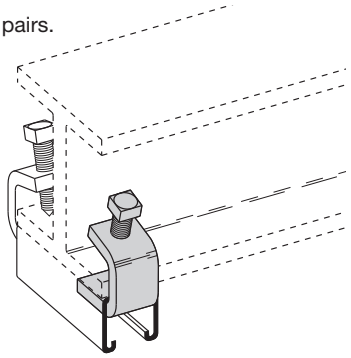
- Sold in pieces with hardware.
- (*) Insert SS4 or SS6
- Sold in pieces.
- Design load when used in pairs.
- Safety Load Factor 5.0



Catalog No.	Design Load lbs	Design Load kN	'A' in.	'A' mm
B441-22(*)	1200	5.34	3 3/8	86
B441-22A(*)	1200	5.34	5	127

Beam Clamp

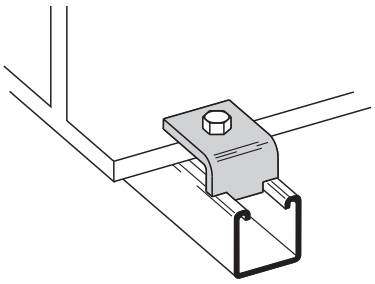
- Sold in pieces.
- Design load when used in pairs.
- Safety Load Factor 5.0
- 304 Stainless Steel



Catalog No.	B212-1/4SS4		B212-3/8SS4	
Design Load *	600 lbs.	2.67 kN	1000 lbs.	4.45 kN
Max. Flange Thick	3/4"	19 mm	1 1/8"	28.6 mm
Mat'l. Thickness	1/4"	6.3 mm	3/8"	9.5 mm

Beam Clamp

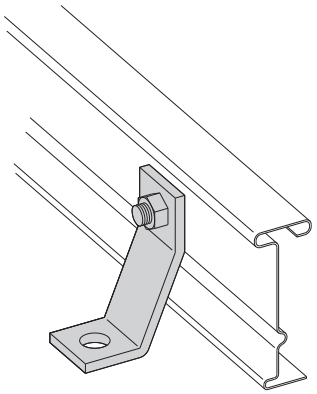
- Sold in pieces.
- Design load is 1200 lbs. (5.34kN) when use in pairs.
- Safety Load Factor 5.0
- Order HHCS and Channel Nuts separately.
- 304 Stainless Steel



Catalog No.	B355 SS4

Heavy Duty Hold-Down Bracket

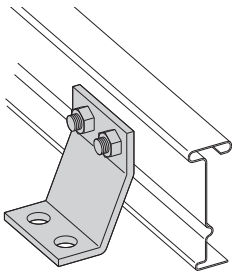
- Design load is 2000 lbs (8.9kN)/pair.
- Two bolt design.
- Sold in pairs.
- 3/8" cable ladder attachment hardware provided.
- 1/2" support attachment hardware **not** provided.
- (*) Insert SS4 or SS6

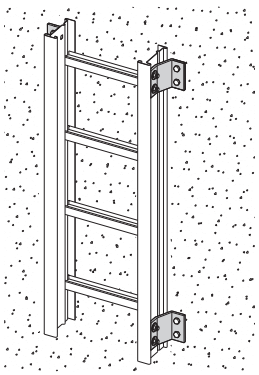


Catalog No.	9(*)-1241

Heavy Duty Hold-Down Bracket

- Design load is 4000 lbs (17.8kN)/pair.
- Four bolt design.
- Sold in pairs.
- 3/8" cable ladder attachment hardware provided
- 1/2" support attachment hardware **not** provided.
- (*) Insert SS4 or SS6

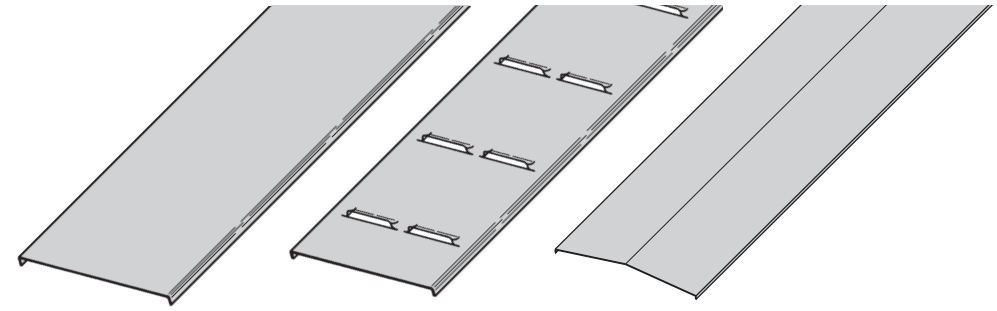




Catalog No.	9(*)-1242

Dimensions in parentheses are in millimeters unless otherwise specified.

Covers



Solid Flanged | Ventilated Flanged | Peaked Flanged

A full range of covers is available for straight sections and fittings.

Solid covers should be used when maximum enclosure of the cable is desired and no accumulation of heat is expected.
Ventilated covers provide an overhead cable shield yet allow heat to escape.
B-Line recommends that covers be placed on vertical cable ladder runs to a height of 6 ft. (1.83 m) to 8 ft. (2.44 m) above the floor to isolate both cables and personnel. **Flanged covers** have a 1/2" (13 mm) flange. Cover clamps are not included with the cover and must be ordered separately. All **peaked covers** are flanged. Standard peaked covers have 1/2" (13 mm) peak.

Stainless Steel Cover Part Numbering

Prefix

Example: **80 3 SS4 - 20 - 24 - 144**

Cover Type	Detail	Material	Material Thickness	Ladder Width	Item Description
80 = Solid 81 = Ventilated 82 = Peaked	2= Flanged Stainless Steel (All fittings) 3= Flanged Stainless Steel (All straight sections) 4= Non-Flanged Stainless Steel (80 & 81 type only, all fittings & straight sections)	SS4 = 304 Stainless Steel SS6 = 316 Stainless Steel	20 = 20 Ga. Stainless Steel	06 = 6" (152mm) 09 = 9" (228mm) 12 = 12" (305mm) 18 = 18" (457mm) 24 = 24" (609mm) 30 = 30" (762mm) 36 = 36" (914mm)	For Straight Section Cover: 120 = 10 ft. (3.05 m) 72 = 6 ft. (1.83 m) 60 = 5 ft. (1.52 m) For fitting covers: Insert suffix of fitting to be covered. See example below.

Covers 30" and 36" wide have reinforcing ridges.

Examples of Catalog Numbers for Fitting Covers:

Horizontal Bend Cover

Prefix / Suffix

80 2 SS4 20 - 18 - 90 HB 24

- 24 — Radius
- HB — Fitting
- 90 — Angle
- 18 — Width
- 20 — Material Thickness
- SS4 — Material
- 2 — Detail
- 80 — Cover Type

Vertical Bend Cover

Prefix / Suffix

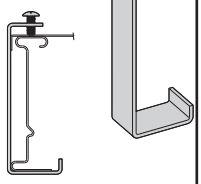
80 2 SS4 20 - 24 - 90 VO 24 - 4*

- 4* — Side Rail* Height
- 24 — Radius
- VO — Fitting
- 90 — Angle
- 24 — Width
- 20 — Material Thickness
- SS4 — Material
- 2 — Detail
- 80 — Cover Type

* Required for VO fittings only

Standard Cover Clamp

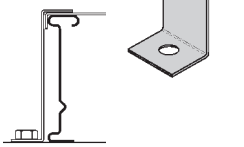
- For indoor service only.
- Sold per piece.
- 316 Stainless Steel



Ladder Type	Side Rail Height in.	Side Rail Height mm	Catalog No.
Stainless Steel	4	101	9SS6-9014
	5	127	9SS6-9015
	6	152	9SS6-9016

Combination Cover and Hold-Down Clamp

- Sold per piece.
- (*) Insert SS4 or SS6
- For indoor service only.

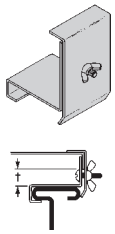


Ladder Type	Side Rail Height in.	Side Rail Height mm	Catalog No.
Stainless Steel	4	101	9(*)-9043
	5	127	9(*)-9053
	6	152	9(*)-9063

Raised Cover Clamp

- For indoor service only.
- For use with flanged covers only.
- (*) Insert SS4 or SS6

† Specify gap of 1" (25mm), 2" (52mm), 3" (76mm) or 4" (101mm)



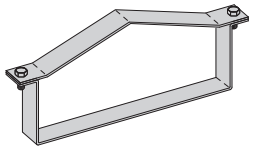
Ladder Type	Catalog No.
Series 3 & 4 Steel Straight Section	9(*)-9115-†
All Steel Fittings (Also Series 1 Steel Straight Sections)	9(*)-910†

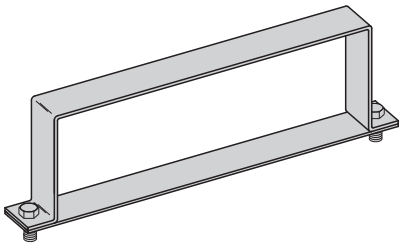
Heavy Duty Cover Clamp

- Recommended for outdoor service.
- (*) Insert SS4 or SS6

(‡) Insert ladder width
† Add P to Catalog No. for 1/2" (13mm) peaked cover clamp.

Peaked Cover Clamp





Side Rail Height in.	Side Rail Height mm	Catalog No.
4	101	9(*)-(‡)-9044†
5	127	9(*)-(‡)-9054†
6	152	9(*)-(‡)-9064†

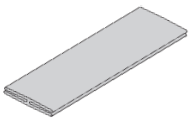
Quantity of Standard Cover Clamps Required

Straight Section 60" (1.52m) or 72" (1.83m) .....4 pcs.
Straight Section 120" (3.05m) or 144" (3.66m).....6 pcs.
Horizontal/Vertical Bends.....4 pcs.
Tees.....6 pcs.
Crosses .....8 pcs.

Note: When using the Heavy Duty Cover Clamp, only one-half the number of clamps stated above is required.

Cover Joint Strip

- Used to join covers
- Plastic
- (‡) Insert ladder width

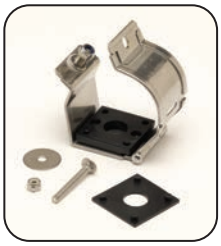


Catalog No.	99-9980-(‡)

Cable Cleats

(See pages CC-1 - CC-5)

Trefoil Cable Cleats



Cable Cleats

Dimensions in parentheses are in millimeters unless otherwise specified.

Section 1- Acceptable Manufacturers

1.01 Manufacturer: Subject to compliance with these specifications, cable ladder systems shall be as manufactured by B-Line.

Section 2- Cable Ladder Sections and Components

2.01 General: Except as otherwise indicated, provide metal cable ladders, of types, classes and sizes indicated; with splice plates, bolts, nuts and washers for connecting units. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additional construction features. Cable ladder shall be installed according to the latest revision of NEMA VE 2.

2.02 Stainless Steel: Straight section and fitting side rails and rungs shall be made of AISI Type [304] [316] stainless steel. Transverse members (rungs) or corrugated bottoms shall be welded to the side rails with Type 316 stainless steel welding wire. Hardware shall be AISI Type 316 stainless steel.

2.03 Ladder Cable Ladders shall consist of two longitudinal members (side rails) with transverse members (rungs) welded to the side rails. Rungs shall be spaced [6] [9] [12] inches on center. Rung spacing in radiused fittings shall be industry standard 9" and measured at the center of the ladder's width. Each rung must be capable of supporting a 200 lb. concentrated load at the center of the cable ladder with a safety factor of 1.5.

2.04 Ventilated Trough Cable Ladders shall consist of two longitudinal members (side rails) with a corrugated bottom welded to the side rails or rungs spaced 4" on center. The peaks of the corrugated bottom shall have a minimum flat cable bearing surface of 2 3/4" and shall be spaced on 6" centers. To provide ventilation in the ladder, the valleys of the corrugated bottom shall have 2 1/4" x 4" rectangular holes punched along the width of the bottom.

2.05 Non-Ventilated Bottom Trough Cable Ladders shall consist of two longitudinal members (side rails) with a corrugated bottom welded to the side rails or a solid sheet over rungs. The peaks of the corrugated bottom shall have a minimum flat cable bearing surface of 2 3/4" and shall be spaced on 6" centers.

2.06 Cable ladder loading depth shall be [3] [4] [5] inches per NEMA VE 1.

2.07 Straight sections shall be fabricated as I-beams. Straight sections shall be supplied in standard [12 foot] [24 foot] [10 foot (3 m)] [20 foot (6 m)] lengths.

2.08 Cable ladder widths shall be [6] [9] [12] [18] [24] [30] [36] inches or as shown on drawings.

2.09 Splice plates shall be manufactured of high strength steel and be secured with 8 nuts and bolts per plate. The resistance of fixed splice connections between an adjacent section of ladder shall not exceed 0.00033 ohm.

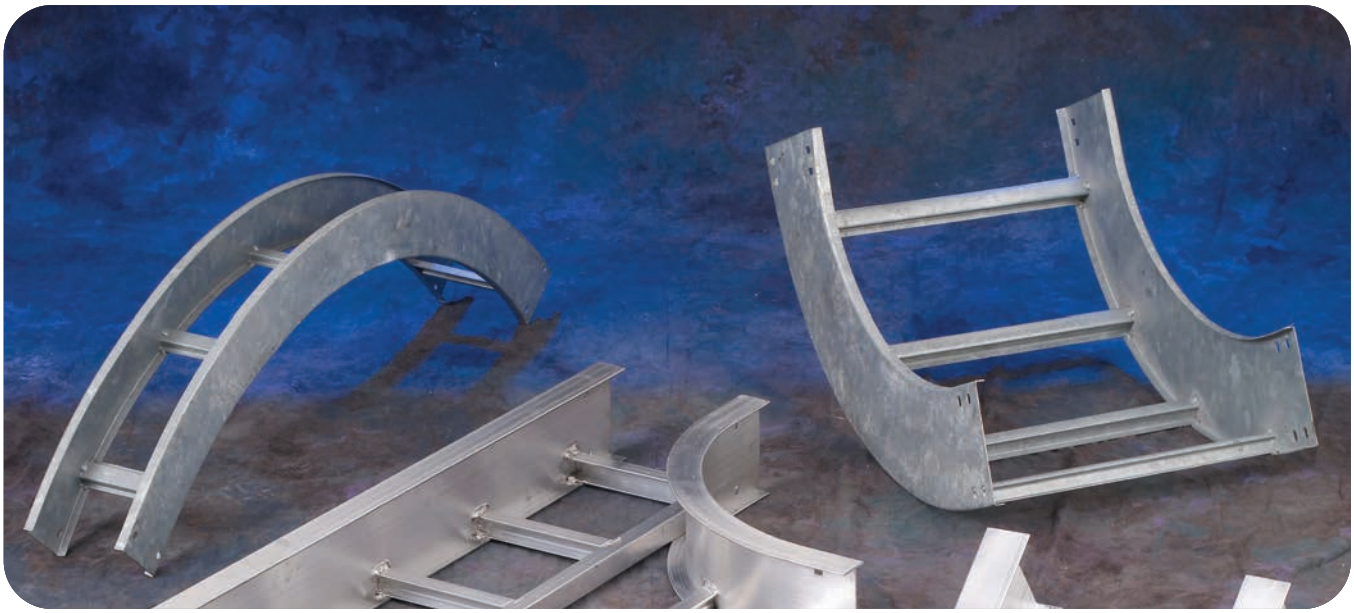
2.11 All fittings must have a minimum radius of [12] [24] [36] [48] inches.

Section 3- Loading Capacities and Testing

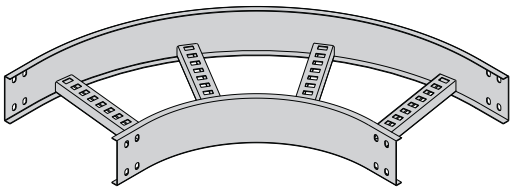
3.01 Cable ladder shall be capable of carrying a uniformly distributed load of _____ lbs./ft. on a _____ ft. support span with a safety factor of 1.5 when supported as a simple span and tested per NEMA VE 1 5.2. In addition to the uniformly distributed load the cable ladder shall support 200 lbs. concentrated load at mid-point of span. Load and safety factors specified are applicable to both the side rails and rung capacities. Cable ladder shall be made to manufacturing tolerances as specified by NEMA.

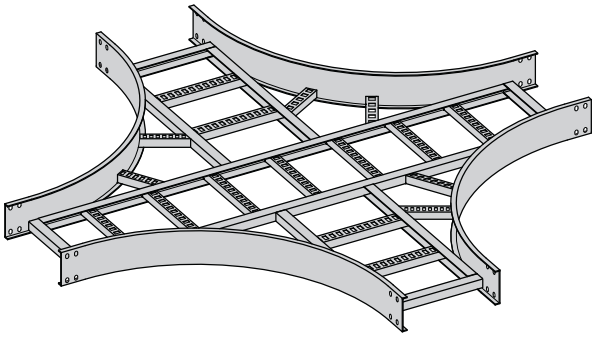
3.02 Upon request, manufacturer shall provide test reports in accordance with the latest revision of NEMA VE 1 or CSA C22.2 No. 126.

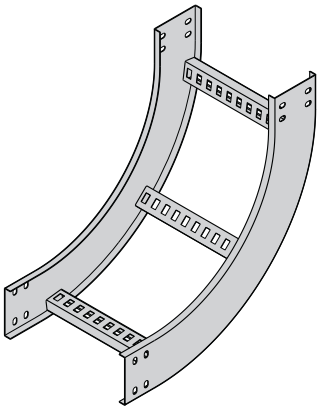
Heavy Duty Steel & Stainless Steel Cable Ladder Fittings



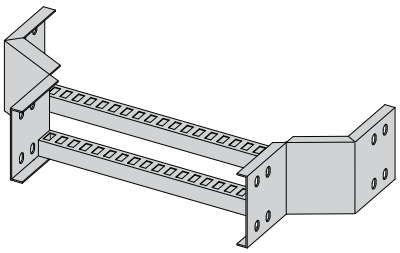
Heavy Duty Steel & Stainless Steel Cable Ladder Fittings







Fittings engineered with 3” tangents for splicing integrity.



Fittings Part Numbering

(9" (228) rung spacing is standard)

Prefix

Example: **4 G - SLDN - 24 - 90 HB 24**

Side Rail Height
4 = 4" (101)
5 = 5" (127)
6 = 6" (152)
7 = 7" (178)

Material
G = HDGAF
P = Pre-Galvanized
SS4 = 304 Stainless Steel
SS6 = 316 Stainless Steel

Rung Type & Orientation
SL = Slotted Rung Alternating up & down
SLDN = Slotted Rung Continuous slot down
SLUP = Slotted Rung Continuous slot up

Width
06 = 6" (152)
09 = 9" (228)
12 = 12" (305)
18 = 18" (457)
24 = 24" (609)
30 = 30" (762)
36 = 36" (914)

Angle
30 = 30°
45 = 45°
60 = 60°
90 = 90°

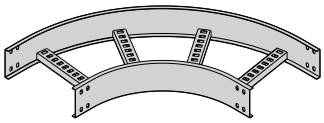
Type
HB = Horizontal Bend
HT = Horizontal Tee
HX = Horizontal Cross
VI = Vertical Inside Bend
VO = Vertical Outside Bend
VT = Vertical Tee
VTU = Vertical Tee, Up
HYR = Horizontal Wye, Right
HYL = Horizontal Wye, Left
CSF = Cable Support Fitting
LR = Left Reducer Fitting
RR = Right Reducer Fitting
SR = Straight Reducer Fitting

Radius
12 = 12" (305)
24 = 24" (609)
36 = 36" (914)
48 = 48" (1219)

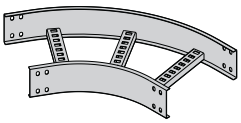
Note: Horizontal crosses and tees 30" or wider, with a radius of 36" or larger, will be of two-piece construction.

Horizontal Bend 90° 60° (HB)

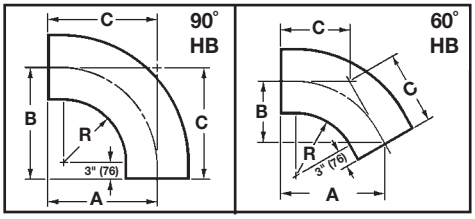
1 pair splice plates with hardware included.



90° Horizontal Bend



60° Horizontal Bend



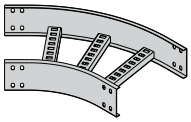
Bend Radius R		Ladder Width		90° Horizontal Bend Dimensions								60° Horizontal Bend Dimensions							
				Catalog No.	A		B		C			Catalog No.	A		B		C		
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm			in.	mm	in.	mm	in.	mm	
12	305	6	152	(Pre)-06-90HB12	18	457	18	457	18	457		(Pre)-06-60HB12	17 1/2	445	10 1/8	257	11 11/16	297	
		9	228	(Pre)-09-90HB12	19 1/2	495	19 1/2	495	19 1/2	495		(Pre)-09-60HB12	18 13/16	478	10 7/8	276	12 1/2	318	
		12	305	(Pre)-12-90HB12	21	533	21	533	21	533		(Pre)-12-60HB12	20 1/16	510	11 5/8	295	13 3/8	340	
		18	457	(Pre)-18-90HB12	24	610	24	610	24	610		(Pre)-18-60HB12	22 11/16	576	13 1/8	333	15 1/8	384	
		24	609	(Pre)-24-90HB12	27	686	27	686	27	686		(Pre)-24-60HB12	25 5/16	643	14 5/8	372	16 7/8	429	
		30	762	(Pre)-30-90HB12	30	762	30	762	30	762		(Pre)-30-60HB12	27 7/8	708	16 1/8	410	18 9/16	472	
		36	914	(Pre)-36-90HB12	33	838	33	838	33	838		(Pre)-36-60HB12	30 1/2	775	17 5/8	448	20 5/16	516	
		42	1218	(Pre)-42-90HB12	36	914	36	914	36	914		(Pre)-42-60HB12	33 1/16	840	19 1/8	486	22 1/16	560	
24	610	6	152	(Pre)-06-90HB24	30	762	30	762	30	762		(Pre)-06-60HB24	27 7/8	708	16 1/8	410	18 9/16	472	
		9	228	(Pre)-09-90HB24	31 1/2	800	31 1/2	800	31 1/2	800		(Pre)-09-60HB24	29 3/16	741	16 7/8	429	19 7/16	494	
		12	305	(Pre)-12-90HB24	33	838	33	838	33	838		(Pre)-12-60HB24	30 1/2	775	17 5/8	448	20 5/16	516	
		18	457	(Pre)-18-90HB24	36	914	36	914	36	914		(Pre)-18-60HB24	33 1/16	708	19 1/8	486	22 1/16	560	
		24	609	(Pre)-24-90HB24	39	991	39	991	39	991		(Pre)-24-60HB24	35 11/16	907	20 5/8	524	23 13/16	605	
		30	762	(Pre)-30-90HB24	42	1067	42	1067	42	1067		(Pre)-30-60HB24	38 1/4	972	22 1/8	564	25 1/2	648	
		36	914	(Pre)-36-90HB24	45	1143	45	1143	45	1143		(Pre)-36-60HB24	40 7/8	1038	23 5/8	600	27 1/4	692	
		42	1218	(Pre)-42-90HB24	48	1219	48	1219	48	1219		(Pre)-42-60HB24	43 1/2	1105	25 1/8	638	29	737	
36	915	6	152	(Pre)-06-90HB36	42	1067	42	1067	42	1067		(Pre)-06-60HB36	38 1/4	971	22 1/8	562	25 1/2	648	
		9	228	(Pre)-09-90HB36	43 1/2	1105	43 1/2	1105	43 1/2	1105		(Pre)-09-60HB36	39 9/16	1005	22 7/8	581	26 3/8	670	
		12	305	(Pre)-12-90HB36	45	1143	45	1143	45	1143		(Pre)-12-60HB36	40 7/8	1038	23 5/8	600	27 1/4	692	
		18	457	(Pre)-18-90HB36	48	1219	48	1219	48	1219		(Pre)-18-60HB36	43 1/2	1105	25 1/8	638	29	737	
		24	609	(Pre)-24-90HB36	51	1295	51	1295	51	1295		(Pre)-24-60HB36	46 1/16	1170	26 5/8	676	30 11/16	780	
		30	762	(Pre)-30-90HB36	54	1372	54	1375	54	1372		(Pre)-30-60HB36	48 1/16	1237	28 1/8	714	32 7/16	824	
		36	914	(Pre)-36-90HB36	57	1448	57	1488	57	1448		(Pre)-36-60HB36	51 1/4	1302	29 5/8	753	34 3/16	869	
		42	1218	(Pre)-42-90HB36	60	1524	60	1524	60	1524		(Pre)-42-60HB36	53 7/8	1368	31 1/8	791	35 15/16	913	
48	1220	6	152	(Pre)-06-90HB48	54	1372	54	1372	54	1372		(Pre)-06-60HB48	48 1/16	1221	28 1/8	715	32 11/16	830	
		9	228	(Pre)-09-90HB48	55 1/2	1410	55 1/2	1410	55 1/2	1410		(Pre)-09-60HB48	49 15/16	1268	28 7/8	734	33 5/16	846	
		12	305	(Pre)-12-90HB48	57	1448	57	1448	57	1448		(Pre)-12-60HB48	51 1/4	1302	29 5/8	753	34 3/16	868	
		18	457	(Pre)-18-90HB48	60	1524	60	1524	60	1524		(Pre)-18-60HB48	53 7/8	1368	31 1/8	791	35 15/16	913	
		24	609	(Pre)-24-90HB48	63	1600	63	1600	63	1600		(Pre)-24-60HB48	56 7/16	1434	32 5/8	829	37 5/8	956	
		30	762	(Pre)-30-90HB48	66	1676	66	1676	66	1676		(Pre)-30-60HB48	59 1/16	1500	34 1/8	867	39 3/8	1000	
		36	914	(Pre)-36-90HB48	69	1753	69	1753	69	1753		(Pre)-36-60HB48	61 11/16	1567	35 5/8	905	41 1/8	1045	
		42	1218	(Pre)-42-90HB48	72	1829	72	1829	72	1829		(Pre)-42-60HB48	64 1/4	1632	37 1/8	943	42 13/16	1087	

(Prefix) See page SFIT-2 for catalog number prefix.
Width dimensions are to inside wall. For all fittings add 1.375" (34.9mm) for total outside width.
Manufacturing tolerances apply to all dimensions.

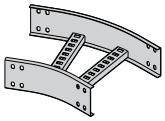
Dimensions in parentheses are in millimeters unless otherwise specified.

Horizontal Bend 45° 30° (HB)

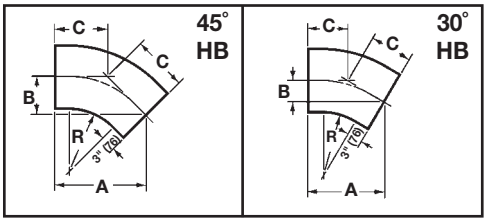
1 pair splice plates with hardware included.



45° Horizontal Bend



30° Horizontal Bend



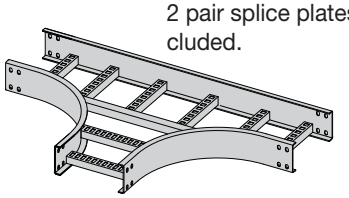
Bend Radius R		Ladder Width		45° Horizontal Bend Dimensions								30° Horizontal Bend Dimensions							
				Catalog No.	A		B		C			Catalog No.	A		B		C		
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm			in.	mm	in.	mm	in.	mm	
12	305	6	152	(Pre)-06-45HB12	15 3/4	400	6 1/2	165	9 3/16	233		(Pre)-06-30HB12	13 1/8	333	3 1/2	89	7	179	
		9	228	(Pre)-09-45HB12	16 13/16	427	6 15/16	176	9 13/16	249		(Pre)-09-30HB12	13 7/8	352	3 11/16	94	7 7/16	189	
		12	305	(Pre)-12-45HB12	17 7/8	454	7 3/8	187	10 7/16	265		(Pre)-12-30HB12	14 5/8	372	3 15/16	100	7 13/16	198	
		18	457	(Pre)-18-45HB12	20	508	8 1/4	210	11 11/16	297		(Pre)-18-30HB12	16 1/8	410	4 5/16	135	8 5/8	219	
		24	609	(Pre)-24-45HB12	22 1/16	560	9 1/8	232	12 15/16	329		(Pre)-24-30HB12	17 5/8	448	4 11/16	119	9 7/16	240	
		30	762	(Pre)-30-45HB12	24 3/16	614	10	254	14 3/16	360		(Pre)-30-30HB12	19 1/8	486	5 1/8	130	10 1/4	260	
		36	914	(Pre)-36-45HB12	26 5/16	668	10 15/16	278	15 7/16	392		(Pre)-36-30HB12	20 5/8	524	5 1/2	140	11 1/16	281	
		42	1218	(Pre)-42-45HB12	28 7/16	722	11 13/16	300	16 11/16	424		(Pre)-42-30HB12	22 1/8	562	5 15/16	151	11 13/16	300	
24	610	6	152	(Pre)-06-45HB24	24 3/16	614	10	254	14 3/16	360		(Pre)-06-30HB24	19 1/8	486	5 1/8	130	10 1/4	260	
		9	228	(Pre)-09-45HB24	25 1/4	641	10 1/2	267	14 13/16	376		(Pre)-09-30HB24	19 7/8	505	5 5/16	135	10 5/8	270	
		12	305	(Pre)-12-45HB24	26 5/16	668	10 15/16	278	15 7/16	392		(Pre)-12-30HB24	20 5/8	524	5 1/2	140	11 1/16	281	
		18	457	(Pre)-18-45HB24	28 7/16	722	11 13/16	300	16 11/16	424		(Pre)-18-30HB24	22 1/8	562	5 15/16	151	11 13/16	300	
		24	609	(Pre)-24-45HB24	30 9/16	766	12 11/16	322	17 15/16	456		(Pre)-24-30HB24	23 5/8	600	6 5/16	160	12 5/8	321	
		30	762	(Pre)-30-45HB24	32 11/16	830	13 9/16	344	19 1/8	486		(Pre)-30-30HB24	25 1/8	638	6 3/4	172	13 7/16	341	
		36	914	(Pre)-36-45HB24	34 13/16	884	14 7/16	367	20 3/8	518		(Pre)-36-30HB24	26 5/8	676	7 1/8	181	14 1/4	362	
		42	1218	(Pre)-42-45HB24	36 15/16	938	15 5/16	389	21 5/8	549		(Pre)-42-30HB24	28 1/8	715	7 1/2	191	15 1/16	383	
36	915	6	152	(Pre)-06-45HB36	32 11/16	830	13 9/16	344	19 1/8	486		(Pre)-06-30HB36	25 1/8	638	6 3/4	171	13 7/16	341	
		9	228	(Pre)-09-45HB36	33 3/4	857	14	356	19 3/4	502		(Pre)-09-30HB36	25 7/8	657	6 15/16	176	13 7/8	352	
		12	305	(Pre)-12-45HB36	34 13/16	884	14 7/16	367	20 3/8	518		(Pre)-12-30HB36	26 5/8	676	7 1/8	181	14 1/4	362	
		18	457	(Pre)-18-45HB36	36 15/16	938	15 5/16	389	21 5/8	549		(Pre)-18-30HB36	28 1/8	114	7 1/2	191	15 1/16	383	
		24	609	(Pre)-24-45HB36	39 1/6	992	16 3/16	411	22 7/8	581		(Pre)-24-30HB36	29 5/8	753	7 15/16	202	15 7/8	403	
		30	762	(Pre)-30-45HB36	41 3/6	1046	17 1/16	433	24 1/8	613		(Pre)-30-30HB36	31 1/8	790	8 5/16	211	16 11/16	424	
		36	914	(Pre)-36-45HB36	43 5/6	1100	17 15/16	456	25 3/8	645		(Pre)-36-30HB36	32 5/8	829	8 3/4	222	17 1/2	445	
		42	1218	(Pre)-42-45HB36	45 7/16	1154	18 13/16	478	26 5/8	676		(Pre)-42-30HB36	34 1/8	867	9 1/8	232	18 1/4	464	
48	1220	6	152	(Pre)-06-45HB48	41 3/16	1046	17 1/16	433	24 1/8	613		(Pre)-06-30HB48	31 1/8	791	8 5/16	211	16 11/16	424	
		9	228	(Pre)-09-45HB48	42 1/4	1073	17 1/2	445	24 3/4	629		(Pre)-09-30HB48	31 7/8	810	8 9/16	218	17 1/16	433	
		12	305	(Pre)-12-45HB48	43 5/16	1100	17 15/16	456	25 3/8	645		(Pre)-12-30HB48	32 5/8	829	8 3/4	222	17 1/2	445	
		18	457	(Pre)-18-45HB48	45 7/16	1154	18 13/16	487	26 5/8	676		(Pre)-18-30HB48	34 1/8	867	9 1/8	232	18 1/4	464	
		24	609	(Pre)-24-45HB48	47 9/16	1208	19 11/16	500	27 7/8	708		(Pre)-24-30HB48	35 5/8	905	9 9/16	243	19 1/16	484	
		30	762	(Pre)-30-45HB48	49 11/16	1262	20 9/16	522	29 1/8	740		(Pre)-30-30HB48	37 1/8	943	9 15/16	252	19 7/8	505	
		36	914	(Pre)-36-45HB48	51 13/16	1316	21 7/16	545	30 5/16	770		(Pre)-36-30HB48	38 5/8	981	10 5/16	262	20 11/16	525	
		42	1218	(Pre)-42-45HB48	54 15/16	1395	22 5/16	567	31 9/16	802		(Pre)-42-30HB48	40 1/8	1019	10 3/4	273	21 1/2	546	

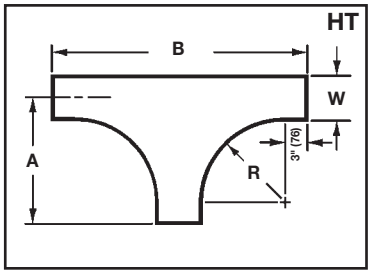
(Prefix) See page SFIT-2 for catalog number prefix.
Width dimensions are to inside wall. For all fittings add 1.375" (34.9mm) for total outside width.
Manufacturing tolerances apply to all dimensions.

Heavy Duty Steel & Stainless Steel Cable Ladder Fittings

Horizontal Tee (HT)

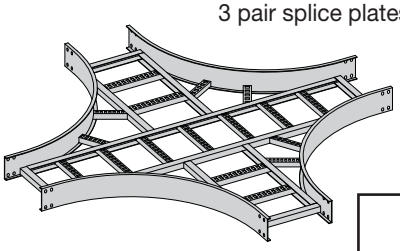
2 pair splice plates with hardware included.

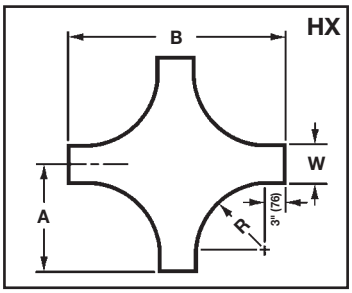




Horizontal Cross (HX)

3 pair splice plates with hardware included.





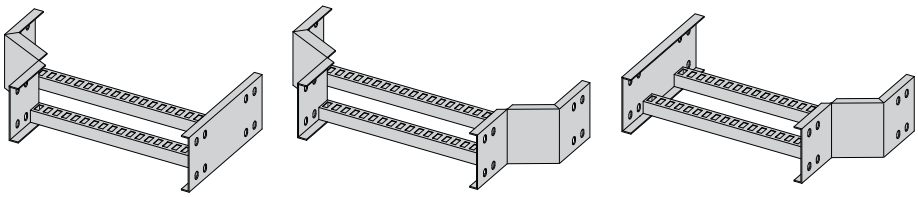
Bend Radius R		Ladder Width		Horizontal Tee					Horizontal Cross				
				Catalog Number	Dimensions A		Dimensions B		Catalog Number	Dimensions A		Dimensions B	
in.	mm	in.	mm		in.	mm	in.	mm		in.	mm	in.	mm
12	305	6	152	(Prefix)-06-HT12	18	457	36	914	(Prefix)-06-HX12	18	457	36	914
		9	229	(Prefix)-09-HT12	19½	496	39	991	(Prefix)-09-HX12	19½	496	39	991
		12	305	(Prefix)-12-HT12	21	533	42	1067	(Prefix)-12-HX12	21	533	42	1067
		18	457	(Prefix)-18-HT12	24	609	48	1219	(Prefix)-18-HX12	24	609	48	1219
		24	609	(Prefix)-24-HT12	27	686	54	1372	(Prefix)-24-HX12	27	686	54	1372
		30	762	(Prefix)-30-HT12	30	762	60	1524	(Prefix)-30-HX12	30	762	60	1524
		36	914	(Prefix)-36-HT12	33	838	66	1676	(Prefix)-36-HX12	33	838	66	1676
		42	1067	(Prefix)-42-HT12	36	914	72	1829	(Prefix)-42-HX12	36	914	72	1829
24	610	6	152	(Prefix)-06-HT24	30	762	60	1542	(Prefix)-06-HX24	30	762	60	1524
		9	229	(Prefix)-09-HT24	31½	800	63	1600	(Prefix)-09-HX24	31½	800	63	1600
		12	305	(Prefix)-12-HT24	33	838	66	1676	(Prefix)-12-HX24	33	838	66	1676
		18	457	(Prefix)-18-HT24	36	914	72	1828	(Prefix)-18-HX24	36	914	72	1828
		24	609	(Prefix)-24-HT24	39	991	78	1982	(Prefix)-24-HX24	39	991	78	1982
		30	762	(Prefix)-30-HT24	42	1067	84	2134	(Prefix)-30-HX24	42	1067	84	2134
		36	914	(Prefix)-36-HT24	45	1143	90	2286	(Prefix)-36-HX24	45	1143	90	2286
		42	1067	(Prefix)-42-HT24	48	1219	96	2438	(Prefix)-42-HX24	48	1219	96	2438
36	915	6	152	(Prefix)-06-HT36	42	1067	84	2134	(Prefix)-06-HX36	42	1067	84	2134
		9	229	(Prefix)-09-HT36	43½	1105	87	2210	(Prefix)-09-HX36	43½	1105	87	2210
		12	305	(Prefix)-12-HT36	45	1143	90	2286	(Prefix)-12-HX36	45	1143	90	2286
		18	457	(Prefix)-18-HT36	48	1219	96	2438	(Prefix)-18-HX36	48	1219	96	2438
		24	609	(Prefix)-24-HT36	51	1295	102	2590	(Prefix)-24-HX36	51	1295	102	2590
		30	762	(Prefix)-30-HT36	54	1372	108	2744	(Prefix)-30-HX36	54	1372	108	2744
		36	914	(Prefix)-36-HT36	57	1488	114	2896	(Prefix)-36-HX36	57	1448	114	2896
		42	1067	(Prefix)-42-HT36	60	1524	120	3048	(Prefix)-42-HX36	60	1524	120	3048
48	1220	6	152	(Prefix)-06-HT48	54	1372	108	2743	(Prefix)-06-HX48	54	1372	108	2743
		9	229	(Prefix)-09-HT48	55½	1410	111	2820	(Prefix)-09-HX48	55½	1410	111	2820
		12	305	(Prefix)-12-HT48	57	1448	114	2896	(Prefix)-12-HX48	57	1448	114	2896
		18	457	(Prefix)-18-HT48	60	1524	120	3048	(Prefix)-18-HX48	60	1524	120	3048
		24	609	(Prefix)-24-HT48	63	1600	126	3200	(Prefix)-24-HX48	63	1600	126	3200
		30	762	(Prefix)-30-HT48	66	1676	132	3353	(Prefix)-30-HX48	66	1676	132	3353
		36	914	(Prefix)-36-HT48	69	1753	138	3535	(Prefix)-36-HX48	69	1753	138	3505
		42	1067	(Prefix)-42-HT48	72	1829	144	3658	(Prefix)-42-HX48	72	1829	144	3658

(Prefix) See page SFIT-2 for catalog number prefix.
Width dimensions are to inside wall. For all fittings add 1.375" (34.9mm) for total outside width.
Manufacturing tolerances apply to all dimensions.

Dimensions in parentheses are in millimeters unless otherwise specified.

Reducers (LR, SR, RR)

1 pair splice plates with hardware included.

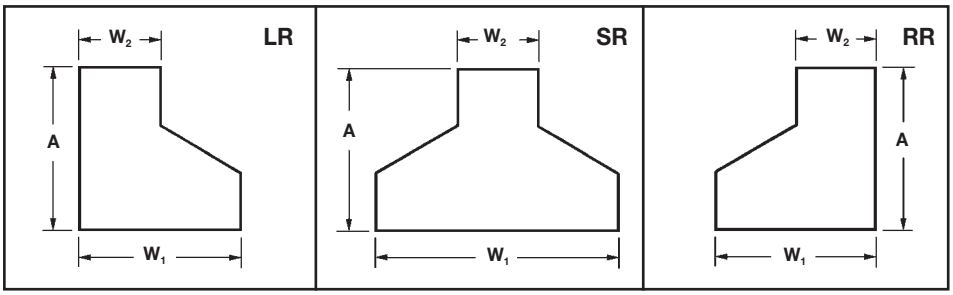


Left Reducer | Straight Reducer | Right Reducer

Reducer Part Numbering

Prefix - 24 - RR - 18

- 18 — $Width_2$
- RR — Fitting
- 24 — $Width_1$
- Prefix — Prefix

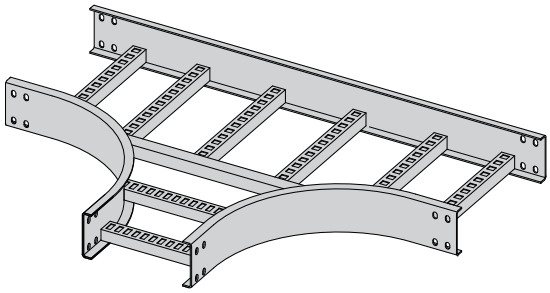


Ladder Width				Left Hand Reducer			Straight Reducer			Right Hand Reducer		
W_1		W_2		Catalog No.	A		Catalog No.	A		Catalog No.	A	
in.	mm	in.	mm		in.	mm		in.	mm		in.	mm
9	228	6	152	(Prefix)-09-LR06	9 3/4	248	(Prefix)-09-SR06	8 7/8	225	(Prefix)-09-RR06	9 3/4	248
12	305	6	152	(Prefix)-12-LR06	11 1/2	292	(Prefix)-12-SR06	9 3/4	248	(Prefix)-12-RR06	11 1/2	292
		9	228	(Prefix)-12-LR09	9 3/4	248	(Prefix)-12-SR09	8 7/8	225	(Prefix)-12-RR09	9 3/4	248
18	457	6	152	(Prefix)-18-LR06	14 15/16	379	(Prefix)-18-SR06	11 1/2	292	(Prefix)-18-RR06	14 15/16	379
		9	228	(Prefix)-18-LR09	13 3/16	340	(Prefix)-18-SR09	10 5/8	270	(Prefix)-18-RR09	13 3/16	340
		12	305	(Prefix)-18-LR12	11 1/2	292	(Prefix)-18-SR12	9 3/4	248	(Prefix)-18-RR12	11 1/2	292
24	609	6	152	(Prefix)-24-LR06	18 3/8	467	(Prefix)-24-SR06	13 3/16	340	(Prefix)-24-RR06	18 3/8	467
		9	228	(Prefix)-24-LR09	16 11/16	424	(Prefix)-24-SR09	12 3/8	314	(Prefix)-24-RR09	16 11/16	424
		12	305	(Prefix)-24-LR12	14 15/16	379	(Prefix)-24-SR12	11 1/2	292	(Prefix)-24-RR12	14 15/16	379
		18	457	(Prefix)-24-LR18	11 1/2	292	(Prefix)-24-SR18	9 3/4	248	(Prefix)-24-RR18	11 1/2	292
30	762	6	152	(Prefix)-30-LR06	21 7/8	555	(Prefix)-30-SR06	14 15/16	380	(Prefix)-30-RR06	21 7/8	555
		9	228	(Prefix)-30-LR09	20 1/8	511	(Prefix)-30-SR09	14 1/16	358	(Prefix)-30-RR09	20 1/8	511
		12	305	(Prefix)-30-LR12	18 3/8	462	(Prefix)-30-SR12	13 3/16	335	(Prefix)-30-RR12	18 3/8	462
		18	459	(Prefix)-30-LR18	14 15/16	380	(Prefix)-30-SR18	11 1/2	292	(Prefix)-30-RR18	14 15/16	380
		24	609	(Prefix)-30-LR24	11 1/2	292	(Prefix)-30-SR24	9 3/4	248	(Prefix)-30-RR24	11 1/2	292
36	914	6	152	(Prefix)-36-LR06	25 5/16	643	(Prefix)-36-SR06	16 11/16	424	(Prefix)-36-RR06	23 5/16	643
		9	228	(Prefix)-36-LR09	23 9/16	598	(Prefix)-36-SR09	15 13/16	402	(Prefix)-36-RR09	23 9/16	598
		12	305	(Prefix)-36-LR12	21 7/8	555	(Prefix)-36-SR12	14 15/16	380	(Prefix)-36-RR12	21 7/8	555
		18	457	(Prefix)-36-LR18	18 3/8	462	(Prefix)-36-SR18	13 3/16	335	(Prefix)-36-RR18	18 3/8	462
		24	609	(Prefix)-36-LR24	14 15/16	380	(Prefix)-36-SR24	11 1/2	292	(Prefix)-36-RR24	14 15/16	380
		30	762	(Prefix)-36-LR30	11 1/2	292	(Prefix)-36-SR30	9 3/4	248	(Prefix)-36-RR30	11 1/2	292
42	1067	6	152	(Prefix)-42-LR06	28 3/4	730	(Prefix)-42-SR06	18 3/8	467	(Prefix)-42-RR06	28 3/4	732
		9	228	(Prefix)-42-LR09	27 1/16	687	(Prefix)-42-SR09	17 1/2	445	(Prefix)-42-RR09	27 1/16	687
		12	305	(Prefix)-42-LR12	25 5/16	643	(Prefix)-42-SR12	16 11/16	424	(Prefix)-42-RR12	25 15/16	643
		18	457	(Prefix)-42-LR18	21 7/8	556	(Prefix)-42-SR18	14 15/16	379	(Prefix)-42-RR18	21 7/8	556
		24	609	(Prefix)-42-LR24	18 3/8	467	(Prefix)-42-SR24	13 3/16	335	(Prefix)-42-RR24	18 3/8	467
		30	762	(Prefix)-42-LR30	14 15/16	379	(Prefix)-42-SR30	11 1/2	292	(Prefix)-42-RR30	14 15/16	379
		36	914	(Prefix)-42-LR36	11 1/2	292	(Prefix)-42-SR36	9 3/4	249	(Prefix)-42-RR36	11 1/2	292

(Prefix) See page SFIT-2 for catalog number prefix.
Width dimensions are to inside wall. For all fittings add 1.375" (34.9mm) for total outside width.
Manufacturing tolerances apply to all dimensions.

Horizontal Reducing Tee (HT)

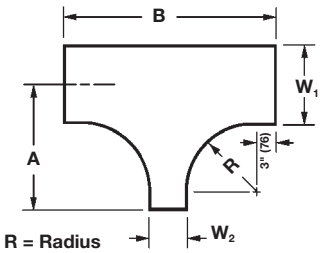
2 pair splice plates with hardware included.



Prefix - 36 - 18 HT 24

- Radius
- Fitting
- Width W_2
- Width W_1
- To complete catalog number, insert fitting prefix.

HT



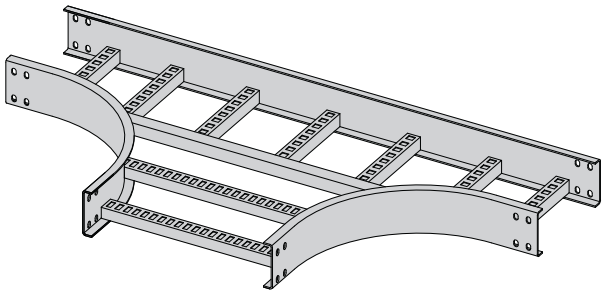
Ladder Width				* Insert Radius (12", 24", 36", or 48")	12" (305mm) Radius				24" (609mm) Radius				36" (914mm) Radius				48" (1219mm) Radius			
W_1		W_2		Catalog No.	A		B		A		B		A		B		A		B	
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
9	228	6	152	(Prefix)-09-06-HT*	19 1/2	496	36	914	31 1/2	800	60	1524	43	1092	84	2134	55 1/2	1410	108	2743
12	305	6	152	(Prefix)-12-06-HT*	21	533	36	914	33	838	60	1524	45	1143	84	2134	57	1448	108	2743
		9	228	(Prefix)-12-09-HT*	21	533	39	991	33	838	63	1600	45	1143	87	2210	57	1448	111	2819
18	475	6	152	(Prefix)-18-06-HT*	24	609	36	914	36	914	60	1524	48	1219	84	2134	60	1524	108	2743
		9	228	(Prefix)-18-09-HT*	24	609	39	991	36	914	63	1600	48	1219	87	2210	60	1524	111	2819
		12	305	(Prefix)-18-12-HT*	24	609	42	1067	36	914	66	1676	48	1219	90	2286	60	1524	114	2496
24	609	6	152	(Prefix)-24-06-HT*	27	686	36	914	39	991	60	1524	51	1295	84	2134	63	1600	108	2743
		9	228	(Prefix)-24-09-HT*	27	686	39	991	39	991	63	1600	51	1295	87	2210	63	1600	111	2819
		12	305	(Prefix)-24-12-HT*	27	686	42	1067	39	991	66	1676	51	1295	90	2286	63	1600	114	2496
		18	457	(Prefix)-24-18-HT*	27	686	48	1219	39	991	72	1829	51	1295	96	2438	63	1600	120	3048
30	762	6	152	(Prefix)-30-06-HT*	30	762	36	914	42	1067	60	1524	54	1372	84	2134	66	1676	108	2743
		9	228	(Prefix)-30-09-HT*	30	762	39	991	42	1067	63	1600	54	1372	87	2210	66	1676	111	2819
		12	305	(Prefix)-30-12-HT*	30	762	42	1067	42	1067	66	1676	54	1372	90	2286	66	1676	114	2496
		18	457	(Prefix)-30-18-HT*	30	762	48	1219	42	1067	72	1829	54	1372	96	2438	66	1676	120	3048
		24	609	(Prefix)-30-24-HT*	30	762	54	1372	42	1067	78	1981	54	1372	102	2591	66	1676	126	3200
36	914	6	152	(Prefix)-36-06-HT*	33	838	36	914	45	1143	60	1524	57	1448	84	2134	69	1753	108	2743
		9	228	(Prefix)-36-09-HT*	33	838	39	991	45	1143	63	1600	57	1448	87	2210	69	1753	111	2819
		12	305	(Prefix)-36-12-HT*	33	838	42	1067	45	1143	66	1676	57	1448	90	2286	69	1753	114	2496
		18	457	(Prefix)-36-18-HT*	33	838	48	1219	45	1143	72	1829	57	1448	96	2438	69	1753	120	3048
		24	609	(Prefix)-36-24-HT*	33	838	54	1372	45	1143	78	1981	57	1448	102	2591	69	1753	126	3200
		30	762	(Prefix)-36-30-HT*	33	838	60	1524	45	1143	84	2134	57	1448	108	2743	69	1753	132	3353
42	1067	6	152	(Prefix)-42-06-HT*	36	914	36	914	48	1219	60	1524	60	1524	84	2134	72	1829	108	2743
		9	228	(Prefix)-42-09-HT*	36	914	39	991	48	1219	63	1600	60	1524	87	2210	72	1829	111	2819
		12	305	(Prefix)-42-12-HT*	36	914	42	1067	48	1219	66	1676	60	1524	90	2286	72	1829	114	2496
		18	457	(Prefix)-42-18-HT*	36	914	48	1219	48	1219	72	1829	60	1524	96	2438	72	1829	120	3048
		24	609	(Prefix)-42-24-HT*	36	914	54	1372	48	1219	78	1981	60	1524	102	2591	72	1829	126	3200
		30	762	(Prefix)-42-30-HT*	36	914	60	1524	48	1219	84	2134	60	1524	108	2743	72	1829	132	3353
		36	914	(Prefix)-42-36-HT*	36	914	66	1676	48	1219	90	2286	60	1524	114	2895	72	1829	138	3505

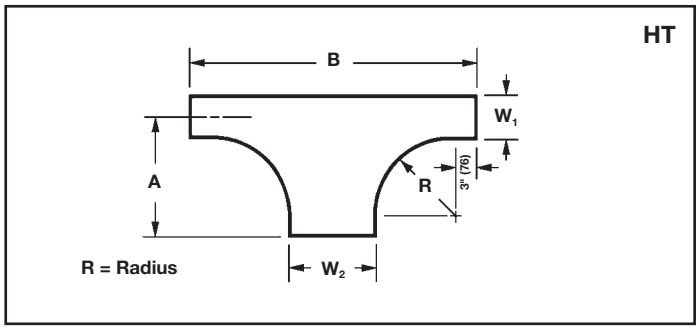
(Prefix) See page SFIT-2 for catalog number prefix.
Width dimensions are to inside wall. For all fittings add 1.375" (34.9mm) for total outside width.
Manufacturing tolerances apply to all dimensions.

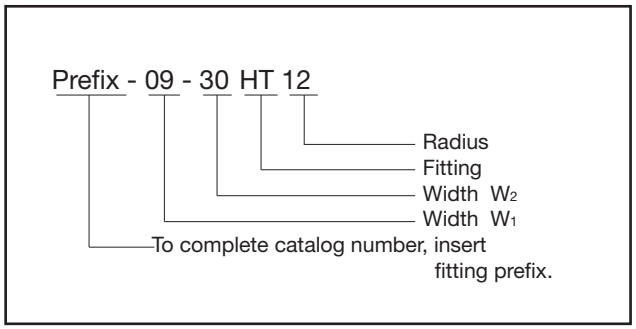
Dimensions in parentheses are in millimeters unless otherwise specified.

Horizontal Expanding Tee (HT)

2 pair splice plates with hardware included.





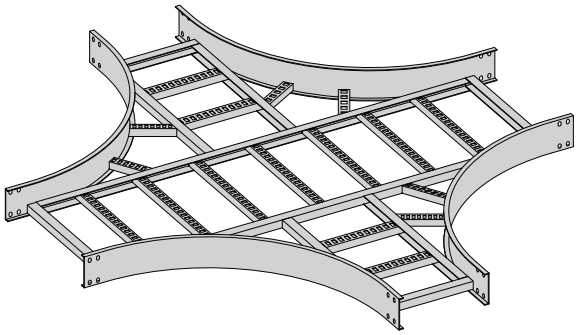


Ladder Width W1 in	Ladder Width W1 mm	Ladder Width W2 in.	Ladder Width W2 mm	*Insert Radius (12", 24", 36", or 48") Catalog No.	12" (305mm) Radius A in.	12" (305mm) Radius A mm	12" (305mm) Radius B in.	12" (305mm) Radius B mm	24" (609mm) Radius A in.	24" (609mm) Radius A mm	24" (609mm) Radius B in.	24" (609mm) Radius B mm	36" (914mm) Radius A in.	36" (914mm) Radius A mm	36" (914mm) Radius B in.	36" (914mm) Radius B mm	48" (1219mm) Radius A in.	48" (1219mm) Radius A mm	48" (1219mm) Radius B in.	48" (1219mm) Radius B mm
6	152	9	228	(Prefix)-06-09-HT*	18	457	39	991	30	762	63	1600	42	1067	87	2210	54	1372	111	2819
		12	305	(Prefix)-06-12-HT*	18	457	42	1067	30	762	66	1676	42	1067	90	2286	54	1372	114	2496
		18	457	(Prefix)-06-18-HT*	18	457	48	1219	30	762	72	1829	42	1067	96	2438	54	1372	120	3048
		24	609	(Prefix)-06-24-HT*	18	457	54	1372	30	762	78	1981	42	1067	102	2591	54	1372	126	3200
		30	762	(Prefix)-06-30-HT*	18	457	60	1524	30	762	84	2134	42	1067	108	2743	54	1372	132	3353
		36	914	(Prefix)-06-36-HT*	18	457	66	1676	30	762	90	2286	42	1067	114	2895	54	1372	138	3503
		42	1067	(Prefix)-06-42-HT*	18	457	72	1829	30	762	96	2438	42	1067	120	3048	54	1372	144	3658
9	228	12	305	(Prefix)-09-12-HT*	19½	496	42	1067	31½	800	66	1676	43½	1105	90	2286	55½	1410	114	2496
		18	457	(Prefix)-09-18-HT*	19½	496	48	1219	31½	800	72	1829	43½	1105	96	2438	55½	1410	120	3048
		24	609	(Prefix)-09-24-HT*	19½	496	54	1372	31½	800	78	1981	43½	1105	102	2591	55½	1410	126	3200
		30	762	(Prefix)-09-30-HT*	19½	496	60	1524	31½	800	84	2134	43½	1105	108	2743	55½	1410	132	3353
		36	914	(Prefix)-09-36-HT*	19½	496	66	1676	31½	800	90	2286	43½	1105	114	2895	55½	1410	138	3503
		42	1067	(Prefix)-09-42-HT*	19½	496	72	1829	31½	800	96	2438	43½	1105	120	3048	55½	1410	144	3658
12	305	18	457	(Prefix)-12-18-HT*	21	533	48	1219	33	838	72	1829	45	1143	96	2438	57	1448	120	3048
		24	609	(Prefix)-12-24-HT*	21	533	54	1372	33	838	78	1981	45	1143	102	2591	57	1448	126	3200
		30	762	(Prefix)-12-30-HT*	21	533	60	1524	33	838	84	2134	45	1143	108	2743	57	1448	132	3353
		36	914	(Prefix)-12-36-HT*	21	533	66	1676	33	838	90	2286	45	1143	114	2895	57	1448	138	3503
		42	1067	(Prefix)-12-42-HT*	21	533	72	1829	33	838	96	2438	45	1143	120	3048	57	1448	144	3658
18	457	24	609	(Prefix)-18-24-HT*	24	609	54	1372	36	914	78	1981	48	1219	102	2591	60	1524	126	3200
		30	762	(Prefix)-18-30-HT*	24	609	60	1524	36	914	84	2134	48	1219	108	2743	60	1524	132	3353
		36	914	(Prefix)-18-36-HT*	24	609	66	1676	36	914	90	2286	48	1219	114	2895	60	1524	138	3503
		42	1067	(Prefix)-18-42-HT*	24	609	72	1829	36	914	96	2438	48	1219	120	3048	60	1524	144	3658
24	609	30	762	(Prefix)-24-30-HT*	27	686	60	1524	39	991	84	2134	51	1295	108	2743	63	1600	132	3353
		36	914	(Prefix)-24-36-HT*	27	686	66	1676	39	991	90	2286	51	1295	114	2895	63	1600	138	3503
		42	1067	(Prefix)-24-42-HT*	27	686	72	1829	39	991	96	2438	51	1295	120	3048	63	1600	144	3658
30	762	36	914	(Prefix)-30-36-HT*	30	762	66	1676	42	1067	90	2286	54	1372	114	2895	66	1676	138	3503
		42	1067	(Prefix)-30-42-HT*	30	762	72	1829	42	1067	96	2438	54	1372	120	3048	66	1676	144	3658
36	914	42	1067	(Prefix)-36-42-HT*	33	838	72	1829	45	1143	96	2438	57	1448	120	3048	69	1753	144	3658

(Prefix) See page SFIT-2 for catalog number prefix.
Width dimensions are to inside wall. For all fittings add 1.375" (34.9mm) for total outside width.
Manufacturing tolerances apply to all dimensions.

Horizontal Expanding/Reducing Cross (HX)

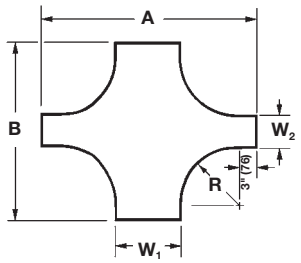
3 pair splice plates with hardware included.



Prefix - 36 - 18 HX 24

- Radius
- Fitting
- Width W_2
- Width W_1
- To complete catalog number, insert fitting prefix.

HX



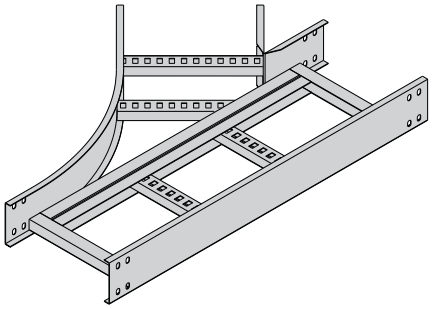
Ladder Width				* Insert Radius (12", 24", 36", or 48")	12" (305mm) Radius				24" (609mm) Radius				36" (914mm) Radius				48" (1219mm) Radius			
W1		W2		Catalog No.	A		B		A		B		A		B		A		B	
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
9	228	6	152	(Prefix)-09-06-HX*	39	991	36	914	63	1600	60	1372	87	2210	84	2134	111	2819	108	2743
12	305	6	152	(Prefix)-12-06-HX*	42	1067	36	914	66	1676	60	1372	90	2286	84	2134	114	2896	108	2743
		9	228	(Prefix)-12-09-HX*	42	1067	39	991	66	1676	63	1600	90	2286	87	2210	114	2896	111	2819
18	457	6	152	(Prefix)-18-06-HX*	48	1219	36	914	72	1829	60	1372	96	2438	84	2134	120	3048	108	2743
		9	228	(Prefix)-18-09-HX*	48	1219	39	991	72	1829	63	1600	96	2438	87	2210	120	3048	111	2819
		12	305	(Prefix)-18-12-HX*	48	1219	42	1067	72	1829	66	1676	96	2438	90	2286	120	3048	114	2896
24	609	6	152	(Prefix)-24-06-HX*	54	1372	36	914	78	1981	60	1372	102	2591	84	2134	126	3200	108	2743
		9	228	(Prefix)-24-09-HX*	54	1372	39	991	78	1981	63	1600	102	2591	87	2210	126	3200	111	2819
		12	305	(Prefix)-24-12-HX*	54	1372	42	1067	78	1981	66	1676	102	2591	90	2286	126	3200	114	2896
		18	457	(Prefix)-24-18-HX*	54	1372	48	1219	78	1981	72	1829	102	2591	96	2438	126	3200	120	3048
30	762	6	152	(Prefix)-30-06-HX*	60	1524	36	914	84	2134	60	1372	108	2743	84	2134	132	3353	108	2743
		9	228	(Prefix)-30-09-HX*	60	1524	39	991	84	2134	63	1600	108	2743	87	2210	132	3353	111	2819
		12	305	(Prefix)-30-12-HX*	60	1524	42	1067	84	2134	66	1676	108	2743	90	2286	132	3353	114	2896
		18	457	(Prefix)-30-18-HX*	60	1524	48	1219	84	2134	72	1829	108	2743	96	2438	132	3353	120	3048
		24	609	(Prefix)-30-24-HX*	60	1524	54	1372	84	2134	78	1981	108	2743	102	2591	132	3353	126	3200
36	914	6	152	(Prefix)-36-06-HX*	66	1676	36	914	90	2286	60	1372	114	2896	84	2134	138	3505	108	2743
		9	228	(Prefix)-36-09-HX*	66	1676	39	991	90	2286	63	1600	114	2896	87	2210	138	3505	111	2819
		12	305	(Prefix)-36-12-HX*	66	1676	42	1067	90	2286	66	1676	114	2896	90	2286	138	3505	114	2896
		18	457	(Prefix)-36-18-HX*	66	1676	48	1219	90	2286	72	1829	114	2896	96	2438	138	3505	120	3048
		24	609	(Prefix)-36-24-HX*	66	1676	54	1372	90	2286	78	1981	114	2896	102	2591	138	3505	126	3200
		30	762	(Prefix)-36-30-HX*	66	1676	60	1524	90	2286	84	2134	114	2896	108	2743	138	3505	132	3353
42	1067	6	152	(Prefix)-42-06-HX*	72	1829	36	914	96	2438	60	1372	120	3048	84	2134	144	3658	108	2743
		9	228	(Prefix)-42-09-HX*	72	1829	39	991	96	2438	63	1600	120	3048	87	2210	144	3658	111	2819
		12	305	(Prefix)-42-12-HX*	72	1829	42	1067	96	2438	66	1676	120	3048	90	2286	144	3658	114	2896
		18	457	(Prefix)-42-18-HX*	72	1829	48	1219	96	2438	72	1829	120	3048	96	2438	144	3658	120	3048
		24	609	(Prefix)-42-24-HX*	72	1829	54	1372	96	2438	78	1981	120	3048	102	2591	144	3658	126	3200
		30	762	(Prefix)-42-30-HX*	72	1829	60	1524	96	2438	84	2134	120	3048	108	2743	144	3658	132	3353
		36	914	(Prefix)-42-36-HX*	72	1829	66	1676	96	2438	90	2286	120	3048	114	2896	144	3658	138	3505

(Prefix) See page SFIT-2 for catalog number prefix.
Width dimensions are to inside wall. For all fittings add 1.375" (34.9mm) for total outside width.
Manufacturing tolerances apply to all dimensions.

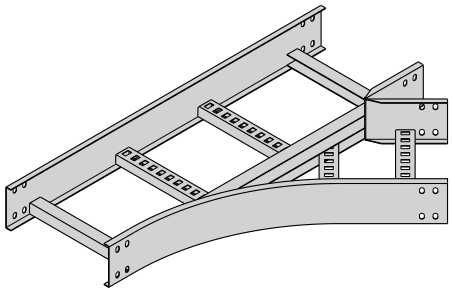
Dimensions in parentheses are in millimeters unless otherwise specified.

Horizontal Wye (HYL, HYR)

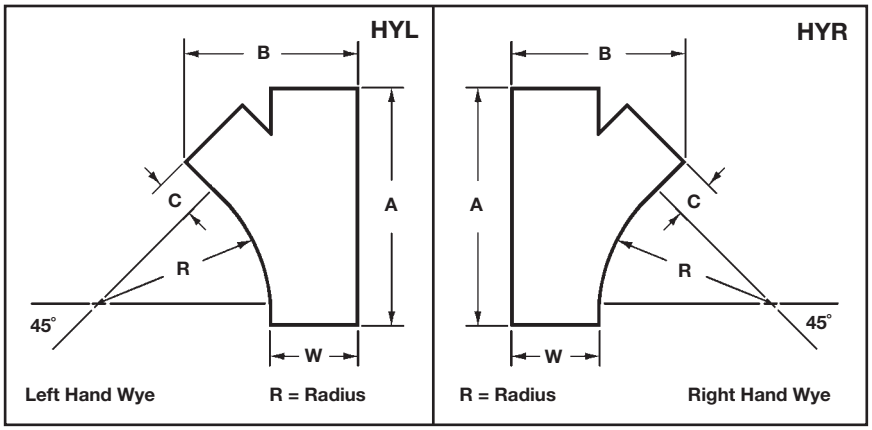
2 pair splice plates with hardware included.



Left Hand Wye

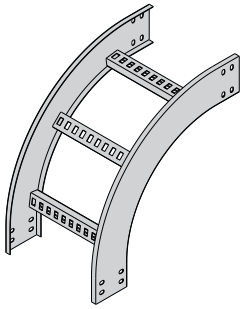


Right Hand Wye

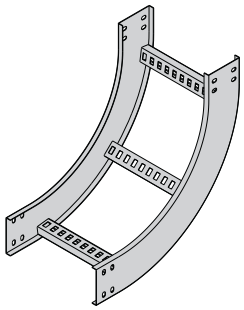


Bend Radius in.	Bend Radius mm	Ladder Width in.	Ladder Width mm	Left Hand Wye Catalog No.	Right Hand Wye Catalog No.	A in.	A mm	B in.	B mm	C in.	C mm
24	609	6	152	(Prefix)-06-HYL	(Prefix)-06-HYR	28 7/16	722	15 3/16	386	3 1/16	77
		9	228	(Prefix)-09-HYL	(Prefix)-09-HYR	32 11/16	831	20 5/16	516	6 1/16	154
		12	305	(Prefix)-12-HYL	(Prefix)-12-HYR	36 15/16	938	25 7/16	646	9 1/16	231
		18	457	(Prefix)-18-HYL	(Prefix)-18-HYR	45 3/8	1153	35 13/16	910	15 1/16	383
		24	609	(Prefix)-24-HYL	(Prefix)-24-HYR	53 7/8	1368	45 15/16	1167	21 1/16	535
		30	762	(Prefix)-30-HYL	(Prefix)-30-HYR	62 3/8	1585	56 3/16	1427	27 1/16	688
		36	914	(Prefix)-36-HYL	(Prefix)-36-HYR	70 7/8	1800	66 7/16	1687	33 1/16	993
		42	1067	(Prefix)-42-HYL	(Prefix)-42-HYR	79 3/8	2016	76 5/8	1946	39 1/16	992

(Prefix) See page SFIT-2 for catalog number prefix.
Width dimensions are to inside wall. For all fittings add 1.375" (34.9mm) for total outside width.
Manufacturing tolerances apply to all dimensions.



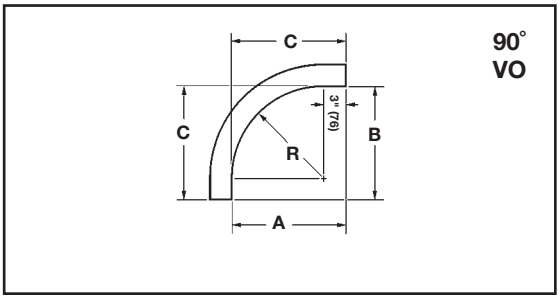
90° Vertical Outside

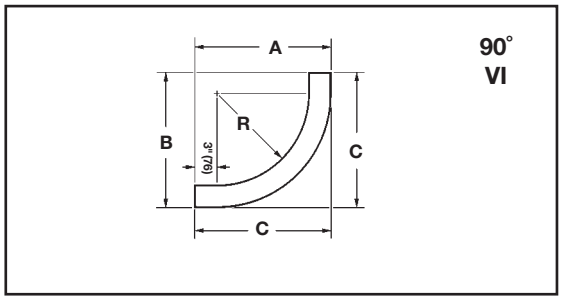


90° Vertical Inside

Vertical Bend 90° (VO, VI)

1 pair splice plates with hardware included.





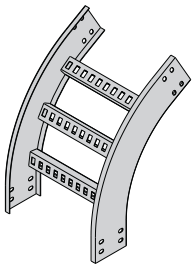
Bend Radius R	Ladder Width		(*) Insert "VO" for Vert. Outside Bend Insert "VI" for Vert. Inside Bend	VO Side Rail Height 4" - 7"			VI Side Rail Height											
							4" (101mm)			5" (127mm)			6" (152mm)			7" (178mm)		
				A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
in.	in.	mm	Catalog No.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)-06-90(*)12	15 (381)	15 (381)	15 (381)	19 (483)	19 (483)	19 (483)	20 (508)	20 (508)	20 (508)	21 (533)	21 (533)	21 (533)	22 (559)	22 (559)	22 (559)
	9	228	(Prefix)-09-90(*)12															
	12	305	(Prefix)-12-90(*)12															
	18	457	(Prefix)-18-90(*)12															
	24	609	(Prefix)-24-90(*)12															
	30	762	(Prefix)-30-90(*)12															
	36	914	(Prefix)-36-90(*)12															
	42	1067	(Prefix)-42-90(*)12															
24 (609)	6	152	(Prefix)-06-90(*)24	27 (686)	27 (686)	27 (686)	31 (787)	31 (787)	31 (787)	32 (813)	32 (813)	32 (813)	33 (838)	33 (838)	33 (838)	34 (864)	34 (864)	34 (864)
	9	228	(Prefix)-09-90(*)24															
	12	305	(Prefix)-12-90(*)24															
	18	457	(Prefix)-18-90(*)24															
	24	609	(Prefix)-24-90(*)24															
	30	762	(Prefix)-30-90(*)24															
	36	914	(Prefix)-36-90(*)24															
	42	1067	(Prefix)-42-90(*)24															
36 (914)	6	152	(Prefix)-06-90(*)36	39 (991)	39 (991)	39 (991)	43 (1092)	43 (1092)	43 (1092)	44 (1118)	44 (1118)	44 (1118)	45 (1143)	45 (1143)	45 (1143)	46 (1168)	46 (1168)	46 (1168)
	9	228	(Prefix)-09-90(*)36															
	12	305	(Prefix)-12-90(*)36															
	18	457	(Prefix)-18-90(*)36															
	24	609	(Prefix)-24-90(*)36															
	30	762	(Prefix)-30-90(*)36															
	36	914	(Prefix)-36-90(*)36															
	42	1067	(Prefix)-42-90(*)36															
48 (1219)	6	152	(Prefix)-06-90(*)48	51 (1295)	51 (1295)	51 (1295)	55 (1397)	55 (1397)	55 (1397)	56 (1422)	56 (1422)	56 (1422)	57 (1448)	57 (1448)	57 (1448)	58 (1473)	58 (1473)	58 (1473)
	9	228	(Prefix)-09-90(*)48															
	12	305	(Prefix)-12-90(*)48															
	18	457	(Prefix)-18-90(*)48															
	24	609	(Prefix)-24-90(*)48															
	30	762	(Prefix)-30-90(*)48															
	36	914	(Prefix)-36-90(*)48															
	42	1067	(Prefix)-42-90(*)48															

(Prefix) See page SFIT-2 for catalog number prefix.
Width dimensions are to inside wall. For all fittings add 1.375" (34.9mm) for total outside width.
Manufacturing tolerances apply to all dimensions.

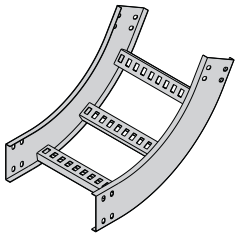
Dimensions in parentheses are in millimeters unless otherwise specified.

Vertical Bend 60˚ (VO, VI)

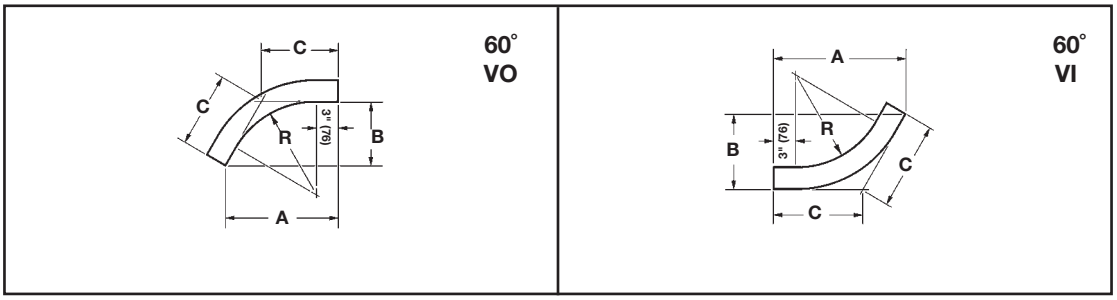
1 pair splice plates with hardware included.



60˚ Vertical Outside



60˚ Vertical Inside

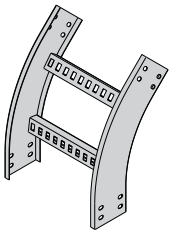


Bend Radius R	Ladder Width		(*) Insert "VO" for Vert. Outside Bend Insert "VI" for Vert. Inside Bend	VO Side Rail Height 4" - 7"			VI Side Rail Height											
							4" (101mm)			5" (127mm)			6" (152mm)			7" (178mm)		
				A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
in.	in.	mm	Catalog No.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)-06-60(*)12	14 7/8 (378)	8 5/8 (219)	9 15/16 (253)	18 3/8 (467)	10 5/8 (270)	12 1/4 (311)	19 1/4 (489	11 1/8 (283)	12 13/16 (326)	20 1/16 (510)	11 5/8 (296)	13 3/8 (340)	21 15/16 (557)	12 1/8 (308)	14 (356)
	9	228	(Prefix)-09-60(*)12															
	12	305	(Prefix)-12-60(*)12															
	18	457	(Prefix)-18-60(*)12															
	24	609	(Prefix)-24-60(*)12															
	30	762	(Prefix)-30-60(*)12															
	36	914	(Prefix)-36-60(*)12															
	42	1067	(Prefix)-42-60(*)12															
24 (609)	6	152	(Prefix)-06-60(*)24	25 5/16 (643)	14 5/8 (372)	16 7/8 (428)	28 3/4 (730)	16 5/8 (422)	19 3/16 (488)	29 5/8 (753)	17 1/8 (435)	19 3/4 (502)	30 1/2 (775)	17 5/8 (448)	20 5/16 (516)	31 3/8 (797)	18 1/8 (461)	20 7/8 (530)
	9	228	(Prefix)-09-60(*)24															
	12	305	(Prefix)-12-60(*)24															
	18	457	(Prefix)-18-60(*)24															
	24	609	(Prefix)-24-60(*)24															
	30	762	(Prefix)-30-60(*)24															
	36	914	(Prefix)-36-60(*)24															
	42	1067	(Prefix)-42-60(*)24															
36 (914)	6	152	(Prefix)-06-60(*)36	35 11/16 (907)	20 5/8 (524)	23 13/16 (605)	39 1/8 (994)	22 5/8 (575)	26 1/8 (663)	40 (1016)	23 1/8 (587)	26 11/16 (687)	40 7/8 (1038)	23 5/8 (600)	27 1/4 (692)	41 3/4 (1060)	24 1/8 (613)	27 13/16 (706)
	9	228	(Prefix)-09-60(*)36															
	12	305	(Prefix)-12-60(*)36															
	18	457	(Prefix)-18-60(*)36															
	24	609	(Prefix)-24-60(*)36															
	30	762	(Prefix)-30-60(*)36															
	36	914	(Prefix)-36-60(*)36															
	42	1067	(Prefix)-42-60(*)36															
48 (1219)	6	152	(Prefix)-06-60(*)48	46 1/16 (1170)	26 5/8 (676)	30 11/16 (780)	49 9/16 (1259)	28 5/8 (727)	33 (838)	50 3/8 (1280)	29 1/8 (740)	33 5/8 (854)	51 1/4 (1302)	29 5/8 (753)	34 3/16 (868)	52 1/8 (1324)	30 1/8 (765)	34 3/4 (883)
	9	228	(Prefix)-09-60(*)48															
	12	305	(Prefix)-12-60(*)48															
	18	457	(Prefix)-18-60(*)48															
	24	609	(Prefix)-24-60(*)48															
	30	762	(Prefix)-30-60(*)48															
	36	914	(Prefix)-36-60(*)48															
	42	1067	(Prefix)-42-60(*)48															

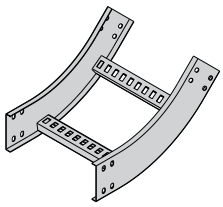
(Prefix) See page SFIT-2 for catalog number prefix.
Width dimensions are to inside wall. For all fittings add 1.375" (34.9mm) for total outside width.
Manufacturing tolerances apply to all dimensions.

Vertical Bend 45° (VO, VI)

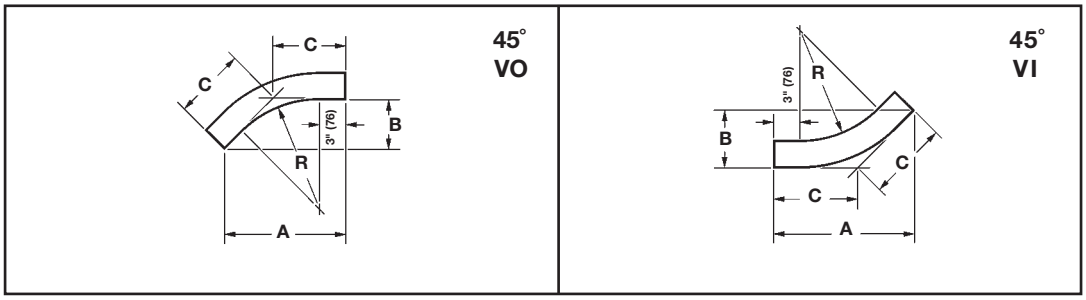
1 pair splice plates with hardware included.



45° Vertical Outside



45° Vertical Inside



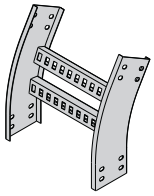
Bend Radius R	Ladder Width Insert		(*) Insert "VO" for Vert. Outside Bend "VI" for Vert. Inside Bend	VO Side Rail Height 4" - 7"			VI Side Rail Height											
							4" (101mm)			5" (127mm)			6" (152mm)			7" (178mm)		
				A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
in.	in.	mm	Catalog No.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)-06-45(*)12	$13\frac{5}{8}$ (346)	$5\frac{5}{8}$ (143)	8 (203)	$16\frac{7}{16}$ (417)	$6\frac{13}{16}$ (173)	$9\frac{5}{8}$ (245)	$17\frac{1}{8}$ (435)	$7\frac{1}{8}$ (181)	$10\frac{1}{16}$ (256)	$17\frac{7}{8}$ (454)	$7\frac{3}{8}$ (188)	$10\frac{7}{16}$ (265)	$18\frac{9}{16}$ (471)	$7\frac{11}{16}$ (195)	$10\frac{7}{8}$ (2176)
	9	228	(Prefix)-09-45(*)12															
	12	305	(Prefix)-12-45(*)12															
	18	457	(Prefix)-18-45(*)12															
	24	609	(Prefix)-24-45(*)12															
	30	762	(Prefix)-30-45(*)12															
	36	914	(Prefix)-36-45(*)12															
	42	1067	(Prefix)-42-45(*)12															
24 (609)	6	152	(Prefix)-06-45(*)24	$22\frac{1}{16}$ (561)	$9\frac{1}{8}$ (232)	$12\frac{15}{16}$ (329)	$24\frac{15}{16}$ (634)	$10\frac{5}{16}$ (262)	$14\frac{5}{8}$ (372)	$25\frac{5}{8}$ (651)	$10\frac{5}{8}$ (270)	15 (381)	$26\frac{5}{16}$ (668)	$10\frac{15}{16}$ (278)	$15\frac{7}{16}$ (392)	$27\frac{1}{16}$ (687)	$11\frac{3}{16}$ (284)	$15\frac{13}{16}$ (402)
	9	228	(Prefix)-09-45(*)24															
	12	305	(Prefix)-12-45(*)24															
	18	457	(Prefix)-18-45(*)24															
	24	609	(Prefix)-24-45(*)24															
	30	762	(Prefix)-30-45(*)24															
	36	914	(Prefix)-36-45(*)24															
	42	1067	(Prefix)-42-45(*)24															
36 (924)	6	152	(Prefix)-06-45(*)36	$30\frac{9}{16}$ (776)	$12\frac{11}{16}$ (323)	$17\frac{15}{16}$ (456)	$33\frac{3}{8}$ (848)	$13\frac{13}{16}$ (351)	$19\frac{9}{16}$ (497)	$34\frac{1}{8}$ (867)	$14\frac{1}{8}$ (359)	20 (508)	$34\frac{13}{16}$ (885)	$14\frac{7}{16}$ (367)	$20\frac{3}{8}$ (518)	$35\frac{1}{2}$ (902)	$14\frac{11}{16}$ (284)	$20\frac{13}{16}$ (402)
	9	228	(Prefix)-09-45(*)36															
	12	305	(Prefix)-12-45(*)36															
	18	457	(Prefix)-18-45(*)36															
	24	609	(Prefix)-24-45(*)36															
	30	762	(Prefix)-30-45(*)36															
	36	914	(Prefix)-36-45(*)36															
	42	1067	(Prefix)-42-45(*)36															
48 (1219)	6	152	(Prefix)-06-45(*)48	$39\frac{1}{16}$ (992)	$16\frac{3}{16}$ (411)	$22\frac{7}{8}$ (581)	$41\frac{7}{8}$ (1064)	$17\frac{3}{8}$ (441)	$24\frac{9}{16}$ (624)	$42\frac{5}{8}$ (1083)	$17\frac{5}{8}$ (448)	$24\frac{15}{16}$ (633)	$43\frac{5}{16}$ (1100)	$17\frac{15}{16}$ (456)	$25\frac{3}{8}$ (645)	44 (1118)	$18\frac{1}{4}$ (464)	$25\frac{13}{16}$ (656)
	9	228	(Prefix)-09-45(*)48															
	12	305	(Prefix)-12-45(*)48															
	18	457	(Prefix)-18-45(*)48															
	24	609	(Prefix)-24-45(*)48															
	30	762	(Prefix)-30-45(*)48															
	36	914	(Prefix)-36-45(*)48															
	42	1067	(Prefix)-42-45(*)48															

(Prefix) See page SFIT-1 for catalog number prefix.
Width dimensions are to inside wall. For all fittings add 1.375" (34.9mm) for total outside width.
Manufacturing tolerances apply to all dimensions.

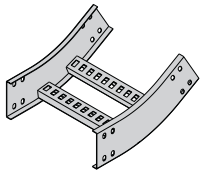
Dimensions in parentheses are in millimeters unless otherwise specified.

Vertical Bend 30˚ (VO, VI)

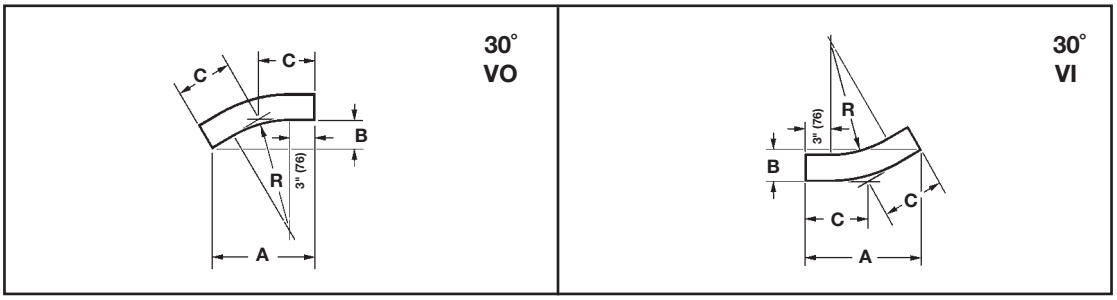
1 pair splice plates with hardware included.



30˚ Vertical Outside



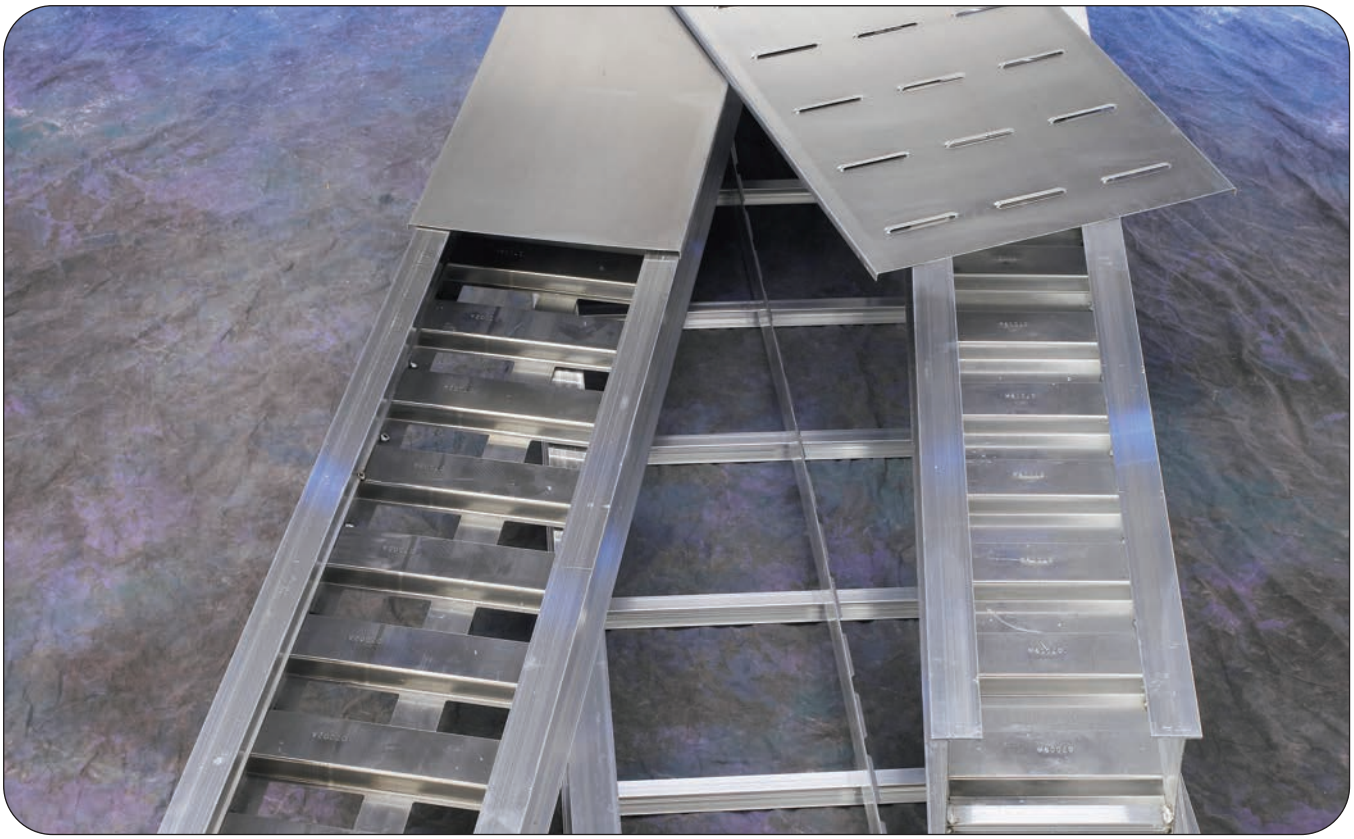
30˚ Vertical Inside

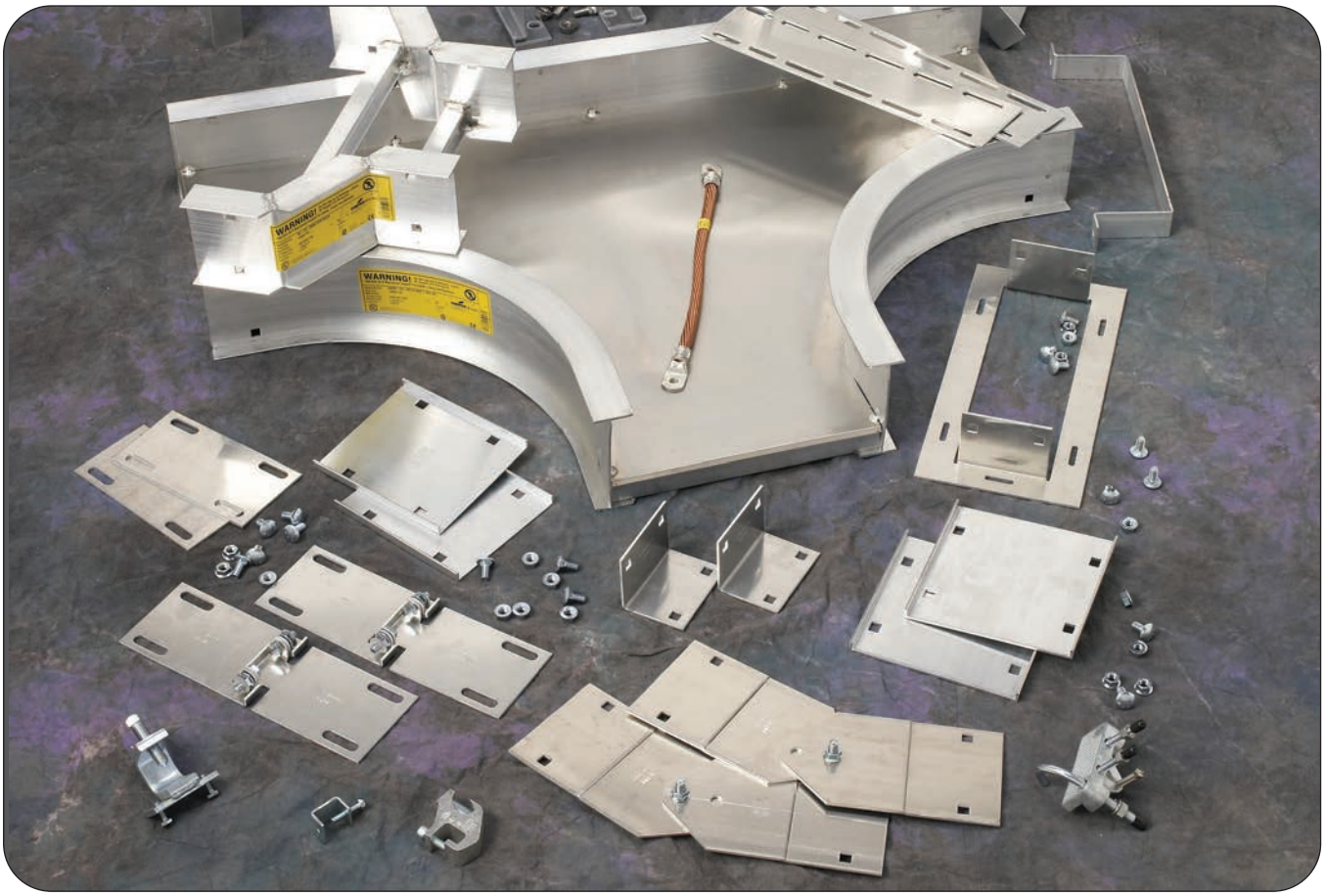


Bend Radius R	Ladder Width		(*) Insert "VO" for Vert. Outside Bend Insert "VI" for Vert. Inside Bend	VO Side Rail Height 4" - 7"			VI Side Rail Height											
							4" (101mm)			5" (127mm)			6" (152mm)			7" (178mm)		
				A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
in.	in.	mm	Catalog No.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)-06-30(*)12	$11\frac{5}{8}$ (296)	$3\frac{1}{8}$ (79)	$6\frac{3}{16}$ (157)	$13\frac{5}{8}$ (346)	$3\frac{5}{8}$ (92)	$7\frac{5}{16}$ (186)	$14\frac{1}{8}$ (359)	$3\frac{3}{4}$ (95)	$7\frac{9}{16}$ (192)	$14\frac{5}{8}$ (372)	$3\frac{15}{16}$ (100)	$7\frac{13}{16}$ (199)	$15\frac{1}{8}$ (384)	$4\frac{1}{16}$ (103)	$8\frac{1}{16}$ (205)
	9	228	(Prefix)-09-30(*)12															
	12	305	(Prefix)-12-30(*)12															
	18	457	(Prefix)-18-30(*)12															
	24	609	(Prefix)-24-30(*)12															
	30	762	(Prefix)-30-30(*)12															
	36	914	(Prefix)-36-30(*)12															
	42	1067	(Prefix)-42-30(*)12															
24 (609)	6	152	(Prefix)-06-30(*)24	$17\frac{5}{8}$ (448)	$4\frac{11}{16}$ (120)	$9\frac{7}{16}$ (240)	$19\frac{5}{8}$ (499)	$5\frac{1}{4}$ (133)	$1\frac{1}{2}$ (267)	$20\frac{1}{8}$ (511	$5\frac{3}{8}$ (137)	$10\frac{3}{4}$ (273)	$20\frac{5}{8}$ (524)	$5\frac{1}{2}$ (140)	$11\frac{1}{16}$ (282)	$21\frac{1}{8}$ (537)	$5\frac{5}{8}$ (143)	$11\frac{5}{16}$ (287)
	9	228	(Prefix)-09-30(*)24															
	12	305	(Prefix)-12-30(*)24															
	18	457	(Prefix)-18-30(*)24															
	24	609	(Prefix)-24-30(*)24															
	30	762	(Prefix)-30-30(*)24															
	36	914	(Prefix)-36-30(*)24															
	42	1067	(Prefix)-42-30(*)24															
36 (914)	6	152	(Prefix)-06-30(*)36	$23\frac{5}{8}$ (600)	$6\frac{5}{16}$ (160)	$12\frac{5}{8}$ (321)	$25\frac{5}{8}$ (651)	$6\frac{7}{8}$ (174)	$13\frac{11}{16}$ (348)	$26\frac{1}{8}$ (663)	7 (175)	14 (356)	$26\frac{5}{8}$ (676)	$7\frac{1}{8}$ (181)	$14\frac{1}{4}$ (362)	$27\frac{1}{8}$ (689)	$7\frac{1}{4}$ (184)	$14\frac{1}{2}$ (287)
	9	228	(Prefix)-09-30(*)36															
	12	305	(Prefix)-12-30(*)36															
	18	457	(Prefix)-18-30(*)36															
	24	609	(Prefix)-24-30(*)36															
	30	762	(Prefix)-30-30(*)36															
	36	914	(Prefix)-36-30(*)36															
	42	1067	(Prefix)-42-30(*)36															
48 (1219)	6	152	(Prefix)-06-30(*)48	$29\frac{5}{8}$ (753)	$7\frac{15}{16}$ (202)	$15\frac{7}{8}$ (403)	$31\frac{5}{8}$ (803)	$8\frac{7}{16}$ (214)	$16\frac{15}{16}$ (430)	$32\frac{1}{8}$ (816)	$8\frac{5}{8}$ (219)	$17\frac{3}{16}$ (437)	$32\frac{5}{8}$ (829)	$8\frac{3}{4}$ (222)	$17\frac{1}{2}$ (445)	$33\frac{1}{8}$ (842)	$8\frac{7}{8}$ (226)	$17\frac{3}{4}$ (451)
	9	228	(Prefix)-09-30(*)48															
	12	305	(Prefix)-12-30(*)48															
	18	457	(Prefix)-18-30(*)48															
	24	609	(Prefix)-24-30(*)48															
	30	762	(Prefix)-30-30(*)48															
	36	914	(Prefix)-36-30(*)48															
	42	1067	(Prefix)-42-30(*)48															

(Prefix) See page SFIT-2 for catalog number prefix.
Width dimensions are to inside wall. For all fittings add 1.375" (34.9mm) for total outside width.
Manufacturing tolerances apply to all dimensions.

Aluminum Cable Ladder





NEMA 12B Rated Aluminum Cable Ladder

RWI04A, RWI05A, RWI06A, and RWI07A Straight Sections

Straight Section Part Numbering

Prefix

Example: **RWI 04 A 09 SL - 12 - 120**

Series
RWI

Height
04 = 4”
05 = 5”
06 = 6”
07 = 7”

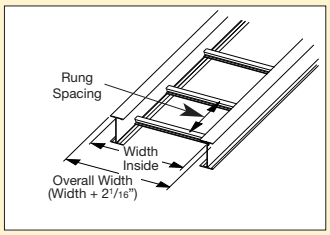
Material
A = Aluminum

Bottom Type
06 = 6” Rung Spacing
09 = 9” Rung Spacing
12 = 12” Rung Spacing

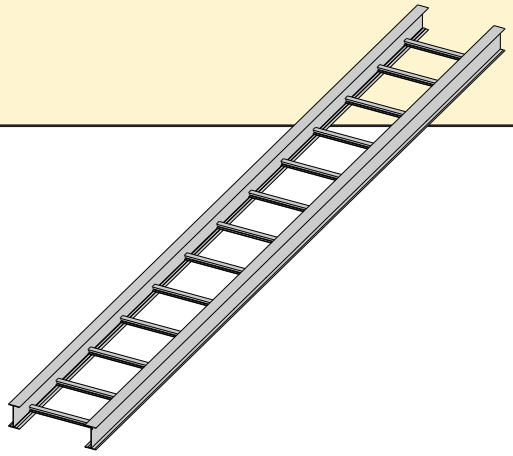
Construction
SL = Straight Ladder Section

Width
06 = 6”
09 = 9”
12 = 12”
18 = 18”
24 = 24”
30 = 30”
36 = 36”

Length
144 = 12 ft. (3.00m)
120 = 10 ft. (3.66m)



Values are based on simple beam tests per VE-1 on 36” wide cable ladder with rungs spaced on 12” centers. The published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply the published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the tray. These systems will support without collapse a 200 lb. concentrated load.



B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
RWI04A	1.71 / 3.54 / 2.68	NEMA: 12B	6	224	0.0015	Area = 0.93 in²	1.8	333	0.025	Area = 5.99 cm²
		UL Cross-Sectional	10	108	0.0115	Sx = 1.96 in³	3.0	161	0.196	Sx = 81.70 cm³
		Area: 0.40 in²	12	75	0.0238	Ix = 1.11 in⁴	3.7	112	0.406	Ix = 18.10 cm⁴
RWI05A	1.71 / 4.53 / 3.66	NEMA: 12B	6	224	0.0008	Area = 1.08 in²	1.8	333	0.014	Area = 6.95 cm²
		UL Cross-Sectional	10	119	0.0064	Sx = 3.53 in³	3.0	178	0.109	Sx = 147.00 cm³
		Area: 0.60 in²	12	83	0.0132	Ix = 1.55 in⁴	3.7	123	0.225	Ix = 25.40 cm⁴
RWI06A	1.71 / 5.51 / 4.64	NEMA: 12B	6	224	0.0005	Area = 1.18 in²	1.8	333	0.009	Area = 7.59 cm²
		UL Cross-Sectional	10	118	0.0041	Sx = 5.51 in³	3.0	175	0.070	Sx = 230.00 cm³
		Area: 0.60 in²	12	82	0.0085	Ix = 1.98 in⁴	3.7	121	0.144	Ix = 32.50 cm⁴
RWI07A	1.71 / 6.50 / 5.63	NEMA: 12C	6	224	0.0003	Area = 1.50 in²	1.8	333	0.006	Area = 9.68 cm²
		UL Cross-Sectional	10	176	0.0026	Sx = 8.79 in³	3.0	262	0.044	Sx = 366.00 cm³
		Area: 0.60 in²	12	122	0.0053	Ix = 2.69 in⁴	3.7	182	0.091	Ix = 44.10 cm⁴

NEMA 12B Rated Aluminum Cable Ladder

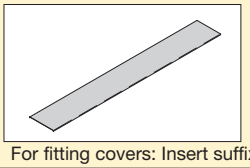
Accessories

Aluminum Cover Part Numbering

Prefix

Example: **86 7 A 40 SL - 12 - 72**

Cover Type	Detail	Material	Material Thickness	Cover Style	Ladder Width	Radius
86 = Solid **87** = Vented	**7** = Flanged	Aluminum	**40** = .040"	**SL** = Straight Ladder Section	**06** = 6" **09** = 9" **12** = 12" **18** = 18" **24** = 24" **30** = 30" **36** = 36"	**R12** = 12" (305) **R24** = 24" (609) **R36** = 36" (914)



For fitting covers: Insert suffix of fitting to be covered. See examples below.

Examples of Catalog Numbers for Fitting Covers

Horizontal Bend Cover

Prefix Suffix

86 7 A 40 HB - 18 -90 R24

- R24 — Radius
- -90 — Angle
- 18 — Width
- HB — Fitting
- 40 — Material Thickness
- A — Material
- 7 — Detail
- 86 — Cover Type

Vertical Inside & Outside Bend Cover

Prefix Suffix

86 7 A 40 VI/O - 24 -90 R24 - 4

- 4 — Side Rail Height
- R24 — Radius
- -90 — Angle
- 24 — Width
- VI/O — Fitting
- 40 — Material Thickness
- A — Material
- 7 — Detail
- 86 — Cover Type

* Insert I for Inside or O for Outside Bend

Horizontal Expanding Cross Cover

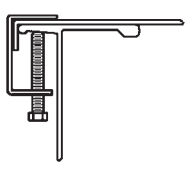
Prefix Suffix

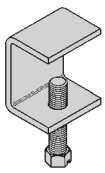
86 7 A 40 RX - 12 -24 - R24

- R24 — Radius
- -24 — Width[1]
- 12 — Width[2]
- RX — Fitting
- 40 — Material Thickness
- A — Material
- 7 — Detail
- 86 — Cover Type

Standard Cover Clamp

- Setscrew included.
- For indoor service only.
- Sold each.

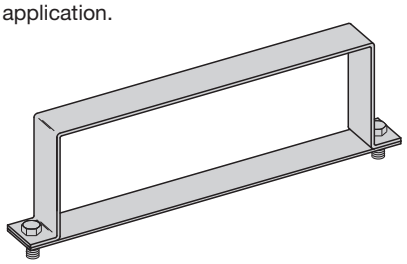




Ladder Type	Side Rail Height	Catalog No.
Aluminium	All Sizes	**9ZN-9012**
		9A-9012

Heavy Duty Cover Clamp

- For heavy duty application.
- Sold per piece.



Ladder Series	Catalog No.
RWI04A	**R4A-HDCC-†**
RWI05A	**R5A-HDCC-†**
RWI06A	**R6A-HDCC-†**
RWI07A	**R7A-HDCC-†**

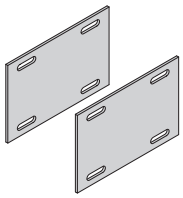
† = tray width

Aluminum

Accessories

Standard Splice Plates

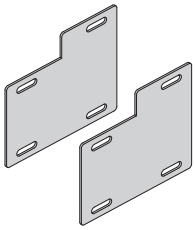
- Furnished in pairs with 1/4" hardware.
- UL Classified.
- One pair including hardware provided with each straight section.



Ladder Series	Catalog No.
RWI04A	**R4A-SSP**
RWI05A	**R5A-SSP**
RWI06A	**R6A-SSP**
RWI07A	**R7A-SSP**

Step Down Splice Plates

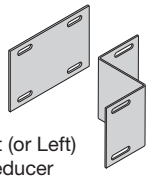
- Furnished in pairs with 1/4" hardware.
- UL Classified.



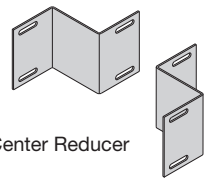
Ladder Series	Catalog No.
RWI05A to RWI04A	**RAA-DSP-45**
RWI06A to RWI04A	**RAA-DSP-46**
RWI07A to RWI04A	**RAA-DSP-47**
RWI06A to RWI05A	**RAA-DSP-56**
RWI07A to RWI05A	**RAA-DSP-57**
RWI07A to RWI06A	**RAA-DSP-67**

Offset Reducing Splice Plates

- Furnished in pairs with 1/4" hardware.
- UL Classified.



Right (or Left) Reducer



Center Reducer

Ladder Series	Catalog No.
RWI04A	**R4A-RSP-†r**
RWI05A	**R5A-RSP-†r**
RWI06A	**R6A-RSP-†r**
RWI07A	**R7A-RSP-†r**

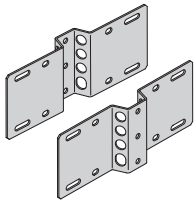
Specify the following:

† C = center reducer
S = side reducer

r (ladder reduction) 3", 6", 9", 12", 15", 18", 21", 24", 27" or 30"

Flex-Mount™ Adjustable Splice Plates

- Furnished in pairs with 1/4" hardware.
- Horizontally adjustable to 90°.
- Vertically adjustable to 15°.
- UL Classified.

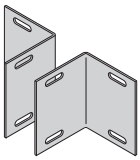


Ladder Series	Catalog No.
RWI04A	**R4A-FSP**
RWI05A	**R5A-FSP**
RWI06A	**R6A-FSP**
RWI07A	**R7A-FSP**

Requires supports within 24" on both sides, per NEMA VE 2.

Tray To Box Splice Plates

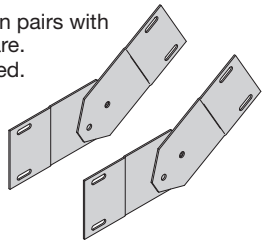
- Furnished in pairs with 1/4" hardware.
- UL Classified.



Ladder Series	Catalog No.
RWI04A	**R4A-TTB**
RWI05A	**R5A-TTB**
RWI06A	**R6A-TTB**
RWI07A	**R7A-TTB**

Vertical Adjustable Splice Plates

- Furnished in pairs with 1/4" hardware.
- UL Classified.

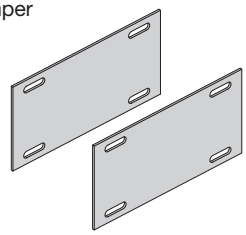


Requires supports within 24" on both sides, per NEMA VE 2.

Ladder Series	Catalog No.
RWI04A	**R4A-VSP**
RWI05A	**R5A-VSP**
RWI06A	**R6A-VSP**
RWI07A	**R7A-VSP**

Expansion Splice Plates

- Furnished in pairs with 1/4" hardware.
- Bonding jumper required.

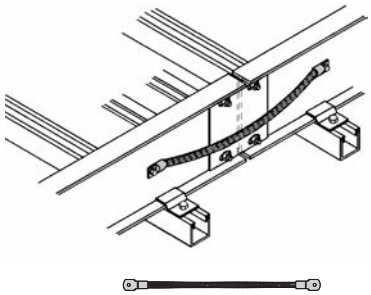


Ladder Series	Catalog No.
RWI04A	**R4A-ESP**
RWI05A	**R5A-ESP**
RWI06A	**R6A-ESP**
RWI07A	**R7A-ESP**

Accessories

Bonding Jumper

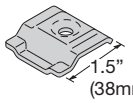
- Furnished with 1/4" hardware.
- UL Classified.

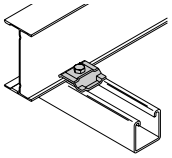


Ampacity	Catalog No.
1200	**99-30**

Clamp/Guide

- Features a no-twist design.
- Has four times the strength of the traditional design.
- Each side is labeled to ensure proper installation.
- Designed for 1/4" hardware.
- Furnished in pairs with or without hardware.



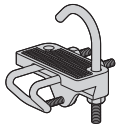


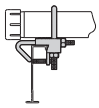
Patent No. RE35479

Catalog No.
9ZN-1204 (without hardware)
9ZN-1204NB (with hardware)

Conduit to Ladder Adaptors

- For easy attachment of conduit terminating at a cable ladder.
- Use on aluminum cable ladders.

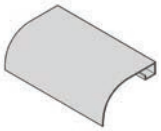




Catalog No.	Conduit Size in.	Conduit Size mm
9G-1158-1/2, 3/4	1/2, 3/4	15, 20
9G-1158-1, 1 1/4	1, 1 1/4	25, 32
9G-1158-1 1/2, 2	1 1/2, 2	40, 50
9G-1158-2 1/2, 3	2 1/2, 3	65, 80
9G-1158-3 1/2, 4	3 1/2, 4	90, 100

Ladder Drop-Out

- Specially-designed Ladder Drop-Outs provide a rounded surface with 4" (101 mm) radius to protect cable as it exits from the cable tray, preventing damage to insulation. The drop-out will attach to any desired rung.
- (†) Insert tray width

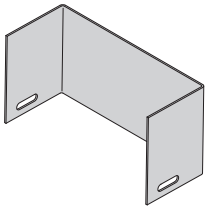


Catalog No.	9A-1103-†

† = ladder width

Blind End

- Furnished as one plate with 1/4" hardware.

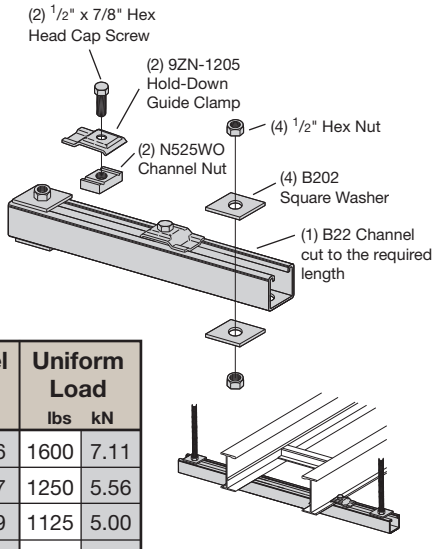


Ladder Series	Catalog No.
RWI04A	**R4A-END-†**
RWI05A	**R5A-END-†**
RWI06A	**R6A-END-†**
RWI07A	**R7A-END-†**

† = ladder width

Trapeze Support Kit

- Single Trapeze Support in one package is available in pre-galvanized steel with zinc-plated hardware or hot dip galvanized steel with 316 stainless steel hardware.
- SH Channel provides pre-punched slots eliminating field drilling.
- Hardware is sealed in plastic bag and boxed with channel that is pre-cut to appropriate length.
- Designed for use with 1/2" threaded rod. Order rod separately.



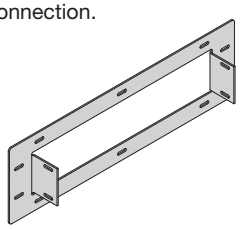
Catalog No.	Ladder Width in.	Ladder Width mm	Channel Length in.	Channel Length mm	Uniform Load lbs	Uniform Load kN
9P-5506-22SH(†)	6	152	16	406	1600	7.11
9P-5509-22SH(†)	9	229	18	457	1250	5.56
9P-5512-22SH(†)	12	305	22	559	1125	5.00
9P-5518-22SH(†)	18	457	28	711	865	3.85
9P-5524-22SH(†)	24	610	34	864	700	3.11
9P-5530-22SH(†)	30	762	40	1016	590	2.62
9P-5536-22SH(†)	36	914	46	1168	510	2.27
9P-5542-22SH(†)	42	1067	52	1321	450	2.00

- (†) Insert 3/8 for 3/8" threaded rod hardware.

Safety factor of 3.0 on all loads.

Frame Type Box Connector

- Furnished with 1/4" hardware for tray connection.



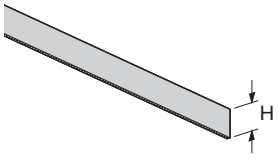
Ladder Series	Catalog No.
RWI04A	**R4A-FTB-†**
RWI05A	**R5A-FTB-†**
RWI06A	**R6A-FTB-†**
RWI07A	**R7A-FTB-†**

† = ladder width

Accessories

Straight Section Barrier Strip

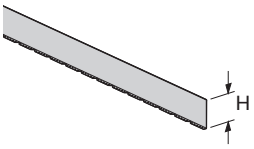
- Furnished with four (4) barrier strip clips, mounting hardware and splice.
- Standard lengths are 144” (12 ft) & 120” (10 ft).



Ladder Series	Catalog No.	H in	H mm
RWI04A	**R4A-DSL-Length**	3	76
RWI05A	**R5A-DSL-Length**	4	101
RWI06A	**R6A-DSL-Length**	5	127
RWI07A	**R7A-DSL-Length**	6	152

Horizontal Bend Barrier Strip

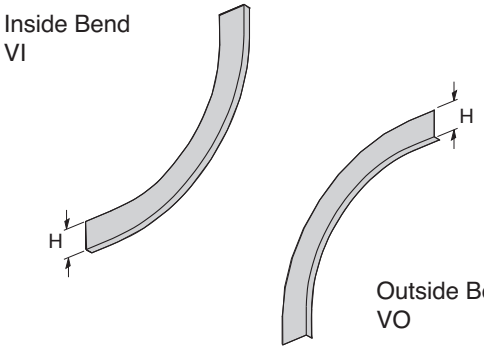
- Horizontal Bend Barriers are flexible in order to conform to any horizontal fitting radius.
- Furnished with three (3) barrier strip clips, mounting hardware and splice.
- Standard length is 72” (6 ft).



Ladder Series	Catalog No.	H in	H mm
RWI04A	**R4A-DHB**	3	76
RWI05A	**R5A-DHB**	4	101
RWI06A	**R6A-DHB**	5	127
RWI07A	**R7A-DHB**	6	152

Vertical Bend Barrier Strip

- Furnished with three (3) barrier strip clips, mounting hardware and splice.



Ladder Series	Catalog No. Inside Bend	Catalog No. Outside Bend	H in	H mm
RWI04A	**R4A-DVI-(**)R(†)**	**R4A-DVO-(**)R(†)**	3	76
RWI05A	**R5A-DVI-(**)R(†)**	**R6A-DVO-(**)R(†)**	4	101
RWI06A	**R6A-DVI-(**)R(†)**	**R6A-DVO-(**)R(†)**	5	127
RWI07A	**R7A-DVI-(**)R(†)**	**R7A-DVO-(**)R(†)**	6	152

Inside Bend
(**) Insert 30°, 45°, 60°, or 90° for angles
(†) Insert 12, 24, or 36 for radius

NEMA 12B Rated Aluminum Cable Ladder

Specifications - Section 161xx - NEMA 12B Aluminium Cable Ladder

Part 1 - General

1.01 Section Includes

A. The work covered under this section consists of the furnishing of all necessary labour, supervision, materials, equipment, tests and services to install complete cable ladder systems as shown on the drawings.

B. Cable ladder systems are defined to include, but are not limited to straight sections of [ladder type] cable ladders, bends, tees, elbows, drop-outs, supports and accessories.

1.02 References

A. ANSI/NFPA 70 - National Electrical Code

B. NEMA VE 1-2009 - Metallic Cable Ladder Systems

C. NEMA VE 2-2006 - Cable Ladder installation Guidelines

1.03 Drawings

A. The drawings, which constitute a part of these specifications, indicate the general route of the cable ladder systems. Data presented on these drawings are as accurate as preliminary surveys and planning can determine until final equipment selection is made. Accuracy is not guaranteed and field verification, of all dimensions, routing, etc., is directed. dimensions, routing, etc., is directed.

B. Specifications and drawings are for assistance and guidance, but exact routing, locations, distances and levels will be governed by actual field conditions. Contractor is directed to make field surveys as part of his work prior to submitting system layout drawings.

1.04 Submittals

A. Submittal Drawings: Submit drawings of cable ladder and accessories including clamps, brackets, hanger rods, splice plate connectors, expansion joint assemblies, and fittings, showing accurately scaled components.

B. Product Data: Submit manufacturer's data on cable ladder including, but not limited to, types, materials, finishes, rung spacings, inside depths and fitting radii. For side rails and rungs, submit cross sectional properties including Section Modulus (Sx) and Moment of Inertia (Ix).

1.05 Quality Assurance

A. Manufacturers: Firms regularly engaged in manufacture of cable ladders and fittings of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. NEMA Compliance: Comply with NEMA Standards Publication Number VE 1, "Cable Ladder Systems".

C. NEC Compliance: Comply with NEC, as applicable to construction and installation of cable ladder (Article 392, NEC).

D. UL Compliance: Provide products that are UL-classified and labeled.

E. NFPA Compliance: Comply with NFPA 70B, "Recommended Practice for Electrical Equipment Maintenance" pertaining to installation of cable ladder systems.

1.06 Delivery, Storage and Handling

A. Deliver cable ladder systems and components carefully to avoid breakage, denting and scoring finishes. Do not install damaged equipment.

B. Store cable ladders and accessories in original cartons and in clean dry space; protect from weather and construction traffic. Wet materials should be unpacked and dried before storage.

Part 2 - Products

2.01 Acceptable Manufacturers

A. Subject to compliance with these specifications, cable ladder systems shall be as manufactured by B-Line.

2.02 Cable Ladder Sections and Components

A. General: Except as otherwise indicated, provide metal cable ladders, of types, classes, and sizes indicated; with splice plates, bolts, nuts and washers or connecting units. Construct connecting units. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additional construction features. Cable ladder shall be installed according to the latest revision of NEMA VE-2.

B. Material and Finish: Straight sections, fitting side rails, rungs and splice plates shall be extruded from Aluminium Association Alloy 6063. All fabricated parts shall be made from Aluminium Association Alloy 5052.

2.03 Type of Ladder System

A. Ladder Cable ladders shall consist of two longitudinal members (side rails) with transverse members (rungs) mechanically fastened to the side rails. Rungs shall be spaces [6] [9] [12] be spaces [6] [9] [12] inches on center. Rung spacing in radiused fittings shall be industry standard 9" and measured at the center of the ladder's width. Each rung must be capable of supporting 1 200 lb. concentrated load at the center of a 18" wide cable ladder with a safety factor of 1.5. Rungs shall be capable of easy removal, reinstallation, or replacement if necessary.

B. Cable Ladder loading depth shall be [3] [4] [5] [6] inches per NEMA VE-1.

C. Straight sections shall be supplied in standard [10 foot (3.05m)] [12 foot (3.65m)] lengths.

D. Cable Ladder widths shall be [6] [9] [12] [18] [24] [30] [36] inches or as shown on drawings.

E. Splice plates shall have (4) four nuts and bolts per plate. The resistance of fixed splice connections between adjacent sections of ladder shall not exceed 0.00033 ohms. Splice plates shall be furnished with straight sections and fittings.

F. All fittings must have a minimum radius of [12] [24] [36] inches.

2.04 Loading Capacities

A. Cable ladders shall meet NEMA class designation: [75 lbs./ft. on 12 ft. span].
OR

A. Cable ladder shall be capable of carrying a uniformly distributed load of _____ lbs./ft on a _____ foot support span with a safety factor of 1.5 when supported as a simple span and tested per NEMA VE 1 Section 5.2.

Part 3 - Execution

3.01 Installation

A. Install cable ladders as indicated: Installation shall be in accordance with equipment manufacturer's instructions, and with recognized industry practices to ensure that cable ladder equipment comply with requirements of NEC and applicable portions of NFPA 70B. Reference NEMA VE-2 for general cable ladder installation guidelines.

B. Coordinate cable ladder with other electrical work as necessary to properly integrate installation of cable ladder work with other work.

C. Provide sufficient space encompassing cable ladders to permit access for installing and maintaining cables.

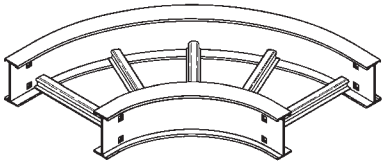
D. Cable ladder fitting supports shall be located such that they meet the strength requirements of straight sections. Install fitting supports per NEMA VE-2 guidelines, or in accordance with manufacturer's instructions.

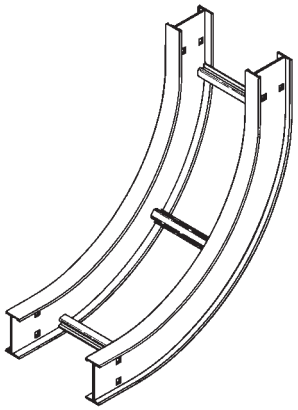
3.02 Testing

A. Test cable ladders to ensure electrical continuity of bonding and grounding connections, and to demonstrate compliance with specified maximum grounding resistance. See NFPA 70B, Chapter 18, for testing and test methods.

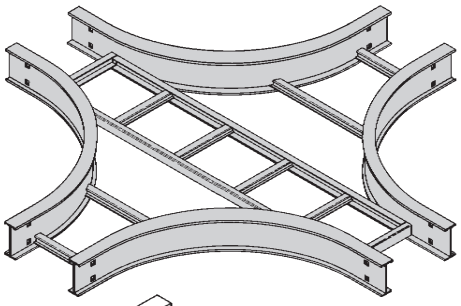
B. Manufacturer shall provide test reports witnessed by an independent testing laboratory of the "worst case" loading conditions outlined in this specification and performed in accordance with the latest revision of NEMA VE-1-2002/CSA C22.2 No. 126.1-02.

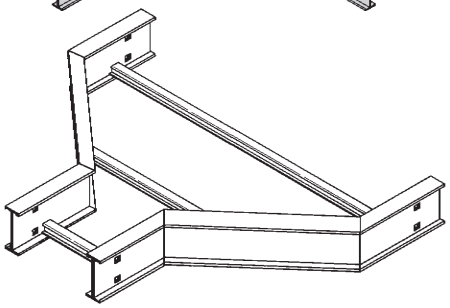
End Of Section.





Fittings engineered with 3” tangents for splicing integrity.





Fittings Part Numbering

Prefix

Example: **RWI 04 A09 HB - 09 - 30 R24**

Series	Height	Material	Type	Width	Angle	Radius
RWI	**4** = 4" (101) **5** = 5" (127) **6** = 6" (152) **7** = 7" (178)	Aluminum 9” Rung Spacing	**HB** = Horizontal Bend * **HT** = Horizontal Tee * **HX** = Horizontal Cross **VI** = Vertical Inside Bend **VO** = Vertical Outside Bend * **VTD** = Vertical Tee, Down * **VTU** = Vertical Tee, Up	**06** = 6" (152) **09** = 9" (228) **12** = 12" (305) **18** = 18" (457) **24** = 24" (609) **30** = 30" (762) **36** = 36" (914)	**30** = 30° **45** = 45° **60** = 60° **90** = 90°	**R12** = 12" (305) **R24** = 24" (609) **R36** = 36" (914)

* Angle not required in part number

Horizontal Reducing / Expanding Tee or Cross Fittings Part Numbering

Prefix

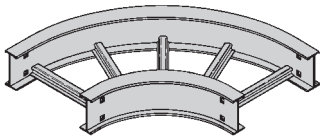
Example: **RWI 04 A09 ET - 09 - 30 R12**

Series	Height	Material	Type	Width[1]	Width[2]	Radius
RWI	**4** = 4" (101) **5** = 5" (127) **6** = 6" (152) **7** = 7" (178)	Aluminum 9” Rung Spacing	**ET** = Expanding Tee **RT** = Reducing Tee **RX** = Expanding/Reducing Cross	**06** = 6" (152) **09** = 9" (228) **12** = 12" (305) **18** = 18" (457) **24** = 24" (609) **30** = 30" (762) **36** = 36" (914)	**06** = 6" (152) **09** = 9" (228) **12** = 12" (305) **18** = 18" (457) **24** = 24" (609) **30** = 30" (762) **36** = 36" (914)	**R12** = 12" (305) **R24** = 24" (609) **R36** = 36" (914)

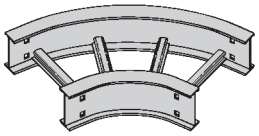
Dimensions in gray shaded columns are in millimeters unless otherwise specified.

Horizontal Bend 90° 60° (HB)

1 pair splice plates with hardware included.



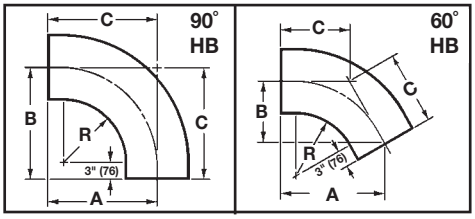
90° Horizontal Bend



60° Horizontal Bend

Bottoms manufactured:

09 = 9" Rung Spacing

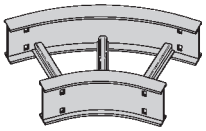


Bend Radius R		Ladder Width		90° Horizontal Bend Dimensions								60° Horizontal Bend Dimensions							
				Catalog No.	A		B		C			Catalog No.	A		B		C		
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm			in.	mm	in.	mm	in.	mm	
12	305	6	152	(Pre)HB-06-90R12	18 1/16	459	18 1/16	459	18 1/16	459		(Pre)HB-06-60R12	17 9/16	445	10 1/8	258	11 11/16	297	
		9	228	(Pre)HB-09-90R12	19 9/16	497	19 9/16	497	19 9/16	497		(Pre)HB-09-60R12	18 13/16	478	10 7/8	277	12 9/16	319	
		12	305	(Pre)HB-12-90R12	21 1/16	535	21 1/16	535	21 1/16	535		(Pre)HB-12-60R12	20 1/8	511	11 5/8	296	13 7/16	341	
		18	457	(Pre)HB-18-90R12	24 1/16	611	24 1/16	611	24 1/16	611		(Pre)HB-18-60R12	22 3/4	577	13 1/8	334	15 3/16	385	
		24	609	(Pre)HB-24-90R12	27 1/16	687	27 1/16	687	27 1/16	687		(Pre)HB-24-60R12	25 5/16	643	14 5/8	372	16 7/8	429	
		30	762	(Pre)HB-30-90R12	30 1/16	763	30 1/16	763	30 1/16	763		(Pre)HB-30-60R12	27 15/16	709	16 1/8	410	18 5/8	473	
		36	914	(Pre)HB-36-90R12	33 1/16	840	33 1/16	840	33 1/16	840		(Pre)HB-36-60R12	30 1/2	775	17 5/8	448	20 3/8	517	
24	610	6	152	(Pre)HB-06-90R24	30 1/16	763	30 1/16	763	30 1/16	763		(Pre)HB-06-60R24	27 15/16	709	16 1/8	410	18 5/8	473	
		9	228	(Pre)HB-09-90R24	31 9/16	802	31 9/16	802	31 9/16	802		(Pre)HB-09-60R24	29 1/4	742	16 7/8	429	19 1/2	495	
		12	305	(Pre)HB-12-90R24	33 1/16	840	33 1/16	840	33 1/16	840		(Pre)HB-12-60R24	30 1/2	775	17 5/8	448	20 3/8	517	
		18	457	(Pre)HB-18-90R24	36 1/16	916	36 1/16	916	36 1/16	916		(Pre)HB-18-60R24	33 1/8	841	19 1/8	486	22 1/8	561	
		24	609	(Pre)HB-24-90R24	39 1/16	992	39 1/16	992	39 1/16	992		(Pre)HB-24-60R24	35 3/4	907	20 5/8	524	23 13/16	605	
		30	762	(Pre)HB-30-90R24	42 1/16	1068	42 1/16	1068	42 1/16	1068		(Pre)HB-30-60R24	38 5/16	973	22 1/8	564	25 9/16	649	
		36	914	(Pre)HB-36-90R24	45 1/16	1144	45 1/16	1144	45 1/16	1144		(Pre)HB-36-60R24	40 15/16	1039	23 5/8	600	27 15/16	693	
36	915	6	152	(Pre)HB-06-90R36	42 1/16	1068	42 1/16	1068	42 1/16	1068		(Pre)HB-06-60R36	38 3/8	975	22 1/8	562	25 9/16	649	
		9	228	(Pre)HB-09-90R36	43 9/16	1107	43 9/16	1107	43 9/16	1107		(Pre)HB-09-60R36	39 5/8	1006	22 7/8	581	26 7/16	672	
		12	305	(Pre)HB-12-90R36	45 1/16	1145	45 1/16	1145	45 1/16	1145		(Pre)HB-12-60R36	41	1041	23 5/8	600	27 5/16	694	
		18	457	(Pre)HB-18-90R36	48 1/16	1221	48 1/16	1221	48 1/16	1221		(Pre)HB-18-60R36	43 1/2	1105	25 1 16	637	29	737	
		24	609	(Pre)HB-24-90R36	51 1/16	1297	51 1/16	1297	51 1/16	1297		(Pre)HB-24-60R36	46 1/8	1172	26 5/8	676	30 3/4	781	
		30	762	(Pre)HB-30-90R36	54 1/16	1373	54 1/16	1373	54 1/16	1373		(Pre)HB-30-60R36	48 3/4	1238	28 1/16	713	32 1/2	826	
		36	914	(Pre)HB-36-90R36	57 1/16	1449	57 1/16	1449	57 1/16	1449		(Pre)HB-36-60R36	51 5/16	13023	29 9/16	751	34 1/4	870	

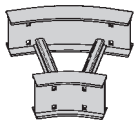
(Pre) See page AL-8 for catalog number prefix.
Width dimensions are to inside wall.
Manufacturing tolerances apply to all dimensions.

Horizontal Bend 45° 30° (HB)

1 pair splice plates with hardware included.



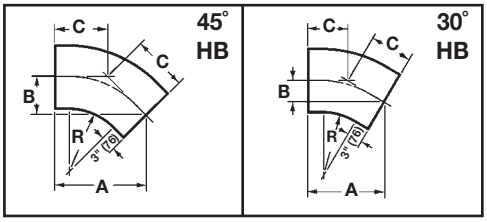
45° Horizontal Bend



30° Horizontal Bend

Bottoms manufactured:

09 = 9" Rung Spacing



Bend Radius R		Ladder Width		45° Horizontal Bend Dimensions								30° Horizontal Bend Dimensions							
				Catalog No.	A		B		C			Catalog No.	A		B		C		
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm			in.	mm	in.	mm	in.	mm	
12	305	6	152	(Pre)HB-06-45R12	15 3/4	400	6 1/2	165	9 3/16	233		(Pre)HB-06-30R12	13 3/16	338	3 9/16	90	7 1/16	180	
		9	228	(Pre)HB-09-4R12	16 13/16	427	6 15/16	176	9 13/16	249		(Pre)HB-09-30R12	13 15/16	354	3 3/4	95	7 7/2	190	
		12	305	(Pre)HB-12-45R12	17 7/8	454	7 7/16	189	10 1/2	267		(Pre)HB-12-30R12	14 11/16	373	3 15/16	100	7 7/8	200	
		18	457	(Pre)HB-18-45R12	20 1/2	521	8 5/16	211	11 3/4	298		(Pre)HB-18-30R12	16 3/16	411	4 9/16	110	8 11/16	220	
		24	609	(Pre)HB-24-45R12	22 1/16	560	9 3/16	233	12 15/16	328		(Pre)HB-24-30R12	17 11/16	449	4 3/4	120	9 1/2	241	
		30	762	(Pre)HB-30-45R12	24 5/16	617	10 1/16	255	14 1/4	362		(Pre)HB-30-30R12	19 3/16	487	5 1/8	131	10 5/16	261	
		36	914	(Pre)HB-36-45R12	26 7/16	671	10 15/16	278	15 7/16	392		(Pre)HB-36-30R12	20 11/16	525	5 9/16	141	11 1/16	282	
24	610	6	152	(Pre)HB-06-45R24	24 5/16	617	10 1/16	255	14 3/16	360		(Pre)HB-06-30R24	19 3/16	487	5 1/8	131	10 5/16	261	
		9	228	(Pre)HB-09-45R24	25 1/4	641	10 1/2	267	14 13/16	376		(Pre)HB-09-30R24	19 15/16	506	5 5/16	136	10 11/16	271	
		12	305	(Pre)HB-12-45R24	26 7/16	672	10 15/16	278	15 7/16	392		(Pre)HB-12-30R24	20 11/16	525	5 9/16	141	11 1/16	282	
		18	457	(Pre)HB-18-45R24	28 9/16	725	11 13/16	300	16 11/16	424		(Pre)HB-18-30R24	22 3/16	563	5 15/16	151	11 7/8	302	
		24	609	(Pre)HB-24-45R24	30 11/16	779	12 11/16	322	17 15/16	456		(Pre)HB-24-30R24	23 11/16	601	6 3/8	161	12 11/16	322	
		30	762	(Pre)HB-30-45R24	32 13/16	833	13 9/16	345	19 3/16	487		(Pre)HB-30-30R24	25 3/16	640	6 3/4	171	13 1/2	343	
		36	914	(Pre)HB-36-45R24	34 15/16	887	14 7/16	367	20 7/16	519		(Pre)HB-36-30R24	26 11/16	678	7 1/8	182	14 5/16	363	
36	915	6	152	(Pre)HB-06-45R36	32 3/4	832	13 9/16	345	19 1/4	489		(Pre)HB-06-30R36	25 3/16	640	6 3/4	171	13 1/2	343	
		9	228	(Pre)HB-09-45R36	33 13/16	859	14	356	19 13/16	503		(Pre)HB-09-30R36	25 15/16	659	7	179	13 15/16	354	
		12	305	(Pre)HB-12-45R36	34 15/16	887	14 1/2	368	20 7/16	519		(Pre)HB-12-30R36	26 11/16	678	7 1/8	181	14 5/16	364	
		18	457	(Pre)HB-18-45R36	37	940	15 1/4	387	21 11/16	551		(Pre)HB-18-30R36	28 3/16	716	7 1/2	191	15 1/8	384	
		24	609	(Pre)HB-24-45R36	39 1/8	994	16 1/4	413	22 15/16	583		(Pre)HB-24-30R36	29 11/16	754	8	203	15 15/16	405	
		30	762	(Pre)HB-30-45R36	41 1/4	1048	17	432	24 3/16	614		(Pre)HB-30-30R36	31 3/16	792	8 5/16	211	16 3/4	425	
		36	914	(Pre)HB-36-45R36	43 3/8	1102	17 15/16	456	25 7/16	646		(Pre)HB-36-30R36	32 11/16	830	8 3/4	222	17 1/2	445	

(Pre) See page AL-8 for catalog number prefix.
Width dimensions are to inside wall.
Manufacturing tolerances apply to all dimensions.

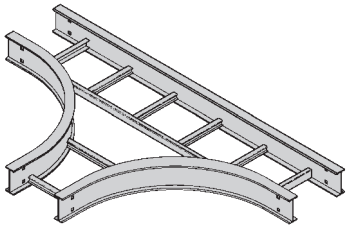
Aluminum

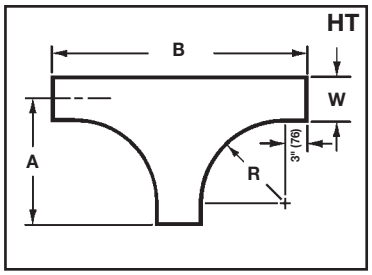
Dimensions in gray shaded columns are in millimeters unless otherwise specified.

NEMA 12B Rated Aluminum Cable Ladder

Horizontal Tee (HT)

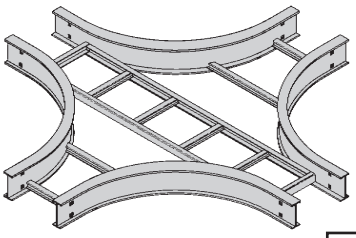
2 pair splice plates with hardware included.

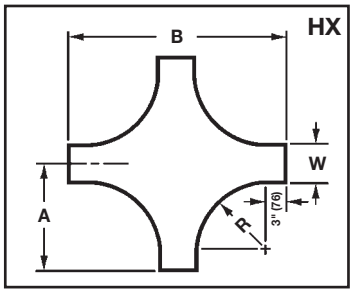




Horizontal Cross (HX)

3 pair splice plates with hardware included.



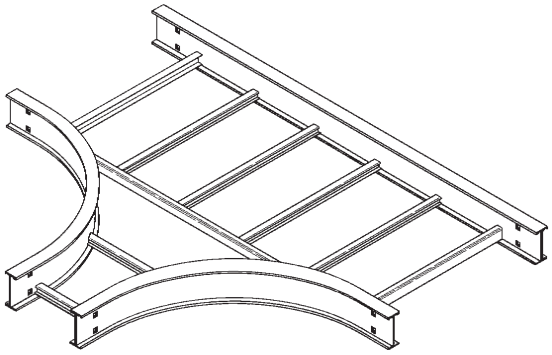


Bend Radius R		Ladder Width		Horizontal Tee					Horizontal Cross				
				Catalog Number	Dimensions A		Dimensions B		Catalog Number	Dimensions A		Dimensions B	
in.	mm	in.	mm		in.	mm	in.	mm		in.	mm	in.	mm
12	305	6	152	**(Prefix)HT-06-R12**	18 1/16	458	36 3/4	933	**(Prefix)HX-06-R12**	18 1/16	458	36 3/4	933
		9	229	**(Prefix)HT-09-R12**	19 9/16	497	39 7/8	1013	**(Prefix)HX-09-R12**	19 9/16	497	39 7/8	1013
		12	305	**(Prefix)HT-12-R12**	21 1/16	535	42 1/4	1073	**(Prefix)HX-12-R12**	21 1/16	535	42 1/4	1073
		18	457	**(Prefix)HT-18-R12**	24 1/16	611	48 1/2	1232	**(Prefix)HX-18-R12**	24 1/16	611	48 1/2	1232
		24	609	**(Prefix)HT-24-R12**	27 1/16	687	54 13/16	1392	**(Prefix)HX-24-R12**	27 1/16	687	54 13/16	1392
		30	762	**(Prefix)HT-30-R12**	30 1/16	763	60 1/4	1530	**(Prefix)HX-30-R12**	30 1/16	763	60 1/4	1530
		36	914	**(Prefix)HT-36-R12**	33 1/16	839	66 9/16	1691	**(Prefix)HX-36-R12**	33 1/16	839	66 9/16	1691
24	610	6	152	**(Prefix)HT-06-R24**	30 1/16	763	60 1/16	1551	**(Prefix)HX-06-R24**	30 1/16	763	60 1/16	1551
		9	229	**(Prefix)HT-09-R24**	31 9/16	801	63 1/4	1606	**(Prefix)HX-09-R24**	31 9/16	801	63 1/4	1606
		12	305	**(Prefix)HT-12-R24**	33 1/16	839	66 9/16	1691	**(Prefix)HX-12-R24**	33 1/16	839	66 9/16	1691
		18	457	**(Prefix)HT-18-R24**	36 1/16	916	72 1/16	1830	**(Prefix)HX-18-R24**	36 1/16	916	72 1/16	1830
		24	609	**(Prefix)HT-24-R24**	39 1/16	992	78 3/8	1991	**(Prefix)HX-24-R24**	39 1/16	992	78 3/8	1991
		30	762	**(Prefix)HT-30-R24**	42 1/16	1068	84 5/8	2150	**(Prefix)HX-30-R24**	42 1/16	1068	84 5/8	2150
		36	914	**(Prefix)HT-36-R24**	45 1/16	1144	90 15/16	2310	**(Prefix)HX-36-R24**	45 1/16	1144	90 15/16	2310
36	915	6	152	**(Prefix)HT-06-R36**	42 1/16	1068	84 1/16	2135	**(Prefix)HX-06-R36**	42 1/16	1068	84 1/16	2135
		9	229	**(Prefix)HT-09-R36**	43 9/16	1106	87 1/4	2216	**(Prefix)HX-09-R36**	43 9/16	1106	87 1/4	2216
		12	305	**(Prefix)HT-12-R36**	45 1/16	1144	90 9/16	2301	**(Prefix)HX-12-R36**	45 1/16	1144	90 9/16	2301
		18	457	**(Prefix)HT-28-R36**	48 1/16	1221	96 1/16	2440	**(Prefix)HX-18-R36**	48 1/16	1221	96 1/16	2440
		24	609	**(Prefix)HT-24-R36**	51 1/16	1297	102 3/8	2601	**(Prefix)HX-24-R36**	51 1/16	1297	102 3/8	2601
		30	762	**(Prefix)HT-30-R36**	54 1/16	1373	108 5/8	2760	**(Prefix)HX-30-R36**	54 1/16	1373	108 5/8	2760
		36	914	**(Prefix)HT-36-R36**	57 1/16	1449	114 15/16	2920	**(Prefix)HX-36-R36**	57 1/16	1449	114 15/16	2920

(Pre) See page AL-8 for catalog number prefix.
Width dimensions are to inside wall.
Manufacturing tolerances apply to all dimensions.

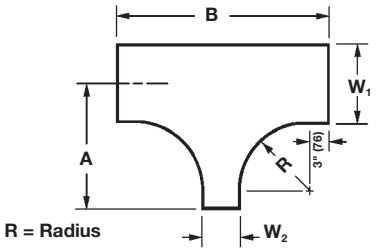
Horizontal Reducing Tee (RT)

2 pair splice plates with hardware included.



Prefix RT - 36 - 18 R24

- R24 — Radius
- 18 — Width W_2
- 36 — Width W_1
- RT — Fitting
- Prefix — To complete catalog number, insert fitting prefix.



Ladder Width W1 in.	Ladder Width W1 mm	Ladder Width W2 in.	Ladder Width W2 mm	* Insert Radius (12", 24", 36", or 48") Catalog No.	12" Radius A mm	12" Radius A in.	12" Radius B mm	12" Radius B in.	24" Radius A mm	24" Radius A in.	24" Radius B mm	24" Radius B in.	36" Radius A mm	36" Radius A in.	36" Radius B mm	36" Radius B in.
9	228	6	152	(Prefix)RT-09-06-R*	19 9/16	497	36 3/4	933	31 9/16	801	61 1/16	1551	43 9/16	1106	85 1/16	2161
12	305	6	152	(Prefix)RT-12-06-R*	21 1/16	535	36 3/4	933	33 1/16	839	61 1/16	1551	45 1/16	1144	85 1/16	2161
		9	228	(Prefix)RT-12-09-R*	21 1/16	535	39 7/8	1013	33 1/16	839	64 1/4	1631	45 1/16	1144	88 1/4	2241
18	475	6	152	(Prefix)RT-18-06-R*	24 1/16	611	36 3/4	933	36 1/16	916	61 1/16	1551	48 1/16	1221	85 1/16	2161
		9	228	(Prefix)RT-18-09-R*	24 1/16	611	39 7/8	1013	36 1/16	916	64 1/4	1631	48 1/16	1221	88 1/4	2241
		12	305	(Prefix)RT-18-12-R*	24 1/16	611	42 1/4	1073	36 1/16	916	66 9/16	1691	48 1/16	1221	90 9/16	2301
24	609	6	152	(Prefix)RT-24-06-R*	27 1/16	687	36 3/4	933	39 1/16	992	61 1/16	1551	51 1/16	1297	85 1/16	2161
		9	228	(Prefix)RT-24-09-R*	27 1/16	687	39 7/8	1013	39 1/16	992	64 1/4	1631	51 1/16	1297	88 1/4	2241
		12	305	(Prefix)RT-24-12-R*	27 1/16	687	42 1/4	1073	39 1/16	992	66 9/16	1691	51 1/16	1297	90 9/16	2301
		18	457	(Prefix)RT-24-18-R*	27 1/16	687	48 1/2	1232	39 1/16	992	72 1/16	1830	51 1/16	1297	96 1/16	2440
30	762	6	152	(Prefix)RT-30-06-R*	30 1/16	763	36 3/4	933	42 1/16	1068	61 1/16	1551	54 1/16	1373	85 1/16	2161
		9	228	(Prefix)RT-30-09-R*	30 1/16	763	39 7/8	1013	42 1/16	1068	64 1/4	1631	54 1/16	1373	88 1/4	2241
		12	305	(Prefix)RT-30-12-R*	30 1/16	763	42 1/4	1073	42 1/16	1068	66 9/16	1691	54 1/16	1373	90 9/16	2301
		18	457	(Prefix)RT-30-18-R*	30 1/16	763	48 1/2	1232	42 1/16	1068	72 1/16	1830	54 1/16	1373	96 1/16	2440
		24	609	(Prefix)RT-30-24-R*	30 1/16	763	54 13/16	1392	42 1/16	1068	78 1/8	1991	54 1/16	1373	102 1/8	2601
36	914	6	152	(Prefix)RT-36-06-R*	33 1/16	839	36 3/4	933	45 1/16	1144	61 1/16	1551	57 1/16	1449	85 1/16	2161
		9	228	(Prefix)RT-36-09-R*	33 1/16	839	39 7/8	1013	45 1/16	1144	64 1/4	1631	57 1/16	1449	88 1/4	2241
		12	305	(Prefix)RT-36-12-R*	33 1/16	839	42 1/4	1073	45 1/16	1144	66 9/16	1691	57 1/16	1449	90 9/16	2301
		18	457	(Prefix)RT-36-18-R*	33 1/16	839	48 1/2	1232	45 1/16	1144	72 1/16	1830	57 1/16	1449	96 1/16	2440
		24	609	(Prefix)RT-36-24-R*	33 1/16	839	54 13/16	1392	45 1/16	1144	78 1/8	1991	57 1/16	1449	102 1/8	2601
		30	762	(Prefix)RT-36-30-R*	33 1/16	839	60 1/4	1532	45 1/16	1144	84 5/8	2150	57 1/16	1449	108 5/8	2760

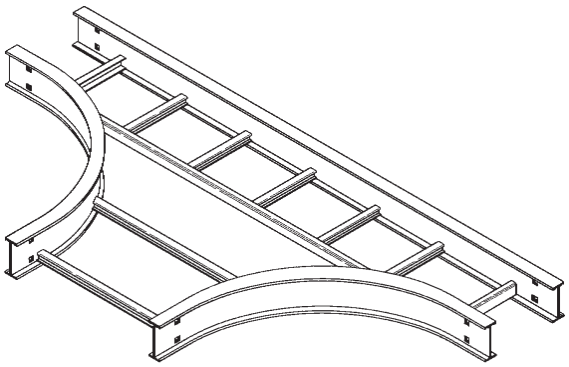
(Pre) See page AL-8 for catalog number prefix.
Width dimensions are to inside wall.
Manufacturing tolerances apply to all dimensions.

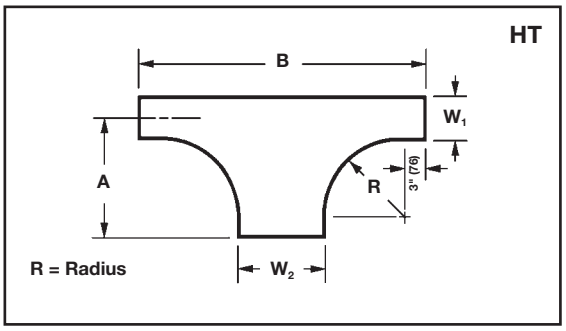
Aluminum

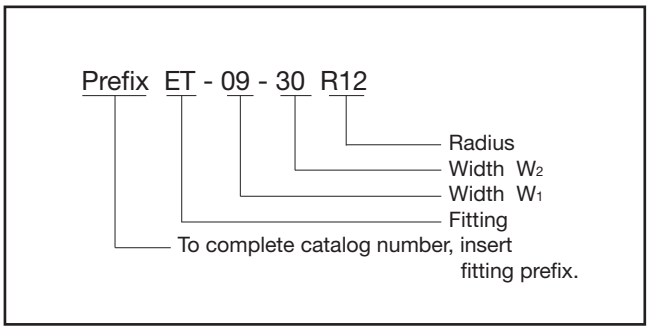
Dimensions in gray shaded columns are in millimeters unless otherwise specified.

Horizontal Expanding Tee (ET)

2 pair splice plates with hardware included.





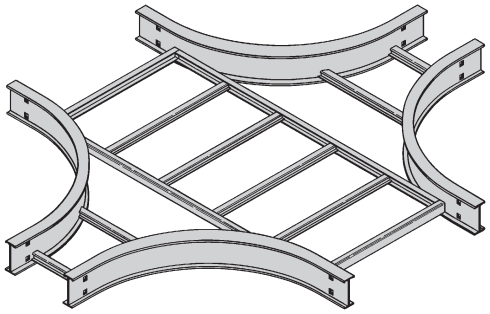


Ladder Width W1 in.	Ladder Width W1 mm	Ladder Width W2 in.	Ladder Width W2 mm	*Insert Radius (12", 24", or 36") Catalog No.	12" Radius A in.	12" Radius A mm	12" Radius B in.	12" Radius B mm	24" Radius A in.	24" Radius A mm	24" Radius B in.	24" Radius B mm	36" Radius A in.	36" Radius A mm	36" Radius B in.	36" Radius B mm
6	152	9	228	(Prefix)ET-06-09-R*	18 1/16	458	39 7/8	1013	30 1/16	763	64 1/4	1631	42 1/16	1068	87 1/4	2241
		12	305	(Prefix)ET-06-12-R*	18 1/16	458	42 1/4	1073	30 1/16	763	66 9/16	1691	42 1/16	1068	90 9/16	2301
		18	457	(Prefix)ET-06-18-R*	18 1/16	458	48 1/2	1232	30 1/16	763	72 1/16	1830	42 1/16	1068	96 1/16	2440
		24	609	(Prefix)ET-06-24-R*	18 1/16	458	54 13/16	1392	30 1/16	763	78 3/8	1991	42 1/16	1068	102 3/8	2601
		30	762	(Prefix)ET-06-30-R*	18 1/16	458	60 1/4	1532	30 1/16	763	84 5/8	2150	42 1/16	1068	108 5/8	2760
		36	914	(Prefix)ET-06-36-R*	18 1/16	458	66 9/16	1691	30 1/16	763	90 15/16	2310	42 1/16	1068	114 15/16	2920
9	228	12	305	(Prefix)ET-09-12-R*	19 9/16	497	42 1/4	1073	31 9/16	801	66 9/16	1691	43 9/16	1106	90 9/16	2301
		18	457	(Prefix)ET-09-19-R*	19 9/16	497	48 1/2	1232	31 9/16	801	72 1/16	1830	43 9/16	1106	96 1/16	2440
		24	609	(Prefix)ET-09-24-R*	19 9/16	497	54 13/16	1392	31 9/16	801	78 3/8	1991	43 9/16	1106	102 3/8	2601
		30	762	(Prefix)ET-09-30-R*	19 9/16	497	60 1/4	1532	31 9/16	801	84 5/8	2150	43 9/16	1106	108 5/8	2760
		36	914	(Prefix)ET-09-36-R*	19 9/16	497	66 9/16	1691	31 9/16	801	90 15/16	2310	43 9/16	1106	114 15/16	2920
12	305	18	457	(Prefix)ET-12-18-R*	21 1/16	535	48 1/2	1232	33 1/16	839	72 1/16	1830	45 1/16	1144	96 1/16	2440
		24	609	(Prefix)ET-12-24-R*	21 1/16	535	54 13/16	1392	33 1/16	839	78 3/8	1991	45 1/16	1144	102 3/8	2601
		30	762	(Prefix)ET-12-30-R*	21 1/16	535	60 1/4	1532	33 1/16	839	84 5/8	2150	45 1/16	1144	108 5/8	2760
		36	914	(Prefix)ET-12-36-R*	21 1/16	535	66 9/16	1691	33 1/16	839	90 15/16	2310	45 1/16	1144	114 15/16	2920
18	457	24	609	(Prefix)ET-18-24-R*	24 1/16	611	54 13/16	1392	36 1/16	916	78 3/8	1991	48 1/16	1221	102 3/8	2601
		30	762	(Prefix)ET-18-30-R*	24 1/16	611	60 1/4	1532	36 1/16	916	84 5/8	2150	48 1/16	1221	108 5/8	2760
		36	914	(Prefix)ET-18-36-R*	24 1/16	611	66 9/16	1691	36 1/16	916	90 15/16	2310	48 1/16	1221	114 15/16	2920
24	609	30	762	(Prefix)ET-24-30-R*	27 1/16	687	60 1/4	1532	39 1/16	992	84 5/8	2150	51 1/16	1297	108 5/8	2760
		36	914	(Prefix)ET-24-36-R*	27 1/16	687	66 9/16	1691	39 1/16	992	90 15/16	2310	51 1/16	1297	114 15/16	2920
30	762	36	914	(Prefix)ET-30-36-R*	30 1/16	763	66 9/16	1691	42 1/16	1068	90 15/16	2310	54 1/16	1373	114 15/16	2920

(Pre) See page AL-8 for catalog number prefix.
Width dimensions are to inside wall.
Manufacturing tolerances apply to all dimensions.

Horizontal Expanding/Reducing Cross (RX)

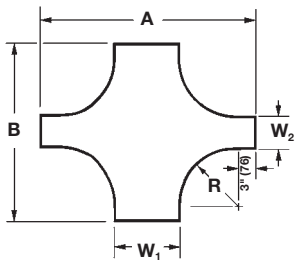
3 pair splice plates with hardware included.



Prefix RX - 09 - 24 R24

- R24 — Radius
- 24 — Width W_2
- 09 — Width W_1
- RX — Fitting
- Prefix — To complete catalog number, insert fitting prefix.

HX



Ladder Width				*Insert Radius (12", 24", or 36")	12" Radius				24" Radius				36" Radius			
W1		W2		Catalog No.	A		B		A		B		A		B	
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
6	152	9	228	(Prefix)RX-06-09-R*	36 3/4	933	39 7/8	1013	60 1/16	1525	64 1/4	1631	84 1/16	2135	88 1/4	2241
		12	305	(Prefix)RX-06-12-R*	36 3/4	933	42 1/4	1073	60 1/16	1525	66 9/16	1691	84 1/16	2135	90 9/16	2301
		18	457	(Prefix)RX-06-18-R*	36 3/4	933	48 1/2	1232	60 1/16	1525	72 1/16	1830	84 1/16	2135	96 1/16	2440
		24	609	(Prefix)RX-06-24-R*	36 3/4	933	54 13/16	1392	60 1/16	1525	78 3/8	1991	84 1/16	2135	102 3/8	2601
		30	762	(Prefix)RX-06-30-R*	36 3/4	933	60 1/4	1532	60 1/16	1525	84 5/8	2150	84 1/16	2135	108 5/8	2760
		36	914	(Prefix)RX-06-36-R*	36 3/4	933	66 9/16	1691	60 1/16	1525	90 15/16	2310	84 1/16	2135	114 15/16	2920
9	228	12	305	(Prefix)RX-09-12-R*	39 7/8	1013	42 1/4	1073	64 1/4	1632	66 9/16	1691	88 1/4	2242	90 9/16	2301
		18	457	(Prefix)RX-09-19-R*	39 7/8	1013	48 1/2	1232	64 1/4	1632	72 1/16	1830	88 1/4	2242	96 1/16	2440
		24	609	(Prefix)RX-09-24-R*	39 7/8	1013	54 13/16	1392	64 1/4	1632	78 3/8	1991	88 1/4	2242	102 3/8	2601
		30	762	(Prefix)RX-09-30-R*	39 7/8	1013	60 1/4	1532	64 1/4	1632	84 5/8	2150	88 1/4	2242	108 5/8	2760
		36	914	(Prefix)RX-09-36-R*	39 7/8	1013	66 9/16	1691	64 1/4	1632	90 15/16	2310	88 1/4	2242	114 15/16	2920
12	305	18	457	(Prefix)RX-12-18-R*	42 1/4	1073	48 1/2	1232	66 9/16	1691	72 1/16	1830	90 9/16	2301	96 1/16	2440
		24	609	(Prefix)RX-12-24-R*	42 1/4	1073	54 13/16	1392	66 9/16	1691	78 3/8	1991	90 9/16	2301	102 3/8	2601
		30	762	(Prefix)RX-12-30-R*	42 1/4	1073	60 1/4	1532	66 9/16	1691	84 5/8	2150	90 9/16	2301	108 5/8	2760
		36	914	(Prefix)RX-12-36-R*	42 1/4	1073	66 9/16	1691	66 9/16	1691	90 15/16	2310	90 9/16	2301	114 15/16	2920
18	457	24	609	(Prefix)RX-18-24-R*	48 1/2	1232	54 13/16	1392	72 1/16	1830	78 3/8	1991	96 1/16	2440	102 3/8	2601
		30	762	(Prefix)RX-18-30-R*	48 1/2	1232	60 1/4	1532	72 1/16	1830	84 5/8	2150	96 1/16	2440	108 5/8	2760
		36	914	(Prefix)RX-18-36-R*	48 1/2	1232	66 9/16	1691	72 1/16	1830	90 15/16	2310	96 1/16	2440	114 15/16	2920
24	609	30	762	(Prefix)RX-24-30-R*	54 13/16	1392	60 1/4	1532	78 3/8	1991	84 5/8	2150	102 3/8	2601	108 5/8	2760
		36	914	(Prefix)RX-24-36-R*	54 13/16	1392	66 9/16	1691	78 3/8	1991	90 15/16	2310	102 3/8	2601	114 15/16	2920
30	762	36	914	(Prefix)RX-30-36-R*	60 1/4	1530	66 9/16	1691	84 5/8	2149	90 15/16	2310	108 1/8	2759	114 15/16	2920

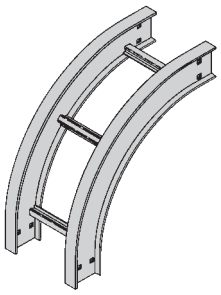
(Pre) See page AL-8 for catalog number prefix.
Width dimensions are to inside wall.
Manufacturing tolerances apply to all dimensions.

Aluminum

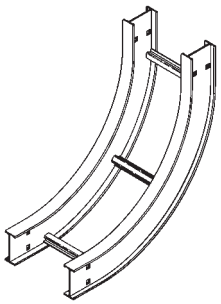
Dimensions in gray shaded columns are in millimeters unless otherwise specified.

Vertical Bend 90° (VO, VI)

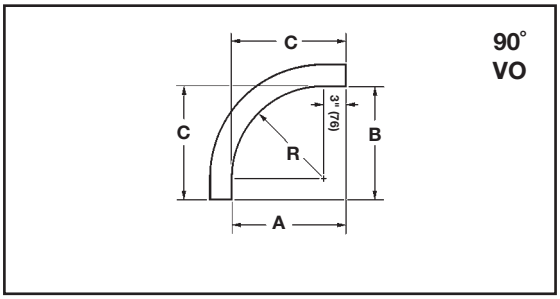
1 pair splice plates with hardware included.

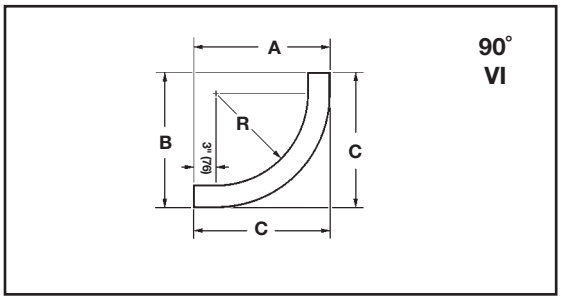


90° Vertical Outside



90° Vertical Inside



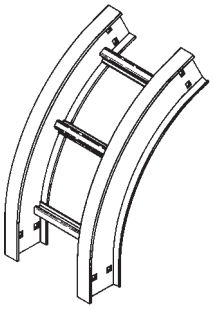


Bend Radius R	Ladder Width		(*) Insert "VO" for Vert. Outside Bend Insert "VI" for Vert. Inside Bend	VO Side Rail Height 4" - 7"			VI Side Rail Height											
							4"			5"			6"			7"		
				A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
in.	in.	mm	Catalog No.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)(*)-06-90R12	15 (381)	15 (381)	15 (381)	18 1/2 (470)	18 1/2 (470)	18 1/2 (470)	19 1/2 (495)	19 1/2 (495)	19 1/2 (495)	20 1/2 (521)	20 1/2 (521)	20 1/2 (521)	21 1/2 (546)	21 1/2 (546)	21 1/2 (546)
	9	228	(Prefix)(*)-09-90R12															
	12	305	(Prefix)(*)-12-90R12															
	18	457	(Prefix)(*)-18-90R12															
	24	609	(Prefix)(*)-24-90R12															
	30	762	(Prefix)(*)-30-90R12															
	36	914	(Prefix)(*)-36-90R12															
24 (609)	6	152	(Prefix)(*)-06-90R24	27 (686)	27 (686)	27 (686)	31 1/2 (775)	31 1/2 (775)	31 1/2 (775)	31 1/2 (800)	31 1/2 (800)	31 1/2 (800)	32 1/2 (825)	32 1/2 (825)	32 1/2 (825)	33 1/2 (851)	33 1/2 (851)	33 1/2 (851)
	9	228	(Prefix)(*)-09-90R24															
	12	305	(Prefix)(*)-12-90R24															
	18	457	(Prefix)(*)-18-90R24															
	24	609	(Prefix)(*)-24-90R24															
	30	762	(Prefix)(*)-30-90R24															
	36	914	(Prefix)(*)-36-90R24															
36 (914)	6	152	(Prefix)(*)-06-90R36	39 (991)	39 (991)	39 (991)	42 1/2 (1080)	42 1/2 (1080)	42 1/2 (1080)	43 1/2 (1105)	43 1/2 (1105)	43 1/2 (1105)	44 1/2 (1130)	44 1/2 (1130)	44 1/2 (1130)	45 1/2 (1156)	45 1/2 (1156)	45 1/2 (1156)
	9	228	(Prefix)(*)-09-90R36															
	12	305	(Prefix)(*)-12-90R36															
	18	457	(Prefix)(*)-18-90R36															
	24	609	(Prefix)(*)-24-90R36															
	30	762	(Prefix)(*)-30-90R36															
	36	914	(Prefix)(*)-36-90R36															

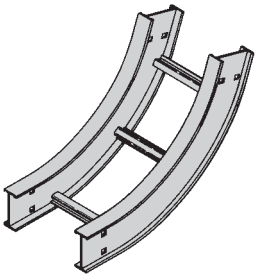
(Pre) See page AL-8 for catalog number prefix.
Width dimensions are to inside wall.
Manufacturing tolerances apply to all dimensions.

Vertical Bend 60° (VO, VI)

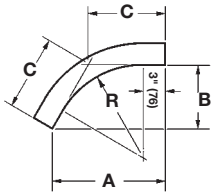
1 pair splice plates with hardware included.



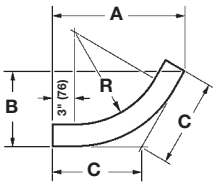
60° Vertical Outside



60° Vertical Inside



60° VO



60° VI

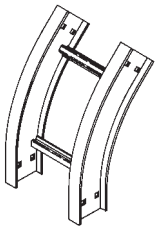
Bend Radius R	Ladder Width		(*) Insert "VO" for Vert. Outside Bend Insert "VI" for Vert. Inside Bend	VO Side Rail Height 4" - 7"			VI Side Rail Height											
							4"			5"			6"			7"		
				A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
in.	in.	mm	Catalog No.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)(*)-06-60R12	$14\frac{7}{8}$ (378)	$8\frac{5}{8}$ (219)	$9\frac{15}{16}$ (252)	18 (457)	$10\frac{3}{8}$ (263)	12 (305)	$18\frac{13}{16}$ (478)	$10\frac{7}{8}$ (276)	$12\frac{9}{16}$ (319)	$19\frac{11}{16}$ (500)	$11\frac{3}{8}$ (289)	$13\frac{1}{8}$ (333)	$20\frac{15}{16}$ (522)	$11\frac{7}{8}$ (301)	$13\frac{11}{16}$ (347)
	9	228	(Prefix)(*)-09-60R12															
	12	305	(Prefix)(*)-12-60R12															
	18	457	(Prefix)(*)-18-60R12															
	24	609	(Prefix)(*)-24-60R12															
	30	762	(Prefix)(*)-30-60R12															
	36	914	(Prefix)(*)-36-60R12															
24 (609)	6	152	(Prefix)(*)-06-60R24	$25\frac{9}{16}$ (643)	$14\frac{5}{8}$ (371)	$16\frac{7}{8}$ (428)	$28\frac{3}{8}$ (721)	$16\frac{3}{8}$ (415)	$18\frac{15}{16}$ (481)	$29\frac{1}{4}$ (743)	$16\frac{7}{8}$ (428)	$19\frac{1}{2}$ (495)	$30\frac{1}{16}$ (763)	$17\frac{3}{8}$ (441)	$20\frac{1}{16}$ (509)	$30\frac{15}{16}$ (786)	$17\frac{7}{8}$ (454)	$20\frac{5}{8}$ (524)
	9	228	(Prefix)(*)-09-60R24															
	12	305	(Prefix)(*)-12-60R24															
	18	457	(Prefix)(*)-18-60R24															
	24	609	(Prefix)(*)-24-60R24															
	30	762	(Prefix)(*)-30-60R24															
	36	914	(Prefix)(*)-36-60R24															
36 (914)	6	152	(Prefix)(*)-06-60R36	$35\frac{3}{4}$ (908)	$20\frac{5}{8}$ (524)	$23\frac{13}{16}$ (605)	$38\frac{3}{4}$ (984)	$22\frac{3}{8}$ (568)	$25\frac{7}{8}$ (1657)	$39\frac{5}{8}$ (1006)	$22\frac{7}{8}$ (581)	$26\frac{7}{16}$ (672)	$40\frac{1}{2}$ (1029)	$23\frac{3}{8}$ (594)	27 (686)	$41\frac{3}{8}$ (1051)	$23\frac{7}{8}$ (606)	$27\frac{9}{16}$ (700)
	9	228	(Prefix)(*)-09-60R36															
	12	305	(Prefix)(*)-12-60R36															
	18	457	(Prefix)(*)-18-60R36															
	24	609	(Prefix)(*)-24-60R36															
	30	762	(Prefix)(*)-30-60R36															
	36	914	(Prefix)(*)-36-60R36															

(Pre) See page AL-8 for catalog number prefix.
Width dimensions are to inside wall.
Manufacturing tolerances apply to all dimensions.

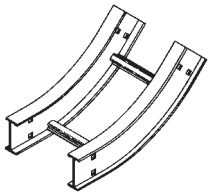
Dimensions in gray shaded columns are in millimeters unless otherwise specified.

Vertical Bend 45° (VO, VI)

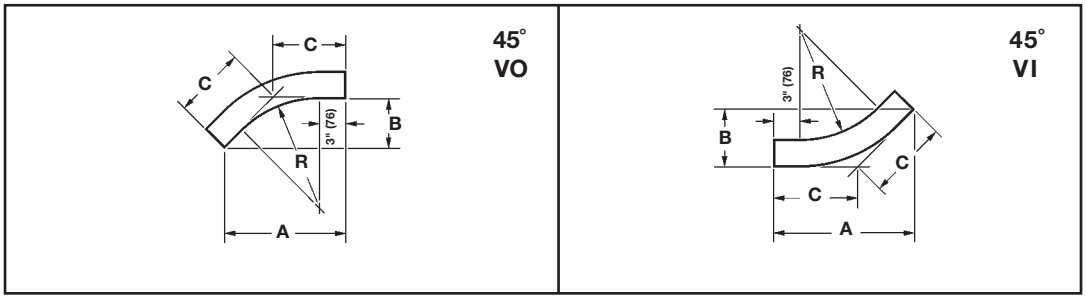
1 pair splice plates with hardware included.



45° Vertical Outside



45° Vertical Inside

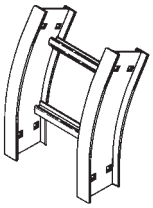


Bend Radius R	Ladder Width		(*) Insert "VO" for Vert. Outside Bend Insert "VI" for Vert. Inside Bend	VO Side Rail Height 4" - 7"			VI Side Rail Height											
							4"			5"			6"			7"		
				A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
in.	in.	mm	Catalog No.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)(*)-06-45R12	$13\frac{5}{8}$ (346)	$5\frac{3}{8}$ (136)	8 (203)	$16\frac{1}{8}$ (409)	$6\frac{11}{16}$ (170)	$9\frac{7}{16}$ (239)	$16\frac{7}{8}$ (428)	7 (178)	$9\frac{7}{8}$ (251)	$17\frac{9}{16}$ (446)	$7\frac{1}{4}$ (184)	$10\frac{1}{4}$ (260)	$18\frac{1}{4}$ (463)	$7\frac{9}{16}$ (192)	$10\frac{11}{16}$ (271)
	9	228	(Prefix)(*)-09-45R12															
	12	305	(Prefix)(*)-12-45R12															
	18	457	(Prefix)(*)-18-45R12															
	24	609	(Prefix)(*)-24-45R12															
	30	762	(Prefix)(*)-30-45R12															
	36	914	(Prefix)(*)-36-45R12															
24 (609)	6	152	(Prefix)(*)-06-45R24	$22\frac{1}{8}$ (562)	$9\frac{3}{16}$ (233)	$12\frac{15}{16}$ (328)	$24\frac{5}{8}$ (625)	$10\frac{3}{16}$ (259)	$14\frac{7}{16}$ (366)	$25\frac{5}{16}$ (643)	$10\frac{1}{2}$ (267)	$14\frac{13}{16}$ (376)	26 (660)	$10\frac{3}{4}$ (273)	$15\frac{1}{4}$ (387)	$26\frac{3}{4}$ (679)	$11\frac{1}{16}$ (281)	$15\frac{5}{8}$ (397)
	9	228	(Prefix)(*)-09-45R24															
	12	305	(Prefix)(*)-12-45R24															
	18	457	(Prefix)(*)-18-45R24															
	24	609	(Prefix)(*)-24-45R24															
	30	762	(Prefix)(*)-30-45R24															
	36	914	(Prefix)(*)-36-45R24															
36 (914)	6	152	(Prefix)(*)-06-45R36	$30\frac{11}{16}$ (779)	$12\frac{11}{16}$ (322)	18 (457)	$33\frac{1}{8}$ (841)	$13\frac{3}{4}$ (349)	$19\frac{7}{16}$ (494)	$33\frac{13}{16}$ (859)	14 (356)	$19\frac{13}{16}$ (503)	$34\frac{9}{16}$ (878)	$14\frac{15}{16}$ (364)	$20\frac{1}{4}$ (514)	$35\frac{1}{4}$ (895)	$14\frac{5}{8}$ (371)	$20\frac{5}{8}$ (524)
	9	228	(Prefix)(*)-09-45R36															
	12	305	(Prefix)(*)-12-45R36															
	18	457	(Prefix)(*)-18-45R36															
	24	609	(Prefix)(*)-24-45R36															
	30	762	(Prefix)(*)-30-45R36															
	36	914	(Prefix)(*)-36-45R36															

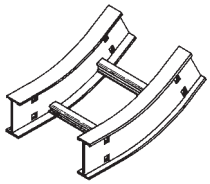
(Pre) See page AL-8 for catalog number prefix.
Width dimensions are to inside wall.
Manufacturing tolerances apply to all dimensions.

Vertical Bend 30° (VO, VI)

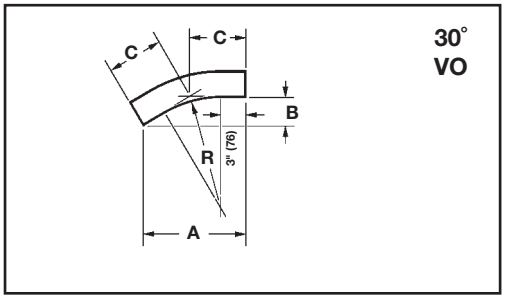
1 pair splice plates with hardware included.

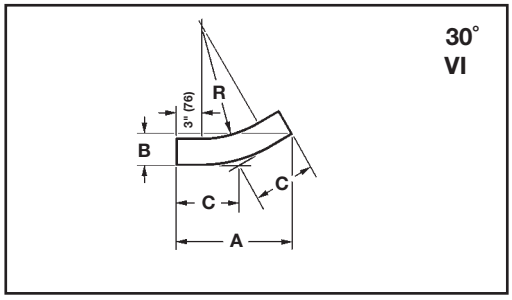


30° Vertical Outside



30° Vertical Inside





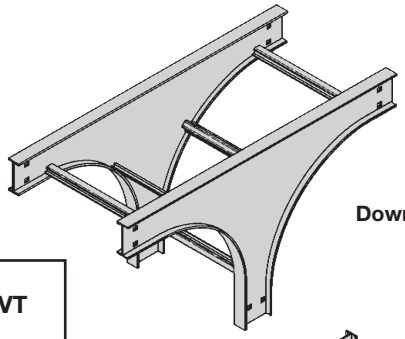
Bend Radius R	Ladder Width		(*) Insert "VO" for Vert. Outside Bend Insert "VI" for Vert. Inside Bend	VO Side Rail Height 4" - 7"			VI Side Rail Height											
							4"			5"			6"			7"		
				A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
in.	in.	mm	Catalog No.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)(*)-06-30R12	$11\frac{5}{8}$ (295)	$3\frac{1}{8}$ (79)	$6\frac{1}{4}$ (159)	$13\frac{7}{16}$ (341)	$3\frac{5}{8}$ (92)	$7\frac{3}{16}$ (182)	$13\frac{15}{16}$ (354)	$3\frac{3}{4}$ (95)	$7\frac{7}{16}$ (189)	$14\frac{7}{16}$ (366)	$3\frac{7}{8}$ (98)	$7\frac{3}{4}$ (197)	$14\frac{7}{8}$ (378)	4 (101)	8 (203)
	9	228	(Prefix)(*)-09-30R12															
	12	305	(Prefix)(*)-12-30R12															
	18	457	(Prefix)(*)-18-30R12															
	24	609	(Prefix)(*)-24-30R12															
	30	762	(Prefix)(*)-30-30R12															
	36	914	(Prefix)(*)-36-30R12															
24 (609)	6	152	(Prefix)(*)-06-30R24	$17\frac{5}{8}$ (447)	$4\frac{3}{4}$ (120)	$9\frac{7}{16}$ (239)	$19\frac{7}{16}$ (493)	$5\frac{3}{16}$ (132)	$10\frac{7}{16}$ (265)	$19\frac{15}{16}$ (506)	$5\frac{5}{16}$ (135)	$10\frac{11}{16}$ (271)	$20\frac{7}{16}$ (519)	$5\frac{7}{16}$ (138)	$10\frac{15}{16}$ (278)	$20\frac{7}{8}$ (530)	$5\frac{5}{8}$ (143)	$11\frac{3}{16}$ (284)
	9	228	(Prefix)(*)-09-30R24															
	12	305	(Prefix)(*)-12-30R24															
	18	457	(Prefix)(*)-18-30R24															
	24	609	(Prefix)(*)-24-30R24															
	30	762	(Prefix)(*)-30-30R24															
	36	914	(Prefix)(*)-36-30R24															
36 (914)	6	152	(Prefix)(*)-06-30R36	$23\frac{11}{16}$ (602)	$6\frac{5}{16}$ (160)	$12\frac{3}{4}$ (324)	$25\frac{7}{16}$ (646)	$6\frac{13}{16}$ (173)	$13\frac{5}{8}$ (346)	$25\frac{15}{16}$ (659)	$6\frac{15}{16}$ (176)	$13\frac{7}{8}$ (352)	$26\frac{7}{16}$ (672)	$7\frac{1}{16}$ (179)	$14\frac{3}{16}$ (360)	$26\frac{15}{16}$ (684)	$7\frac{1}{4}$ (184)	$14\frac{7}{16}$ (367)
	9	228	(Prefix)(*)-09-30R36															
	12	305	(Prefix)(*)-12-30R36															
	18	457	(Prefix)(*)-18-30R36															
	24	609	(Prefix)(*)-24-30R36															
	30	762	(Prefix)(*)-30-30R36															
	36	914	(Prefix)(*)-36-30R36															

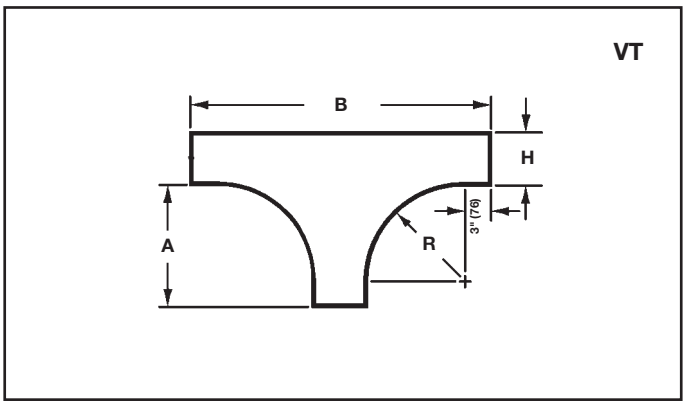
(Pre) See page AL-8 for catalog number prefix.
Width dimensions are to inside wall.
Manufacturing tolerances apply to all dimensions.

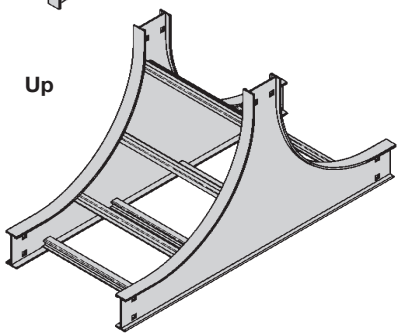
Dimensions in gray shaded columns are in millimeters unless otherwise specified.

Vertical Tee Up/Down (VTU/VT)

2 pair splice plates with hardware included.







Bend Radius R	Ladder Width		Vertical Tee Down	Vertical Tee Up	Side Rail Height "H"							
					4"		5"		6"		7"	
			Catalog No.	Catalog No.	A	B	A	B	A	B	A	B
in.	in.	mm			in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)VTD-06-R12	(Prefix)VTU-06-R12	15 (381)	33 7/16 (849)	15 (381)	34 3/8 (874)	15 (381)	35 3/8 (899)	15 (381)	36 3/8 (924)
	9	228	(Prefix)VTD-09-R12	(Prefix)VTU-09-R12								
	12	305	(Prefix)VTD-12-R12	(Prefix)VTU-12-R12								
	18	457	(Prefix)VTD-18-R12	(Prefix)VTU-18-R12								
	24	609	(Prefix)VTD-24-R12	(Prefix)VTU-24-R12								
	30	762	(Prefix)VTD-30-R12	(Prefix)VTU-30-R12								
	36	914	(Prefix)VTD-36-R12	(Prefix)VTU-36-R12								
24 (609)	6	152	(Prefix)VTD-06-R24	(Prefix)VTU-06-R24	27 (6867)	57 7/16 (1458)	27 (686)	58 3/8 (1483)	27 (686)	59 3/8 (1508)	27 (686)	60 3/8 (1533)
	9	228	(Prefix)VTD-09-R24	(Prefix)VTU-09-R24								
	12	305	(Prefix)VTD-12-R24	(Prefix)VTU-12-R24								
	18	457	(Prefix)VTD-18-R24	(Prefix)VTU-18-R24								
	24	609	(Prefix)VTD-24-R24	(Prefix)VTU-24-R24								
	30	762	(Prefix)VTD-30-R24	(Prefix)VTU-30-R24								
	36	914	(Prefix)VTD-36-R24	(Prefix)VTU-36-R24								
36 (914)	6	152	(Prefix)VTD-06-R36	(Prefix)VTU-06-R36	39 (991)	81 7/16 (2068)	39 (991)	82 3/8 (2093)	39 (991)	83 3/8 (2118)	39 (991)	84 3/8 (2143)
	9	228	(Prefix)VTD-09-R36	(Prefix)VTU-09-R36								
	12	305	(Prefix)VTD-12-R36	(Prefix)VTU-12-R36								
	18	457	(Prefix)VTD-18-R36	(Prefix)VTU-18-R36								
	24	609	(Prefix)VTD-24-R36	(Prefix)VTU-24-R36								
	30	762	(Prefix)VTD-30-R36	(Prefix)VTU-30-R36								
	36	914	(Prefix)VTD-36-R36	(Prefix)VTU-36-R36								

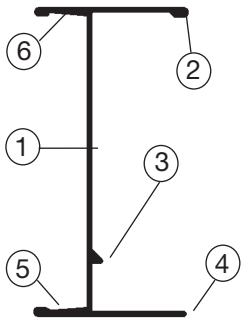
(Pre) See page AL-8 for catalog number prefix.
Width dimensions are to inside wall.
Manufacturing tolerances apply to all dimensions.

Aluminum Cable Ladder, Series 2, 3 & 4

Side Rails

B-Line I-Beam -- the most efficient structural shape

Constructed with “Copper-free” 6063-T6 Aluminum Alloy



1. **I-beam side rail design**
   - maximize strength-to-weight ratio
2. **Added material to top flange to increase cable ladder stiffness**
3. **Weld bead**
   - positive rung support
   - added material disperses heat
4. **Bottom flange inside**
   - positive rung support
5. **Bottom flange outside**
   - strong lower flange for hold down clamps and expansion guides
6. **Top flange outside**
   - strong upper flange for securing the ladder cover or the conduit-to-ladder adapter

Rungs

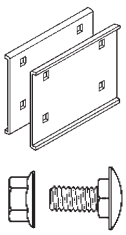
The rungs can represent 40% of your cable ladder system.

Rung A Standard for widths through 24"
The 24" width supports 589 lbs. with safety factor 1.5
Rung B Standard for widths greater than 24"
The 36" width supports 487 lbs. with safety factor 1.5

- For industrial applications -- 200 lb. concentrated loads
- New P-Rung design allows P-Clamp cable fastening at any location.

Splices

Unique Wedge Lock splice system:



- Channel-shaped for extra strength
- Snaps into the side rail
- Positions and holds for bolting, a labor-saving feature
- Four bolt pattern reduces installation time
- 316 Stainless Steel available

Fittings

Surpasses NEMA VE 1 requirements
3" straight tangents for splice integrity

200 lb. Concentrated Load

Rungs and side rail engineered to support a 200 lb. concentrated load plus cable load

3" NEMA VE 1 Loading Depth
4" Side Rail Height

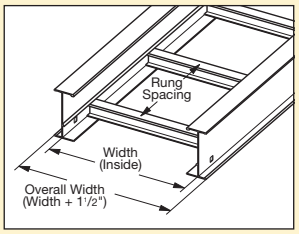
Straight Section Part Numbering

Prefix

Example: **24 A 09 - 24 - 144**

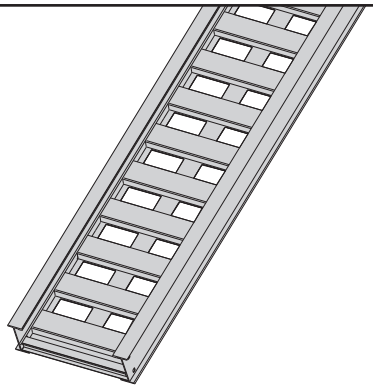
Series	Material	*Type	*Width	Length
24	**A** = Aluminum	**Ladder-** **06** = 6" rung spacing **09** = 9" rung spacing **12** = 12" rung spacing **Trough-** 6" thru 36" wide **VT** = Vented Trough **ST** = Non-Ventilated Trough	**06** = 6" **09** = 9" **12** = 12" **18** = 18" **24** = 24" **30** = 30" **36** = 36"	① **144** = 12 ft. ② 120 = 10 ft. (24) ① **240** = 20 ft. ② 144 = 12 ft. (34)
34				

①Primary Length.
②Secondary Length.

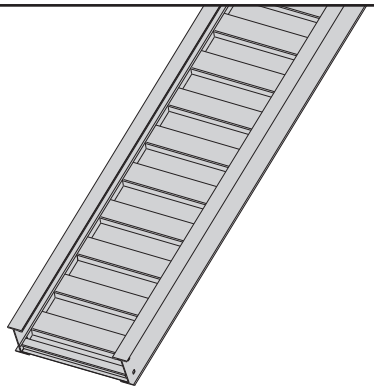


See page MIS-2 for additional rung options. *Special sizes available.

Ladder Type
(Specify Rung Spacing)



Ventilated Trough



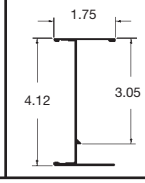
Non-Ventilated Trough

Dimensional & Loading Information

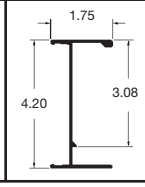
3" NEMA VE 1 Loading Depth
4" Side Rail Height

Values are based on simple beam tests per NEMA VE 1 on 36" wide cable ladder with rungs spaced on 12" centers. Cable ladders will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply the published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable ladder being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads. See table on page CLS-13 for rung capacities.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
24		NEMA: 16A, 12C CSA: D1-3m UL Cross-Sectional Area:1.00 in²	6 8 10 12 14 16	487* 284 181 126 93 71	0.001 0.003 0.008 0.016 0.030 0.052	Area=1.05 in² Sx=1.34 in³ Ix=2.85 in⁴	1.8 2.4 3.0 3.7 4.3 4.9	725* 422 270 187 138 105	0.017 0.055 0.135 0.279 0.518 0.883	Area=6.77 cm² Sx=21.96 cm³ Ix=118.63 cm⁴

When ladders are used in continuous spans, the deflection of the ladder is reduced by as much as 50%.
Design factors: Ix = Moment of Inertia, Sx = Section Modulus.
* When using 18" rung spacing, load capacity is limited to 394 lbs/ft (586.27 kg/m) for 30" ladder width and 325 lbs/ft (483.6 kg/m) for 36" ladder width.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
34		NEMA: 20B, 16C CSA: E-6m UL Cross-Sectional Area: 1.50 in²	10 12 14 16 18 20	320 222 163 125 99 80	0.005 0.009 0.017 0.030 0.047 0.072	Area=1.82 in² Sx=2.10 in³ Ix=4.98 in⁴	3.0 3.7 4.3 4.9 5.5 6.1	476 331 243 186 147 119	0.077 0.160 0.296 0.505 0.810 1.234	Area=11.74 cm² Sx=34.41 cm³ Ix=207.28 cm⁴

When ladders are used in continuous spans, the deflection of the tray is reduced by as much as 50%.
Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

4" NEMA VE 1 Loading Depth
5" Side Rail Height

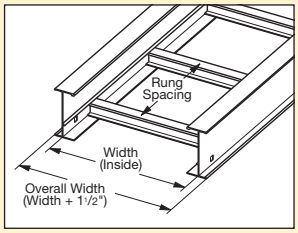
Straight Section Part Numbering

Prefix

Example: **25 A 09 - 24 - 144**

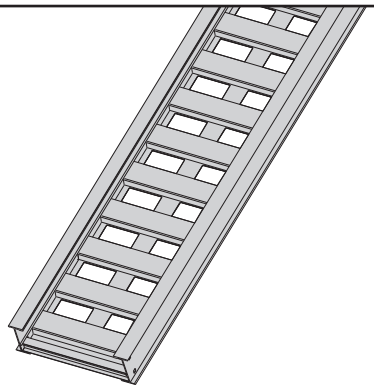
Series	Material	*Type	*Width	Length
25	**A** = Aluminum	**Ladder-** **06** = 6" rung spacing **09** = 9" rung spacing **12** = 12" rung spacing	**06** = 6" **09** = 9" **12** = 12" **18** = 18" **24** = 24" **30** = 30" **36** = 36"	① **144** = 12 ft. ② 240 = 20 ft.
35		**Trough-** 6" thru 36" wide **VT** = Vented Trough **ST** = Non-Ventilated Trough		① **240** = 20 ft. ② 144 = 12 ft.

①Primary Length.
②Secondary Length.

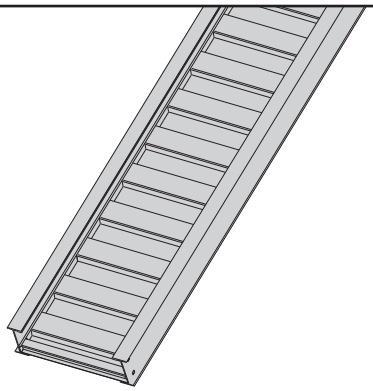


See page MIS-2 for additional rung options. *Special sizes available.

Ladder Type
(Specify Rung Spacing)



Ventilated Trough



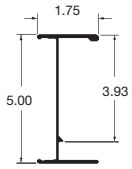
Non-Ventilated Trough

Dimensional & Loading Information

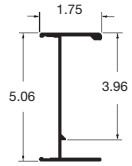
4" NEMA VE 1 Loading Depth
5" Side Rail Height

Values are based on simple beam tests per NEMA VE 1 on 36" wide cable ladder with rungs spaced on 12" centers. Cable ladders will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable ladder being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads. See table on page CLS-13 for rung capacities.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
25		NEMA: 20A, 12C CSA: D1-6m UL Cross-Sectional Area: 1.00 in²	10 12 14 16 18 20	200 139 102 78 62 50	0.0049 0.010 0.019 0.032 0.051 0.078	Area=1.24 in² Sx=1.80 in³ Ix=4.62 in⁴	3.0 3.7 4.3 4.9 5.5 6.1	298 207 152 116 92 74	0.083 0.172 0.319 0.545 0.873 1.330	Area=8.00 cm² Sx=29.50 cm³ Ix=192.30 cm⁴

When ladders are used in continuous spans, the deflection of the ladder is reduced by as much as 50%.
Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
35		NEMA: 20B, 16C CSA: E-3m UL Cross-Sectional Area: 1.50 in²	10 12 14 16 18 20	310 215 158 121 96 77	0.0035 0.0073 0.014 0.023 0.037 0.057	Area=1.67 in² Sx=2.35 in³ Ix=6.37 in⁴	3.0 3.7 4.3 4.9 5.5 6.1	461 320 235 180 142 115	0.060 0.125 0.232 0.395 0.633 0.965	Area=10.77 cm² Sx=38.51 cm³ Ix=265.14 cm⁴

When ladders are used in continuous spans, the deflection of the ladder is reduced by as much as 50%.
Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

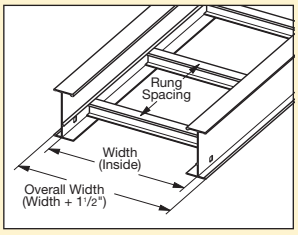
5" NEMA VE 1 Loading Depth
6" Side Rail Height

Straight Section Part Numbering

Prefix

Example: **26 A 09 - 24 - 144**

Series	Material	*Type	*Width	Length
26	**A** = Aluminum	**Ladder-** **06** = 6" rung spacing **09** = 9" rung spacing **12** = 12" rung spacing	**06** = 6" **09** = 9" **12** = 12" **18** = 18" **24** = 24" **30** = 30" **36** = 36"	① **144** = 12 ft. ② 240 = 20 ft. (26) ① **240** = 20 ft. ② 144 = 12 ft. (36) ① **240** = 20 ft. ② 288 = 24 ft. (46) ① **240** = 20 ft. ② 300 = 25 ft. (H46)
36				
46				
H46†		**Trough-** 6" thru 36" wide **VT** = Vented Trough **ST** = Non-Ventilated Trough		

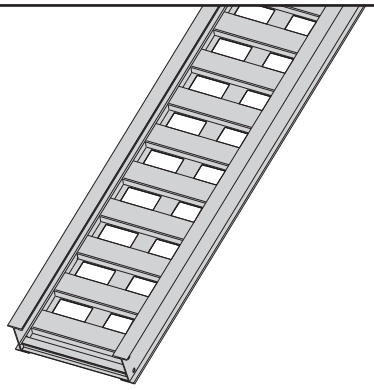


† H46A only available in ladder type 9" and 12" rung spacing.

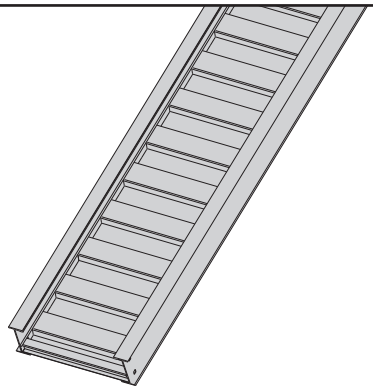
①Primary Length.
②Secondary Length.

See page MIS-2 for additional rung options. *Special sizes available.

Ladder Type
(Specify Rung Spacing)



Ventilated Trough



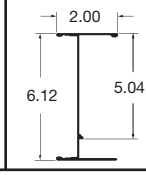
Non-Ventilated Trough

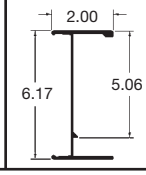
Dimensional & Loading Information

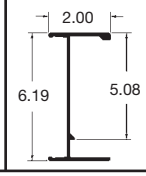
5" NEMA VE 1 Loading Depth
6" Side Rail Height

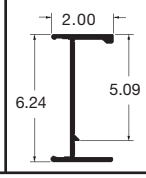
Values are based on simple beam tests per NEMA VE 1 on 36" wide cable ladder with rungs spaced on 12" centers. Cable ladders will support, without collapse, a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply the published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable ladder being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads. See table on page CLS-13 for rung capacities.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
26		NEMA: 20A, 16B CSA: D1-6m UL Cross-Sectional Area: 1.00 in²	10 12 14 16 18 20	204 142 104 80 63 51	0.0028 0.006 0.011 0.019 0.030 0.045	Area=1.41 in² Sx=2.53 in³ Ix=7.915 in⁴	3.0 3.7 4.3 4.9 5.5 6.1	304 211 155 119 94 76	0.049 0.101 0.186 0.318 0.509 0.776	Area=9.10 cm² Sx=41.46 cm³ Ix=329.45 cm⁴

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
36		NEMA: 20B, 16C CSA: E-6m UL Cross-Sectional Area: 1.50 in²	12 14 16 18 20 22	233 171 131 104 84 69	0.0043 0.008 0.014 0.022 0.033 0.049	Area=1.81 in² Sx=3.36 in³ Ix=10.85 in⁴	3.7 4.3 4.9 5.5 6.1 6.7	347 255 195 154 125 103	0.073 0.136 0.232 0.372 0.566 0.829	Area=11.68 cm² Sx=55.06 cm³ Ix=451.61 cm⁴

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
46		NEMA: 20C CSA: E-6m UL Cross-Sectional Area: 1.50 in²	14 16 18 20 22 24	210 161 127 103 85 72	0.0071 0.012 0.019 0.030 0.043 0.061	Area=2.06 in² Sx=3.59 in³ Ix=12.18 in⁴	4.3 4.9 5.5 6.1 6.7 7.3	313 239 189 153 127 106	0.121 0.207 0.331 0.505 0.739 1.046	Area=13.29 cm² Sx=58.83 cm³ Ix=506.97 cm⁴

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
H46		NEMA: 20C+ CSA: 131 kg/m 7.6m UL Cross-Sectional Area: 2.00 in²	16 18 20 22 24 25	261 206 167 138 116 88	0.0085 0.014 0.021 0.030 0.043 0.051	Area=2.95 in² Sx=5.33 in³ Ix=17.30 in⁴	4.9 5.5 6.1 6.7 7.3 7.6	388 307 248 205 173 131	0.145 0.233 0.355 0.520 0.737 0.867	Area=19.03 cm² Sx=87.34 cm³ Ix=720.08 cm⁴

When ladders are used in continuous spans, the deflection of the ladder is reduced by as much as 50%.
Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

Dimensions in parentheses are in millimeters unless otherwise specified.

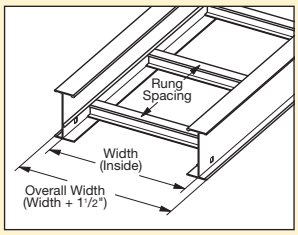
6" NEMA VE 1 Loading Depth
7" Side Rail Height

Straight Section Part Numbering

Prefix

Example: **37 A 09 - 24 - 240**

Series	Material	*Type	*Width	Length
37	**A** = Aluminum	**Ladder-**	**06** = 6"	① **240** = 20 ft. ② 144 = 12 ft. — 37
47		**06** = 6" rung spacing	**09** = 9"	① **240** = 20 ft. ② 288 = 24 ft. — 47
H47†		**09** = 9" rung spacing	**12** = 12"	① **240** = 20 ft. ② 300 = 25 ft. — H47
57†		**12** = 12" rung spacing	**18** = 18"	① **360** = 30 ft. ② 300 = 25 ft. — 57
			24 = 24"	
			30 = 30"	
			36 = 36"	

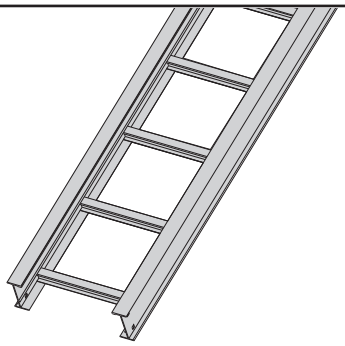


Trough-
6" thru 36" wide
VT = Vented Trough
ST = Non-Ventilated Trough

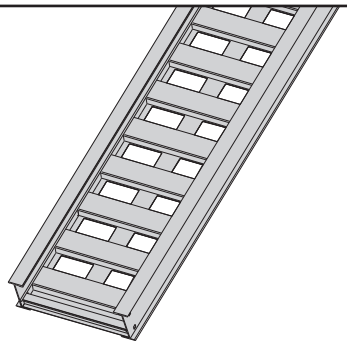
† H47A & 57A only available in ladder type 9" and 12" rung spacing.

①Primary Length.
②Secondary Length.

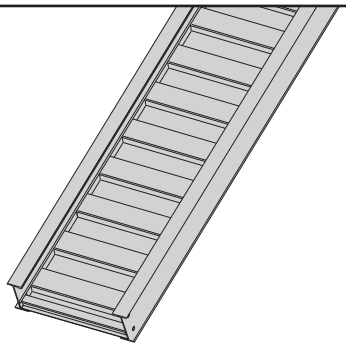
See page MIS-2 for additional rung options. *Special sizes available.



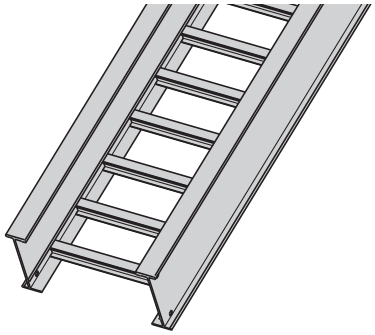
Ladder Type
(Specify Rung Spacing)



Ventilated Trough



Non-Ventilated Trough



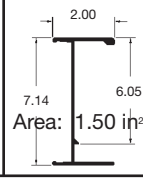
57A available in
(9" & 12" rung spacing in 12" to 36" widths)

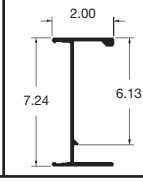
Dimensional & Loading Information

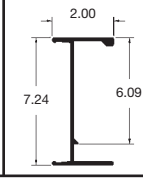
6" NEMA VE 1 Loading Depth
7" Side Rail Height

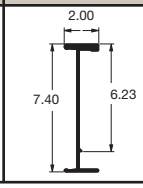
Values are based on simple beam tests per NEMA VE 1 on 36" wide cable ladder with rungs spaced on 12" centers. Cable ladders will support without collapse a 200 lb. (90.7 kg) concentrated load over and above published loads. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply the published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable ladder being installed.

Individual rungs will support without collapse a 200 lb. (90.7 kg) concentrated load applied at the mid-span of the rung, over and above the NEMA rated cable load with a 1.5 safety factor for highlighted NEMA spans and loads. See table on page CLS-13 for rung capacities.

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
37		NEMA: 20B, 16C CSA: 106 kg/m 6.1m UL Cross-Sectional	12 14 16 18 20 22	222 163 125 99 80 66	0.0035 0.0064 0.011 0.017 0.027 0.039	Area=1.81 in² Sx=3.77 in³ Ix=13.50 in⁴	3.7 4.3 4.9 5.5 6.1 6.7	331 243 186 147 119 98	0.059 0.109 0.186 0.299 0.455 0.666	Area=11.68 cm² Sx=61.78 cm³ Ix=561.91 cm⁴

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
47		NEMA: 20C CSA: 142 kg/m 6.1m UL Cross-Sectional Area: 2.00 in^2	14 16 18 20 22 24	204 156 123 100 83 69	0.0048 0.0082 0.0132 0.0201 0.0295 0.0418	Area=2.38 in² Sx=4.94 in³ Ix=17.88 in⁴	4.3 4.9 5.5 6.1 6.7 7.3	304 233 184 149 123 103	0.083 0.141 0.225 0.344 0.503 0.713	Area=15.35 cm² Sx=80.95 cm³ Ix=744.22 cm⁴

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
H47		NEMA: 20C+ CSA: 241 kg/m 6.1m UL Cross-Sectional Area: 2.00 in²	16 18 20 22 24 25	233 184 149 123 103 95	0.0064 0.010 0.016 0.023 0.033 0.038	Area=3.04 in² Sx=6.10 in³ Ix=22.91 in⁴	4.9 5.5 6.1 6.7 7.3 7.6	346 274 222 183 154 142	0.110 0.176 0.268 0.393 0.556 0.655	Area=19.61 cm² Sx=99.96 cm³ Ix=953.59 cm⁴

B-Line Series	Side Rail Dimensions	NEMA, CSA & UL Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Design Factors for Two Rails	Span meters	Load kg/m	Deflection Multiplier	Design Factors for Two Rails
57		NEMA: 20C+ CSA: 152 kg/m 9.1m UL Cross-Sectional Area: 2.00 in²	20 22 24 26 28 30	232 192 161 136 117 102	0.011 0.016 0.023 0.031 0.042 0.055	Area=4.22 in² Sx=7.73 in³ Ix=32.86 in⁴	6.1 6.7 7.3 7.9 8.5 9.1	345 285 240 202 174 152	0.187 0.274 0.388 0.534 0.718 0.947	Area=27.23 cm² Sx=126.67 cm³ Ix=1367.74 cm⁴

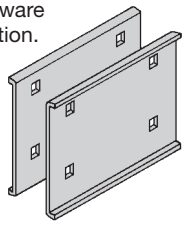
When ladders are used in continuous spans, the deflection of the ladder is reduced by as much as 50%.
Design factors: Ix = Moment of Inertia, Sx = Section Modulus.

Dimensions in parentheses are in millimeters unless otherwise specified.

Series 2, 3, 4, & 5 Aluminum Cable Ladder

Wedge Lock Splice Plates
(Excluding H46, H47 & 57 Series)

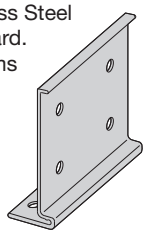
- Standard 4-hole pattern (except 9A-1007).
- Furnished in pairs, with hardware.
- One pair including hardware provided with each section.
- Boxed in pairs with hardware.
- For field installation drill $^{13}/_{32}$" hole.



Catalog No.	Height	
	in.	mm
9A-1004	4	101
9A-1005	5	127
9A-1006	6	152
9A-1007	7	178

H46A, H47A and 57A Mid-Span Splice

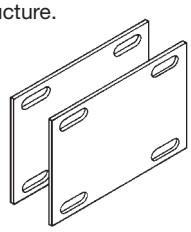
- Standard for H46A, H47A and 57A straight sections.
- Six bolt design $^{1}/_{2}$" Stainless Steel Type 316 hardware standard.
- Available on ladder bottoms only. 09 and 12" rung spacing.



Ladder Series	Catalog No.
H46A	9A-6006
H47A, 57A	9A-6007

Expansion Splice Plates

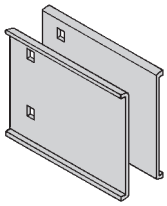
- Expansion plates allow for one inch expansion or contraction of the cable ladder, or where expansion joints occur in the supporting structure.
- Furnished in pairs with hardware.
- **Bonding Jumpers are required on each siderail. Order Separately.**



Catalog No.	Height	
	in.	mm
9A-1014	4	101
9A-1015	5	127
9A-1016	6	152
9A-1017	7	178

Universal Splice Plates

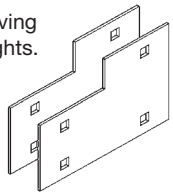
- Used to splice to existing cable ladder systems.
- Furnished in pairs with hardware.



Catalog No.	Height	
	in.	mm
9A-1004-$^{1}/_{2}$	4	101
9A-1005-$^{1}/_{2}$	5	127
9A-1006-$^{1}/_{2}$	6	152
9A-1007-$^{1}/_{2}$	7	178

Step Down Splice Plates

- These splice plates are offered for connecting cable ladder sections having side rails of different heights.
- Furnished in pairs with hardware.

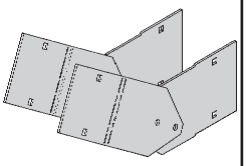


Catalog No.	Height	
	in.	mm
9A-1045	5 to 4	127 to 101
9A-1046	6 to 4	152 to 101
9A-1060	6 to 5	152 to 127
9A-1047	7 to 4	178 to 101
9A-1061	7 to 5	178 to 127
9A-1062	7 to 6	178 to 152

Vertical Adjustable Splice Plates

- These plates provide for changes in elevation that do not conform to standard vertical fittings.
- Furnished in pairs with hardware.
- **Bonding Jumper not required.**

Requires supports within 24" on both sides, per NEMA VE 2.

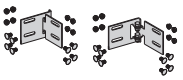


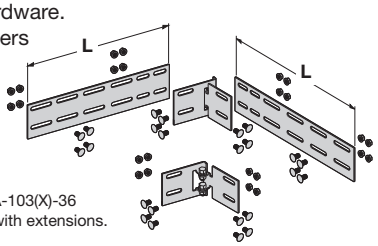
Catalog No.	Height	
	in.	mm
9A-1024	4	101
9A-1025	5	127
9A-1026	6	152
9A-1027	7	178

Horizontal Adjustable Splice Plates

- Offered to adjust a cable ladder run for changes in direction in a horizontal plane that do not conform to standard horizontal fittings.
- Furnished in pairs with hardware.
- New design bonding jumpers **not** required.
- (X) Insert 4, 5, 6 or 7 for side rail height.

9A-103(X) Splice only





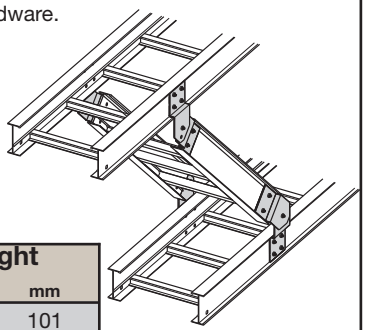
9A-103(X)-12 or 9A-103(X)-36
One pair splice plates with extensions.

Catalog No.	Ladder End Cut	Ladder Width	'L'
9A-103(X)	Mitered	Thru 36"	N/A
9A-103(X)-12	Not mitered	Thru 12"	16"
9A-103(X)-36	Not mitered	Thru 36"	41"

Requires supports within 24" on both sides, per NEMA VE 2.

Branch Pivot Connectors

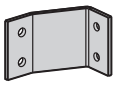
- Branch from existing cable ladder runs at any point.
- Pivot to any required angle.
- UL Classified for grounding (bonding jumper not required).
- Furnished in pairs with hardware.

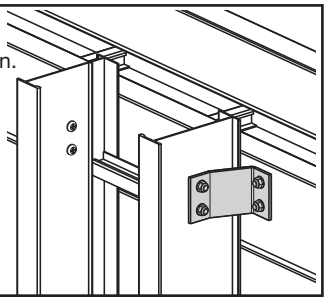


Catalog No.	Height	
	in.	mm
9A-2044	4	101
9A-2045	5	127
9A-2046	6	152
9A-2047	7	178

Cross Connector Bracket

- For field connecting crossing section.
- Furnished in pairs with 3/8" hardware.

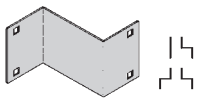




Catalog No.	9A-1240

Offset Reducing Splice Plate

- This plate is used for joining cable ladders having different widths. When used in pairs they form a straight reduction; when used with standard splice plate, they form an offset reduction.
- Furnished as one plate with hardware.
- (‡) Insert reduction



Catalog No.	Height in.	Height mm
9A-1064-(‡)	4	101
9A-1065-(‡)	5	127
9A-1066-(‡)	6	152
9A-1067-(‡)	7	178

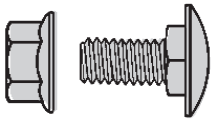
Ladder Hardware

For field installation drill 13/32" hole.

Standard Ladder Hardware

Catalog No. SNCB 3/8" x 3/4" Znplt Square Neck Carriage Bolt ASTM A307 Grade A

Catalog No. SFHN 3/8"-16 Znplt Serrated Flange Hex Nut ASTM A563 Grade A

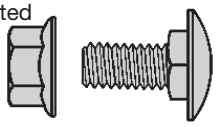


Finish: Zinc Plated ASTM B633, SC1

Optional Ladder Hardware

Catalog No. SNCB 3/8" x 3/4" SS6 Square Neck Carriage Bolt AISI 316 Stainless Steel

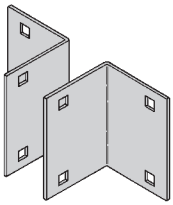
Catalog No. SFHN 3/8"-16 SS6 Serrated Flange Hex Nut AISI 316 Stainless Steel



To order optional 316 Stainless Steel hardware add SS6 suffix to part number
Example: 9A-1004SS6

Ladder to Box Splice Plates

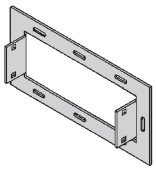
- Used to attach the end of a cable ladder run to a distribution box or control panel.
- Furnished in pairs with hardware.



Catalog No.	Height in.	Height mm
9A-1054	4	101
9A-1055	5	127
9A-1056	6	152
9A-1057	7	178

Frame Type Box Connector

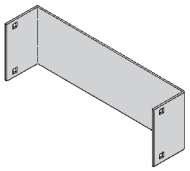
- Designed to attach the end of a cable ladder run to a distribution cabinet or control center to help reinforce the box at the point of entry.
- Furnished with ladder connection hardware.
- (‡) Insert ladder width



Catalog No.	Height in.	Height mm
9A-1074-(‡)	4	101
9A-1075-(‡)	5	127
9A-1076-(‡)	6	152
9A-1077-(‡)	7	178

Blind End

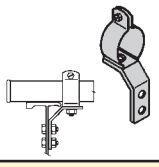
- This plate forms a closure for a dead end cable ladder.
- Furnished as one plate with hardware.
- (‡) Insert ladder width



Catalog No.	Height in.	Height mm
9A-1084-(‡)	4	101
9A-1085-(‡)	5	127
9A-1086-(‡)	6	152
9A-1087-(‡)	7	178

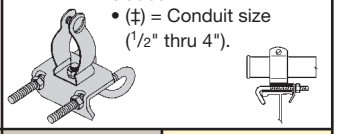
Conduit to Cable Ladder Adaptors

- Assembly required.
- Mounting hardware included.
- Conduit clamps provided.
- (‡) = Conduit size (1/2" thru 4").



Catalog No.	9ZN-1150-(‡)

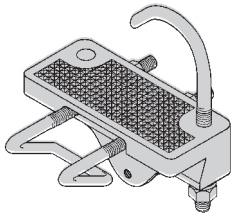
- Assembly required.
- Conduit clamp included.
- (‡) = Conduit size (1/2" thru 4").

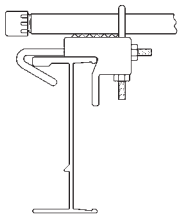


Catalog No.	9ZN-1155-(‡)

Conduit to Cable Ladder Adaptor

- For easy attachment of conduit terminating at a cable ladder.
- Use on aluminum or steel cable ladders.

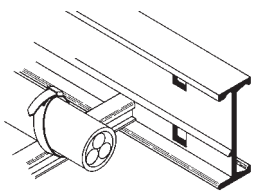




Aluminum I-Beam

Catalog No.	Conduit Size in.	Conduit Size mm
9G-1158-1/2, 3/4	1/2, 3/4	15, 20
9G-1158-1, 1 1/4	1, 1 1/4	25, 32
9G-1158-1 1/2, 2	1 1/2, 2	40, 50
9G-1158-2 1/2, 3	2 1/2, 3	65, 80
9G-1158-3 1/2, 4	3 1/2, 4	90, 100

Cable Tie (Ladder Ladder)



Nylon ties provide easy attachment of cable to ladder rungs; maximum cable O.D. is 3" (76mm).

Overall Length 15"

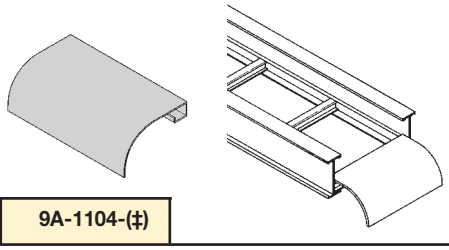
Catalog No.	99-2125-15

Aluminum

Dimensions in parentheses are in millimeters unless otherwise specified.

Ladder Drop-Out

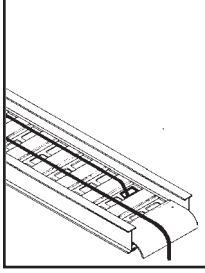
- Specially-designed Ladder Drop-Outs provide a rounded surface with 4" (101 mm) radius to protect cable as it exits from the cable ladder, preventing damage to insulation. The drop-out will attach to any desired rung.
- (‡) Insert ladder width



Catalog No.	9A-1104-(‡)

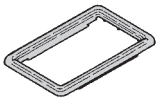
Trough Drop-Out & Drop-Out Bushing

- These devices provide a rounded surface to protect cable as it exits from the trough-type cable ladder.
- Hardware is included for attachment of the trough bottom drop-out.
- (‡) Insert ladder width



Catalog No.
9A-1104T-(‡)

Trough-Type Drop-Out



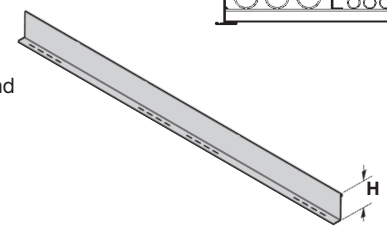
Catalog No.
99-1124

Snap-In Plastic Bushing

Barriers

Straight Section

- Standard length: 120" (3 m) 144" (12 ft.).
- Order catalog number based on loading depth.
- Furnished with four #10 x 1/2" plated self-drilling screws and a 99-9982 splice.

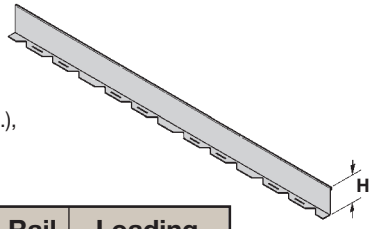


Catalog No.	Side Rail Height		Loading Depth 'H'	
	in.	mm	in.	mm
73A-Length	4	101	3	76
74A-Length	5	127	4	101
75A-Length	6	152	5	127
76A-Length	7	178	6	152

Length = 144 for 12' or 120 for 10'

Horizontal Bend

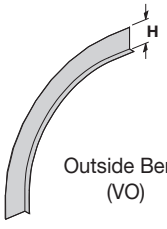
- Horizontal Bend Barriers are flexible in order to conform to any horizontal fitting radius. Cut to length.
- Order catalog number based on loading depth.
- Furnished with three #10 x 1/2" zinc plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- Standard length is 72" (6 ft.), sold individually.



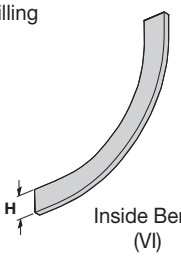
Catalog No.	Side Rail Height		Loading Depth 'H'	
	in.	mm	in.	mm
73A-90HBFL	4	101	3	76
74A-90HBFL	5	127	4	101
75A-90HBFL	6	152	5	127
76A-90HBFL	7	178	6	152

Vertical Bend Barriers

- Vertical Bend Barriers are preformed to conform to a specific vertical fitting.
- Furnished with three #10 x 1/2" plated self-drilling screws and a 99-9982 Barrier Strip Splice.
- (*) Insert 30, 45, 60 or 90 for degrees
- (†) Insert 12, 24, 36 or 48 for radius



Outside Bend (VO)

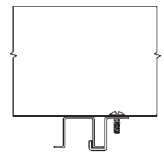


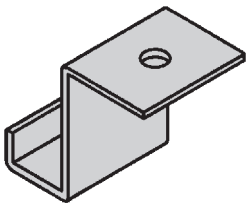
Inside Bend (VI)

Inside Bend Catalog No.	Outside Bend Catalog No.	Side Rail Height		Loading Depth 'H'	
		in.	mm	in.	mm
73A-(*)VI(†)	73A-(*)VO(†)	4	101	3	76
74A-(*)VI(†)	74A-(*)VO(†)	5	127	4	101
75A-(*)VI(†)	75A-(*)VO(†)	6	152	5	127
76A-(*)VI(†)	76A-(*)VO(†)	7	178	6	152

Barrier Strip Clip

- Zinc plated steel barrier clip fastens to either aluminum or steel ladder rung.
- Furnished with one #10 x 1/2" zinc plated self-drilling screw.

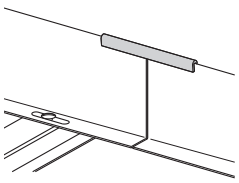


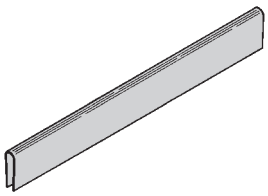


Catalog No.	9ZN-9002

Barrier Strip Splice

- Plastic splice holds adjoining barrier strips in straight alignment.

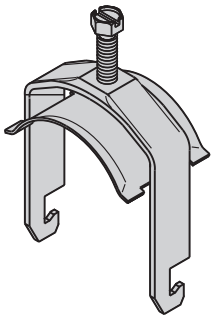




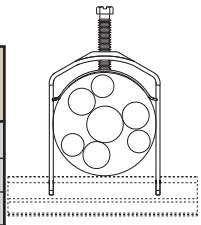
Catalog No.	99-9982

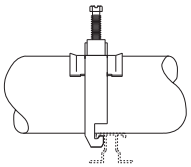
Stainless Steel Cable Clamp "P"

- Fits with series 2, 3, & 4 rungs.
- Attaches to rung at any point.
- 14 gauge Type 316 stainless steel material to minimize corrosion and induction heating.
- Plated steel and aluminum also available.



Refer Cable Fixing Section



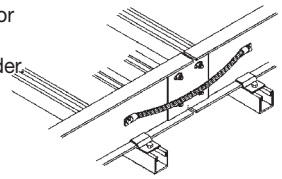


Catalog No.	Cable Size	
	in.	mm
BP081SS	.250 - .840	6.4 - 21.3
BP110SS	.810 - 1.100	20.6 - 28.0
BP135SS	.850 - 1.350	21.6 - 34.8
BP175SS	1.250 - 1.750	31.8 - 44.5
BP205SS	1.550 - 2.050	39.4 - 52.1
BP250SS	2.000 - 2.500	50.8 - 63.5
BP300SS	2.500 - 3.000	63.5 - 76.2
BP325SS	2.750 - 3.250	69.9 - 82.6
BP375SS	3.250 - 3.750	82.6 - 95.3
BP425SS	3.750 - 4.250	95.3 - 108.0
BP475SS	4.250 - 4.750	108.0 - 120.7

Bonding Jumper

Use at each expansion splice and where the cable ladder is not mechanically/electrically continuous to ground.
Sold individually.

- Hardware included.
- See table 392.7(B)(2) on page CLS-9 for amperage ratings required to match the UL cross-sectional area of the ladder.
- See ladder loading chart for UL cross-sectional area.
- Bonding jumper is 16" long.

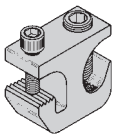


Catalog No.	Cross-Sectional Area	Ampacity
99-N1	0.40 Square inches	600
99-40	1.5 Square inches	1600
99-1620	2.0 Square inches	2000

Grounding Clamp

B-Line Cable Ladder is UL® classified as to its suitability as an equipment grounding conductor. If a separate conductor for additional grounding capability is desired, B-Line offers this clamp for bolting the conductor at least once to each cable ladder section.

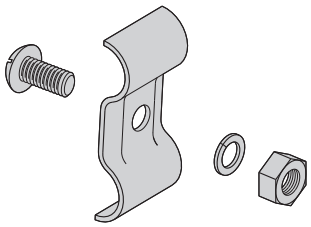
- Accepts #6 AWG to 250 MCM.



Catalog No.	Material
9A-2130	Tin Plated Aluminum

Ground Clamp

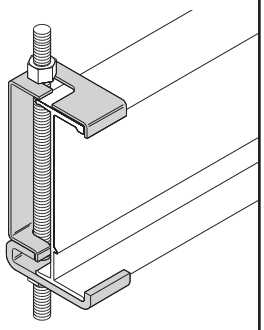
- Mechanically attaches grounding cables to cable ladder.
- Hardware included.
- (*) Insert ZN or SS4



Catalog No.	Cable Size
9(*)-2351	#1 thru 2/0
9(*)-2352	3/0 thru 250 MCM

Hanger Rod Clamp

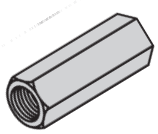
- For 1/2" ATR.
- Furnished in pairs.
- Order ATR and hex nuts separately.
- Two-piece "J"-hanger design.
- 1500 lbs./pair capacity safety factor 3.
- (*) Insert ZN or G

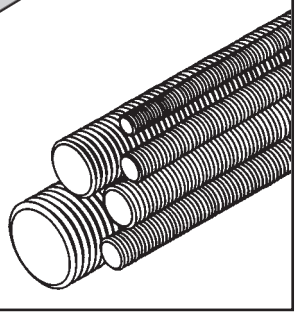


Catalog No.	Rail Height	
	in.	mm
9(*)-5324	4	101
9(*)-5325	5	127
9(*)-5326	6	152
9(*)-5327	7	178

Threaded Rod (ATR) & Rod Coupling

Size	Loading lbs	Catalog No.	Available Lengths	Coupling Cat. No.
3/8"-16	730	ATR 3/8" x Length	36", 72", 120", 144"	B655-3/8
1/2"-13	1350	ATR 1/2" x Length	36", 72", 120", 144"	B655-1/2





All dimensions in shaded areas are millimeters unless otherwise specified.

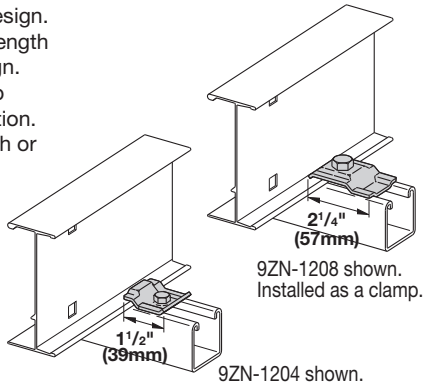
Loading based on safety factor 5.
Standard Finish: Zinc plated

Aluminum

Dimensions in parentheses are in millimeters unless otherwise specified.

Cable Ladder Clamp/Guide

- Features a no-twist design.
- Has four times the strength of the traditional design.
- Each side is labeled to ensure proper installation.
- Furnished in pairs, with or without hardware.



9ZN-1208 shown. Installed as a clamp.

9ZN-1204 shown. Installed as a guide.

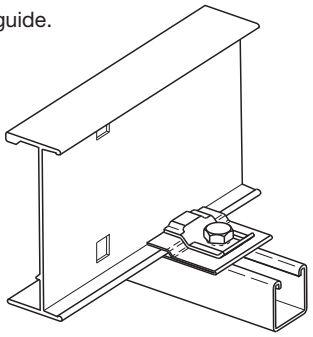
Patent # RE35479

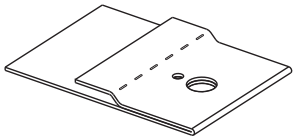
Note: For heavy duty or vertical applications see 9(*)-1241 or 9(*)-1242 page AL-36

Catalog No.		Overall Length		Hardware Size	Finish
Without Hardware	With Hardware	in.	mm		
9ZN-1204	9ZN-1204NB	1 1/2	38	1/4"	ZnPlt
9ZN-1208	9ZN-1208NB	2 1/4	57	3/8"	ZnPlt
9A-1205	9A-1205NB	2 1/4	57	1/2"	Alum.
9G-1205	9G-1205NB	2 1/4	57	1/2"	HDGAF
9SS6-1205	9SS6-1205NB	2 1/4	57	1/2"	316SS
9ZN-1205	9ZN-1205NB	2 1/4	57	1/2"	ZnPlt

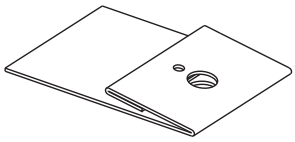
Isolator Pad

- Use as a friction reducer and/or as a dissimilar metal isolator barrier.
- UV resistant HDPE.
- Temperature range: -100 to 160° F.
- Designed to use with 9(*)-1205 or 9(*)-1208 clamp/guide.





Isolation pad shown as when used with a guide.

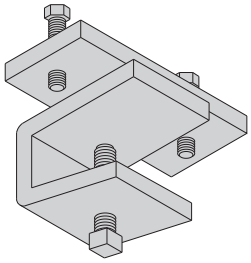


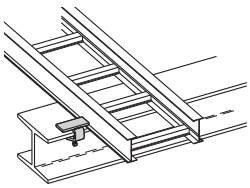
Isolation pad shown with top flange doubled under for clamp application.

Catalog No.	99-PE34

Cable Ladder Clamp

- Hold-down clamps for single or double cable ladder runs.
- No drilling of support I-beam or channel is required.
- Sold in pieces - two clamps are required per ladder.
- Maximum beam flange thickness 1 1/8" (28.58 mm).

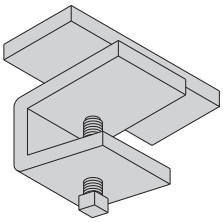




Catalog No.	Finish
9ZN-1249HD	ZnPlt
9G-1249HD	HDGAF

Cable Ladder Guide

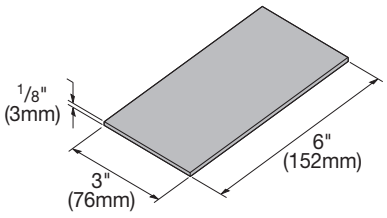
- Expansion guide for single or double cable ladder runs.
- Guide allows for longitudinal movement of the cable ladder.
- No field drilling of support I-beam or channel is required.
- Guides are required on both sides of cable ladder to prevent lateral movement - can be placed on either the inside or outside flange of cable ladder.
- Guides are sold in pieces - two guides are required per ladder.
- Maximum flange thickness 1 1/8" (28.58 mm).



Catalog No.	Finish
9ZN-1249	ZnPlt
9G-1249	HDGAF

Nylon Pad

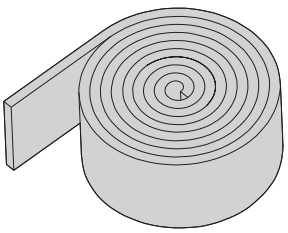
- Use for friction reduction.
- Hardness: Shore D80.
- Low friction coefficient.
- UV resistant.
- Excellent weatherability.
- UL - 94HB.



Catalog No.	99-PE36

Neoprene Roll

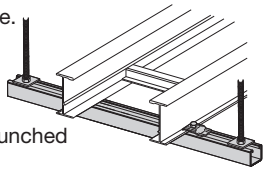
- Use for material isolation.
- 1/8" x 2" x 25' roll.
- Hardness: Shore A60.
- Good weatherability.



Catalog No.	99-NP300

Trapeze Support Kit

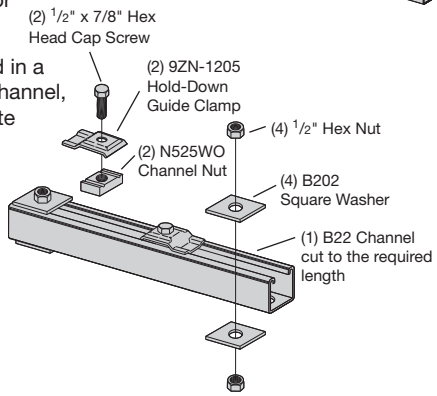
B-Line's trapeze kits provide the components required for a single trapeze support in one package. These kits are available in pre-galvanized steel with zinc-plated hardware or hot dip galvanized steel with 316 stainless steel hardware.



The SH channel provides the convenience of pre-punched slots, which eliminate the need for field drilling.

The illustrated hardware is sealed in a plastic bag and boxed with the channel, which is pre-cut to the appropriate length as shown in the chart.

Designed for use with 1/2" threaded rod.
Order rod separately.

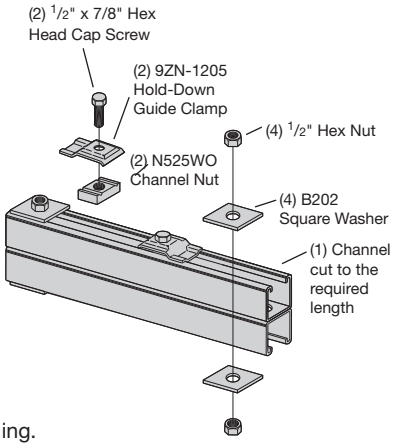


Catalog No.	Ladder Width in.	Ladder Width mm	Channel Length in.	Channel Length mm	Uniform Load lbs	Uniform Load kN
9P-5506-22SH(†)	6	152	16	406	1600	7.11
9P-5509-22SH(†)	9	229	18	457	1250	5.56
9P-5512-22SH(†)	12	305	22	559	1125	5.00
9P-5518-22SH(†)	18	457	28	711	865	3.85
9P-5524-22SH(†)	24	610	34	864	700	3.11
9P-5530-22SH(†)	30	762	40	1016	590	2.62
9P-5536-22SH(†)	36	914	46	1168	510	2.27
9P-5542-22SH(†)	42	1067	52	1321	450	2.00

• (†) Insert 3/8 for 3/8" threaded rod hardware.

Safety factor of 3.0 on all loads.

Heavy Duty Trapeze Support Kit



B-Line's trapeze kits provide the components required for a single trapeze support in one package. These kits are available in DURA-GREEN™ epoxy coated steel with zinc-plated hardware or hot dip galvanized steel with 316 stainless steel hardware.

The SH channel provides the convenience of pre-punched slots, which eliminates the need for field drilling.

The illustrated hardware is sealed in a plastic bag and boxed with the channel, which is pre-cut to the appropriate length as shown in the chart.

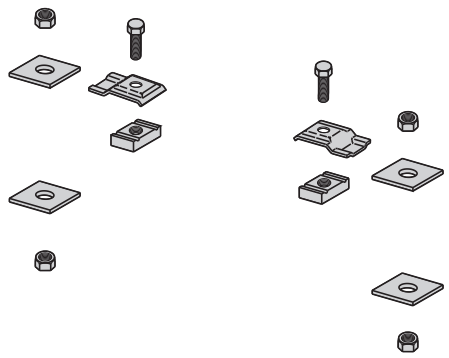
Designed for use with 1/2" threaded rod.
Order rod separately.

Catalog No.	Ladder Width in.	Ladder Width mm	Channel Length in.	Channel Length mm	Uniform Load lbs	Uniform Load kN
9(*)-5506-22SHA	6	152	16	406	1350	6.01
9(*)-5509-22SHA	9	229	18	457	1350	6.01
9(*)-5512-22SHA	12	305	22	559	1350	6.01
9(*)-5518-22SHA	18	457	28	711	1350	6.01
9(*)-5524-22SHA	24	610	34	864	1350	6.01
9(*)-5530-22SHA	30	762	40	1016	1350	6.01
9(*)-5536-22SHA	36	914	46	1168	1350	6.01
9(*)-5542-22SHA	42	1067	52	1321	1350	6.01

• (*) Insert GRN or G

Safety factor of 3.0 on all loads.

Trapeze Hardware Kit



Catalog No.	9ZN-5500-1/2	9G-5500-1/2
In plastic bag	1 pr. 9ZN-1205 2 HHC Screw 1/2" x 7/8" ZN 2 N525 WO ZN 4 B202 ZN 1/2" sq washer 4 HN 1/2 ZN	1 pr. 9G-1205 2 HHC Screw 1/2" x 7/8" SS6 2 N525 WO SS6 4 B202 HDG 1/2" sq washer 4 HN 1/2 SS6

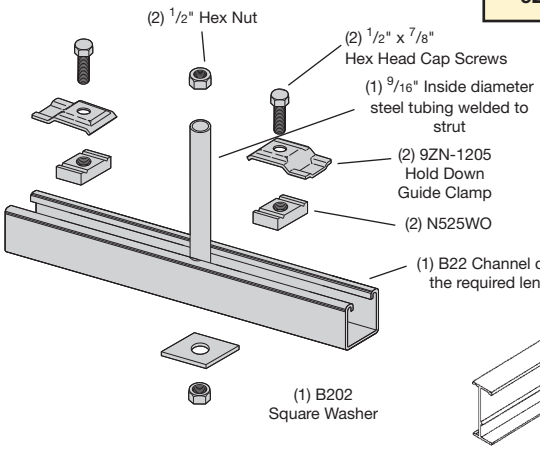
Dimensions in parentheses are in millimeters unless otherwise specified.

Series 2, 3, 4, & 5 Aluminum Cable Ladder

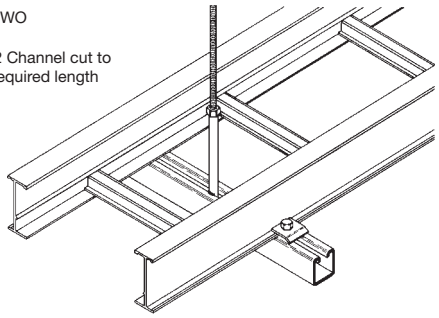
Center Hung Ladder Support

- Allows cable to be laid-in from both sides.
- Eliminates costly cable pulling and field cutting of cable ladder supports. Labor costs are dramatically reduced.
- Required hardware and threaded rod material for trapeze assemblies are reduced by 50%.
- Designed for use with 1/2" threaded rod. (Order rod separately)
- Use with all aluminum and steel cable ladders through 24" width.
- Load capacity is 700 lbs. per support. Safety factor of 3.0. Eccentric loading is not to exceed a 60% vs. 40% load differential.
- Maximum recommended unsupported span length is 144"/12 ft. (3.66 m).
- Hardware shown is furnished.

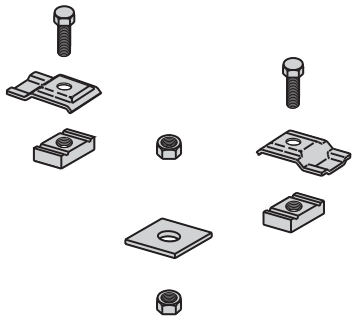
Catalog No.	Ladder Width	Channel Length
9ZN-5212	6", 9", 12"	18"
9ZN-5224	18", 24"	30"



ZN = Zinc Plated

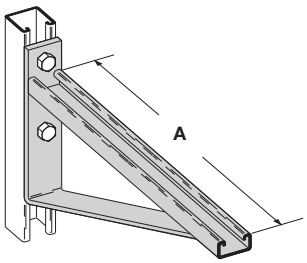


Center Hung Support Hardware Kit



Catalog No.	9ZN-5200
In plastic bag	1 pr. 9ZN-1205 2 HHC Screw 1/2" x 7/8" ZN 2 N525 WO ZN 1 B202 ZN 1/2" sq washer 2 HN 1/2 ZN

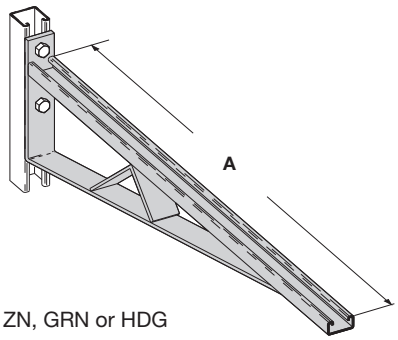
Bracket



Finishes available: ZN, GRN or HDG
Safety Load Factor 2.5

Catalog No.	Uniform Load lbs	Uniform Load kN	Ladder Width in.	Ladder Width mm	'A' in.	'A' mm
B494-12	1580	7.02	6 & 9	152 & 229	12	305
B494-18	1000	4.45	12	305	18	457
B494-24	996	4.43	18	457	24	610

Bracket

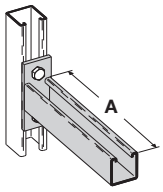


Finishes available: ZN, GRN or HDG
Safety Load Factor 2.5

Catalog No.	Uniform Load lbs	Uniform Load kN	Ladder Width in.	Ladder Width mm	'A' in.	'A' mm
B494-30	924	4.11	24	610	30	762
B494-36	864	3.84	30	762	36	914
B494-42	580	2.58	36	914	42	1067
B494-48	500	2.22	42	1067	48	1219

Dimensions in parentheses are in millimeters unless otherwise specified.

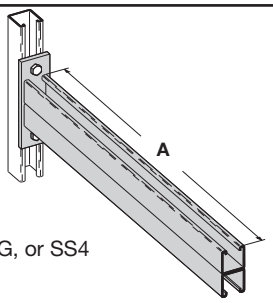
Cantilever Bracket



Finishes available: ZN, GRN, HDG, SS4 or SS6
Safety Load Factor 2.5

Catalog No.	Uniform Load lbs	Uniform Load kN	Ladder Width in.	Ladder Width mm	'A' in.	'A' mm
B409-12	960	4.27	6 & 9	152 & 229	12	305
B409-18	640	2.84	12	305	18	457
B409-24	480	2.13	18	457	24	610

Cantilever Bracket



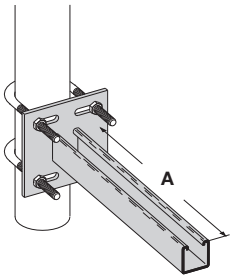
Finishes available: ZN, GRN, HDG, or SS4
Safety Load Factor 2.5

Catalog No.	Uniform Load lbs	Uniform Load kN	Ladder Width in.	Ladder Width mm	'A' in.	'A' mm
B297-12	1660	7.38	6 & 9	152 & 229	12	305
B297-18	1100	4.89	12	305	18	457
B297-24	835	3.71	18	457	24	610
B297-30	665	2.95	24	610	30	762
B297-36	550	2.44	30	762	36	914
B297-42	465	2.06	36	914	42	1067

Underfloor Support (U-Bolts not included)

U-Bolt Size	Fits Pipe O.D.
B501-3/4	.841 - 1.050
B501-1	1.051 - 1.315
B501-1 1/4	1.316 - 1.660
B501-1 1/2	1.661 - 1.900
B501-2	1.901 - 2.375
B501-2 1/2	2.376 - 2.875

- Order properly sized U-Bolts separately.

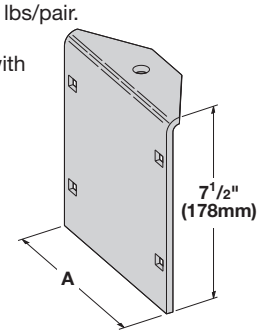


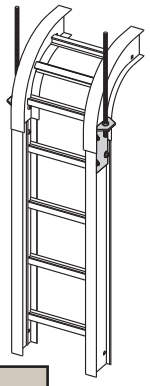
Finish available: ZN
Safety Load Factor 2.5

Catalog No.	Uniform Load lbs	Uniform Load kN	Ladder Width in.	Ladder Width mm	'A' in.	'A' mm
B409UF-12	800	3.55	6 & 9	152 & 229	12	305
B409UF-21	450	2.00	12 & 18	305 & 457	21	533

Vertical Hanger Splice Plates

- Design load is 1500 lbs/pair. Safety Factor of 2.5
- Furnished in pairs with hardware.

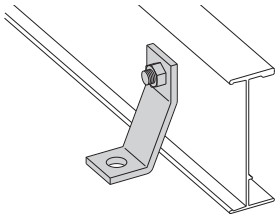




Catalog No.	Outside Ladder Ht.	'A' in.	'A' mm
9A-1224	4"	3.84	97.54
9A-1225	5"	4.73	120.14
9A-1226	6"	5.84	148.34
9A-1227	7"	6.84	173.74

Heavy Duty Hold Down Bracket

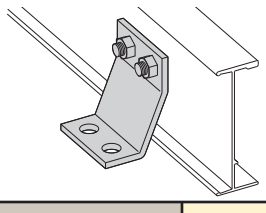
- Design load is 2000 lbs/pair.
- Two bolt design.
- Sold in pairs.
- 3/8" cable ladder attachment hardware provided.
- 1/2" support attachment hardware **not** provided.
- (*) Insert: ZN, SS4 or SS6

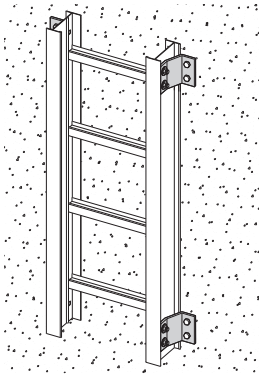


Catalog No.	9(*)-1241

Heavy Duty Hold-Down Bracket

- Design load is 4000 lbs/pair.
- Four bolt design.
- Sold in pairs.
- 3/8" cable ladder attachment hardware provided
- 1/2" support attachment hardware **not** provided.
- (*) Insert: ZN, SS4 or SS6





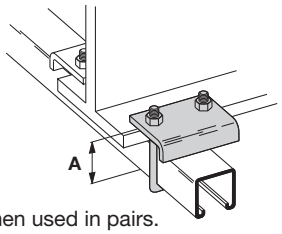
Catalog No.	9(*)-1242

Dimensions in parentheses are in millimeters unless otherwise specified.

Series 2, 3, 4, & 5 Aluminum Cable Ladder

Beam Clamp

- Finishes available: ZN or HDG
- Sold in pieces.

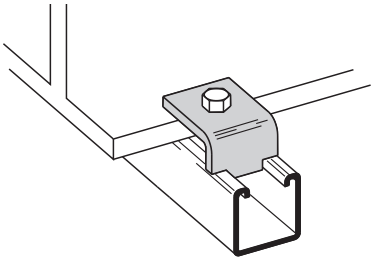


Design load when used in pairs.
Safety Load Factor 5.0

Catalog	Design Load*		'A'	
	lbs	kN	in.	mm
B441-22	1200	5.34	3 3/8	86
B441-22A	1200	5.34	5	127

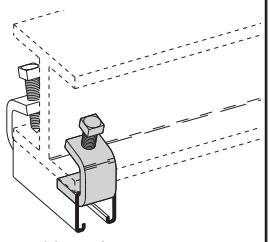
Beam Clamp B355

- Finishes available: ZN, GRN, HDG or SS4
- Sold in pieces.
- Design load is 1200 lbs. when used in pairs.
- Safety Load Factor 5.0
- Order HHCS and Channel Nuts separately.



Beam Clamp

- Finishes available: ZN, GRN or HDG
- Sold in pieces.

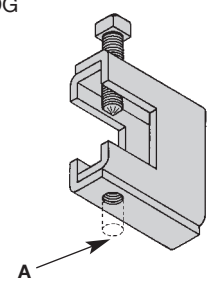


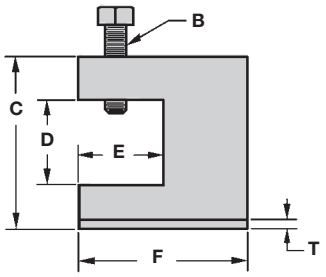
Design load when used in pairs.
Safety Load Factor 5.0

Cat. No.	B212-1/4		B212-3/8	
Design Load *	600 lbs.	2.67 kN	1000 lbs.	4.45 kN
Max. Flange Thick	3/4"	19 mm	1 1/8"	28.6 mm
Mat'l. Thickness	1/4"	6.3 mm	3/8"	9.5 mm

B305 Thru B308 & B321 Series Beam Clamps

- Finishes available: ZN or HDG
- Setscrew included.
- Safety Load Factor 5.0

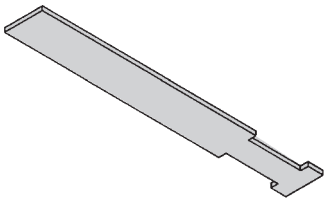




Cat. No.	Rod Size A	B	C	D	E	F	T	Design Load	
								lbs	kN
B305	3/8"-16	3/8"-16	2 5/16"	7/8"	1 1/8"	2 1/2"	11 Ga.	600	2.67
B306	3/8"-16	1/2"-13	2 7/16"	7/8"	1 1/8"	2 1/2"	7 Ga.	1100	4.90
B307	1/2"-13	1/2"-13	2 7/16"	7/8"	1 1/8"	2 1/2"	7 Ga.	1100	4.90
B308	1/2"-13	1/2"-13	2 9/16"	7/8"	1 1/8"	2 1/2"	1/4"	1500	6.68
B321-1	3/8"-16	1/2"-13	3 9/16"	1 11/16"	1 5/8"	3 1/4"	1/4"	1300	5.79
B321-2	1/2"-13	1/2"-13	3 9/16"	1 11/16"	1 5/8"	3 1/4"	1/4"	1400	6.23

B312 Anchor Strap

- Finish available: ZN
- For a maximum beam thickness of 3/4".
- For thicker beams, step up one flange width size.

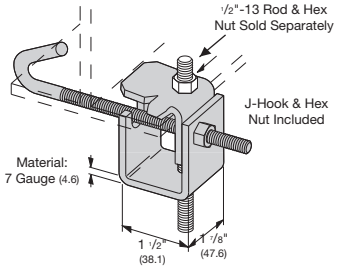


Cat. No.	Flange Width
B312-6	Up to 6"
B312-9	6" - 9"
B312-12	9" - 12"

Beam Clamp

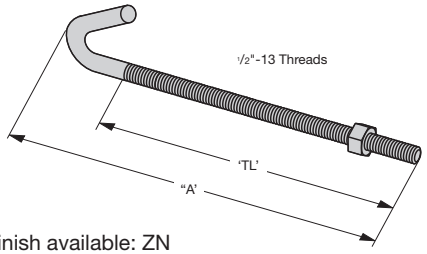
Catalog No.	For Flange Width		Wt./C	
	in.	mm	lbs	kg
B750-J4	3"- 6"	76.2 - 152.4	109	49.4
B750-J6	5"- 9"	127.0 - 288.6	124	56.2
B750-J9	8"- 12"	203.2 - 304.8	135	61.2
B750-J12	11"- 15"	279.4 - 381.0	147	66.7

- Finish available: ZN
- Design Load 500 lbs. (2.22 kN)
- Safety Load Factor 5.0
- Recommended torque: 'J'-Hook Nut 125 In.-Lbs. (14.1 kN/m)
- Maximum flange thickness of 3/4"



Beam Clamp

Catalog No.	'A'		Thread Length 'TL'		Wt./C	
	in.	mm	in.	mm	lbs	kg
B700-J4	8 1/2"	215.9	5"	127.0	44	19.9
B700-J6	11 1/2"	292.1	6"	152.4	53	24.0
B700-J9	12 1/4"	368.3	6"	152.4	63	28.6
B700-J12	17 1/2"	444.5	6"	152.4	78	35.4

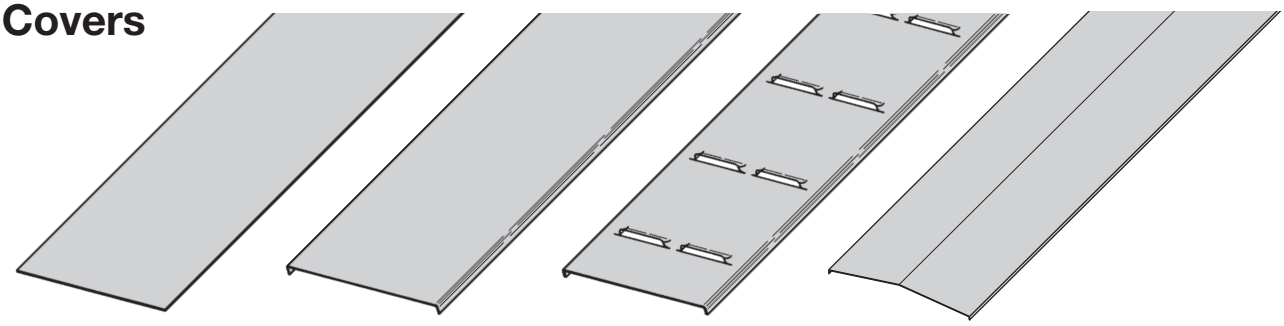


- Finish available: ZN
- Hex Nut included.

Aluminum

Dimensions in parentheses are in millimeters unless otherwise specified.

Covers



Solid Non-Flanged | Solid Flanged | Ventilated Flanged | Peaked Flanged

A full range of covers is available for straight sections and fittings.

Solid covers should be used when maximum enclosure of the cable is desired and no accumulation of heat is expected. **Ventilated covers** provide an overhead cable shield, yet allow heat to escape.

B-Line recommends that covers be placed on vertical cable ladder runs to a height of 6 ft. (1.83 m) to 8 ft. (2.44 m) above the floor to isolate both cables and personnel. **Flanged covers** have a 1/2 in. (13 mm) flange. Cover clamps are not included with the cover and must be ordered separately. All **peaked covers** are flanged. Standard peaked covers have 1/2" peak.

Aluminum Cover Part Numbering

Prefix

Example: **80 7 A 40 - 24 - 144**

Cover Type	Detail	Material	Material Thickness	Ladder Width	Item Description
80 = Solid	6 = Non-Flanged (80 & 81 type only)	A = Aluminum	40 = .040 Aluminum All except 2 to 3 pitch	06 = 6"	For Straight Section Cover:
81 = Ventilated	7 = Flange			09 = 9"	144 = 12 ft. (3.66 m)
82 = Peaked				12 = 12"	120 = 10 ft. (3.05 m)
				18 = 18"	72 = 6 ft. (1.83 m)
				24 = 24"	60 = 5 ft. (1.52 m)
				30 = 30"	For fitting covers: Insert suffix of fitting to be covered.
				36 = 36"	
				See example below.	

Covers 30" and 36" wide have reinforcing ridges.

Examples of Catalog Numbers for Fitting Covers:

Horizontal Bend Cover

Prefix / Suffix

80 7 A 40 - 18 - 90 HB 24

- 24 — Radius
- HB — Fitting
- 90 — Angle
- 18 — Width
- 40 — Material Thickness
- A — Material
- 7 — Detail
- 80 — Cover Type

Vertical Bend Cover

Prefix / Suffix

80 7 A 40 - 24 - 90 VO 24 - 4*

- 4* — Side Rail* Height
- 24 — Radius
- VO — Fitting
- 90 — Angle
- 24 — Width
- 40 — Material Thickness
- A — Material
- 7 — Detail
- 80 — Cover Type

* Required for VO fittings only

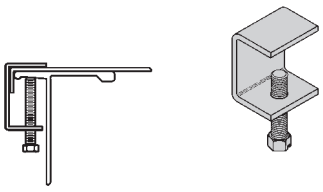
Aluminum

Dimensions in parentheses are in millimeters unless otherwise specified.

Series 2, 3, 4, & 5 Aluminum Cable Ladder

Standard Cover Clamp

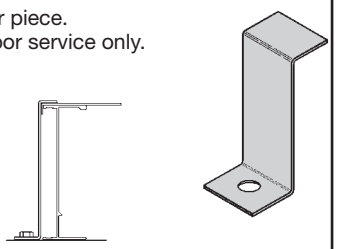
- For indoor service only.
- Setscrew included.
- Sold per piece.



Ladder Type	Side Rail Height	Catalog No.
Aluminum	All Sizes	9ZN-9012
		9A-9012

Combination Cover and Hold Down Clamp

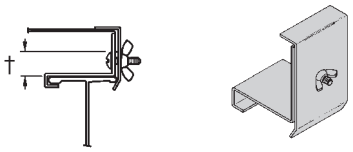
- Sold per piece.
- For indoor service only.



Ladder Type	Side Rail Height in.	Side Rail Height mm	Catalog No.
Aluminum	4	101	9P-9043
	5	127	9P-9053
	6	152	9P-9063
	7	178	9P-9073

Raised Cover Clamp

- For indoor service only.
- For use with flanged covers only.

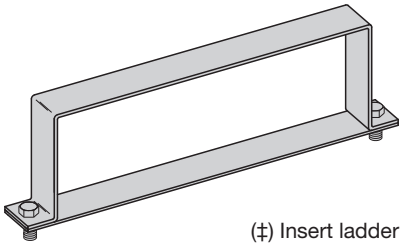


† Specify gap of 1", 2", 3" or 4".

Ladder Type	Side Rail Height	Catalog No.
Aluminum	4" & 5" Deep	9ZN-9112-†
	6" & 7" Deep	9ZN-9113-†

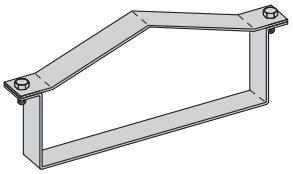
Heavy Duty Cover Clamp

- Recommended for outdoor service.



(‡) Insert ladder width
† Add P to Catalog No. for peaked cover clamp.

Peaked Cover Clamp



Side Rail Height in.	Side Rail Height mm	Catalog No.
4	101	9A-(‡)-9044†
5	127	9A-(‡)-9054†
6	152	9A-(‡)-9064†
7	178	9A-(‡)-9074†

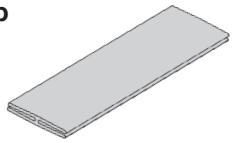
Quantity of Standard Cover Clamps Required

Straight Section 60" or 72" .....4 pcs.
Straight Section 120" or 144" .....6 pcs.
Horizontal/Vertical Bends.....4 pcs.
Tees.....6 pcs.
Crosses.....8 pcs.

Note: When using the Heavy Duty Cover Clamp, only one-half the number of clamps stated above is required.

Cover Joint Strip

- Used to join covers
- Plastic
- (‡) Insert ladder width

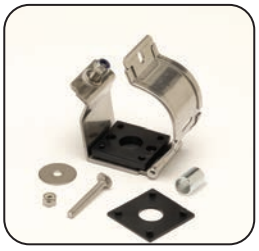


Catalog No.	99-9980-(‡)

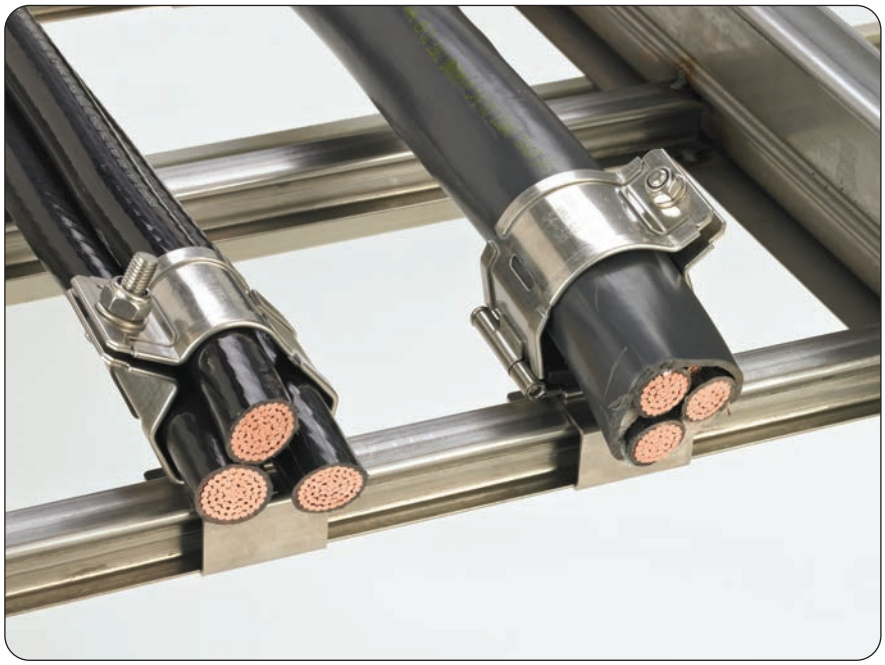
Cable Cleats

(see pages CC-1 thru CC-5)

Trefoil Cable Cleats



Single Cable Cleats



Section 1- Acceptable Manufacturers

1.01 Manufacturer: Subject to compliance with these specifications, cable ladder systems shall be as manufactured by B-Line.

Section 2- Cable Ladder Sections and Components

2.01 General: Except as otherwise indicated, provide metal cable ladders, of types, classes and sizes indicated; with splice plates, bolts, nuts and washers for connecting units. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additional construction features. Cable ladder shall be installed according to the latest revision of NEMA VE 2.

2.02 Materials and Finish: Straight section and fitting side rails and rungs shall be extruded from Aluminum Association Alloy 6063. All fabricated parts shall be made from Aluminum Association Alloy 5052.

2.03 Ladder Cable Ladders shall consist of two longitudinal members (side rails) with transverse members (rungs) welded to the side rails. Rungs shall be spaced [6] [9] [12] inches on center. Rung spacing in radiused fittings shall be industry standard 9" and measured at the center of the ladder's width. Each rung must be capable of supporting a 200 lb. concentrated load at the center of the cable ladder over and above the cable load with a safety factor of 1.5.

2.04 Ventilated Trough Cable Ladders shall consist of two longitudinal members (side rails) with a corrugated bottom welded to the side rails or rungs spaced 4" on center. The peaks of the corrugated bottom shall have a minimum flat cable bearing surface of $2^{3}/_{4}$" and shall be spaced on 6" centers. To provide ventilation in the ladder, the valleys of the corrugated bottom shall have $2^{1}/_{4}$" x 4" rectangular holes punched along the width of the bottom.

2.05 Non-Ventilated Bottom Trough Cable Ladders shall consist of two longitudinal members (side rails) with

a corrugated bottom welded to the side rails or a solid sheet over rungs. The peaks of the corrugated bottom shall have a minimum flat cable bearing surface of $2^{3}/_{4}$" and shall be spaced on 6" centers.

2.06 Cable ladder loading depth shall be [3] [4] [5] [6] inches per NEMA VE 1.

2.07 Straight sections shall have side rails fabricated as I-beams. Straight sections shall be supplied in standard [12 foot] [24 foot] [10 foot (3 m)] [20 foot (6 m)] lengths.

2.08 Cable ladder widths shall be [6] [9] [12] [18] [24] [30] [36] inches or as shown on drawings.

2.09 Splice plates shall be the Wedge-Lock design with 4 nuts and bolts per plate. The resistance of fixed splice connections between an adjacent section of ladder shall not exceed 0.00033 ohm.

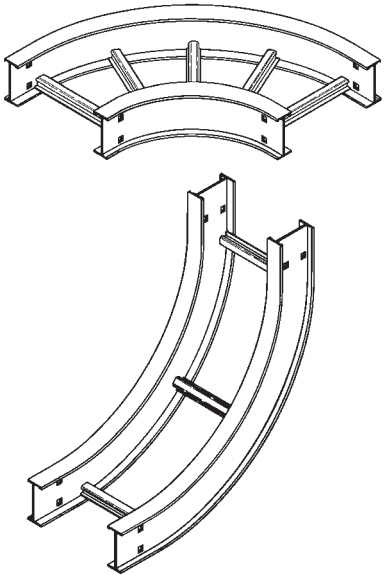
2.10 All fittings must have a minimum radius of [12] [24] [36] [48] inches.

Section 3- Loading Capacities and Testing

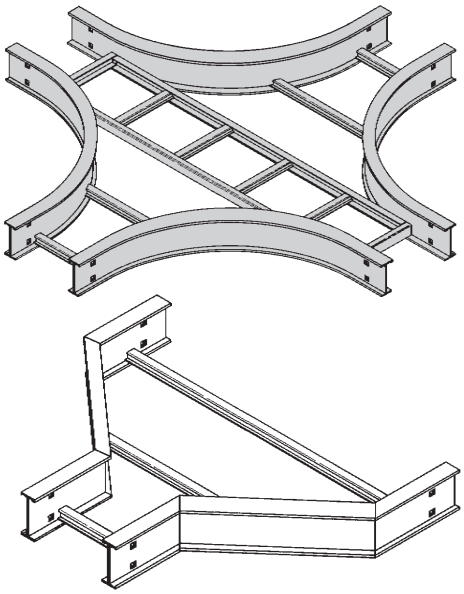
3.01 Cable ladder shall be capable of carrying a uniformly distributed load of _____ lbs./ft. on a _____ ft. support span with a safety factor of 1.5 when supported as a simple span and tested per NEMA VE 1 5.2. In addition to the uniformly distributed load the cable ladder shall support 200 lbs. concentrated load at mid-point of span. Load and safety factors specified are applicable to both the side rails and rung capacities. Cable ladder shall be made to manufacturing tolerances as specified by NEMA.

3.02 Upon request, manufacturer shall provide test reports in accordance with the latest revision of NEMA VE 1 or CSA C22.2 No. 126.

Series 2, 3, 4, & 5 Aluminum Cable Ladder



Fittings engineered with 3” tangents for splicing integrity.



Fittings Part Numbering

Prefix

Example: **4 A - 24 - 90 HB 24**

(9" rung spacing is standard)

Side Rail Height
4 = 4" (101)
5 = 5" (127)
6 = 6" (152)
7 = 7" (178)

Material
A= Aluminum

Width
06 = 6" (152)
09 = 9" (228)
12 = 12" (305)
18 = 18" (457)
24 = 24" (609)
30 = 30" (762)
36 = 36" (914)

Angle
30 = 30°
45 = 45°
60 = 60°
90 = 90°

Type
HB = Horizontal Bend
HT = Horizontal Tee
HX = Horizontal Cross
VI = Vertical Inside Bend
VO = Vertical Outside Bend
VT = Vertical Tee
VTU = Vertical Tee, Up
HYR = Horizontal Wye, Right
HYL = Horizontal Wye, Left
CSF = Cable Support Fitting
LR = Left Reducer Fitting
RR = Right Reducer Fitting
SR = Straight Reducer Fitting

Radius
12 = 12" (305)
24 = 24" (609)
36 = 36" (914)
48 = 48" (1219)

For ventilated trough, solid trough, ventilated bottom or solid bottom, add VT, ST, 04 or SB as shown below: Available 6" thru 36"

Prefix
4AVT - 24 - 90HB24
Vented Trough

Prefix
4AST - 24 - 90HB24
Non-Ventilated Trough

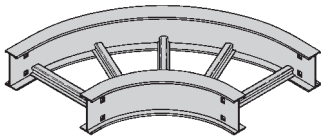
For flat non-ventilated: Available 6" and Wider

Prefix
5ASB - 24 - 90HB24
Non-Ventilated

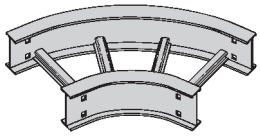
Note: Horizontal crosses and tees 30" or wider, with a radius of 36" or larger, will be of two-piece construction.

Horizontal Bend 90° 60° (HB)

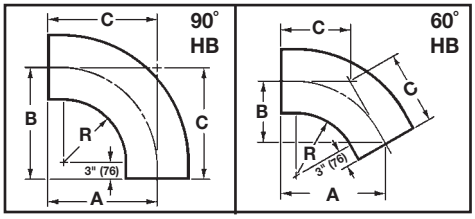
1 pair splice plates with hardware included.



90° Horizontal Bend



60° Horizontal Bend



Bottoms manufactured:
Ladder = 9" Rung Spacing
VT & 04 = 4" Rung Spacing
ST & SB = Flat sheet over 12" Rung Spacing

Bend Radius R		Ladder Width		90° Horizontal Bend Dimensions								60° Horizontal Bend Dimensions							
				Catalog No.	A		B		C			Catalog No.	A		B		C		
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm			in.	mm	in.	mm	in.	mm	
12	305	6	152	(Pre)-06-90HB12	18	457	18	457	18	457		(Pre)-06-60HB12	17 1/2	445	10 1/8	257	11 11/16	297	
		9	228	(Pre)-09-90HB12	19 1/2	495	19 1/2	495	19 1/2	495		(Pre)-09-60HB12	18 13/16	478	10 7/8	276	12 1/2	318	
		12	305	(Pre)-12-90HB12	21	533	21	533	21	533		(Pre)-12-60HB12	20 1/16	510	11 5/8	295	13 3/8	340	
		18	457	(Pre)-18-90HB12	24	610	24	610	24	610		(Pre)-18-60HB12	22 11/16	576	13 1/8	333	15 1/8	384	
		24	609	(Pre)-24-90HB12	27	686	27	686	27	686		(Pre)-24-60HB12	25 5/16	643	14 5/8	372	16 7/8	429	
		30	762	(Pre)-30-90HB12	30	762	30	762	30	762		(Pre)-30-60HB12	27 7/8	708	16 1/8	410	18 9/16	472	
		36	914	(Pre)-36-90HB12	33	838	33	838	33	838		(Pre)-36-60HB12	30 1/2	775	17 5/8	448	20 5/16	516	
		42	1218	(Pre)-42-90HB12	36	914	36	914	36	914		(Pre)-42-60HB12	33 1/16	840	19 1/8	486	22 1/16	560	
24	610	6	152	(Pre)-06-90HB24	30	762	30	762	30	762		(Pre)-06-60HB24	27 7/8	708	16 1/8	410	18 9/16	472	
		9	228	(Pre)-09-90HB24	31 1/2	800	31 1/2	800	31 1/2	800		(Pre)-09-60HB24	29 3/16	741	16 7/8	429	19 7/16	494	
		12	305	(Pre)-12-90HB24	33	838	33	838	33	838		(Pre)-12-60HB24	30 1/2	775	17 5/8	448	20 5/16	516	
		18	457	(Pre)-18-90HB24	36	914	36	914	36	914		(Pre)-18-60HB24	33 1/16	708	19 1/8	486	22 1/16	560	
		24	609	(Pre)-24-90HB24	39	991	39	991	39	991		(Pre)-24-60HB24	35 11/16	907	20 5/8	524	23 13/16	605	
		30	762	(Pre)-30-90HB24	42	1067	42	1067	42	1067		(Pre)-30-60HB24	38 1/4	972	22 1/8	564	25 1/2	648	
		36	914	(Pre)-36-90HB24	45	1143	45	1143	45	1143		(Pre)-36-60HB24	40 7/8	1038	23 5/8	600	27 1/4	692	
		42	1218	(Pre)-42-90HB24	48	1219	48	1219	48	1219		(Pre)-42-60HB24	43 1/2	1105	25 1/8	638	29	737	
36	915	6	152	(Pre)-06-90HB36	42	1067	42	1067	42	1067		(Pre)-06-60HB36	38 1/4	971	22 1/8	562	25 1/2	648	
		9	228	(Pre)-09-90HB36	43 1/2	1105	43 1/2	1105	43 1/2	1105		(Pre)-09-60HB36	39 9/16	1005	22 7/8	581	26 3/8	670	
		12	305	(Pre)-12-90HB36	45	1143	45	1143	45	1143		(Pre)-12-60HB36	40 7/8	1038	23 5/8	600	27 1/4	692	
		18	457	(Pre)-18-90HB36	48	1219	48	1219	48	1219		(Pre)-18-60HB36	43 1/2	1105	25 1/8	638	29	737	
		24	609	(Pre)-24-90HB36	51	1295	51	1295	51	1295		(Pre)-24-60HB36	46 1/16	1170	26 5/8	676	30 11/16	780	
		30	762	(Pre)-30-90HB36	54	1372	54	1375	54	1372		(Pre)-30-60HB36	48 1/16	1237	28 1/8	714	32 7/16	824	
		36	914	(Pre)-36-90HB36	57	1448	57	1488	57	1448		(Pre)-36-60HB36	51 1/4	1302	29 5/8	753	34 3/16	869	
		42	1218	(Pre)-42-90HB36	60	1524	60	1524	60	1524		(Pre)-42-60HB36	53 7/8	1368	31 1/8	791	35 15/16	913	
48	1220	6	152	(Pre)-06-90HB48	54	1372	54	1372	54	1372		(Pre)-06-60HB48	48 1/16	1221	28 1/8	715	32 11/16	830	
		9	228	(Pre)-09-90HB48	55 1/2	1410	55 1/2	1410	55 1/2	1410		(Pre)-09-60HB48	49 15/16	1268	28 7/8	734	33 5/16	846	
		12	305	(Pre)-12-90HB48	57	1448	57	1448	57	1448		(Pre)-12-60HB48	51 1/4	1302	29 5/8	753	34 3/16	868	
		18	457	(Pre)-18-90HB48	60	1524	60	1524	60	1524		(Pre)-18-60HB48	53 7/8	1368	31 1/8	791	35 15/16	913	
		24	609	(Pre)-24-90HB48	63	1600	63	1600	63	1600		(Pre)-24-60HB48	56 7/16	1434	32 5/8	829	37 5/8	956	
		30	762	(Pre)-30-90HB48	66	1676	66	1676	66	1676		(Pre)-30-60HB48	59 1/16	1500	34 1/8	867	39 3/8	1000	
		36	914	(Pre)-36-90HB48	69	1753	69	1753	69	1753		(Pre)-36-60HB48	61 11/16	1567	35 5/8	905	41 1/8	1045	
		42	1218	(Pre)-42-90HB48	72	1829	72	1829	72	1829		(Pre)-42-60HB48	64 1/4	1632	37 1/8	943	42 13/16	1087	

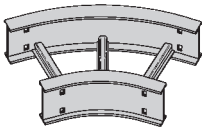
(Pre) See page AL-41 for catalog number prefix.
Width dimensions are to inside wall. For aluminum fittings add 1.5 inches for total outside width.
Manufacturing tolerances apply to all dimensions.

Dimensions in parentheses are in millimeters unless otherwise specified.

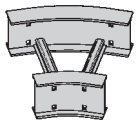
Horizontal Bend 45° 30° (HB)

1 pair splice plates with hardware included.

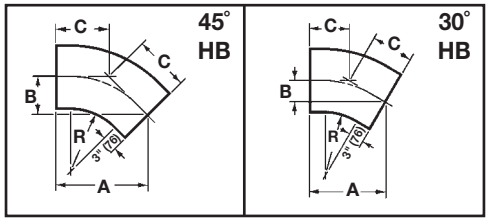
Bottoms manufactured:
Ladder = 9" Rung Spacing
VT & 04 = 4" Rung Spacing
ST & SB = Flat sheet over 12" Rung Spacing



45° Horizontal Bend



30° Horizontal Bend

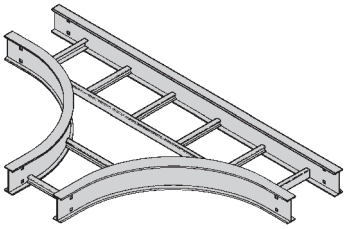


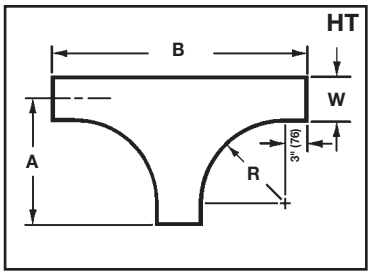
Bend Radius R		Ladder Width		45° Horizontal Bend Dimensions								30° Horizontal Bend Dimensions							
				Catalog No.	A		B		C			Catalog No.	A		B		C		
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm			in.	mm	in.	mm	in.	mm	
12	305	6	152	(Pre)-06-45HB12	15 3/4	400	6 1/2	165	9 3/16	233		(Pre)-06-30HB12	13 1/8	333	3 1/2	89	7	179	
		9	228	(Pre)-09-45HB12	16 13/16	427	6 15/16	176	9 13/16	249		(Pre)-09-30HB12	13 7/8	352	3 11/16	94	7 7/16	189	
		12	305	(Pre)-12-45HB12	17 7/8	454	7 3/8	187	10 7/16	265		(Pre)-12-30HB12	14 5/8	372	3 15/16	100	7 13/16	198	
		18	457	(Pre)-18-45HB12	20	508	8 1/4	210	11 11/16	297		(Pre)-18-30HB12	16 1/8	410	4 5/16	135	8 5/8	219	
		24	609	(Pre)-24-45HB12	22 1/16	560	9 1/8	232	12 15/16	329		(Pre)-24-30HB12	17 5/8	448	4 11/16	119	9 7/16	240	
		30	762	(Pre)-30-45HB12	24 3/16	614	10	254	14 3/16	360		(Pre)-30-30HB12	19 1/8	486	5 1/8	130	10 1/4	260	
		36	914	(Pre)-36-45HB12	26 5/16	668	10 15/16	278	15 7/16	392		(Pre)-36-30HB12	20 5/8	524	5 1/2	140	11 1/16	281	
		42	1218	(Pre)-42-45HB12	28 7/16	722	11 13/16	300	16 11/16	424		(Pre)-42-30HB12	22 1/8	562	5 15/16	151	11 13/16	300	
24	610	6	152	(Pre)-06-45HB24	24 3/16	614	10	254	14 3/16	360		(Pre)-06-30HB24	19 1/8	486	5 1/8	130	10 1/4	260	
		9	228	(Pre)-09-45HB24	25 1/4	641	10 1/2	267	14 13/16	376		(Pre)-09-30HB24	19 7/8	505	5 5/16	135	10 5/8	270	
		12	305	(Pre)-12-45HB24	26 5/16	668	10 15/16	278	15 7/16	392		(Pre)-12-30HB24	20 5/8	524	5 1/2	140	11 1/16	281	
		18	457	(Pre)-18-45HB24	28 7/16	722	11 13/16	300	16 11/16	424		(Pre)-18-30HB24	22 1/8	562	5 15/16	151	11 13/16	300	
		24	609	(Pre)-24-45HB24	30 9/16	766	12 11/16	322	17 15/16	456		(Pre)-24-30HB24	23 5/8	600	6 5/16	160	12 5/8	321	
		30	762	(Pre)-30-45HB24	32 11/16	830	13 9/16	344	19 1/8	486		(Pre)-30-30HB24	25 1/8	638	6 3/4	172	13 7/16	341	
		36	914	(Pre)-36-45HB24	34 13/16	884	14 7/16	367	20 3/8	518		(Pre)-36-30HB24	26 5/8	676	7 1/8	181	14 1/4	362	
		42	1218	(Pre)-42-45HB24	36 15/16	938	15 5/16	389	21 5/8	549		(Pre)-42-30HB24	28 1/8	715	7 1/2	191	15 1/16	383	
36	915	6	152	(Pre)-06-45HB36	32 11/16	830	13 9/16	344	19 1/8	486		(Pre)-06-30HB36	25 1/8	638	6 3/4	171	13 7/16	341	
		9	228	(Pre)-09-45HB36	33 3/4	857	14	356	19 3/4	502		(Pre)-09-30HB36	25 7/8	657	6 15/16	176	13 7/8	352	
		12	305	(Pre)-12-45HB36	34 13/16	884	14 7/16	367	20 3/8	518		(Pre)-12-30HB36	26 5/8	676	7 1/8	181	14 1/4	362	
		18	457	(Pre)-18-45HB36	36 15/16	938	15 5/16	389	21 5/8	549		(Pre)-18-30HB36	28 1/8	114	7 1/2	191	15 1/16	383	
		24	609	(Pre)-24-45HB36	39 1/6	992	16 3/16	411	22 7/8	581		(Pre)-24-30HB36	29 5/8	753	7 15/16	202	15 7/8	403	
		30	762	(Pre)-30-45HB36	41 3/16	1046	17 1/16	433	24 1/8	613		(Pre)-30-30HB36	31 1/8	790	8 5/16	211	16 11/16	424	
		36	914	(Pre)-36-45HB36	43 5/16	1100	17 15/16	456	25 3/8	645		(Pre)-36-30HB36	32 5/8	829	8 3/4	222	17 1/2	445	
		42	1218	(Pre)-42-45HB36	45 7/16	1154	18 13/16	478	26 5/8	676		(Pre)-42-30HB36	34 1/8	867	9 1/8	232	18 1/4	464	
48	1220	6	152	(Pre)-06-45HB48	41 3/16	1046	17 1/16	433	24 1/8	613		(Pre)-06-30HB48	31 1/8	791	8 5/16	211	16 11/16	424	
		9	228	(Pre)-09-45HB48	42 1/4	1073	17 1/2	445	24 3/4	629		(Pre)-09-30HB48	31 7/8	810	8 9/16	218	17 1/16	433	
		12	305	(Pre)-12-45HB48	43 5/16	1100	17 15/16	456	25 3/8	645		(Pre)-12-30HB48	32 5/8	829	8 3/4	222	17 1/2	445	
		18	457	(Pre)-18-45HB48	45 7/16	1154	18 13/16	487	26 5/8	676		(Pre)-18-30HB48	34 1/8	867	9 1/8	232	18 1/4	464	
		24	609	(Pre)-24-45HB48	47 9/16	1208	19 11/16	500	27 7/8	708		(Pre)-24-30HB48	35 5/8	905	9 9/16	243	19 1/16	484	
		30	762	(Pre)-30-45HB48	49 11/16	1262	20 9/16	522	29 1/8	740		(Pre)-30-30HB48	37 1/8	943	9 15/16	252	19 7/8	505	
		36	914	(Pre)-36-45HB48	51 13/16	1316	21 7/16	545	30 5/16	770		(Pre)-36-30HB48	38 5/8	981	10 5/16	262	20 11/16	525	
		42	1218	(Pre)-42-45HB48	54 15/16	1395	22 5/16	567	31 9/16	802		(Pre)-42-30HB48	40 1/8	1019	10 3/4	273	21 1/2	546	

(Pre) See page AL-41 for catalog number prefix.
Width dimensions are to inside wall. For aluminum fittings add 1.5 inches for total outside width.
Manufacturing tolerances apply to all dimensions.

Horizontal Tee (HT)

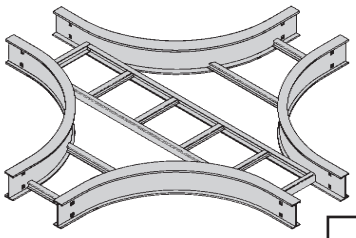
2 pair splice plates with hardware included.

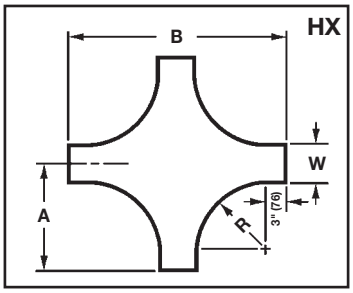




Horizontal Cross (HX)

3 pair splice plates with hardware included.





Bend Radius R		Ladder Width		Horizontal Tee					Horizontal Cross				
				Catalog Number	Dimensions A		Dimensions B		Catalog Number	Dimensions A		Dimensions B	
in.	mm	in.	mm		in.	mm	in.	mm		in.	mm	in.	mm
12	305	6	152	(Prefix)-06-HT12	18	457	36	914	(Prefix)-06-HX12	18	457	36	914
		9	229	(Prefix)-09-HT12	19 1/2	496	39	991	(Prefix)-09-HX12	19 1/2	496	39	991
		12	305	(Prefix)-12-HT12	21	533	42	1067	(Prefix)-12-HX12	21	533	42	1067
		18	457	(Prefix)-18-HT12	24	609	48	1219	(Prefix)-18-HX12	24	609	48	1219
		24	609	(Prefix)-24-HT12	27	686	54	1372	(Prefix)-24-HX12	27	686	54	1372
		30	762	(Prefix)-30-HT12	30	762	60	1524	(Prefix)-30-HX12	30	762	60	1524
		36	914	(Prefix)-36-HT12	33	838	66	1676	(Prefix)-36-HX12	33	838	66	1676
		42	1067	(Prefix)-42-HT12	36	914	72	1829	(Prefix)-42-HX12	36	914	72	1829
24	610	6	152	(Prefix)-06-HT24	30	762	60	1542	(Prefix)-06-HX24	30	762	60	1524
		9	229	(Prefix)-09-HT24	31 1/2	800	63	1600	(Prefix)-09-HX24	31 1/2	800	63	1600
		12	305	(Prefix)-12-HT24	33	838	66	1676	(Prefix)-12-HX24	33	838	66	1676
		18	457	(Prefix)-18-HT24	36	914	72	1828	(Prefix)-18-HX24	36	914	72	1828
		24	609	(Prefix)-24-HT24	39	991	78	1982	(Prefix)-24-HX24	39	991	78	1982
		30	762	(Prefix)-30-HT24	42	1067	84	2134	(Prefix)-30-HX24	42	1067	84	2134
		36	914	(Prefix)-36-HT24	45	1143	90	2286	(Prefix)-36-HX24	45	1143	90	2286
		42	1067	(Prefix)-42-HT24	48	1219	96	2438	(Prefix)-42-HX24	48	1219	96	2438
36	915	6	152	(Prefix)-06-HT36	42	1067	84	2134	(Prefix)-06-HX36	42	1067	84	2134
		9	229	(Prefix)-09-HT36	43 1/2	1105	87	2210	(Prefix)-09-HX36	43 1/2	1105	87	2210
		12	305	(Prefix)-12-HT36	45	1143	90	2286	(Prefix)-12-HX36	45	1143	90	2286
		18	457	(Prefix)-18-HT36	48	1219	96	2438	(Prefix)-18-HX36	48	1219	96	2438
		24	609	(Prefix)-24-HT36	51	1295	102	2590	(Prefix)-24-HX36	51	1295	102	2590
		30	762	(Prefix)-30-HT36	54	1372	108	2744	(Prefix)-30-HX36	54	1372	108	2744
		36	914	(Prefix)-36-HT36	57	1488	114	2896	(Prefix)-36-HX36	57	1448	114	2896
		42	1067	(Prefix)-42-HT36	60	1524	120	3048	(Prefix)-42-HX36	60	1524	120	3048
48	1220	6	152	(Prefix)-06-HT48	54	1372	108	2743	(Prefix)-06-HX48	54	1372	108	2743
		9	229	(Prefix)-09-HT48	55 1/2	1410	111	2820	(Prefix)-09-HX48	55 1/2	1410	111	2820
		12	305	(Prefix)-12-HT48	57	1448	114	2896	(Prefix)-12-HX48	57	1448	114	2896
		18	457	(Prefix)-18-HT48	60	1524	120	3048	(Prefix)-18-HX48	60	1524	120	3048
		24	609	(Prefix)-24-HT48	63	1600	126	3200	(Prefix)-24-HX48	63	1600	126	3200
		30	762	(Prefix)-30-HT48	66	1676	132	3353	(Prefix)-30-HX48	66	1676	132	3353
		36	914	(Prefix)-36-HT48	69	1753	138	3535	(Prefix)-36-HX48	69	1753	138	3505
		42	1067	(Prefix)-42-HT48	72	1829	144	3658	(Prefix)-42-HX48	72	1829	144	3658

(Prefix) See page AL-41 for catalog number prefix.
Width dimensions are to inside wall. For aluminum fittings add 1.5 inches for total outside width.
Manufacturing tolerances apply to all dimensions.

Dimensions in parentheses are in millimeters unless otherwise specified.

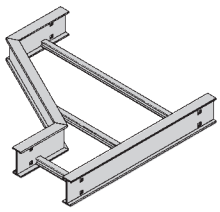
Reducers (LR, SR, RR)

1 pair splice plates with hardware included.

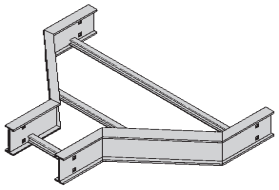
Reducer Part Numbering

Prefix - 24 - RR - 18

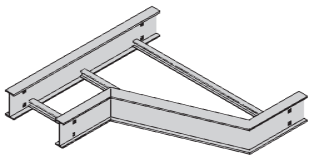
- 18 — $Width_2$
- RR — Fitting
- 24 — $Width_1$
- Prefix



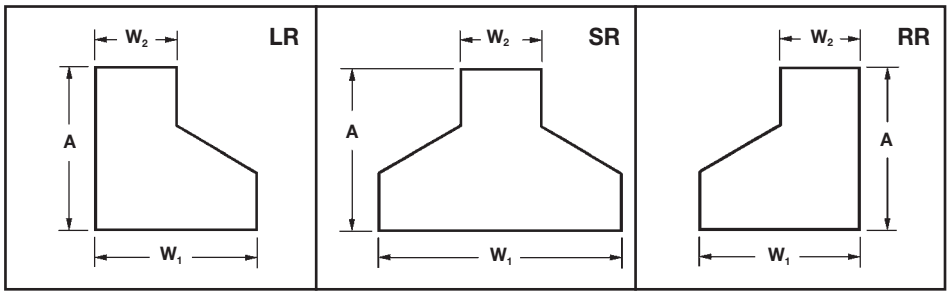
Left Reducer



Straight Reducer



Right Reducer

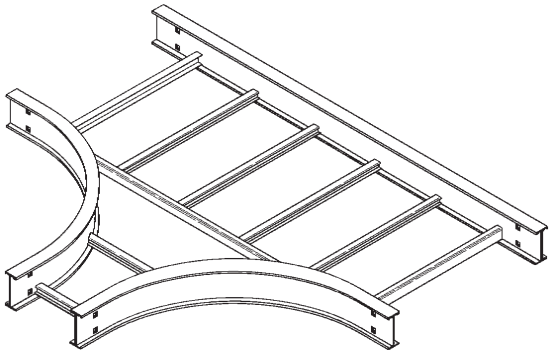


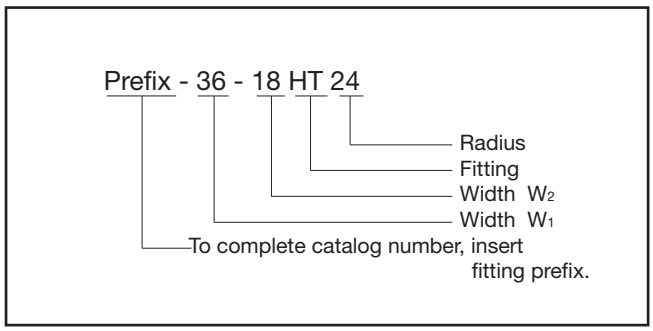
Ladder Width				Left Hand Reducer			Straight Reducer			Right Hand Reducer		
W1		W2		Catalog No.	A		Catalog No.	A		Catalog No.	A	
in.	mm	in.	mm		in.	mm		in.	mm		in.	mm
9	228	6	152	(Prefix)-09-LR06	9 3/4	248	(Prefix)-09-SR06	8 7/8	225	(Prefix)-09-RR06	9 3/4	248
12	305	6	152	(Prefix)-12-LR06	11 1/2	292	(Prefix)-12-SR06	9 3/4	248	(Prefix)-12-RR06	11 1/2	292
		9	228	(Prefix)-12-LR09	9 3/4	248	(Prefix)-12-SR09	8 7/8	225	(Prefix)-12-RR09	9 3/4	248
18	457	6	152	(Prefix)-18-LR06	14 15/16	379	(Prefix)-18-SR06	11 1/2	292	(Prefix)-18-RR06	14 15/16	379
		9	228	(Prefix)-18-LR09	13 3/16	340	(Prefix)-18-SR09	10 5/8	270	(Prefix)-18-RR09	13 3/16	340
		12	305	(Prefix)-18-LR12	11 1/2	292	(Prefix)-18-SR12	9 3/4	248	(Prefix)-18-RR12	11 1/2	292
24	609	6	152	(Prefix)-24-LR06	18 3/8	467	(Prefix)-24-SR06	13 3/16	340	(Prefix)-24-RR06	18 3/8	467
		9	228	(Prefix)-24-LR09	16 11/16	424	(Prefix)-24-SR09	12 3/8	314	(Prefix)-24-RR09	16 11/16	424
		12	305	(Prefix)-24-LR12	14 15/16	379	(Prefix)-24-SR12	11 1/2	292	(Prefix)-24-RR12	14 15/16	379
		18	457	(Prefix)-24-LR18	11 1/2	292	(Prefix)-24-SR18	9 3/4	248	(Prefix)-24-RR18	11 1/2	292
30	762	6	152	(Prefix)-30-LR06	21 7/8	555	(Prefix)-30-SR06	14 15/16	380	(Prefix)-30-RR06	21 7/8	555
		9	228	(Prefix)-30-LR09	20 1/8	511	(Prefix)-30-SR09	14 1/16	358	(Prefix)-30-RR09	20 1/8	511
		12	305	(Prefix)-30-LR12	18 3/8	462	(Prefix)-30-SR12	13 3/16	335	(Prefix)-30-RR12	18 3/8	462
		18	459	(Prefix)-30-LR18	14 15/16	380	(Prefix)-30-SR18	11 1/2	292	(Prefix)-30-RR18	14 15/16	380
		24	609	(Prefix)-30-LR24	11 1/2	292	(Prefix)-30-SR24	9 3/4	248	(Prefix)-30-RR24	11 1/2	292
36	914	6	152	(Prefix)-36-LR06	25 5/16	643	(Prefix)-36-SR06	16 11/16	424	(Prefix)-36-RR06	23 5/16	643
		9	228	(Prefix)-36-LR09	23 9/16	598	(Prefix)-36-SR09	15 13/16	402	(Prefix)-36-RR09	23 9/16	598
		12	305	(Prefix)-36-LR12	21 7/8	555	(Prefix)-36-SR12	14 15/16	380	(Prefix)-36-RR12	21 7/8	555
		18	457	(Prefix)-36-LR18	18 3/8	462	(Prefix)-36-SR18	13 3/16	335	(Prefix)-36-RR18	18 3/8	462
		24	609	(Prefix)-36-LR24	14 15/16	380	(Prefix)-36-SR24	11 1/2	292	(Prefix)-36-RR24	14 15/16	380
		30	762	(Prefix)-36-LR30	11 1/2	292	(Prefix)-36-SR30	9 3/4	248	(Prefix)-36-RR30	11 1/2	292
42	1067	6	152	(Prefix)-42-LR06	28 3/4	730	(Prefix)-42-SR06	18 3/8	467	(Prefix)-42-RR06	28 3/4	732
		9	228	(Prefix)-42-LR09	27 1/16	687	(Prefix)-42-SR09	17 1/2	445	(Prefix)-42-RR09	27 1/16	687
		12	305	(Prefix)-42-LR12	25 5/16	643	(Prefix)-42-SR12	16 11/16	424	(Prefix)-42-RR12	25 15/16	643
		18	457	(Prefix)-42-LR18	21 7/8	556	(Prefix)-42-SR18	14 15/16	379	(Prefix)-42-RR18	21 7/8	556
		24	609	(Prefix)-42-LR24	18 3/8	467	(Prefix)-42-SR24	13 3/16	335	(Prefix)-42-RR24	18 3/8	467
		30	762	(Prefix)-42-LR30	14 15/16	379	(Prefix)-42-SR30	11 1/2	292	(Prefix)-42-RR30	14 15/16	379
		36	914	(Prefix)-42-LR36	11 1/2	292	(Prefix)-42-SR36	9 3/4	249	(Prefix)-42-RR36	11 1/2	292

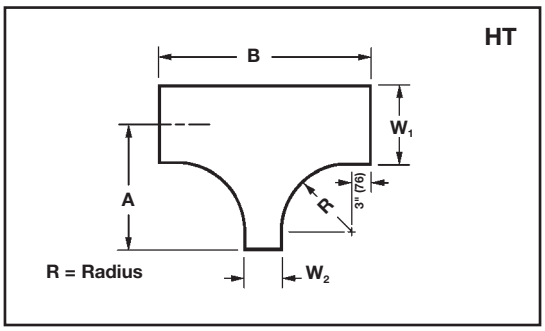
(Prefix) See page AL-41 for catalog number prefix.
Width dimensions are to inside wall. For aluminum fittings add 1.5 inches for total outside width.
Manufacturing tolerances apply to all dimensions.

Horizontal Reducing Tee (HT)

2 pair splice plates with hardware included.







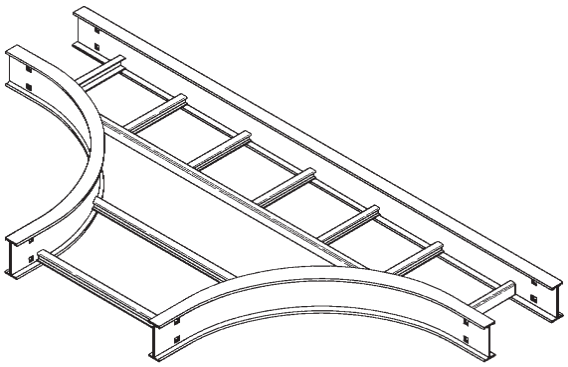
Ladder Width				* Insert Radius (12", 24", 36", or 48") Catalog No.	12" Radius				24" Radius				36" Radius				48" Radius			
W1		W2			A		B		A		B		A		B		A		B	
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
9	228	6	152	(Prefix)-09-06-HT*	19 1/2	496	36	914	31 1/2	800	60	1524	43	1092	84	2134	55 1/2	1410	108	2743
12	305	6	152	(Prefix)-12-06-HT*	21	533	36	914	33	838	60	1524	45	1143	84	2134	57	1448	108	2743
		9	228	(Prefix)-12-09-HT*	21	533	39	991	33	838	63	1600	45	1143	87	2210	57	1448	111	2819
18	475	6	152	(Prefix)-18-06-HT*	24	609	36	914	36	914	60	1524	48	1219	84	2134	60	1524	108	2743
		9	228	(Prefix)-18-09-HT*	24	609	39	991	36	914	63	1600	48	1219	87	2210	60	1524	111	2819
		12	305	(Prefix)-18-12-HT*	24	609	42	1067	36	914	66	1676	48	1219	90	2286	60	1524	114	2496
24	609	6	152	(Prefix)-24-06-HT*	27	686	36	914	39	991	60	1524	51	1295	84	2134	63	1600	108	2743
		9	228	(Prefix)-24-09-HT*	27	686	39	991	39	991	63	1600	51	1295	87	2210	63	1600	111	2819
		12	305	(Prefix)-24-12-HT*	27	686	42	1067	39	991	66	1676	51	1295	90	2286	63	1600	114	2496
		18	457	(Prefix)-24-18-HT*	27	686	48	1219	39	991	72	1829	51	1295	96	2438	63	1600	120	3048
30	762	6	152	(Prefix)-30-06-HT*	30	762	36	914	42	1067	60	1524	54	1372	84	2134	66	1676	108	2743
		9	228	(Prefix)-30-09-HT*	30	762	39	991	42	1067	63	1600	54	1372	87	2210	66	1676	111	2819
		12	305	(Prefix)-30-12-HT*	30	762	42	1067	42	1067	66	1676	54	1372	90	2286	66	1676	114	2496
		18	457	(Prefix)-30-18-HT*	30	762	48	1219	42	1067	72	1829	54	1372	96	2438	66	1676	120	3048
		24	609	(Prefix)-30-24-HT*	30	762	54	1372	42	1067	78	1981	54	1372	102	2591	66	1676	126	3200
36	914	6	152	(Prefix)-36-06-HT*	33	838	36	914	45	1143	60	1524	57	1448	84	2134	69	1753	108	2743
		9	228	(Prefix)-36-09-HT*	33	838	39	991	45	1143	63	1600	57	1448	87	2210	69	1753	111	2819
		12	305	(Prefix)-36-12-HT*	33	838	42	1067	45	1143	66	1676	57	1448	90	2286	69	1753	114	2496
		18	457	(Prefix)-36-18-HT*	33	838	48	1219	45	1143	72	1829	57	1448	96	2438	69	1753	120	3048
		24	609	(Prefix)-36-24-HT*	33	838	54	1372	45	1143	78	1981	57	1448	102	2591	69	1753	126	3200
		30	762	(Prefix)-36-30-HT*	33	838	60	1524	45	1143	84	2134	57	1448	108	2743	69	1753	132	3353
42	1067	6	152	(Prefix)-42-06-HT*	36	914	36	914	48	1219	60	1524	60	1524	84	2134	72	1829	108	2743
		9	228	(Prefix)-42-09-HT*	36	914	39	991	48	1219	63	1600	60	1524	87	2210	72	1829	111	2819
		12	305	(Prefix)-42-12-HT*	36	914	42	1067	48	1219	66	1676	60	1524	90	2286	72	1829	114	2496
		18	457	(Prefix)-42-18-HT*	36	914	48	1219	48	1219	72	1829	60	1524	96	2438	72	1829	120	3048
		24	609	(Prefix)-42-24-HT*	36	914	54	1372	48	1219	78	1981	60	1524	102	2591	72	1829	126	3200
		30	762	(Prefix)-42-30-HT*	36	914	60	1524	48	1219	84	2134	60	1524	108	2743	72	1829	132	3353
		36	914	(Prefix)-42-36-HT*	36	914	66	1676	48	1219	90	2286	60	1524	114	2895	72	1829	138	3505

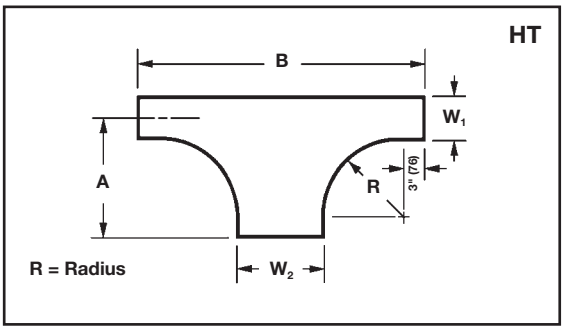
(Prefix) See page AL-41 for catalog number prefix.
Width dimensions are to inside wall. For aluminum fittings add 1.5 inches for total outside width.
Manufacturing tolerances apply to all dimensions.

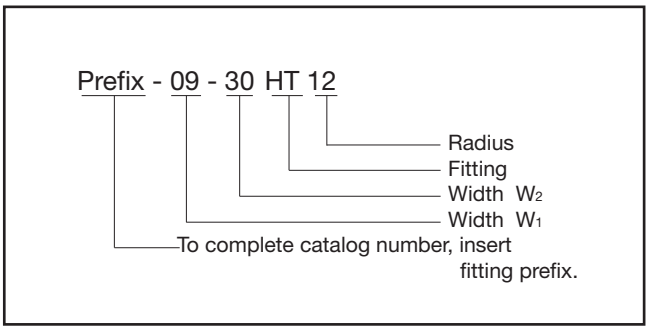
Dimensions in parentheses are in millimeters unless otherwise specified.

Horizontal Expanding Tee (HT)

2 pair splice plates with hardware included.





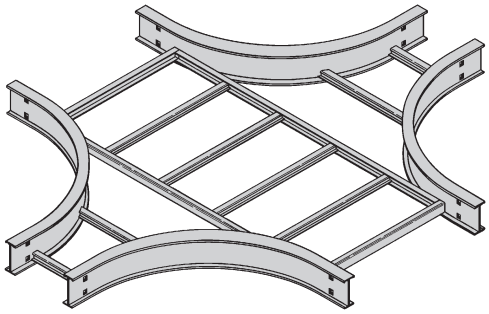


Ladder Width W1 in.	Ladder Width W1 mm	Ladder Width W2 in.	Ladder Width W2 mm	*Insert Radius (12", 24", 36", or 48") Catalog No.	12" Radius A in.	12" Radius A mm	12" Radius B in.	12" Radius B mm	24" Radius A in.	24" Radius A mm	24" Radius B in.	24" Radius B mm	36" Radius A in.	36" Radius A mm	36" Radius B in.	36" Radius B mm	48" Radius A in.	48" Radius A mm	48" Radius B in.	48" Radius B mm
6	152	9	228	(Prefix)-06-09-HT*	18	457	39	991	30	762	63	1600	42	1067	87	2210	54	1372	111	2819
		12	305	(Prefix)-06-12-HT*	18	457	42	1067	30	762	66	1676	42	1067	90	2286	54	1372	114	2496
		18	457	(Prefix)-06-18-HT*	18	457	48	1219	30	762	72	1829	42	1067	96	2438	54	1372	120	3048
		24	609	(Prefix)-06-24-HT*	18	457	54	1372	30	762	78	1981	42	1067	102	2591	54	1372	126	3200
		30	762	(Prefix)-06-30-HT*	18	457	60	1524	30	762	84	2134	42	1067	108	2743	54	1372	132	3353
		36	914	(Prefix)-06-36-HT*	18	457	66	1676	30	762	90	2286	42	1067	114	2895	54	1372	138	3503
		42	1067	(Prefix)-06-42-HT*	18	457	72	1829	30	762	96	2438	42	1067	120	3048	54	1372	144	3658
9	228	12	305	(Prefix)-09-12-HT*	19½	496	42	1067	31½	800	66	1676	43½	1105	90	2286	55½	1410	114	2496
		18	457	(Prefix)-09-18-HT*	19½	496	48	1219	31½	800	72	1829	43½	1105	96	2438	55½	1410	120	3048
		24	609	(Prefix)-09-24-HT*	19½	496	54	1372	31½	800	78	1981	43½	1105	102	2591	55½	1410	126	3200
		30	762	(Prefix)-09-30-HT*	19½	496	60	1524	31½	800	84	2134	43½	1105	108	2743	55½	1410	132	3353
		36	914	(Prefix)-09-36-HT*	19½	496	66	1676	31½	800	90	2286	43½	1105	114	2895	55½	1410	138	3503
		42	1067	(Prefix)-09-42-HT*	19½	496	72	1829	31½	800	96	2438	43½	1105	120	3048	55½	1410	144	3658
12	305	18	457	(Prefix)-12-18-HT*	21	533	48	1219	33	838	72	1829	45	1143	96	2438	57	1448	120	3048
		24	609	(Prefix)-12-24-HT*	21	533	54	1372	33	838	78	1981	45	1143	102	2591	57	1448	126	3200
		30	762	(Prefix)-12-30-HT*	21	533	60	1524	33	838	84	2134	45	1143	108	2743	57	1448	132	3353
		36	914	(Prefix)-12-36-HT*	21	533	66	1676	33	838	90	2286	45	1143	114	2895	57	1448	138	3503
		42	1067	(Prefix)-12-42-HT*	21	533	72	1829	33	838	96	2438	45	1143	120	3048	57	1448	144	3658
18	457	24	609	(Prefix)-18-24-HT*	24	609	54	1372	36	914	78	1981	48	1219	102	2591	60	1524	126	3200
		30	762	(Prefix)-18-30-HT*	24	609	60	1524	36	914	84	2134	48	1219	108	2743	60	1524	132	3353
		36	914	(Prefix)-18-36-HT*	24	609	66	1676	36	914	90	2286	48	1219	114	2895	60	1524	138	3503
		42	1067	(Prefix)-18-42-HT*	24	609	72	1829	36	914	96	2438	48	1219	120	3048	60	1524	144	3658
24	609	30	762	(Prefix)-24-30-HT*	27	686	60	1524	39	991	84	2134	51	1295	108	2743	63	1600	132	3353
		36	914	(Prefix)-24-36-HT*	27	686	66	1676	39	991	90	2286	51	1295	114	2895	63	1600	138	3503
		42	1067	(Prefix)-24-42-HT*	27	686	72	1829	39	991	96	2438	51	1295	120	3048	63	1600	144	3658
30	762	36	914	(Prefix)-30-36-HT*	30	762	66	1676	42	1067	90	2286	54	1372	114	2895	66	1676	138	3503
		42	1067	(Prefix)-30-42-HT*	30	762	72	1829	42	1067	96	2438	54	1372	120	3048	66	1676	144	3658
36	914	42	1067	(Prefix)-36-42-HT*	33	838	72	1829	45	1143	96	2438	57	1448	120	3048	69	1753	144	3658

(Prefix) See page AL-41 for catalog number prefix.
Width dimensions are to inside wall. For aluminum fittings add 1.5 inches for total outside width.
Manufacturing tolerances apply to all dimensions.

Horizontal Expanding/Reducing Cross (HX)

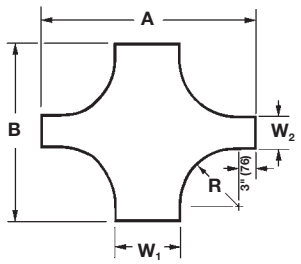
3 pair splice plates with hardware included.



Prefix - 36 - 18 HX 24

- Radius
- Fitting
- Width W_2
- Width W_1
- To complete catalog number, insert fitting prefix.

HX

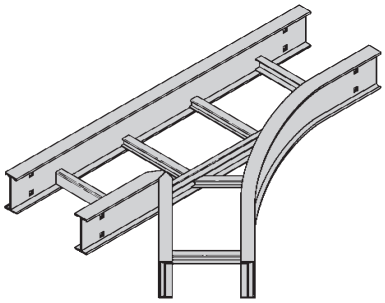


Ladder Width				* Insert Radius (12", 24", 36", or 48")	12" Radius				24" Radius				36" Radius				48" Radius			
W1		W2		Catalog No.	A		B		A		B		A		B		A		B	
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
9	228	6	152	(Prefix)-09-06-HX*	39	991	36	914	63	1600	60	1372	87	2210	84	2134	111	2819	108	2743
12	305	6	152	(Prefix)-12-06-HX*	42	1067	36	914	66	1676	60	1372	90	2286	84	2134	114	2896	108	2743
		9	228	(Prefix)-12-09-HX*	42	1067	39	991	66	1676	63	1600	90	2286	87	2210	114	2896	111	2819
18	457	6	152	(Prefix)-18-06-HX*	48	1219	36	914	72	1829	60	1372	96	2438	84	2134	120	3048	108	2743
		9	228	(Prefix)-18-09-HX*	48	1219	39	991	72	1829	63	1600	96	2438	87	2210	120	3048	111	2819
		12	305	(Prefix)-18-12-HX*	48	1219	42	1067	72	1829	66	1676	96	2438	90	2286	120	3048	114	2896
24	609	6	152	(Prefix)-24-06-HX*	54	1372	36	914	78	1981	60	1372	102	2591	84	2134	126	3200	108	2743
		9	228	(Prefix)-24-09-HX*	54	1372	39	991	78	1981	63	1600	102	2591	87	2210	126	3200	111	2819
		12	305	(Prefix)-24-12-HX*	54	1372	42	1067	78	1981	66	1676	102	2591	90	2286	126	3200	114	2896
		18	457	(Prefix)-24-18-HX*	54	1372	48	1219	78	1981	72	1829	102	2591	96	2438	126	3200	120	3048
30	762	6	152	(Prefix)-30-06-HX*	60	1524	36	914	84	2134	60	1372	108	2743	84	2134	132	3353	108	2743
		9	228	(Prefix)-30-09-HX*	60	1524	39	991	84	2134	63	1600	108	2743	87	2210	132	3353	111	2819
		12	305	(Prefix)-30-12-HX*	60	1524	42	1067	84	2134	66	1676	108	2743	90	2286	132	3353	114	2896
		18	457	(Prefix)-30-18-HX*	60	1524	48	1219	84	2134	72	1829	108	2743	96	2438	132	3353	120	3048
		24	609	(Prefix)-30-24-HX*	60	1524	54	1372	84	2134	78	1981	108	2743	102	2591	132	3353	126	3200
36	914	6	152	(Prefix)-36-06-HX*	66	1676	36	914	90	2286	60	1372	114	2896	84	2134	138	3505	108	2743
		9	228	(Prefix)-36-09-HX*	66	1676	39	991	90	2286	63	1600	114	2896	87	2210	138	3505	111	2819
		12	305	(Prefix)-36-12-HX*	66	1676	42	1067	90	2286	66	1676	114	2896	90	2286	138	3505	114	2896
		18	457	(Prefix)-36-18-HX*	66	1676	48	1219	90	2286	72	1829	114	2896	96	2438	138	3505	120	3048
		24	609	(Prefix)-36-24-HX*	66	1676	54	1372	90	2286	78	1981	114	2896	102	2591	138	3505	126	3200
		30	762	(Prefix)-36-30-HX*	66	1676	60	1524	90	2286	84	2134	114	2896	108	2743	138	3505	132	3353
42	1067	6	152	(Prefix)-42-06-HX*	72	1829	36	914	96	2438	60	1372	120	3048	84	2134	144	3658	108	2743
		9	228	(Prefix)-42-09-HX*	72	1829	39	991	96	2438	63	1600	120	3048	87	2210	144	3658	111	2819
		12	305	(Prefix)-42-12-HX*	72	1829	42	1067	96	2438	66	1676	120	3048	90	2286	144	3658	114	2896
		18	457	(Prefix)-42-18-HX*	72	1829	48	1219	96	2438	72	1829	120	3048	96	2438	144	3658	120	3048
		24	609	(Prefix)-42-24-HX*	72	1829	54	1372	96	2438	78	1981	120	3048	102	2591	144	3658	126	3200
		30	762	(Prefix)-42-30-HX*	72	1829	60	1524	96	2438	84	2134	120	3048	108	2743	144	3658	132	3353
		36	914	(Prefix)-42-36-HX*	72	1829	66	1676	96	2438	90	2286	120	3048	114	2896	144	3658	138	3505

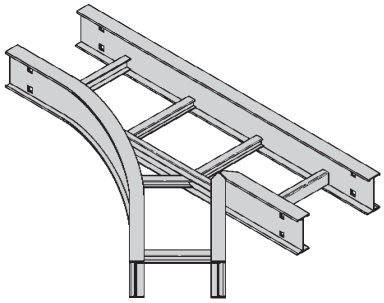
(Prefix) See page AL-41 for catalog number prefix.
Width dimensions are to inside wall. For aluminum fittings add 1.5 inches for total outside width.
Manufacturing tolerances apply to all dimensions.

Horizontal Wye (HYL, HYR)

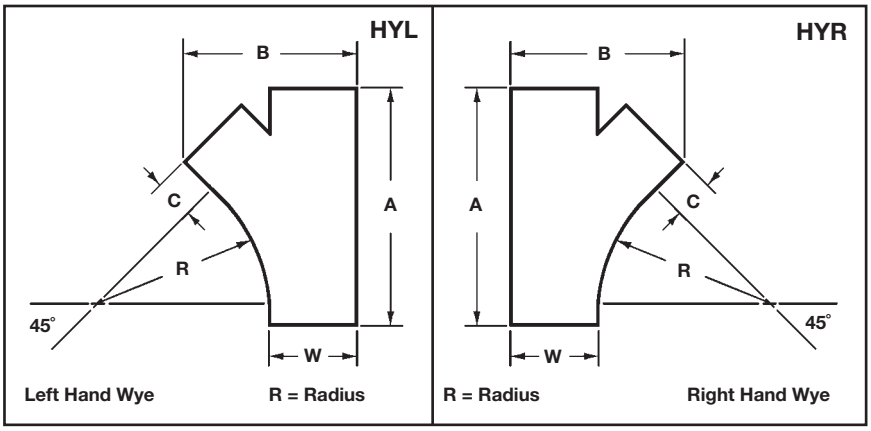
2 pair splice plates with hardware included.



Left Hand Wye



Right Hand Wye

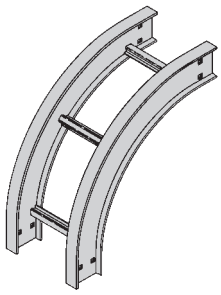


Bend Radius in.	Bend Radius mm	Ladder Width in.	Ladder Width mm	Left Hand Wye Catalog No.	Right Hand Wye Catalog No.	A in.	A mm	B in.	B mm	C in.	C mm
24	609	6	152	(Prefix)-06-HYL	(Prefix)-06-HYR	$28^{7}/_{16}$	722	$15^{3}/_{16}$	386	$3^{1}/_{16}$	77
		9	228	(Prefix)-09-HYL	(Prefix)-09-HYR	$32^{11}/_{16}$	831	$20^{5}/_{16}$	516	$6^{1}/_{16}$	154
		12	305	(Prefix)-12-HYL	(Prefix)-12-HYR	$36^{15}/_{16}$	938	$25^{7}/_{16}$	646	$9^{1}/_{16}$	231
		18	457	(Prefix)-18-HYL	(Prefix)-18-HYR	$45^{3}/_{8}$	1153	$35^{15}/_{16}$	910	$15^{1}/_{16}$	383
		24	609	(Prefix)-24-HYL	(Prefix)-24-HYR	$53^{7}/_{8}$	1368	$45^{15}/_{16}$	1167	$21^{1}/_{16}$	535
		30	762	(Prefix)-30-HYL	(Prefix)-30-HYR	$62^{3}/_{8}$	1585	$56^{3}/_{16}$	1427	$27^{1}/_{16}$	688
		36	914	(Prefix)-36-HYL	(Prefix)-36-HYR	$70^{7}/_{8}$	1800	$66^{7}/_{16}$	1687	$33^{1}/_{16}$	993
		42	1067	(Prefix)-42-HYL	(Prefix)-42-HYR	$79^{3}/_{8}$	2016	$76^{5}/_{8}$	1946	$39^{1}/_{16}$	992

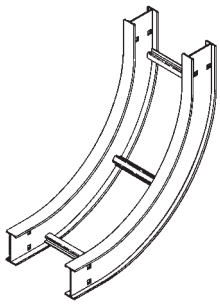
(Prefix) See page AL-41 for catalog number prefix.
Width dimensions are to inside wall. For aluminum fittings add 1.5 inches for total outside width.
Manufacturing tolerances apply to all dimensions.

Vertical Bend 90° (VO, VI)

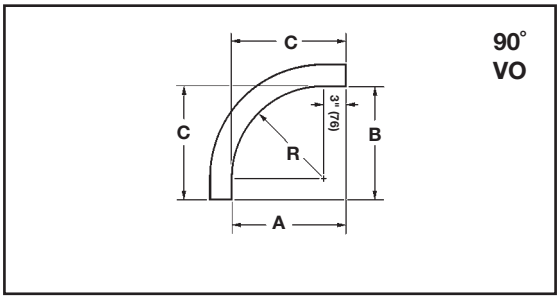
1 pair splice plates with hardware included.

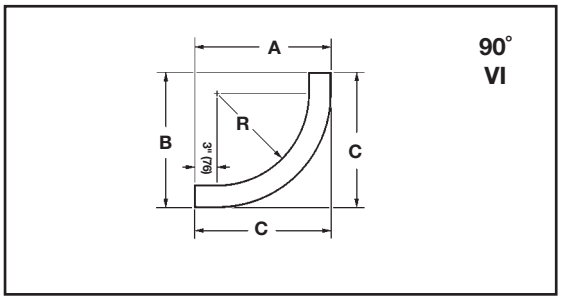


90° Vertical Outside



90° Vertical Inside





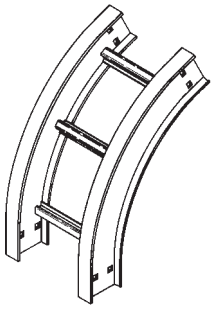
Bend Radius R	Ladder Width		(*) Insert "VO" for Vert. Outside Bend Insert "VI" for Vert. Inside Bend	VO Side Rail Height 4" - 7"			VI Side Rail Height											
							4"			5"			6"			7"		
				A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
in.	in.	mm	Catalog No.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)-06-90(*)12	15 (381)	15 (381)	15 (381)	19 (483)	19 (483)	19 (483)	20 (508)	20 (508)	20 (508)	21 (533)	21 (533)	21 (533)	22 (559)	22 (559)	22 (559)
	9	228	(Prefix)-09-90(*)12															
	12	305	(Prefix)-12-90(*)12															
	18	457	(Prefix)-18-90(*)12															
	24	609	(Prefix)-24-90(*)12															
	30	762	(Prefix)-30-90(*)12															
	36	914	(Prefix)-36-90(*)12															
	42	1067	(Prefix)-42-90(*)12															
24 (609)	6	152	(Prefix)-06-90(*)24	27 (686)	27 (686)	27 (686)	31 (787)	31 (787)	31 (787)	32 (813)	32 (813)	32 (813)	33 (838)	33 (838)	33 (838)	34 (864)	34 (864)	34 (864)
	9	228	(Prefix)-09-90(*)24															
	12	305	(Prefix)-12-90(*)24															
	18	457	(Prefix)-18-90(*)24															
	24	609	(Prefix)-24-90(*)24															
	30	762	(Prefix)-30-90(*)24															
	36	914	(Prefix)-36-90(*)24															
	42	1067	(Prefix)-42-90(*)24															
36 (914)	6	152	(Prefix)-06-90(*)36	39 (991)	39 (991)	39 (991)	43 (1092)	43 (1092)	43 (1092)	44 (1118)	44 (1118)	44 (1118)	45 (1143)	45 (1143)	45 (1143)	46 (1168)	46 (1168)	46 (1168)
	9	228	(Prefix)-09-90(*)36															
	12	305	(Prefix)-12-90(*)36															
	18	457	(Prefix)-18-90(*)36															
	24	609	(Prefix)-24-90(*)36															
	30	762	(Prefix)-30-90(*)36															
	36	914	(Prefix)-36-90(*)36															
	42	1067	(Prefix)-42-90(*)36															
48 (1219)	6	152	(Prefix)-06-90(*)48	51 (1295)	51 (1295)	51 (1295)	55 (1397)	55 (1397)	55 (1397)	56 (1422)	56 (1422)	56 (1422)	57 (1448)	57 (1448)	57 (1448)	58 (1473)	58 (1473)	58 (1473)
	9	228	(Prefix)-09-90(*)48															
	12	305	(Prefix)-12-90(*)48															
	18	457	(Prefix)-18-90(*)48															
	24	609	(Prefix)-24-90(*)48															
	30	762	(Prefix)-30-90(*)48															
	36	914	(Prefix)-36-90(*)48															
	42	1067	(Prefix)-42-90(*)48															

(Prefix) See page AL-41 for catalog number prefix.
Manufacturing tolerances apply to all dimensions.

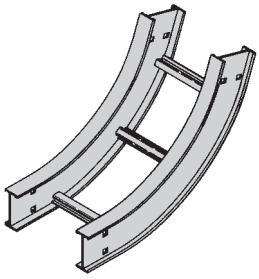
Dimensions in parentheses are in millimeters unless otherwise specified.

Vertical Bend 60° (VO, VI)

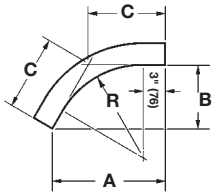
1 pair splice plates with hardware included.



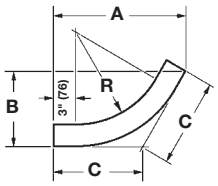
60° Vertical Outside



60° Vertical Inside



60° VO



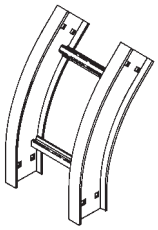
60° VI

Bend Radius R	Ladder Width		(*) Insert "VO" for Vert. Outside Bend Insert "VI" for Vert. Inside Bend	VO Side Rail Height 4" - 7"			VI Side Rail Height											
							4"			5"			6"			7"		
				A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
in.	in.	mm	Catalog No.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)-06-60(*)12	14 7/8 (378)	8 5/8 (219)	9 15/16 (253)	18 3/8 (467)	10 5/8 (270)	12 1/4 (311)	19 1/4 (489	11 1/8 (283)	12 13/16 (326)	20 1/16 (510)	11 5/8 (296)	13 3/8 (340)	21 15/16 (557)	12 1/8 (308)	14 (356)
	9	228	(Prefix)-09-60(*)12															
	12	305	(Prefix)-12-60(*)12															
	18	457	(Prefix)-18-60(*)12															
	24	609	(Prefix)-24-60(*)12															
	30	762	(Prefix)-30-60(*)12															
	36	914	(Prefix)-36-60(*)12															
	42	1067	(Prefix)-42-60(*)12															
24 (609)	6	152	(Prefix)-06-60(*)24	25 5/16 (643)	14 5/8 (372)	16 7/8 (428)	28 3/4 (730)	16 5/8 (422)	19 3/16 (488)	29 5/8 (753)	17 1/8 (435)	19 3/4 (502)	30 1/2 (775)	17 5/8 (448)	20 5/16 (516)	31 3/8 (797)	18 1/8 (461)	20 7/8 (530)
	9	228	(Prefix)-09-60(*)24															
	12	305	(Prefix)-12-60(*)24															
	18	457	(Prefix)-18-60(*)24															
	24	609	(Prefix)-24-60(*)24															
	30	762	(Prefix)-30-60(*)24															
	36	914	(Prefix)-36-60(*)24															
	42	1067	(Prefix)-42-60(*)24															
36 (914)	6	152	(Prefix)-06-60(*)36	35 11/16 (907)	20 5/8 (524)	23 13/16 (605)	39 1/8 (994)	22 5/8 (575)	26 1/8 (663)	40 (1016)	23 1/8 (587)	26 11/16 (687)	40 7/8 (1038)	23 5/8 (600)	27 1/4 (692)	41 3/4 (1060)	24 1/8 (613)	27 13/16 (706)
	9	228	(Prefix)-09-60(*)36															
	12	305	(Prefix)-12-60(*)36															
	18	457	(Prefix)-18-60(*)36															
	24	609	(Prefix)-24-60(*)36															
	30	762	(Prefix)-30-60(*)36															
	36	914	(Prefix)-36-60(*)36															
	42	1067	(Prefix)-42-60(*)36															
48 (1219)	6	152	(Prefix)-06-60(*)48	46 1/16 (1170)	26 5/8 (676)	30 11/16 (780)	49 9/16 (1259)	28 5/8 (727)	33 (838)	50 3/8 (1280)	29 1/8 (740)	33 5/8 (854)	51 1/4 (1302)	29 5/8 (753)	34 3/16 (868)	52 1/8 (1324)	30 1/8 (765)	34 3/4 (883)
	9	228	(Prefix)-09-60(*)48															
	12	305	(Prefix)-12-60(*)48															
	18	457	(Prefix)-18-60(*)48															
	24	609	(Prefix)-24-60(*)48															
	30	762	(Prefix)-30-60(*)48															
	36	914	(Prefix)-36-60(*)48															
	42	1067	(Prefix)-42-60(*)48															

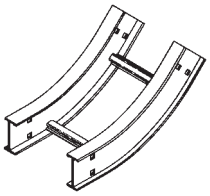
(Prefix) See page AL-41 for catalog number prefix.
Manufacturing tolerances apply to all dimensions.

Vertical Bend 45° (VO, VI)

1 pair splice plates with hardware included.

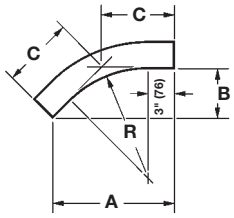


45° Vertical Outside

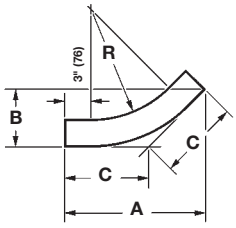


45° Vertical Inside

45° VO



45° VI



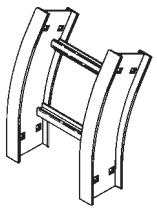
Bend Radius R	Ladder Width		(*) Insert "VO" for Vert. Outside Bend Insert "VI" for Vert. Inside Bend	VO Side Rail Height 4" - 7"			VI Side Rail Height											
							4"			5"			6"			7"		
				A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
in.	in.	mm	Catalog No.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)-06-45(*)12	13 5/8 (346)	5 5/8 (143)	8 (203)	16 7/16 (417)	6 13/16 (173)	9 5/8 (245)	17 1/8 (435)	7 1/8 (181)	10 1/16 (256)	17 7/8 (454)	7 3/8 (188)	10 7/16 (265)	18 9/16 (471)	7 11/16 (195)	10 7/8 (2176)
	9	228	(Prefix)-09-45(*)12															
	12	305	(Prefix)-12-45(*)12															
	18	457	(Prefix)-18-45(*)12															
	24	609	(Prefix)-24-45(*)12															
	30	762	(Prefix)-30-45(*)12															
	36	914	(Prefix)-36-45(*)12															
	42	1067	(Prefix)-42-45(*)12															
24 (609)	6	152	(Prefix)-06-45(*)24	22 1/16 (561)	9 1/8 (232)	12 15/16 (329)	24 15/16 (634)	10 5/16 (262)	14 5/8 (372)	25 5/8 (651)	10 5/8 (270)	15 (381)	26 5/16 (668)	10 15/16 (278)	15 7/16 (392)	27 1/16 (687)	11 3/16 (284)	15 13/16 (402)
	9	228	(Prefix)-09-45(*)24															
	12	305	(Prefix)-12-45(*)24															
	18	457	(Prefix)-18-45(*)24															
	24	609	(Prefix)-24-45(*)24															
	30	762	(Prefix)-30-45(*)24															
	36	914	(Prefix)-36-45(*)24															
	42	1067	(Prefix)-42-45(*)24															
36 (914)	6	152	(Prefix)-06-45(*)36	30 9/16 (776)	12 11/16 (323)	17 15/16 (456)	33 3/8 (848)	13 13/16 (351)	19 9/16 (497)	34 1/8 (867)	14 1/8 (359)	20 (508)	34 13/16 (885)	14 7/16 (367)	20 3/8 (518)	35 1/2 (902)	14 11/16 (373)	20 13/16 (528)
	9	228	(Prefix)-09-45(*)36															
	12	305	(Prefix)-12-45(*)36															
	18	457	(Prefix)-18-45(*)36															
	24	609	(Prefix)-24-45(*)36															
	30	762	(Prefix)-30-45(*)36															
	36	914	(Prefix)-36-45(*)36															
	42	1067	(Prefix)-42-45(*)36															
48 (1219)	6	152	(Prefix)-06-45(*)48	39 1/16 (992)	16 3/16 (411)	22 7/8 (581)	41 7/8 (1064)	17 3/8 (441)	24 9/16 (624)	42 5/8 (1083)	17 5/8 (448)	24 15/16 (633)	43 5/16 (1100)	17 15/16 (456)	25 3/8 (645)	44 (1118)	18 1/4 (464)	25 13/16 (656)
	9	228	(Prefix)-09-45(*)48															
	12	305	(Prefix)-12-45(*)48															
	18	457	(Prefix)-18-45(*)48															
	24	609	(Prefix)-24-45(*)48															
	30	762	(Prefix)-30-45(*)48															
	36	914	(Prefix)-36-45(*)48															
	42	1067	(Prefix)-42-45(*)48															

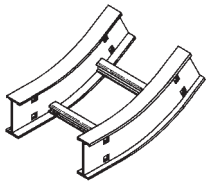
(Prefix) See page AL-41 for catalog number prefix.
Manufacturing tolerances apply to all dimensions.

Dimensions in parentheses are in millimeters unless otherwise specified.

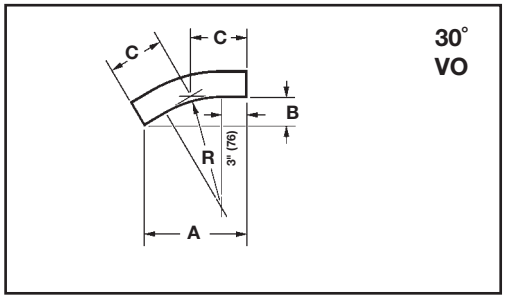
Vertical Bend 30° (VO, VI)

1 pair splice plates with hardware included.

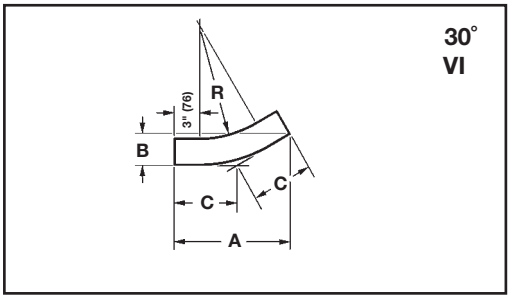




30° Vertical Outside



30° Vertical Inside

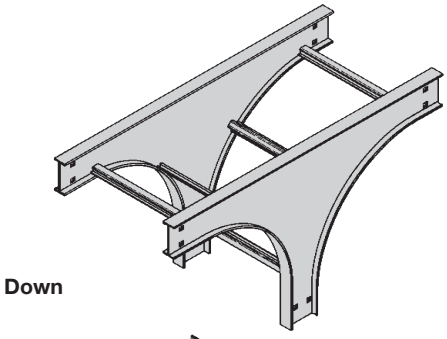


Bend Radius R	Ladder Width		(*) Insert "VO" for Vert. Outside Bend Insert "VI" for Vert. Inside Bend	VO Side Rail Height 4" - 7"			VI Side Rail Height											
							4"			5"			6"			7"		
				A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
in.	in.	mm	Catalog No.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)-06-30(*)12	11 5/8 (296)	3 1/8 (79)	6 3/16 (157)	13 5/8 (346)	3 5/8 (92)	7 5/16 (186)	14 1/8 (359)	3 3/4 (95)	7 9/16 (192)	14 5/8 (372)	3 15/16 (100)	7 13/16 (199)	15 1/8 (384)	4 1/16 (103)	8 1/16 (205)
	9	228	(Prefix)-09-30(*)12															
	12	305	(Prefix)-12-30(*)12															
	18	457	(Prefix)-18-30(*)12															
	24	609	(Prefix)-24-30(*)12															
	30	762	(Prefix)-30-30(*)12															
	36	914	(Prefix)-36-30(*)12															
	42	1067	(Prefix)-42-30(*)12															
24 (609)	6	152	(Prefix)-06-30(*)24	17 5/8 (448)	4 11/16 (120)	9 7/16 (240)	19 5/8 (499)	5 1/4 (133)	10 1/2 (267)	20 1/8 (511	5 3/8 (137)	10 3/4 (273)	20 5/8 (524)	5 1/2 (140)	11 1/16 (282)	21 1/8 (537)	5 5/8 (143)	11 5/16 (287)
	9	228	(Prefix)-09-30(*)24															
	12	305	(Prefix)-12-30(*)24															
	18	457	(Prefix)-18-30(*)24															
	24	609	(Prefix)-24-30(*)24															
	30	762	(Prefix)-30-30(*)24															
	36	914	(Prefix)-36-30(*)24															
	42	1067	(Prefix)-42-30(*)24															
36 (914)	6	152	(Prefix)-06-30(*)36	23 5/8 (600)	6 5/16 (160)	12 5/8 (321)	25 5/8 (651)	6 7/8 (174)	13 11/16 (348)	26 1/8 (663)	7 (175)	14 (356)	26 5/8 (676)	7 1/8 (181)	14 1/4 (362)	27 1/8 (689)	7 1/4 (184)	14 1/2 (287)
	9	228	(Prefix)-09-30(*)36															
	12	305	(Prefix)-12-30(*)36															
	18	457	(Prefix)-18-30(*)36															
	24	609	(Prefix)-24-30(*)36															
	30	762	(Prefix)-30-30(*)36															
	36	914	(Prefix)-36-30(*)36															
	42	1067	(Prefix)-42-30(*)36															
48 (1219)	6	152	(Prefix)-06-30(*)48	29 5/8 (753)	7 15/16 (202)	15 7/8 (403)	31 5/8 (803)	8 7/16 (214)	16 15/16 (430)	32 1/8 (816)	8 5/8 (219)	17 3/16 (437)	32 5/8 (829)	8 3/4 (222)	17 1/2 (445)	33 1/8 (842)	8 7/8 (226)	17 3/4 (451)
	9	228	(Prefix)-09-30(*)48															
	12	305	(Prefix)-12-30(*)48															
	18	457	(Prefix)-18-30(*)48															
	24	609	(Prefix)-24-30(*)48															
	30	762	(Prefix)-30-30(*)48															
	36	914	(Prefix)-36-30(*)48															
	42	1067	(Prefix)-42-30(*)48															

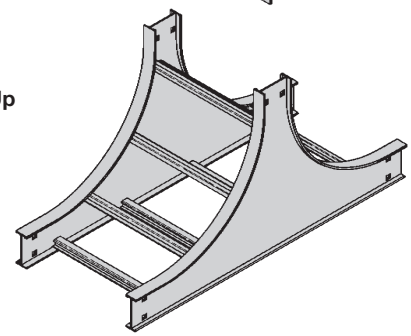
(Prefix) See page AL-41 for catalog number prefix.
Manufacturing tolerances apply to all dimensions.

Vertical Tee Up/Down (VTU/VT)

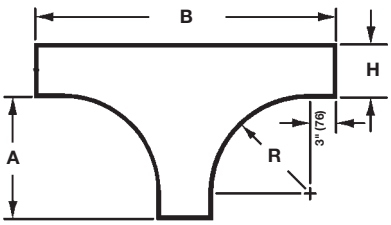
2 pair splice plates with hardware included.



Down



Up



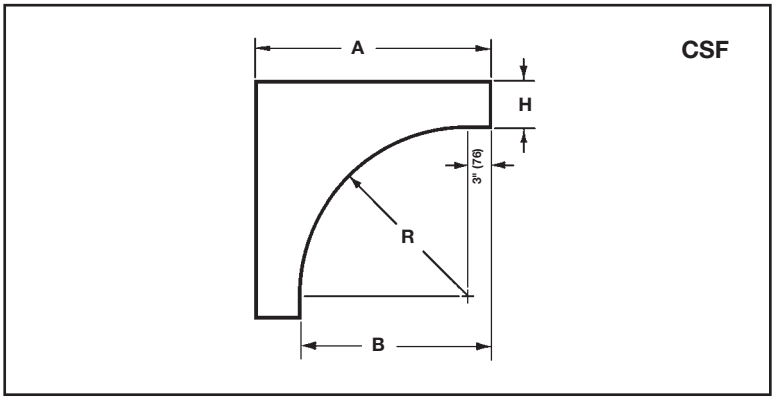
Bend Radius R	Ladder Width		Vertical Tee Down	Vertical Tee Up	Side Rail Height "H"							
					4"		5"		6"		7"	
			Catalog No.	Catalog No.	A	B	A	B	A	B	A	B
in.	in.	mm			in.	in.	in.	in.	in.	in.	in.	in.
12 (305)	6	152	(Prefix)-06-VT12	(Prefix)-06-VTU12	15 (381)	34 (846)	15 (381)	35 (889)	15 (381)	36 (914)	15 (381)	37 (940)
	9	228	(Prefix)-09-VT12	(Prefix)-09-VTU12								
	12	305	(Prefix)-12-VT12	(Prefix)-12-VTU12								
	18	457	(Prefix)-18-VT12	(Prefix)-18-VTU12								
	24	609	(Prefix)-24-VT12	(Prefix)-24-VTU12								
	30	762	(Prefix)-30-VT12	(Prefix)-30-VTU12								
	36	914	(Prefix)-36-VT12	(Prefix)-36-VTU12								
	42	1067	(Prefix)-42-VT12	(Prefix)-42-VTU12								
24 (609)	6	152	(Prefix)-06-VT24	(Prefix)-06-VTU24	27 (6867)	58 (1473)	27 (686)	59 (1498)	27 (686)	60 (1524)	27 (686)	61 (1549)
	9	228	(Prefix)-09-VT24	(Prefix)-09-VTU24								
	12	305	(Prefix)-12-VT24	(Prefix)-12-VTU24								
	18	457	(Prefix)-18-VT24	(Prefix)-18-VTU24								
	24	609	(Prefix)-24-VT24	(Prefix)-24-VTU24								
	30	762	(Prefix)-30-VT24	(Prefix)-30-VTU24								
	36	914	(Prefix)-36-VT24	(Prefix)-36-VTU24								
	42	1067	(Prefix)-42-VT24	(Prefix)-42-VTU24								
36 (914)	6	152	(Prefix)-06-VT36	(Prefix)-06-VTU36	39 (991)	82 (2083)	39 (991)	83 (2108)	39 (991)	84 (2134)	39 (991)	85 (2159)
	9	228	(Prefix)-09-VT36	(Prefix)-09-VTU36								
	12	305	(Prefix)-12-VT36	(Prefix)-12-VTU36								
	18	457	(Prefix)-18-VT36	(Prefix)-18-VTU36								
	24	609	(Prefix)-24-VT36	(Prefix)-24-VTU36								
	30	762	(Prefix)-30-VT36	(Prefix)-30-VTU36								
	36	914	(Prefix)-36-VT36	(Prefix)-36-VTU36								
	42	1067	(Prefix)-42-VT36	(Prefix)-42-VTU36								
48 (1219)	6	152	(Prefix)-06-VT48	(Prefix)-06-VTU48	51 (1295)	106 (2692)	51 (1295)	107 (2718)	51 (1295)	108 (2743)	51 (1295)	109 (2769)
	9	228	(Prefix)-09-VT48	(Prefix)-09-VTU48								
	12	305	(Prefix)-12-VT48	(Prefix)-12-VTU48								
	18	457	(Prefix)-18-VT48	(Prefix)-18-VTU48								
	24	609	(Prefix)-24-VT48	(Prefix)-24-VTU48								
	30	762	(Prefix)-30-VT48	(Prefix)-30-VTU48								
	36	914	(Prefix)-36-VT48	(Prefix)-36-VTU48								
	42	1067	(Prefix)-42-VT48	(Prefix)-42-VTU48								

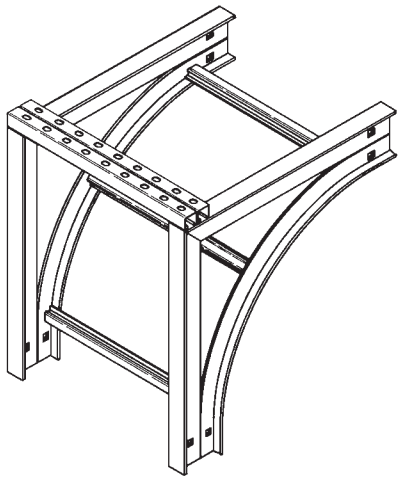
(Prefix) See page AL-41 for catalog number prefix.
Manufacturing tolerances apply to all dimensions.

Dimensions in parentheses are in millimeters unless otherwise specified.

Cable Support Fittings (CSF)

1 pair splice plates with hardware included.





This fitting is recommended for use at the top of vertical runs to support the weight of the cables. The top cross brace is drilled for installing eyebolts, ordered separately.

Bend Radius R in.	Ladder Width in.	Ladder Width mm	Catalog No. in.	Side Rail Height "H" 4" A in.	4" B in.	5" A in.	5" B in.	6" A in.	6" B in.	7" A in.	7" B in.
	6	152	(Prefix)-06-CSF12	19 (483)	15 (381)	20 (508)	15 (381)	21 (533)	15 (381)	22 (559)	15 (381)
	9	228	(Prefix)-09-CSF12								
	12	305	(Prefix)-12-CSF12								
	18	457	(Prefix)-18-CSF12								
	24	609	(Prefix)-24-CSF12								
	30	762	(Prefix)-30-CSF12								
	36	914	(Prefix)-36-CSF12								
	42	1067	(Prefix)-42-CSF12								
	6	152	(Prefix)-06-CSF24	31 (787)	27 (686)	32 (813)	27 (686)	33 (838)	27 (686)	34 (864)	27 (686)
	9	228	(Prefix)-09-CSF24								
	12	305	(Prefix)-12-CSF24								
	18	457	(Prefix)-18-CSF24								
	24	609	(Prefix)-24-CSF24								
	30	762	(Prefix)-30-CSF24								
	36	914	(Prefix)-36-CSF24								
	42	1067	(Prefix)-42-CSF24								
	6	152	(Prefix)-06-CSF36	43 (1092)	39 (991)	44 (1118)	39 (991)	45 (1143)	39 (991)	46 (1168)	39 (991)
	9	228	(Prefix)-09-CSF36								
	12	305	(Prefix)-12-CSF36								
	18	457	(Prefix)-18-CSF36								
	24	609	(Prefix)-24-CSF36								
	30	762	(Prefix)-30-CSF36								
	36	914	(Prefix)-36-CSF36								
	42	1067	(Prefix)-42-CSF36								
48 (1219)	6	152	(Prefix)-06-CSF48	55 (1397)	51 (1295)	56 (1422)	51 (1295)	57 (1448)	51 (1295)	58 (1473)	51 (1295)
	9	228	(Prefix)-09-CSF48								
	12	305	(Prefix)-12-CSF48								
	18	457	(Prefix)-18-CSF48								
	24	609	(Prefix)-24-CSF48								
	30	762	(Prefix)-30-CSF48								
	36	914	(Prefix)-36-CSF48								
	42	1067	(Prefix)-42-CSF48								

(Prefix) See page AL-41 for catalog number prefix.
Manufacturing tolerances apply to all dimensions.

Fiberglass Cable Ladder


WARNING!

Corrosion Guide

The information shown in this corrosion guide is based on full immersion laboratory tests and data generated from resin manufacturer's data. It should be noted that in some of the environments listed, splashes and spill situations may result in a more corrosive situation than indicated due to the evaporation of water. Regular wash down is recommended in these situations.
All data represents the best available information and is believed to be correct. The data should not be construed as a warranty of performance for that product as presented in these tables. User tests should be performed to determine suitability of service if there is any doubt or concern. Such variables as concentration, temperature, time and combined chemical effects of mixtures of chemicals make it impossible to specify the exact suitability of fiber reinforced plastics in all environments. B-Line will be happy to supply material samples for testing. These recommendations should only be used as a guide and B-Line does not take responsibility for design or suitability of materials for service intended. In no event will B-Line be liable for any consequential or special damages for any defective material or workmanship including without limitation, labor charge, other expense or damage to properties resulting from loss of materials or profits or increased expenses of operations.

CHEMICAL ENVIRONMENT	POLYESTER		VINYL ESTER	
	Max Wt. %	Max Oper. Temp °F	Max Wt. %	Max Oper. Temp °F
Acetic Acid	10	190	10	210
Acetic Acid	50	125	50	180
Acetone	N/R	N/R	100	75
Aluminum Chloride	SAT	170	SAT	200
Aluminum Hydroxide	SAT	160	SAT	170
Aluminum Nitrate	SAT	150	SAT	170
Aluminum Sulfate	SAT	180	SAT	200
Ammonium Chloride	SAT	170	SAT	190
Ammonium Hydroxide	1	100	10	150
Ammonium Hydroxide	28	N/R	28	100
Ammonium Carbonate	N/R	N/R	SAT	150
Ammonium Bicarbonate	15	125	SAT	130
Ammonium Nitrate	SAT	160	SAT	190
Ammonium Persulfate	SAT	N/R	SAT	150
Ammonium Sulfate	SAT	170	SAT	200
Amyl Alcohol	ALL	N/R	ALL	90
Amyl Alcohol Vapor	-	140	-	120
Benzene	N/R	N/R	100	140
Benzene Sulfonic Acid	25	110	SAT	200
Benzoic Acid	SAT	150	SAT	200
Benzoyl Alcohol	100	N/R	100	N/R
Borax	SAT	170	SAT	200
Calcium Carbonate	SAT	170	SAT	200
Calcium Chloride	SAT	170	SAT	200
Calcium Hydroxide	25	70	25	165
Calcium Nitrate	SAT	180	SAT	200
Calcium Sulfate	SAT	180	SAT	200
Carbon Disulfide	N/R	N/R	N/R	N/R
Carbonic Acid	SAT	130	SAT	180
Carbon Dioxide Gas	-	200	-	200
Carbon Monoxide Gas	-	200	-	200
Carbon Tetrachloride	N/R	N/R	100	75
Chlorine, Dry Gas	-	140	-	170
Chlorine, Wet Gas	-	N/R	-	180
Chlorine Water	SAT	80	SAT	180

CHEMICAL ENVIRONMENT	POLYESTER		VINYL ESTER	
	Max Wt. %	Max Oper. Temp °F	Max Wt. %	Max Oper. Temp °F
Chromic Acid	5	70	10	120
Citric Acid	SAT	170	SAT	200
Copper Chloride	SAT	170	SAT	200
Copper Cyanide	SAT	170	SAT	200
Copper Nitrate	SAT	170	SAT	200
Crude Oil, Sour	100	170	100	200
Cyclohexane	N/R	N/R	N/R	N/R
Cyclohexane, Vapor	ALL	100	ALL	130
Diesel Fuel	100	160	100	180
Diethyl Ether	N/R	N/R	N/R	N/R
Dimethyl Phthalate	N/R	N/R	N/R	N/R
Ethanol	50	75	50	90
Ethyl Acetate	N/R	N/R	N/R	N/R
Ethylene Chloride	N/R	N/R	N/R	N/R
Ethylene Glycol	100	90	100	200
Fatty Acids	SAT	180	SAT	200
Ferric Chloride	SAT	170	SAT	200
Ferric Nitrate	SAT	170	SAT	200
Ferric Sulfate	SAT	170	SAT	200
Ferrous Chloride	SAT	170	SAT	200
Fluoboric Acid	N/R	N/R	SAT	165
Fluosilicic Acid	N/R	N/R	SAT	70
Formaldehyde	50	75	50	100
Formic Acid	N/R	N/R	50	100
Gasoline	100	80	100	150
Glucose	100	170	100	200
Glycerine	100	150	100	200
Heptane	100	110	100	120
Hexane	100	90	100	130
Hydrobromic Acid	50	120	50	120
Hydrochloric Acid	10	150	10	200
Hydrochloric Acid	20	140	20	190
Hydrochloric Acid	37	75	37	95
Hydrofluoric Acid	N/R	N/R	15	80
Hydrogen Bromide, Dry	100	190	100	200

-: No Information Available N/R: Not Recommended SAT: Saturated Solution FUM: Fumes

Corrosion Guide

CHEMICAL ENVIRONMENT	POLYESTER		VINYL ESTER	
	Max Wt. %	Max Oper. Temp °F	Max Wt. %	Max Oper. Temp °F
Hydrogen Bromide, Wet	100	75	100	130
Hydrogen Chloride	-	120	-	200
Hydrogen Peroxide	5	100	30	100
Hydrogen Sulfide, Dry	100	170	100	210
Hydrogen Sulfide, Wet	100	170	100	210
Hypochlorous Acid	20	80	20	150
Isopropyl Alcohol	N/R	N/R	15	80
Kerosene	100	140	100	180
Lactic Acid	SAT	170	SAT	200
Lead Acetate	SAT	170	SAT	200
Lead Chloride	SAT	140	SAT	200
Lead Nitrate	SAT	-	SAT	200
Linseed Oil	100	150	100	190
Lithium Chloride	SAT	150	SAT	190
Magnesium Carbonate	SAT	140	SAT	170
Magnesium Chloride	SAT	170	SAT	200
Magnesium Hydroxide	SAT	150	SAT	190
Magnesium Nitrate	SAT	140	SAT	180
Magnesium Sulfate	SAT	170	SAT	190
Mercuric Chloride	SAT	150	SAT	190
Mercurous Chloride	SAT	140	SAT	180
Methyl Ethyl Ketone	N/R	N/R	N/R	N/R
Mineral Oils	100	170	100	200
Monochlorobenzene	N/R	N/R	N/R	N/R
Naphtha	100	140	100	170
Nickel Chloride	SAT	170	SAT	200
Nickel Nitrate	SAT	170	SAT	200
Nickel Sulfate	SAT	170	SAT	200
Nitric Acid	5	140	5	150
Nitric Acid	20	70	20	100
Oleic Acid	100	170	100	190
Oxalic Acid	ALL	75	ALL	120
Paper Mill Liquors	-	100	-	120
Perchlorethylene	100	N/R	100	N/R
Perchloric Acid	N/R	N/R	10	150
Perchloric Acid	N/R	N/R	30	80
Phosphoric Acid	10	160	10	200
Phosphoric Acid	100	120	100	200
Potassium Aluminum Sulfate	SAT	170	SAT	200
Potassium Bicarbonate	50	80	50	140
Potassium Carbonate	10	N/R	10	120
Potassium Chloride	SAT	170	SAT	200
Potassium Dichromate	SAT	170	SAT	200

CHEMICAL ENVIRONMENT	POLYESTER		VINYL ESTER	
	Max Wt.	Max Oper. Temp °F	Max Wt. %	Max Oper. Temp °F
Potassium Hydroxide	N/R	N/R	25	150
Potassium Nitrate	SAT	170	SAT	200
Potassium Permanganate	100	80	100	210
Potassium Sulfate	SAT	170	SAT	200
Propylene Glycol	ALL	170	ALL	200
Phthalic Acid	-	-	SAT	200
Sodium Acetate	SAT	160	SAT	200
Sodium Benzoate	SAT	170	SAT	200
Sodium Bicarbonate	SAT	160	SAT	175
Sodium Bisulfate	ALL	170	ALL	200
Sodium Bromide	ALL	170	ALL	200
Sodium Carbonate	10	80	35	160
Sodium Chloride	SAT	170	SAT	200
Sodium Cyanide	SAT	170	SAT	200
Sodium Hydroxide	N/R	N/R	50	150
Sodium Hydroxide	N/R	N/R	25	80
Sodium Hypochloride	N/R	N/R	10	150
Sodium Monophosphate	SAT	170	SAT	200
Sodium Nitrate	SAT	170	SAT	200
Sodium Sulfate	SAT	170	SAT	200
Sodium Thiosulfate	ALL	100	ALL	120
Stannic Chloride	SAT	160	SAT	190
Styrene	N/R	N/R	N/R	N/R
Sulfated Detergent	0/50	170	0/50	200
Sulfur Dioxide	100	80	100	200
Sulfur Trioxide	100	80	100	200
Sulfuric Acid	93	N/R	93	N/R
Sulfuric Acid	50	N/R	50	180
Sulfuric Acid	25	75	25	190
Sulfurous Acid	SAT	80	N/R	N/R
Tartaric Acid	SAT	170	SAT	200
Tetrachloroethylene	N/R	N/R	FUM	75
Toluene	N/R	N/R	N/R	N/R
Trisodium Phosphate	N/R	N/R	SAT	175
Urea	SAT	130	SAT	140
Vinegar	100	170	100	200
Water, Distilled	100	170	100	190
Water, Tap	100	170	100	190
Water, Sea	SAT	170	SAT	190
Xylene	N/R	N/R	N/R	N/R
Zinc Chloride	SAT	170	SAT	200
Zinc Nitrate	SAT	170	SAT	200
Zinc Sulfate	SAT	170	SAT	200

-: No Information Available N/R: Not Recommended SAT: Saturated Solution FUM: Fumes

Fiberglass Cable Ladder

Load Data

Fiberglass Cable Ladder and Cable Channel are offered in four versions for applications as follows:

Standard Series	Resin Type	Color	Meets
13F, 24F, 36F, 46F, H46F, 48F FCC-03, FCC-04, FCC-06, FCC-08	Fire Retardant Polyester	Gray	ASTM E-84 Class 1 - UL94 VO Good Corrosion Resistance in most environments
High Performance			
13FV, 24FV, 36FV, 46FV, H46FV, 48FV FCCV-03, FCCV-04, FCCV-06, FCCV-08	Fire Retardant Vinyl Ester	Beige	ASTM E-84 Class 1 - UL94 VO Improved Corrosion Resistance For more severe environments Higher Heat Distortion Temperature
Dis-Stat/Low Smoke			
13FA, 24FA, 36FA, 46FA, H46FA, 48FA FCCA-03, FCCA-04, FCCA-06, FCCA-08	Fire Retardant Zero Halogen/Dis-Stat	Black	ASTM E-84 Class 1 - UL94 VO ASTM D257-99 Dissipates Static Charge Smoke Generation and Toxicity for Mass Transit Requirements and Off Shore application

Effect of Temperature

Strength properties of reinforced plastics are reduced when continuously exposed to elevated temperatures. Working loads shall be reduced based on the following:

Temperature in Degrees F	Approximate Percent of Strength
75	100
100	90
125	78
150	68
175	60
200	52

NEMA Standard 8-10-1986
If unusual temperature conditions exist, the manufacturer should be consulted.
Authorized Engineering information 8-20-1986

Typical Properties of Pultruded Components

B-Line Fiberglass Cable Ladder systems are manufactured from glass fiber-reinforced plastic shapes that meet ASTM E-84, Smoke Density rating for polyester of 680, for vinyl ester 1025, Class 1 Flame Rating and self-extinguishing requirements of ASTM D-635. A surface veil is applied during pultrusion to insure a resin-rich surface and ultraviolet resistance.

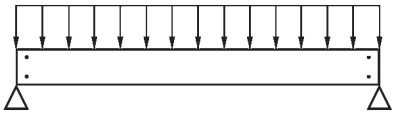
Flame Resistance (FTMS 406-2023) ign/burn, seconds	75/75
Intermittent Flame Test (HLT-15), rating	100
Flammability Test (ASTM D635) Ignition Burning Time	 none 0 sec.

Properties	Test Method	Unit/ Value	3" & 4" Cable Ladder, Cable Channel		6" Cable Ladder	
			Longitudinal	Transverse	Longitudinal	Transverse
Density	ASTM D1505	lbs/in^3	.058-.062	-	.072 - .076	-
Coefficient of Thermal Expansion	ASTM D696	in/in/°F	5.0 x 10^{-6}	-	5.0 x 10^{-6}	-
Water Absorption	ASTM D570	Max %	0.5	-	0.5	-
Dielectic Strength	ASTM D149	V/mil (vpm)	200	-	200	-
Flammability Classification	UL94	VO	-	-	-	-
Flame Spread	ASTM E-84	20 Max	-	-	-	-

Structural Characteristics of Cable Ladder and Supports

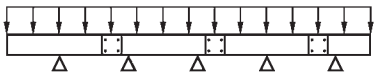
When viewed in its installed condition, any cable ladder system performs functionally as a beam under a uniformly distributed load. There are four basic beam configurations typically found in a cable ladder installation.
All four types of beams support cable ladder but each differ in the way that the beam is attached to the support.
The first two beam configurations, simple and continuous, apply to the cable ladder itself. The second two beam configurations, cantilever and fixed, apply more to the cable ladder supports than to the cable ladder itself.

Simple Beam
A good example of simple beam is a single straight section of cable ladder supported but not fastened at either end. When the ladder is loaded the cable ladder is allowed to deflect.

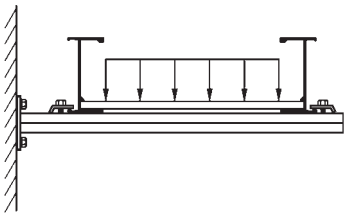


Simply beam analysis is used almost universally for beam comparisons even though it is seldom practical in field installations. The three most prominent reasons for using a simple beam analysis are: calculations are simplified; it represents the worst case loading; and testing is simple and reliable. The published load data in the B-Line cable ladder catalog is based on the simple beam analysis per NEMA Standard FG-1.

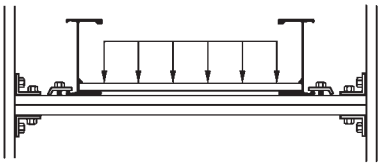
Continuous Beam
Continuous beam is the beam configuration most commonly used in cable ladder installations. An example of this configuration is where cable ladders are installed across several supports to form a number of spans. The continuous beam possesses traits of both the simple and fixed beams.
When equal loads are applied to all spans simultaneously, the counterbalancing effect of the loads on both sides of a support restricts the movement of the cable ladder at the support. The effect is similar to that of a fixed beam. The end spans behave substantially like simple beams. When cable ladders of identical design are compared, continuous beam installations will typically have approximately half the deflection of a simple beam of the same span. Therefore, simple beam data should be used for a general comparison only.



Cantilever Beam
A cantilever beam configuration occurs when one end of the beam is rigidly attached to the support and the other end is unsupported.
This type of configuration is typically used when wall mounting a bracket to support cable ladder. Since one end is unsupported, the cantilever beam will hold considerably less load than a comparable simple beam.



Fixed Beam
A fixed beam configuration has both ends of the beam rigidly attached to the supports. A good example of a fixed beam is the rung of a cable ladder. By attaching the ends of the rung to the side rails, the ends are not free to move, bend or twist. This restriction in end movement effectively increases the load
carrying capacity of the member.
Fixed beam configurations are also typically found in strut rack type support systems. These types of racks are found extensively in tunnel applications for support of pipe and cable ladder.



Standard B-Line Label

WARNING! **Do Not Use As A Walkway, Ladder, Or Support For Personnel.**

Use Only As A Mechanical Support For Cables, Tubing and Raceways.

Catalog Number: 24A09-12-144 STR SECTION
(and description)
Shipping Ticket: 260203 00 001
Mark Number: 78101115400
Purchase Order: D798981
Minimum Area: 1.000 SQ. IN.
Load Class: D1 179 KG/M 3 METER SPAN
REFERENCE FILE # LR360266
This product is classified by Underwriters Laboratories, Inc. as to its suitability as an equipment grounding conductor only. 556E

1 of 1
VENTILATED
09/05/2002

B-Line®

816 LIONS DRIVE
TROY, IL 62294
(618) 667-6779

3078101115400 5

Warning! Walkways

It should be noted that cable ladder is designed as a support for power or control cables, or both and is not intended or designed to be a walkway for personnel, the user is urged to display appropriate warnings cautioning against the use of this support as a walkway. The following language is suggested:

WARNING! Not to be used as a walkway, ladder or support for personnel. To be used only as a mechanical support for cables and tubing.

Authorized Engineering Information 8-20-1986

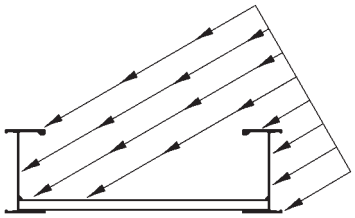
Structural Characteristics of Cable Ladder and Supports

Cable Loads
The cable load is simply the total weight of all the cables to be placed in the ladder. This load should be expressed in lbs./ft.

Concentrated Loads
A concentrated static load represents a static weight applied between the side rails. Tap boxes, conduit attachments and long cable drops are just some of the many types of concentrated loads. When so specified, these concentrated static loads may be converted to an equivalent, uniform load (We) in pounds per linear foot by using the following formula:

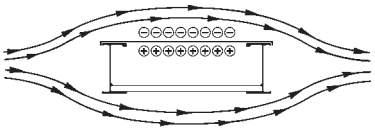
$$We = \frac{2x \text{ (concentrated static load)}}{\text{span length (ft.)}}$$

Wind Loads
Wind loads need to be determined for all outdoor cable ladder installations. Most outdoor cable ladders are ladder type ladders, therefore the most severe loading to be considered is pressure on the ladder side rails (see Detail 1).



Detail 1

When covers are installed on outdoor cable ladders, another factor to be considered is the aerodynamic effect which can produce a lift strong enough to separate a cover from a ladder. Wind moving across a covered ladder (see Detail 2) creates a positive pressure inside the ladder and a negative pressure above the cover. This pressure difference can lift the cover off the ladder.



Detail 2

B-Line recommends the use of heavy duty wrap-around cover clamps when covered ladders are installed in an area where strong winds occur.

Ice Loads
Glaze ice is the most commonly seen form of ice build-up. It is the result of rain or drizzle freezing on impact with an exposed object. Generally, only the top surface (or the cover) and the windward side of a cable ladder system is significantly coated with ice. The maximum design load to be added due to ice should be determined from local and federal weather bureau information.

Snow Loads
Snow is measured by density and thickness. The density of snow varies almost as much as its thickness. The additional design load from snowfall should be determined using local snowfall records which can be obtained from local and federal weather bureaus.

Seismic Loads
In recent years a great deal of testing and evaluation of cable ladder systems, and their supports, has been performed. The conclusions reached from these evaluations have shown the cable ladder/strut support system exhibited more seismic capacity than originally expected. One of the factors contributing to this is the energy dissipating motion of the cables within the ladder. Another factor is the high degree of ductility of the cable ladder and the support material. These factors, working in conjunction with a properly designed cable ladder system, should afford reasonable assurance to withstand even strong motion earthquakes. Please consult the factory with your specific seismic specifications and request a seismic brochure.

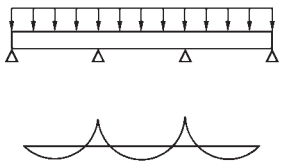
Splices
A lot of attention has been given to the strength of the side rails. These load bearing side rails must be spliced to form a continuous system, therefore the design of the splice plate is very important. The splice plate needs to be both strong and simple to install. These characteristics have been designed into B-Line's splice plates. B-Line's new high strength "L" shaped LAY-IN splice plate offers several advantages:

1) stronger than flat plate splices.
2) time saving - holds ladder in position before fasteners are inserted.
3) provides base for an expansion splice to function - no vertical binding.
4) discourages splice on support-positioning, over the support is the worst place to splice - Fig 3.

The location of splices in a continuous span cable ladder system is also very important. The splices should be located at points of minimum stress whenever practical. NEMA standards FG-1 limits the use of splice plates as follows:

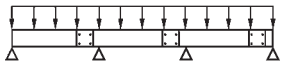
Unspliced straight section should be used on a simple span and on end spans of continuous runs. Straight section lengths should be equal to or greater than the span length to ensure not more than one splice between supports. See Figures 1 through 3 for examples on splicing configurations.

Typical Continuous Span Configuration Figure 1



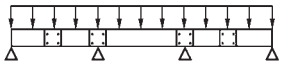
\+ Maximum positive moment
\- Maximum negative moment

Preferred Splice Plate Locations Figure 2



Preferred splice location:
- ¼ span

Undesirable Splice Plate Locations Figure 3



Undesired location:
- over supports
- mid spans

Cable Ladder Thermal Contraction and Expansion

X : Denotes hold-down clamp (anchor) at support.
– : Denotes expansion guide clamp at support.

It is important that thermal contraction and expansion be considered when installing cable ladder systems. The length of the straight cable ladder runs and the temperature differential govern the number of expansion splice plates required (see Table 1 below).

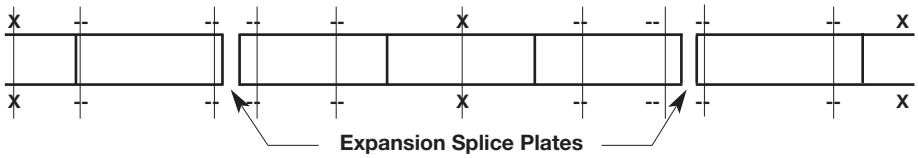


Figure 1 **Typical Cable Ladder Installation**

The cable ladder should be anchored at the support nearest to its midpoint between the expansion splice plates and secured by expansion guides at all other support locations (see Figure 1 - Typical Cable Ladder Installation). The cable ladder should be permitted longitudinal movement in both directions from that fixed point.

Accurate gap settings at the time of installation is necessary for the proper operation of the expansion splice plates. The following procedure should assist the installer in determining the correct gap: (see Figure 2 - Gap Setting)

1. Plot the highest expected ladder temperature on the maximum temperature line.
2. Plot the lowest expected ladder temperature on the minimum temperature line.
3. Draw a line between the maximum and minimum points.
4. Plot the ladder temperature at the time of installation to determine the gap setting.

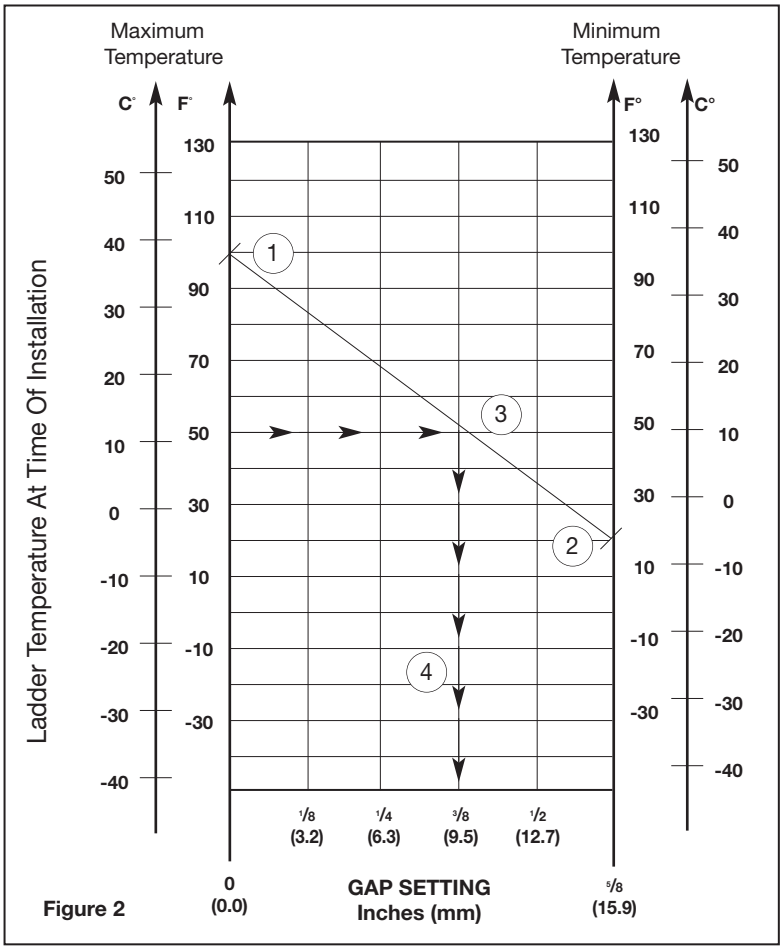


Figure 2

Table 1

Expansion or Contraction for Various Temperature Differences

Temperature Differential °F (°C)	Cable Ladder Length for 1" Expansion	Ladder Length for Each Expansion Connector*
25 (-4)	667 Feet (203.3m)	417 Feet (127.1m)
50 (10)	333 Feet (101.5m)	208 Feet (63.4m)
75 (24)	222 Feet (67.6m)	139 Feet (42.3m)
100 (38)	167 Feet (50.9m)	104 Feet (31.7m)
125 (51)	133 Feet (40.5m)	83 Feet (25.3m)
150 (65)	111 Feet (33.8m)	69 Feet (21.0m)
175 (79)	95 Feet (28.9m)	59 Feet (18.0m)

Note for gap set and hold down/guide location, see installation instruction above.
*1" (25.4mm) slotted holes in each expansion connector allow 5/8" (15.9mm) total expansion or contraction.
Authorized Engineering Information 8-20-1986

Cable Ladder Installation Guide

Installation of B-Line fiberglass cable ladder should be made in accordance with the standards set by NEMA Publication VE-2, Cable Ladder Installation Guide, and National Electrical Code, Article 318.

- Always observe common safety practices when assembling ladder and fittings. Installations generally require some field cutting. Dust created during fabrication presents no serious health hazard, but skin irritation may be experienced by some workers.
- Operators of saws and drills should wear masks, long sleeve shirts or coveralls.
- Fabrication with fiberglass is relatively easy and comparable to working with wood. Ordinary hand tools may be used in most cases.
- Avoid excessive pressure when sawing or drilling. Too much force can rapidly dull tools and also produce excessive heat which softens the bonding resin in the fiberglass resulting in a ragged edge rather than a clean-cut edge.
- Field cutting is simple and can be accomplished with a circular power saw with an abrasive cut-off wheel (masonry type) or hack saw (24 to 32 teeth per inch).
- Drill fiberglass as you would drill hard wood. Standard twist drills are more than adequate.
- Any surface that has been drilled, cut, sanded or otherwise broken, **must be sealed** with a compatible resin. (see page GRP-48)
- Carbide tipped saw blades and drill bits are recommended when cutting large quantities.
- Support the fiberglass material firmly during cutting operations to keep material from shifting which may cause chipping at the cut edge.
- Each ladder section length should be equal to or greater than the support span.
- When possible, the splice should be located at quarter span.
- Fittings should be supported as per NEMA FG-1.

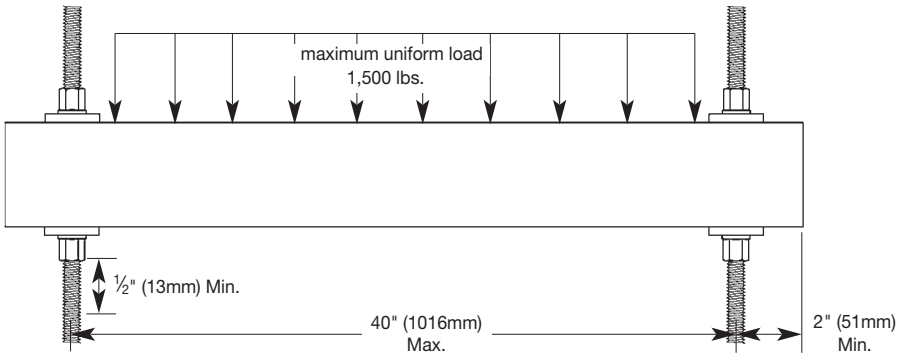
Recommended Fiberglass Trapeze Hanging Systems

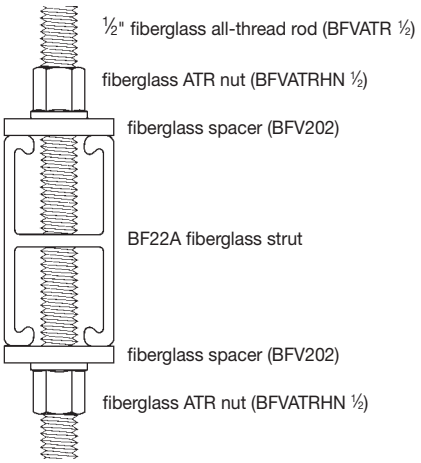
Notes:

1) A snug three to four ft.-lbs. torque is sufficient for all thread rod nuts.
2) When supporting cable ladder, the spacing between each trapeze should not exceed the distance between splice plates.
3) When hanging from beam, B-Line BFPU751 series clamps provide extra thread engagement necessary for load ratings. All thread rod must be fully engaged in the clamp.
4) Design load safety factor is 3:1

BF22A Strut:

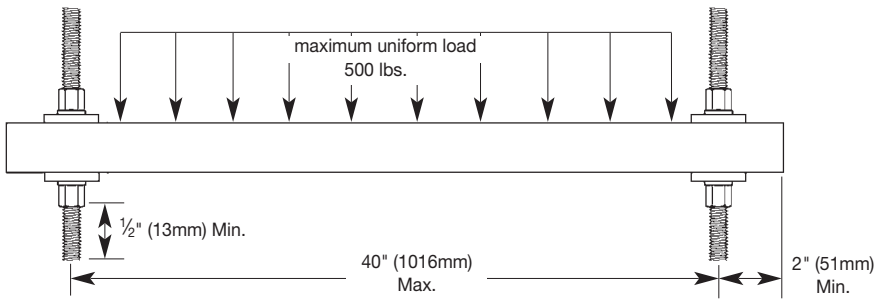
2" max between material being supported and rod

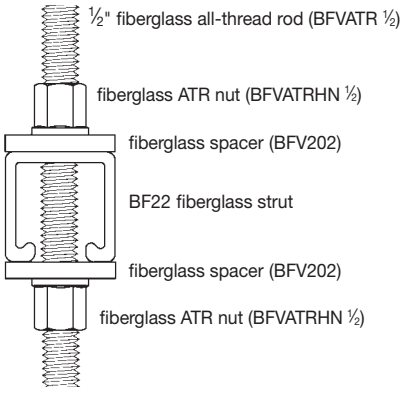




BF22 Strut:

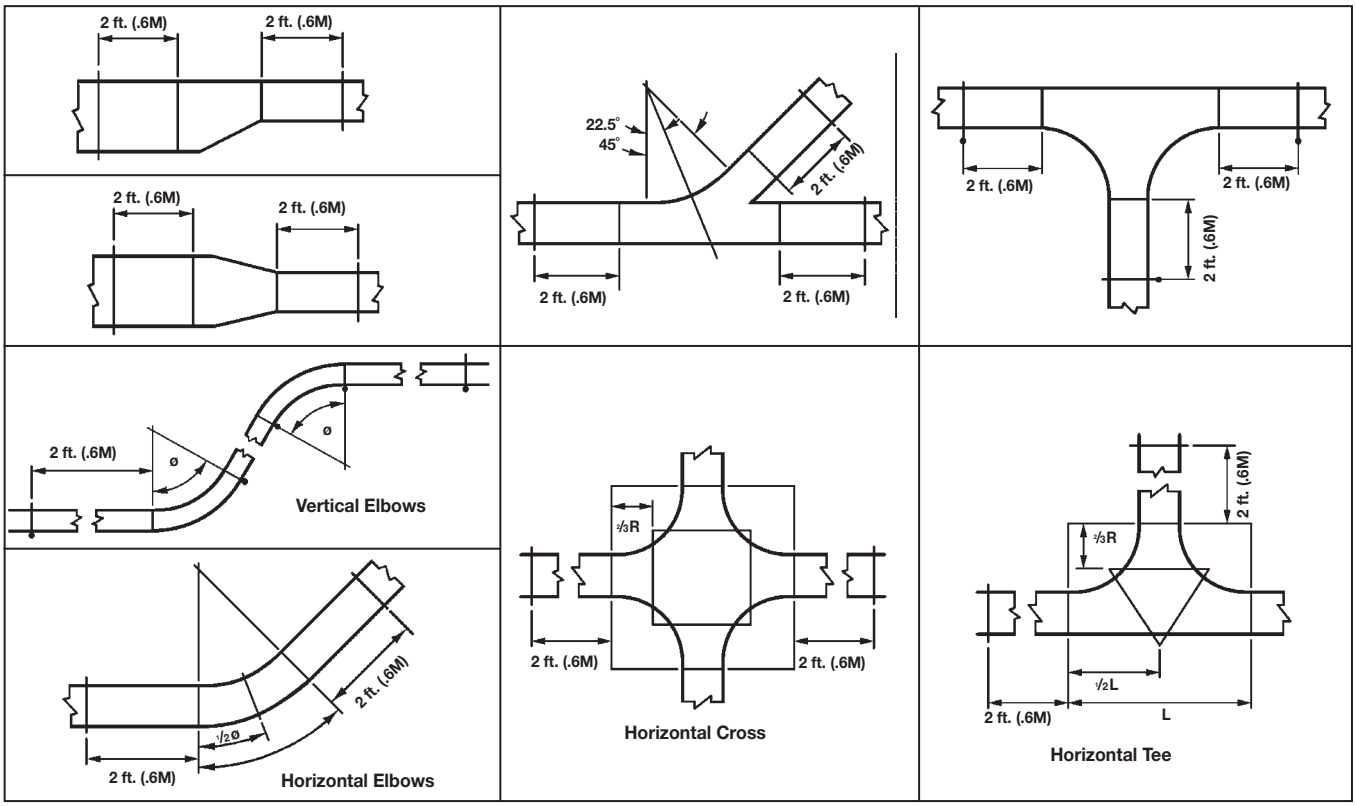
2" max between material being supported and rod





Cable Ladder Support Locations For Fittings

per NEMA VE-2 Installation Guide



Ø = 30°, 45°, 60°, 90°

How To Size Cable Ladder

Based on the National Electrical Code - 1993, Section 318

The National Electrical Code Article 318 was written primarily for verifying the cable fill in cable ladders but little has been done to convert this information into a design procedure.
In the development of a complete cable ladder support system, B-Line established a simple method of determining the right size ladder to support any given amount of cables. The following tables cover our method for determining cable ladder widths based on ladder design and system voltage.

Table I
Table I is subdivided into two categories covering electrical service of 2000 volts or less. The first, Category A, is for any mixture of power or lighting cables with any mixture of control or signal cables. Category B is used when control and/or signal cables only are being used.

Control Circuit - the circuit of a control apparatus or system that carries the electric signals directing the performance of the controller, but does not carry the main power (NEC Article 100).
Signaling Circuit - any electric circuit that energizes signaling equipment (NEC Article 100).

Table II
Table II has only one category of electrical service and that is 2001 volts and over for types MV and MC cables both single and multiconductor.
Type MV is a single or multiconductor solid dielectric insulated cable rated 2001 volts or higher (NEC Article 326).
Type MC cable is a factory assembly of one or more conductors, each individually insulated and enclosed in a metallic sheath or interlocking tape, or a smooth or corrugated tube (NEC Article 334).Cables other than Types MV and MC can be installed provided they are "specifically approved for installation in cable ladders."

Table III
Table III covers 3, 4 and 6 inch ventilated cable channels.

Ladder Sizing Procedure

Step 1. Select proper cable ladder table below based on cable voltage and ladder type.

Cable Voltage	Cable Ladder Type	Use:
2000 Volts or less	Ladder, Cable Ladder	Table I
2001 Volts or more	Ladder, Cable Ladder	Table II
2001 Volts or less	Cable Channel, ventilated	Table III

How To Size Cable Ladder

Tables I - Ladder Cable Ladder - for cables rated 2000 volts or less

For power or lighting or any mixture of power, lighting, control or signal cables:

1. Multiconductor Cable

Conductor sizes 4/0 and larger*	ladder width ≥ Sd	NEC 318-9(a) (1)
Conductor sizes 3/0 and smaller	ladder width ≥ 0.857 Sa	NEC 318-9(a) (2)

Example: Calculate width of cable ladder required for the following Type TC Cables.

6	4/c	500 kcmil	Power:	Diameter = 3.14	6 x 3.14 = 18.84
21	4/c	#8 AWG	Lighting:	Area = 0.407	.857 (21 x 0.407) = 7.32
20	5/c	#12 AWG	Control:	Area = 0.170	.857 (20 x 0.170) = 2.91
					29.07

Solution: Use 30 inch wide ladder

2. Single Conductor Cable

Conductor sizes 250 MCM thru 900 MCM† only	ladder width ≥ 0.023 Sa*	NEC 318-10(a) (2)
Conductor sizes 3/0 and smaller	ladder width ≥ 0.857 Sa	NEC 318-10(a) (4)

Example: Calculate width of cable ladder required for the following Type THW Wires.

6	1/c	4/0 AWG	Power:	Diameter = 0.710	(6 x 0.71) = 4.26
9	1/c	500 kcmil	Power:	Area = 0.83	.923 (9 x 0.83) = 6.89
6	1/c	250 kcmil	Power:	Area = 0.49	.923 (6 x 0.49) = 2.71
					13.86

Solution: Use 18 inch wide ladder

3. Mixture of Single and Multiconductor Cable

Example: Calculate width of cable ladder required for the following mix of cables. Use guidelines from (1) & (2) above.

2	3/c	250 kcmil	Type MC	Power:	Diameter = 1.84	2 x 1.84 = 3.68
12	4/c	#8 AWG	Type TC	Lighting:	Area = 0.41	.857 (12 x 0.41) = 4.22
60	4/c	#12 AWG	Type TC	Control:	Area = 0.12	.857 (60 x 0.12) = 6.17
4	1/c	1/0AWG	Type THW	Power:	Diameter = 0.55	(4 x 0.55) = 2.20
6	1/c	500kc mil	Type THW	Power:	Area = 0.83	.923 (6 x 0.83) = 4.60
						20.87

Solution: Use 24 inch wide ladder

For control and/or signal duty cable only:

1. Multiconductor Cable

$$\text{ladder width} \geq \frac{2Sa}{D}$$ NEC 318-9(b)

All conductor sizes**

Example: Calculate width of cable ladder required for the following Type TC Cables in 4 inch deep ladder.

24	16/c	16 AWG	Control:	Area = 0.29	2(24 x 0.29) ÷ 4 = 3.48
42	4/c	12 AWG	Control:	Area = 0.13	2(42 x 0.13) ÷ 4 = 2.73
18	4/c	10 AWG	Control:	Area = 0.20	2(18 x 0.20) ÷ 4 = 1.80
					8.01

Solution: Use 24 inch wide ladder

* The 4/0 and larger cable shall be installed in a single layer and no other cables shall be placed on them.
** For computation only depth D can not exceed 6 inches.
† For 1000 MCM and larger single conductor cable, refer to NEC 318-10(a)1 for sizing information.
Sd = the sum of the diameters, in inches, of all cables in the same ladder cable ladder.
Sa = the sum of the cross-sectional areas, in square inches, of all cables in the same ladder cable ladder.

How To Size Cable Ladder

Table II - Ladder - for cables rated 2000 volts or less

For MV or MC cables:

1. Mixture of Single and Multiconductor Cable NEC 318-12

All conductor sizes† ladder width ≥ Sd

Example: Calculate width of cable ladder required for the following cables.

4	1/c	500 kcmil	Type MV	Diameter =	1.05	4 x 1.05 = 4.20
10	3/c	2/0 AWG	Type MC	Diameter =	1.55	10 x 1.55 = 15.50
4	3/c	4/0 AWG	Type MV	Diameter =	1.78	4 x 1.78 = 7.12
						26.82

Solution: Use 30 inch wide ladder

Table III - Cable Channel, Ventilated - for cables rated 2000 volts or less

For power, lighting, control and/or signal duty cables:

1. Multiconductor Cable (all size cables) NEC 318-9(E)

	3 inch wide	4 inch wide	6 inch wide
One cable only	Sa ≤ 2.3 in²	Sa ≤ 4.5 in²	Sa ≤ 7.0 in²
Two or more cables	Sa ≤ 1.3 in²	Sa ≤ 2.5 in²	Sa ≤ 3.8 in²

Example: Calculate width of cable channel required for the following Type TC Cables.

1	3/c	1/0 AWG	Area =	1.17 which is less than 1.3. **Use 3 inch wide.**
1	4/c	300 kcmil	Area =	3.77 which is less than 4.5. **Use 3 inch wide.**
6	4/c	#10 AWG	Area =	6 x 0.20 = 1.20 which is less than 1.3. **Use 3 inch wide.**
2	3/c	1/0 AWG	Area =	2 x 1.17 = 2.34 which is less than 2.5. **Use 4 inch wide.**

2. Single Conductor (1/0 AWG or larger) NEC 318-10(b)

	3 inch wide	4 inch wide	6 inch wide
Any number of cables	Sd ≤ 3.0	Sd ≤ 4.0	Sd ≤ 6.0

Example: Type THW Cables.

3	1/c	500 kcmil	Type THW	Diameter =	3 x 1.029 = 3.09 which is less than 4.0. **Use 4 inch wide.**
8	1/c	4/0 kcmil	Type THW	Diameter =	8 x 0.71 = 5.68 which is less than 6.0. **Use 6 inch wide.**

† Cables shall be installed in a single layer. Where single conductor cables are triplexed, quadruplexed or bound together in circuit groups, the sum of the diameters of the single conductors shall not exceed the cable ladder width and these groups shall be installed in single layer arrangement.
Sd = the sum of the diameters, in inches, of all cables in the same ladder cable ladder.
Sa = the sum of the cross-sectional areas, in square inches, of all cables in the same ladder cable ladder.

Covers (Derating)

When cable ladders are continuously covered for more than six feet with solid unventilated covers, the ampacity of the installed cables must be reduced per NEC-1993.

2000 volts or less
- MULTICONDUCTOR CABLES
  - use 95% of tables 310-16 and 310-18
- SINGLE CONDUCTOR CABLES
  - 600 MCM and larger use 70% of tables 310-17 and 310-19 1/0 AWG thru 500 kc mil use 60% of tables 310-17 and 310-19

2001 volts and over
- MULTICONDUCTOR CABLES
  - use 95% of tables 310-75 and 310-76
- SINGLE CONDUCTOR CABLES
  - use 70% of tables 310-69 and 310-70

Cross-Sectional Area

Rarely is the cross-sectional area of a multiconductor cable given in manufacturers literature or the National Electrical Code. To calculate the cross-sectional area simply square the diameter and multiply by 0.7854. The diameter used in the calculations is the overall outside diameter (O.D.) of the cable including insulation and/or armor.

Cross Sectional Area (Square Inches) = $0.7854 (O.D.)^2$

Multipliers Used in Tables

The multipliers used in all tables are mathematical equivalents of Tables 318-9 and 318-10 of the National Electrical Code-1993.

An example can be found in column 1 of Table 318-9. The proportion of cable ladder width (size inches) to allowable fill (seven square inches) is 0.857 for 3/0 and smaller multiconductor cables in ladder type ladders. Therefore the product of 0.857 and the cross-sectional area of cables is the ladder width.

SECTION 161xx
NON-METALLIC CABLE LADDER
POLYESTER, VINYL ESTER

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, tests and services to install complete cable ladder systems as shown on the drawings.

B. Cable ladder systems are defined to include, but are not limited to straight sections of [ladder type] [vented bottom type] [solid bottom type] cable ladders, bends, tees, elbows, drop-outs, supports and accessories.

1.02 REFERENCES

A. ANSI/NFPA 70 – National Electrical Code

B. NEMA FG 1-2002 – Non-Metallic Cable Ladder Systems

C. NEMA VE 2-2002 – Cable Ladder Installation Guidelines

1.03 DRAWINGS

A. The drawings, which constitute a part of these specifications, indicate the general route of the cable ladder systems. Data presented on these drawings are as accurate as preliminary surveys and planning can determine until final equipment selection is made. Accuracy is not guaranteed and field verification, of all dimensions, routing, etc., is directed.

B. Specifications and drawings are for assistance and guidance, but exact routing, locations, distances and levels will be governed by actual field conditions. Contractor is directed to make field surveys as part of his work prior to submitting system layout drawings.

1.04 SUBMITTALS

A. Submittal Drawings: Submit drawings of cable ladder and accessories including clamps, brackets, hanger rods, splice plate connectors, expansion joint assemblies, and fittings, showing accurately scaled components.

B. Product Data: Submit manufacturer's data on cable ladder including, but not limited to, types, materials, finishes, rung spacings, inside depths and fitting radii. For side rails and rungs, submit cross sectional properties including Section Modulus (Sx) and Moment of Inertia (Ix).

1.05 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in manufacture of cable ladders and fittings of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. NEMA Compliance: Comply with NEMA Standards Publication Number FG-1, "Non-Metallic Cable Ladder Systems".

C. NEC Compliance: Comply with NEC, as applicable to construction and installation of cable ladder and cable channel systems (Article 318, NEC).

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver cable ladder systems and components carefully to avoid breakage, denting and scoring finishes. Do not install damaged equipment.

B. Store cable ladders and accessories in original cartons and in clean dry space; protect from weather and construction traffic. Wet materials should be unpacked and dried before storage.

continued on page GRP-14

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with these specifications, cable ladder systems shall be as manufactured by B-Line [or engineer approved equal].

2.02 CABLE LADDER SECTIONS AND COMPONENTS

A. General: Except as otherwise indicated, provide non-metallic cable ladders, of types, classes, and sizes indicated; with splice plates, bolts, nuts and washers for connecting units. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additional construction features. Cable ladder shall be installed according to the latest revision of NEMA VE 2.

B. Material and Finish: Straight section structural elements; side rails, rungs and splice plates shall be pultruded from glass fiber reinforced polyester resin, vinyl ester resin or dis-stat.

C. Pultruded shapes shall be constructed with a surface veil to insure a resin-rich surface and ultraviolet resistance.

D. Pultruded shapes shall meet ASTM E-84, Class 1 flame rating and self-extinguishing requirements of ASTM D-635.

2.03 TYPE OF LADDER SYSTEM

A. Ladder Cable Ladders shall consist of two longitudinal members (side rails) with transverse members (rungs) mechanically fastened and adhesively bonded to the side rails. Rungs shall be spaced [6] [9] [12] inches on center. Rung spacing in radiused fittings shall be industry standard 9" and measured at the center of the ladder's width. Each rung must be capable of supporting a 200 lb. concentrated load at the center of the cable ladder with a safety factor of 1.5 (See following rung loading table).

B. Ventilated Bottom Cable Ladders shall consist of two longitudinal members (side rails) with rungs spaced 4" on center.

C. Solid Bottom Cable Ladders shall consist of two longitudinal members (side rails) with a solid sheet over rungs spaced on 12" centers.

D. Cable ladder loading depth shall be [2] [3] [5] inches per NEMA FG 1.

E. Straight sections shall be supplied in standard [10 foot (3m)] [20 foot (6m)] lengths.

F. Cable ladder inside widths shall be [6] [9] [12] [18] [24] [30] [36] inches or as shown on drawings. Outside width shall not exceed inside by more than a total of 2".

G. Straight and expansion splice plates will be of "L" shaped lay-in design with an eight-bolt pattern in 5" fill systems and four-bolt pattern in 3" and 2" fill systems. Splice plates shall be furnished with straight sections and fittings.

H. All fittings must have a minimum radius of [12] [24] [36].

I. Molded fittings shall be formed with a minimum 3" tangent following the radius.

J. Systems with 3 inch loading depth shall have 90-degree and 45-degree molded fittings in 12 inch or 24 inch radius. (Polyester and vinylester only.)

K. Systems with 5 inch loading depth shall have 90-degree and 45-degree molded fittings in 24 inch or 36 inch radius. (Polyester and vinylester only.)

L. All other fittings shall be of mitered construction.

M. Dimension tolerances will be per NEMA FG 1.

continued on page GRP-15

2.04 LOADING CAPACITIES

A. Cable ladders shall meet NEMA class designation: [8C] [12C] [20B] [20C].

Or

A. Cable ladder shall be capable of carrying a uniformly distributed load of _____ lbs./ft on a _____ foot support span with a safety factor of 1.5 when supported as a simple span and tested per NEMA VE 1 Section 5.2.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install cable ladders as indicated: Installation shall be in accordance with equipment manufacturer's instructions, and with recognized industry practices to ensure that cable ladder equipment comply with requirements of NEC and applicable portions of NFPA 70B. Reference NEMA VE 2 for general cable ladder installation guidelines.

B. Coordinate cable ladder with other electrical work as necessary to properly integrate installation of cable ladder work with other work.

C. Provide sufficient space encompassing cable ladders to permit access for installing and maintaining cables.

D. Cable ladder fitting supports shall be located such that they meet the strength requirements of straight sections. Install fitting supports per NEMA VE 2 guidelines, or in accordance with manufacturer's instructions.

3.02 TESTING

A. Upon request manufacturer shall provide test reports witnessed by an independent testing laboratory of the "worst case" loading conditions outlined in this specification and performed in accordance with the latest revision of NEMA FG 1.

SECTION 161xx

LOW SMOKE, ZERO HALOGEN, NON-METALLIC CABLE LADDER

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, tests and services to install complete cable ladder systems as shown on the drawings.

B. Cable ladder systems are defined to include, but are not limited to straight sections of ladder type cable ladders, bends, tees, elbows, drop-outs, supports and accessories.

1.02 REFERENCES

A. ANSI/NFPA 70 – National Electrical Code

B. NEMA FG 1-2002 – Non-Metallic Cable Ladder Systems

C. NEMA VE 2-2002 – Cable Ladder Installation Guidelines

1.03 DRAWINGS

A. The drawings, which constitute a part of these specifications, indicate the general route of the cable ladder systems. Data presented on these drawings are as accurate as preliminary surveys and planning can determine until final equipment selection is made. Accuracy is not guaranteed and field verification, of all dimensions, routing, etc., is directed.

B. Specifications and drawings are for assistance and guidance, but exact routing, locations, distances and levels will be governed by actual field conditions. Contractor is directed to make field surveys as part of his work prior to submitting system layout drawings.

1.04 SUBMITTALS

A. Submittal Drawings: Submit drawings of cable ladder and accessories including clamps, brackets, hanger rods, splice plate connectors, expansion joint assemblies, and fittings, showing accurately scaled components.

B. Product Data: Submit manufacturer's data on cable ladder including, but not limited to, types, materials, finishes, rung spacings, inside depths and fitting radii. For side rails and rungs, submit cross sectional properties including Section Modulus (Sx) and Moment of Inertia (Ix).

1.05 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in manufacture of cable ladders and fittings of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. NEMA Compliance: Comply with NEMA Standards Publication Number FG-1, "Non-Metallic Cable Ladder Systems".

C. NEC Compliance: Comply with NEC, as applicable to construction and installation of cable ladder and cable channel systems (Article 392, NEC).

continued on page GRP-17

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver cable ladder systems and components carefully to avoid breakage, denting and scoring finishes. Do not install damaged equipment.

B. Store cable ladders and accessories in original cartons and in clean dry space; protect from weather and construction traffic. Wet materials should be unpacked and dried before storage.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with these specifications, cable ladder systems shall be part number **24FT09-12-240** as manufactured by B-Line [or engineer approved equal].

2.02 CABLE LADDER SECTIONS AND COMPONENTS

A. General: Except as otherwise indicated, provide non-metallic cable ladders, of types, classes, and sizes indicated; with splice plates, bolts, nuts and washers for connecting units. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additional construction features. Cable ladder shall be installed according to the latest revision of NEMA VE 2.

B. Material and Finish: Straight section structural elements; side rails, rungs and splice plates shall be pultruded from glass fiber reinforced zero halogen resin.

C. Pultruded shapes shall be constructed with a surface veil to insure a resin-rich surface and ultraviolet resistance.

D. Pultruded shapes shall meet the following criteria shown in Table 1:

Table 1

Test Performed	Specified Requirement
Flexural Strength	25,000 psi, Min.
Flexural Modulus	1,000,000 psi, Min.
Tensile Strength	17,000 psi, Min.
Tensile Modulus	900,000 psi, Min.
Impact Strength	25 ft-lb./in., Min.
Dielectric Strength	170 volts/mil, Min.
Arc Resistance	180 seconds, Min.
Water Absorption	0.2%, Max.
Thermal Expansion	0.000007 in./in./°F., Max.
Flame Spread Index	60, Max.
Flame Resistance	UL 94 V-0, Min.
Tracking Resistance	600 minutes, Min. at 2500V
Specific Optical	200 Max. within 4 minutes
Smoke Density	after start of test.

continued on page GRP-18

SMOKE TOXICITY

Gases	Maximum Quantities
Hydrogen Chloride	10 ppm
Hydrogen Bromide	10 ppm
Hydrogen Cyanide	10 ppm
Hydrogen Sulfide	10 ppm
Vinyl Chloride	10 ppm
Ammonia	500 ppm
Aldehydes	30 ppm
Oxides of Nitrogen	100 ppm
Carbon Dioxide	15,000 ppm
Carbon Monoxide	1,000 ppm

Fiberglass pultruded shapes are manufactured per Creative Pultrusions Inc. Fiberglass Transportation Products-130 specifications.

2.03 TYPE OF LADDER SYSTEM

A. Ladder Cable Ladders shall consist of two longitudinal members (side rails) with transverse members (rungs) mechanically fastened and adhesively bonded to the side rails. Ladder Cable Ladder shall be B-Line part number 24FT09-12-240 [or engineered approved equal]. Rung spacing in radiused fittings shall be industry standard 9" and measured at the center of the ladder's width.

B. Straight and expansion splice plates will be of "L" shaped lay-in design with a four-bolt pattern. Splice plates shall be furnished with straight sections and fittings.

C. All fittings must have a minimum radius of [12] [24] [36].

D. All fittings shall be of mitered construction.

E. Dimension tolerances will be per NEMA FG 1.

2.04 LOADING CAPACITIES

A. Cable ladder shall be capable of carrying a uniformly distributed load of _____ lbs./ft on a _____-foot support span with a safety factor of 1.5 when supported as a simple span and tested per NEMA VE 1 Section 5.2.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install cable ladders as indicated: Installation shall be in accordance with equipment manufacturer's instructions, and with recognized industry practices to ensure that cable ladder equipment comply with requirements of NEC and applicable portions of NFPA 70B. Reference NEMA VE 2 for general cable ladder installation guidelines.

B. Coordinate cable ladder with other electrical work as necessary to properly integrate installation of cable ladder work with other work.

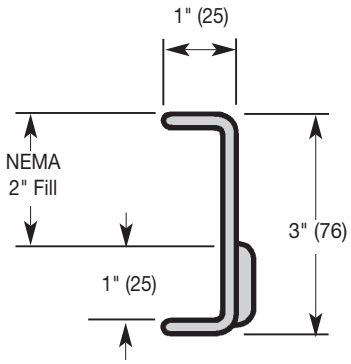
C. Provide sufficient space encompassing cable ladders to permit access for installing and maintaining cables.

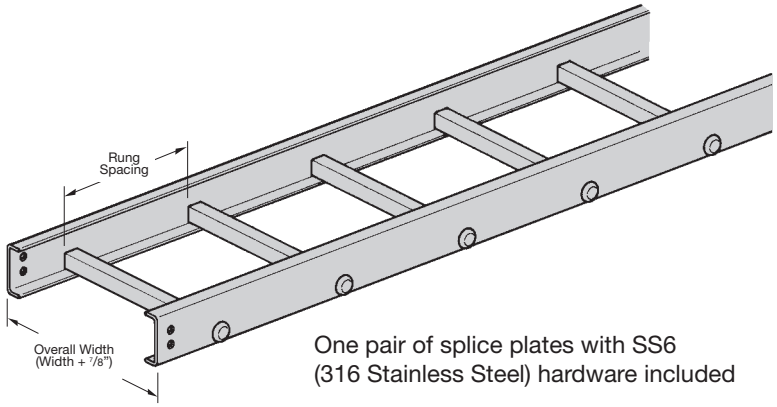
D. Cable ladder fitting supports shall be located such that they meet the strength requirements of straight sections. Install fitting supports per NEMA VE 2 guidelines, or in accordance with manufacturer's instructions.

3.02 TESTING

A. Upon request manufacturer shall provide test reports witnessed by an independent testing laboratory of the "worst case" loading conditions outlined in this specification and performed in accordance with the latest revision of NEMA FG 1.

Fiberglass Cable Ladder





One pair of splice plates with SS6
(316 Stainless Steel) hardware included

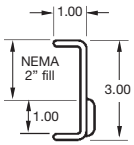
Series 13 Fiberglass Straight Section Part Numbering

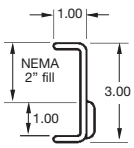
Prefix

Example: **13 F 09 - 24 - 120**

Series	Material	Type	Width	Length
13	**F** = Polyester **FV** = Vinyl Ester **FA** = Zero Halogen/ Dis-Stat	**Ladder -** **06** = 6" rung spacing **09** = 9" rung spacing **12** = 12" rung spacing	**06** = 6" **09** = 9" **12** = 12" **18** = 18" **24** = 24"	① **120** = 10 ft. ② 240 = 20 ft. ①Primary Length. ②Secondary Length.

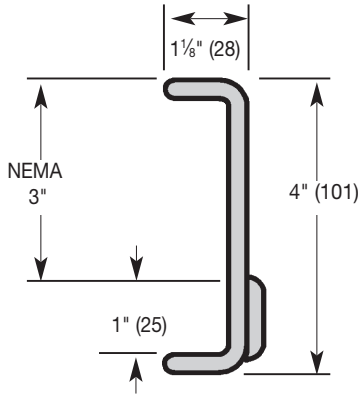
13

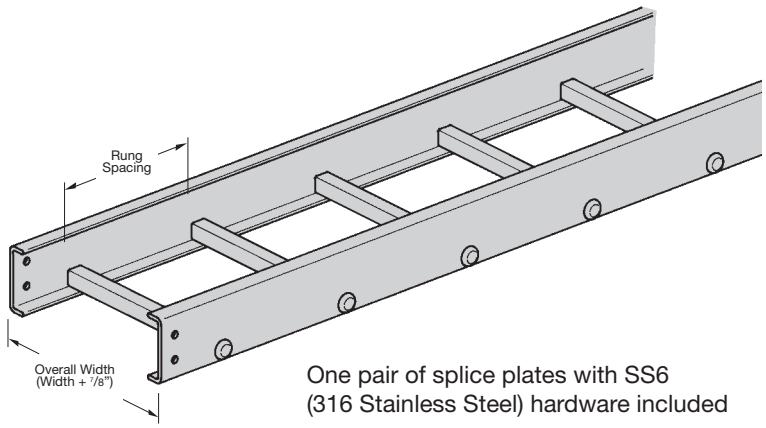
B-Line Series	Side Rail Dimensions	NEMA & CSA Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Span meters	Load kg/m	Deflection Multiplier
13F 13FV		NEMA: 8C	6	257	0.005	1.8	382	0.086
			8	145	0.016	2.4	216	0.267
			10	93	0.040	3.0	138	0.681
			12	64	0.083	3.7	95	1.411
			14	47	0.153	4.3	70	2.614

B-Line Series	Side Rail Dimensions	NEMA & CSA Classifications	Span ft	Load lbs/ft		Span meters	Load kg/m	
13FA		NEMA: 8C	6	178		1.8	264	
			8	100		2.4	149	
			10	64		3.0	95	
			12	44		3.7	65	

Values are based on simple beam tests per NEMA VFG-1 on 24" wide cable ladder rungs spaced on 12" centers. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable being installed.

When ladders are used in continuous spans, the deflection of the ladder is reduced by as much as 50%.





One pair of splice plates with SS6
(316 Stainless Steel) hardware included

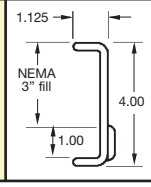
Series 24 Fiberglass Straight Section Part Numbering

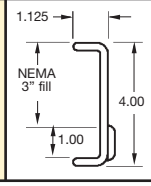
Prefix

Example: **24 F 09 - 24 - 120**

Series	Material	Type	Width	Length
24	**F** = Polyester **FV** = Vinyl Ester **FA** = Zero Halogen/ Dis-Stat	**Ladder -** **06** = 6" rung spacing **09** = 9" rung spacing **12** = 12" rung spacing	**06** = 6" **09** = 9" **12** = 12" **18** = 18" **24** = 24" **30** = 30" **36** = 36"	① **120** = 10 ft. ② 240 = 20 ft. ①Primary Length. ②Secondary Length.

24

B-Line Series	Side Rail Dimensions	NEMA & CSA Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Span meters	Load kg/m	Deflection Multiplier
24F **24FV**		NEMA: 12C CSA: E-3m	6 8 10 12	627 353 226 157	0.001 0.004 0.011 0.022	1.8 2.4 3.0 3.7	933 525 336 233	0.023 0.074 0.182 0.378

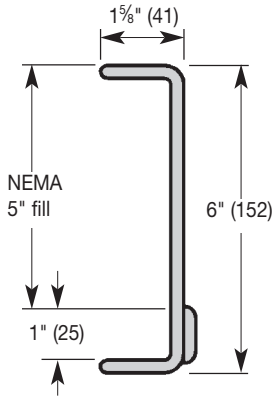
B-Line Series	Side Rail Dimensions	NEMA & CSA Classifications	Span ft	Load lbs/ft		Span meters	Load kg/m	
24FA		NEMA: 12C CSA: E-3m	6 8 10 12	400 226 144 100		1.8 2.4 3.0 3.7	595 336 214 149	

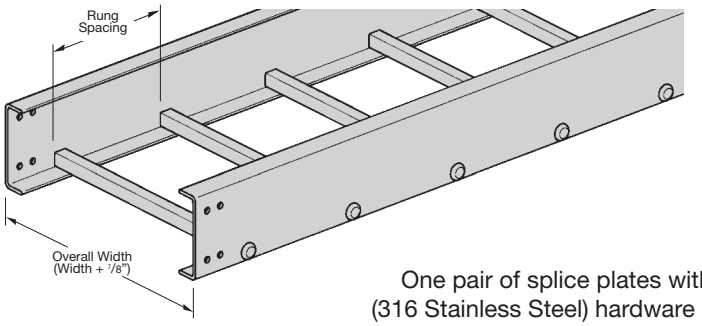
Values are based on simple beam tests per NEMA VFG-1 on 36" wide cable ladder rungs spaced on 12" centers. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable being installed.

When ladders are used in continuous spans, the deflection of the ladder is reduced by as much as 50%.

Dimensions in parentheses are in millimeters unless otherwise specified.

Fiberglass Cable Ladder





One pair of splice plates with SS6
(316 Stainless Steel) hardware included

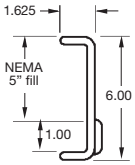
Series 36 Fiberglass Straight Section Part Numbering

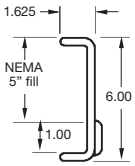
Prefix

Example: **36 F 09 - 24 - 120**

Series	Material	Type	Width	Length
36	**F** = Polyester **FV** = Vinyl Ester **FA** = Zero Halogen/ Dis-Stat	**Ladder -** **06** = 6" rung spacing **09** = 9" rung spacing **12** = 12" rung spacing	**06** = 6" **09** = 9" **12** = 12" **18** = 18" **24** = 24" **30** = 30" **36** = 36"	① **120** = 10 ft. ② 240 = 20 ft. ①Primary Length. ②Secondary Length.

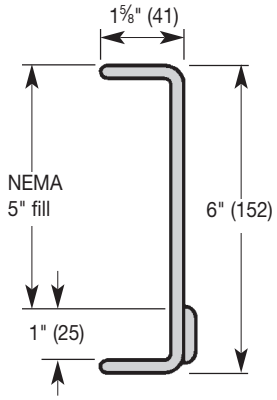
36

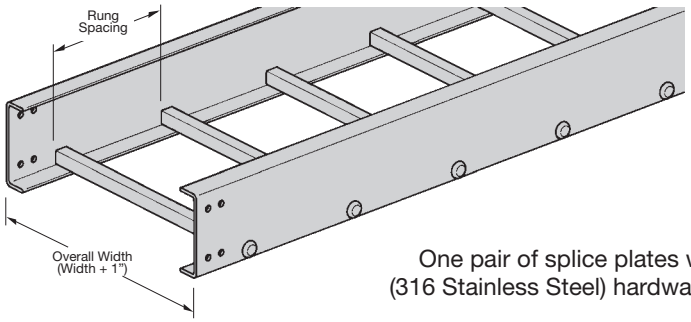
B-Line Series	Side Rail Dimensions	NEMA & CSA Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Span meters	Load kg/m	Deflection Multiplier
36F 36FV		NEMA: 20B CSA: E-6m	12 14 16 18 20	246 181 139 109 89	0.006 0.011 0.019 0.031 0.047	3.7 4.3 4.9 5.5 6.1	367 269 206 163 132	0.104 0.193 0.330 0.528 0.811

B-Line Series	Side Rail Dimensions	NEMA & CSA Classifications	Span ft	Load lbs/ft		Span meters	Load kg/m	
36FA		NEMA: 20B CSA: E-6m	12 14 16 18 20	208 153 117 93 75		3.7 4.3 4.9 5.5 6.1	309 227 174 138 111	

Values are based on simple beam tests per NEMA VFG-1 on 36" wide cable ladder rungs spaced on 12" centers. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable being installed.

When ladders are used in continuous spans, the deflection of the ladder is reduced by as much as 50%.





One pair of splice plates with SS6
(316 Stainless Steel) hardware included

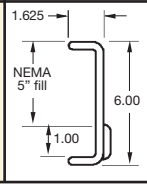
Series 46 Fiberglass Straight Section Part Numbering

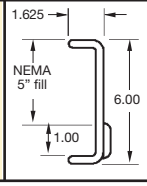
Prefix

Example: **H46 F 09 - 24 - 120**

Series	Material	Type	Width	Length
46	**F** = Polyester **FV** = Vinyl Ester **FA** = Zero Halogen/ Dis-Stat	**Ladder -** **06** = 6" rung spacing **09** = 9" rung spacing **12** = 12" rung spacing	**06** = 6" **09** = 9" **12** = 12" **18** = 18" **24** = 24" **30** = 30" **36** = 36"	① **120** = 10 ft. ② 240 = 20 ft. ①Primary Length. ②Secondary Length.

46

B-Line Series	Side Rail Dimensions	NEMA & CSA Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Span meters	Load kg/m	Deflection Multiplier
46F **46FV**		NEMA: 20C+ CSA: E-6m	12 14 16 18 20	393 288 221 174 141	0.005 0.009 0.015 0.023 0.035	3.7 4.3 4.9 5.5 6.1	584 429 329 260 210	0.079 0.145 0.246 0.396 0.605

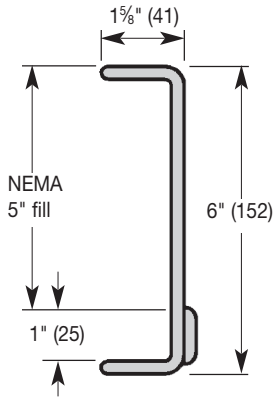
B-Line Series	Side Rail Dimensions	NEMA & CSA Classifications	Span ft	Load lbs/ft		Span meters	Load kg/m	
46FA		NEMA: 20C+ CSA: E-6m	12 14 16 18 20	278 204 156 123 100		3.7 4.3 4.9 5.5 6.1	413 303 232 183 149	

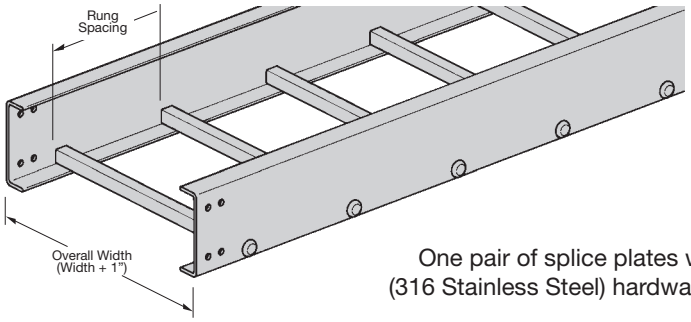
Values are based on simple beam tests per NEMA VFG-1 on 36" wide cable ladder rungs spaced on 12" centers. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable being installed.

When ladders are used in continuous spans, the deflection of the ladder is reduced by as much as 50%.

Dimensions in parentheses are in millimeters unless otherwise specified.

Fiberglass Cable Ladder





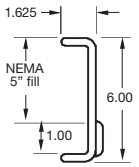
One pair of splice plates with SS6
(316 Stainless Steel) hardware included

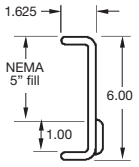
Series H46 Fiberglass Straight Section Part Numbering

Prefix

Example: **H46 F 09 - 24 - 120**

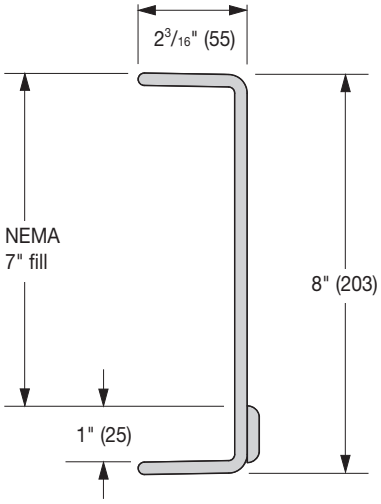
Series	Material	Type	Width	Length
H46	**F** = Polyester **FV** = Vinyl Ester **FA** = Zero Halogen/ Dis-Stat	**Ladder -** **06** = 6" rung spacing **09** = 9" rung spacing **12** = 12" rung spacing	**06** = 6" **09** = 9" **12** = 12" **18** = 18" **24** = 24" **30** = 30" **36** = 36"	① **120** = 10 ft. ② 240 = 20 ft. H46 ①Primary Length. ②Secondary Length.

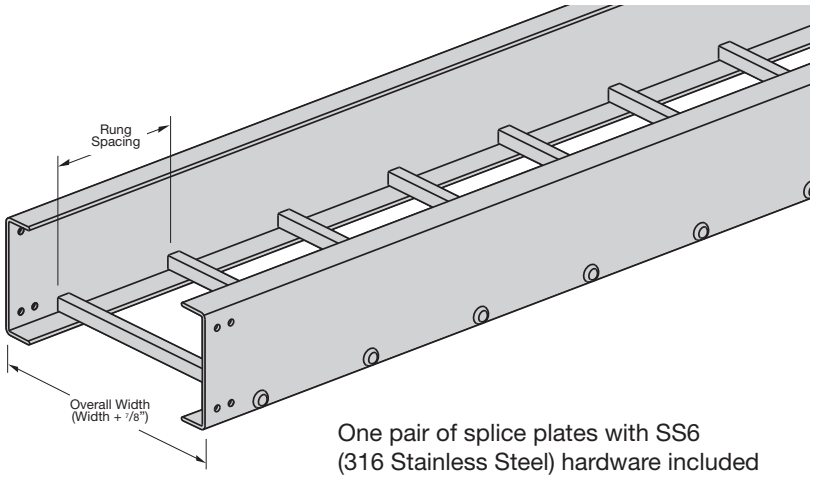
B-Line Series	Side Rail Dimensions	NEMA & CSA Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Span meters	Load kg/m	Deflection Multiplier
H46F H46FV		NEMA: 20C+ CSA: E-6m	12 14 16 18 20	424 312 239 188 153	0.005 0.009 0.015 0.023 0.035	3.7 4.3 4.9 5.5 6.1	631 464 355 280 227	0.079 0.144 0.248 0.396 0.608

B-Line Series	Side Rail Dimensions	NEMA & CSA Classifications	Span ft	Load lbs/ft		Span meters	Load kg/m	
H46FA		NEMA: 20C+ CSA: E-6m	12 14 16 18 20	306 224 172 136 110		3.7 4.3 4.9 5.5 6.1	455 333 245 202 163	

Values are based on simple beam tests per NEMA VFG-1 on 36" wide cable ladder rungs spaced on 12" centers. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable being installed.

When ladders are used in continuous spans, the deflection of the ladder is reduced by as much as 50%.





One pair of splice plates with SS6
(316 Stainless Steel) hardware included

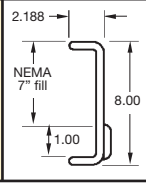
Series 48 Fiberglass Straight Section Part Numbering

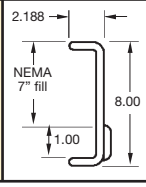
Prefix

Example: **48 F 09 - 24 - 120**

Series	Material	Type	Width	Length
48	**F** = Polyester **FV** = Vinyl Ester **FA** = Zero Halogen Dis-Stat	**Ladder -** **06** = 6" rung spacing **09** = 9" rung spacing **12** = 12" rung spacing	**06** = 6" **09** = 9" **12** = 12" **18** = 18" **24** = 24" **30** = 30" **36** = 36"	① **120** = 10 ft. ② 240 = 20 ft. ①Primary Length. ②Secondary Length.

48

B-Line Series	Side Rail Dimensions	NEMA & CSA Classifications	Span ft	Load lbs/ft	Deflection Multiplier	Span meters	Load kg/m	Deflection Multiplier
48F **48FV**		NEMA: 20C+	12	348	0.003	3.7	518	0.052
			14	256	0.006	4.3	381	0.097
			16	196	0.010	4.9	291	0.165
			18	155	0.015	5.5	231	0.210
			20	125	0.024	6.1	187	0.401

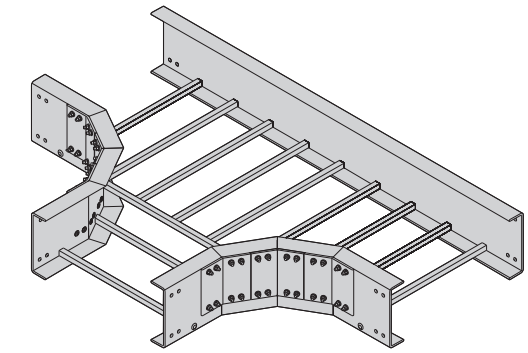
B-Line Series	Side Rail Dimensions	NEMA & CSA Classifications	Span ft	Load lbs/ft		Span meters	Load kg/m	
48FA		NEMA: 20C+	12	278		3.7	413	
			14	204		4.3	303	
			16	156		4.9	232	
			18	123		5.5	183	
			20	100		6.1	149	

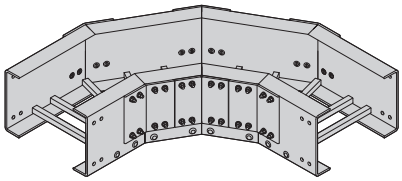
Values are based on simple beam tests per NEMA VFG-1 on 36" wide cable ladder rungs spaced on 12" centers. Published load safety factor is 1.5. To convert 1.5 safety factor to 2.0, multiply published load by 0.75. To obtain mid-span deflection, multiply a load by the deflection multiplier. Cable ladder must be supported on spans shorter than or equal to the length of the cable being installed.

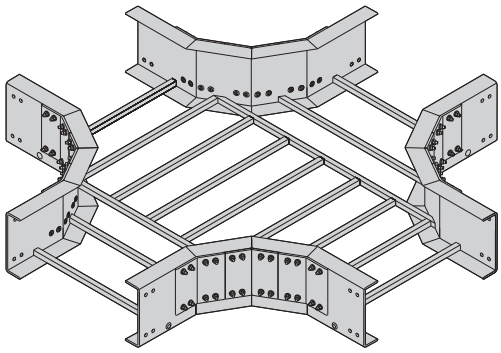
When ladders are used in continuous spans, the deflection of the ladder is reduced by as much as 50%.

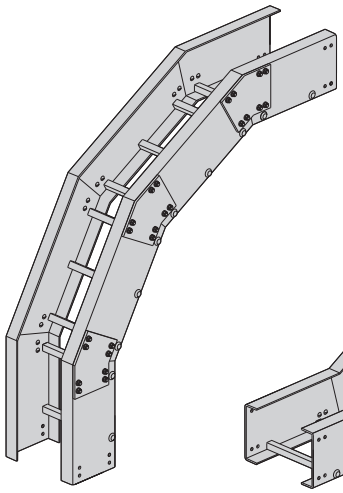
Dimensions in parentheses are in millimeters unless otherwise specified.

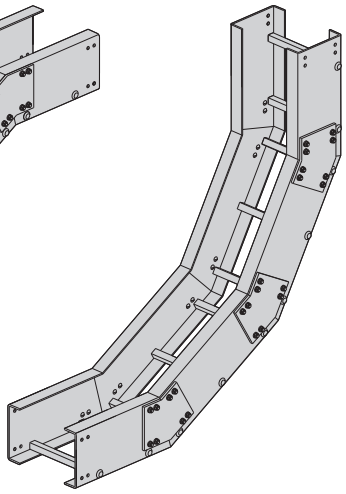
Fiberglass Cable Ladder











Series 24 Fiberglass Fittings Part Numbering

Prefix

Example: **4 F - 12 - 90 HB 12**

(9" rung spacing is standard)

Height

3 = 3" **
4 = 4"
6 = 6"
8 = 8"

** 3" deep fittings are only available in 6" thru 24" widths and 12" radius only.

Material

F = Polyester
FV = Vinyl Ester
FA = Zero Halogen Dis-Stat

Width

06 = 6" (152)
09 = 9" (228)
12 = 12" (305)
18 = 18" (457)
24 = 24" (609)
30 = 30" (762)
36 = 36" (914)

Angle

45 = 45°
90 = 90°

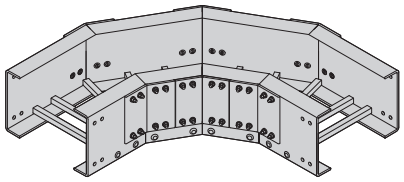
Type

HB = Horizontal Bend
HT = Horizontal Tee
HX = Horizontal Cross
VI = Vertical Inside Bend
VO = Vertical Outside Bend
LR = Left Reducer
RR = Right Reducer
SR = Straight Reducer
VT = Vertical Tee Down
VTU = Vertical Tee Up

Radius

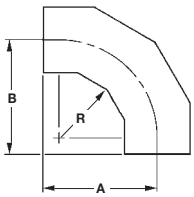
12 = 12" (305)
24 = 24" (609)
36 = 36" (914)

Horizontal Bend 90° (HB)

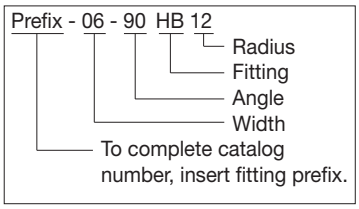


One pair of splice plates with SS6 hardware included.

- R - Bend Radius		Ladder Width		90° Horizontal Bend - Mitered Dimensions				
				Catalog No.	A		B	
in.	mm	in.	mm		in.	mm	in.	mm
12	305	6	152	**(Prefix)-06-90HB12**	20⅜	517	20⅜	517
		9	228	**(Prefix)-09-90HB12**	21⅞	555	21⅞	555
		12	305	**(Prefix)-12-90HB12**	22¾	578	22¾	578
		18	457	**(Prefix)-18-90HB12**	26⁵⁄₁₆	668	26⁵⁄₁₆	668
		24	609	**(Prefix)-24-90HB12**	29⅜	746	29⅜	746
		30	762	**(Prefix)-30-90HB12**	32⅜	822	32⅜	822
		36	914	**(Prefix)-36-90HB12**	35⅜	898	35⅜	898
24	609	6	152	**(Prefix)-06-90HB24**	32½	826	32½	826
		9	228	**(Prefix)-09-90HB24**	34	864	34	864
		12	305	**(Prefix)-12-90HB24**	35½	902	35½	902
		18	457	**(Prefix)-18-90HB24**	38½	978	38½	978
		24	609	**(Prefix)-24-90HB24**	41½	1054	41½	1054
		30	762	**(Prefix)-30-90HB24**	44½	1130	44½	1130
		36	914	**(Prefix)-36-90HB24**	47½	1207	47½	1207
36	914	6	152	**(Prefix)-06-90HB36**	44⅝	1133	44⅝	1133
		9	228	**(Prefix)-09-90HB36**	46⅛	1171	46⅛	1171
		12	305	**(Prefix)-12-90HB36**	47⅝	1209	47⅝	1209
		18	457	**(Prefix)-18-90HB36**	50⅝	1286	50⅝	1286
		24	609	**(Prefix)-24-90HB36**	53⅝	1362	53⅝	1362
		30	762	**(Prefix)-30-90HB36**	56⅝	1438	56⅝	1438
		36	914	**(Prefix)-36-90HB36**	59⅝	1514	59⅝	1514



90° Mitered



(Prefix) See page GRP-25 for catalog number prefix.
Dimensions for reference only, when critical contact factory.

For 3" Fittings

(Ladder Widths - 6" thru 24" Radius 12" only)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All are mitered

For 4" Fittings

(Ladder Widths - 6" thru 36" Radius 12", 24" & 36")
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 6" Fittings

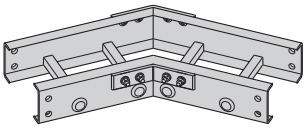
(Ladder Widths - 6" thru 36" Radius 12", 24" & 36")
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 8" Fittings

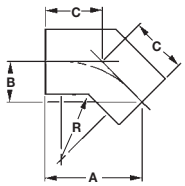
(Ladder Widths - 6" thru 36" Radius 12", 24" & 36")
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

Dimensions in parentheses are in millimeters unless otherwise specified.

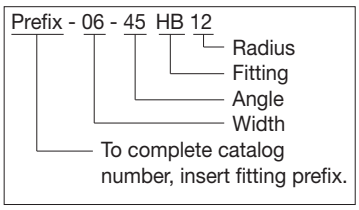
Horizontal Bend 45° (HB)



One pair of splice plates with SS6 hardware included.



45° Mitered



(Prefix) See page GRP-25 for catalog number prefix. Dimensions for reference only, when critical contact factory.

- R - Bend Radius		Ladder Width		45° Horizontal Bend - Mitered Dimensions							
				Catalog No.	A		B		C	
in.	mm	in	mm		in.	mm	in.	mm	in.	mm
12	305	6	152	**(Prefix)-06-45HB12**	22 13/16	579	9 7/16	240	13 3/8	340
		9	228	**(Prefix)-09-45HB12**	23 7/8	606	9 7/8	251	14	355
		12	305	**(Prefix)-12-45HB12**	24 7/8	632	10 5/16	262	14 5/8	371
		18	457	**(Prefix)-18-45HB12**	27	686	11 3/16	284	15 7/8	403
		24	609	**(Prefix)-24-45HB12**	29 1/8	740	12 1/16	306	17 1/16	433
		30	762	**(Prefix)-30-45HB12**	31 1/4	794	12 15/16	328	18 5/16	465
		36	914	**(Prefix)-36-45HB12**	33 3/8	848	13 13/16	351	19 9/16	497
24	609	6	152	**(Prefix)-06-45HB24**	22 13/16	579	9 7/16	240	13 3/8	340
		9	228	**(Prefix)-09-45HB24**	23 7/8	606	9 7/8	251	14	355
		12	305	**(Prefix)-12-45HB24**	24 7/8	632	10 5/16	262	14 5/8	371
		18	457	**(Prefix)-18-45HB24**	27	686	11 3/16	284	15 7/8	403
		24	609	**(Prefix)-24-45HB24**	29 1/8	740	12 1/16	306	17 1/16	433
		30	762	**(Prefix)-30-45HB24**	31 1/4	794	12 15/16	328	18 5/16	465
		36	914	**(Prefix)-36-45HB24**	33 3/8	848	13 13/16	351	19 9/16	497
36	914	6	152	**(Prefix)-06-45HB36**	22 13/16	579	9 7/16	240	13 3/8	340
		9	228	**(Prefix)-09-45HB36**	23 7/8	606	9 7/8	251	14	355
		12	305	**(Prefix)-12-45HB36**	24 7/8	632	10 5/16	262	14 5/8	371
		18	457	**(Prefix)-18-45HB36**	27	686	11 3/16	284	15 7/8	403
		24	609	**(Prefix)-24-45HB36**	29 1/8	740	12 1/16	306	17 1/16	433
		30	762	**(Prefix)-30-45HB36**	31 1/4	794	12 15/16	328	18 5/16	465
		36	914	**(Prefix)-36-45HB36**	33 3/8	848	13 13/16	351	19 9/16	497

For 3” Fittings

(Ladder Widths - 6” thru 24” Radius 12” only)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All are mitered

For 4” Fittings

(Ladder Widths - 6” thru 36” Radius 12”, 24” & 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

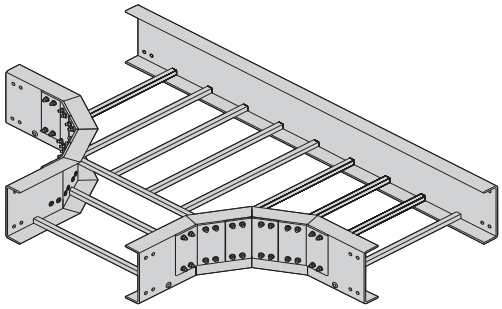
For 6” Fittings

(Ladder Widths - 6” thru 36” Radius 12”, 24” & 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 8” Fittings

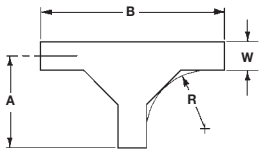
(Ladder Widths - 6” thru 36” Radius 12”, 24” & 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

Horizontal Tee (HT)

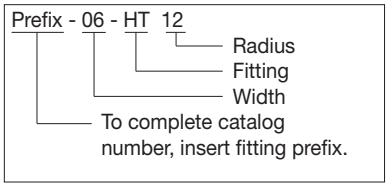


Two pair of splice plates with SS6 hardware included.

- R - Bend Radius		Ladder Width		Horizontal Tee - Mitered Dimensions				
				Catalog No.	A		B	
in.	mm	in.	mm		in.	mm	in.	mm
12	305	6	152	(Prefix)-06-HT12	19¼	489	38	965
		9	228	(Prefix)-09-HT12	20¾	527	41	1041
		12	305	(Prefix)-12-HT12	22¼	565	44	1117
		18	457	(Prefix)-18-HT12	25¼	641	50	1270
		24	609	(Prefix)-24-HT12	28¼	717	56	1422
		30	762	(Prefix)-30-HT12	31¼	794	62	1575
		36	914	(Prefix)-36-HT12	34¼	870	68	1727
24	609	6	152	(Prefix)-06-HT24	31¼	794	62¼	1581
		9	228	(Prefix)-09-HT24	32¾	832	65¼	1657
		12	305	(Prefix)-12-HT24	34¼	870	68¼	1734
		18	457	(Prefix)-18-HT24	37¼	946	74¼	1886
		24	609	(Prefix)-24-HT24	40¼	1022	80¼	2038
		30	762	(Prefix)-30-HT24	43¼	1098	86¼	2191
		36	914	(Prefix)-36-HT24	46¼	1175	92¼	2343
36	914	6	152	(Prefix)-06-HT36	43¼	1098	86½	2191
		9	228	(Prefix)-09-HT36	44¾	1136	89½	2273
		12	305	(Prefix)-12-HT36	46¼	1175	92½	2343
		18	457	(Prefix)-18-HT36	49¼	1251	98½	2502
		24	609	(Prefix)-24-HT36	52¼	1327	104½	2654
		30	762	(Prefix)-30-HT36	55¼	1403	110½	2807
		36	914	(Prefix)-36-HT36	58¼	1479	116½	2959



Mitered Tee



(Prefix) See page GRP-25 for catalog number prefix.
Dimensions for reference only, when critical contact factory.

For 3" Fittings

(Ladder Widths - 6" thru 24" Radius 12" only)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All are mitered

For 4" Fittings

(Ladder Widths - 6" thru 36" Radius 12", 24" & 36")
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 6" Fittings

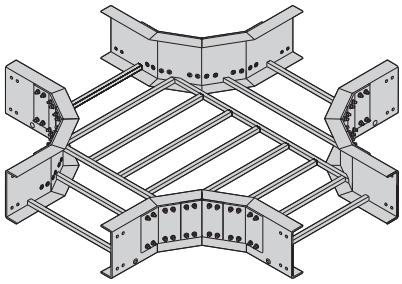
(Ladder Widths - 6" thru 36" Radius 12", 24" & 36")
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 8" Fittings

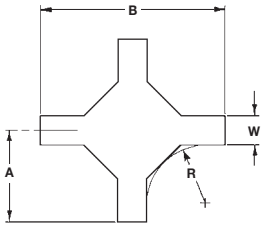
(Ladder Widths - 6" thru 36" Radius 12", 24" & 36")
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

Dimensions in parentheses are in millimeters unless otherwise specified.

Horizontal Cross (HX)



Three pair of splice plates with SS6 hardware included.



Mitered Cross

Prefix - 06 - HX 12
- Radius
- Fitting
- Width
- To complete catalog number, insert fitting prefix.

(Prefix) See page GRP-25 for catalog number prefix.
Dimensions for reference only, when critical contact factory.

For 3" Fittings

(Ladder Widths - 6" thru 24" Radius 12" only)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All are mitered

For 4" Fittings

(Ladder Widths - 6" thru 36" Radius 12", 24" & 36")
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 6" Fittings

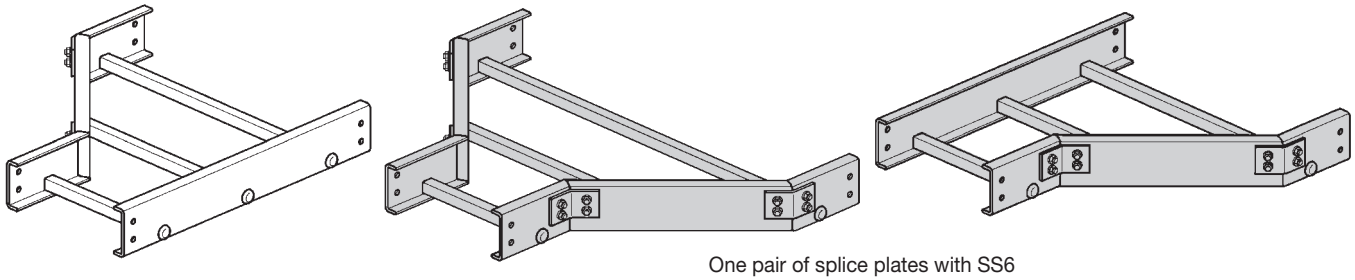
(Ladder Widths - 6" thru 36" Radius 12", 24" & 36")
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 8" Fittings

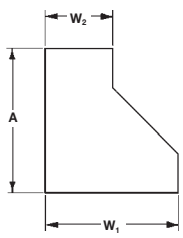
(Ladder Widths - 6" thru 36" Radius 12", 24" & 36")
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

- R - Bend Radius		Ladder Width		Horizontal Cross - Mitered Dimensions				
				Catalog No.	A		B	
in.	mm	in.	mm		in.	mm	in.	mm
12	305	6	152	**(Prefix)-06-HX12**	19¼	489	38	965
		9	228	**(Prefix)-09-HX12**	20¾	527	41	1041
		12	305	**(Prefix)-12-HX12**	22¼	565	44	1117
		18	457	**(Prefix)-18-HX12**	25¼	641	50	1270
		24	609	**(Prefix)-24-HX12**	28¼	717	56	1422
		30	762	**(Prefix)-30-HX12**	31¼	794	62	1575
		36	914	**(Prefix)-36-HX12**	34¼	870	68	1727
24	609	6	152	**(Prefix)-06-HX24**	31¼	794	62¼	1581
		9	228	**(Prefix)-09-HX24**	32¾	832	65¼	1657
		12	305	**(Prefix)-12-HX24**	34¼	870	68¼	1734
		18	457	**(Prefix)-18-HX24**	37¼	946	74¼	1886
		24	609	**(Prefix)-24-HX24**	40¼	1022	80¼	2038
		30	762	**(Prefix)-30-HX24**	43¼	1098	86¼	2191
		36	914	**(Prefix)-36-HX24**	46¼	1175	92¼	2343
36	914	6	152	**(Prefix)-06-HX36**	43¼	1098	86½	2191
		9	228	**(Prefix)-09-HX36**	44¾	1136	89½	2273
		12	305	**(Prefix)-12-HX36**	46¼	1175	92½	2343
		18	457	**(Prefix)-18-HX36**	49¼	1251	98½	2502
		24	609	**(Prefix)-24-HX36**	52¼	1327	104½	2654
		30	762	**(Prefix)-30-HX36**	55¼	1403	110½	2807
		36	914	**(Prefix)-36-HX36**	58¼	1479	116½	2959

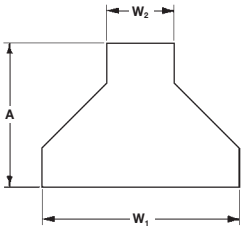
Reducers (LR) (SR) (RR)



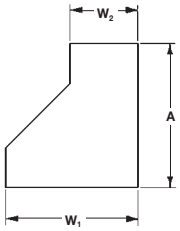
One pair of splice plates with SS6 hardware included.



Left Reducer



Straight Reducer



Right Reducer

3" Fittings
(Only available in W1 widths of 9", 12", 18" & 24")

4", 6" & 8" Fittings
(Available in all W1 widths shown in chart)

Reducers are all of mitered construction.

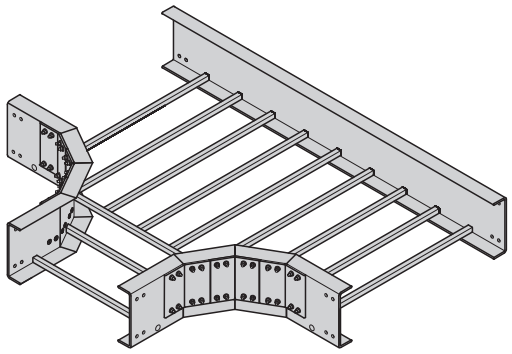
Prefix - 12 - SR 09
- Width$_2$ W_2
- Fitting
- Width$_1$ W_1
- To complete catalog number, insert fitting prefix.

(Prefix) See page GRP-25 for catalog number prefix.
Dimensions for reference only, when critical contact factory.

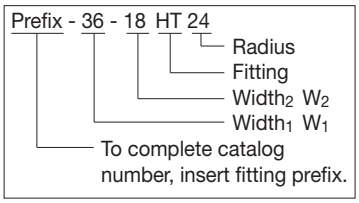
Ladder Width				Left Hand Reducer			Straight Reducer			Right Hand Reducer		
W_1		W_2		Catalog No.	A		Catalog No.	A		Catalog No.	A	
in.	mm	in.	mm		in.	mm		in.	mm		in.	mm
9	228	6	152	(Prefix)-09-LR06	17½	444	(Prefix)-09-SR06	16	406	(Prefix)-09-RR06	17½	444
12	305	6	152	(Prefix)-12-LR06	20½	521	(Prefix)-12-SR06	17½	444	(Prefix)-12-RR06	20½	521
		9	228	(Prefix)-12-LR09	17½	444	(Prefix)-12-SR09	16	406	(Prefix)-12-RR09	17½	444
18	457	6	152	(Prefix)-18-LR06	26½	673	(Prefix)-18-SR06	20½	521	(Prefix)-18-RR06	26½	673
		9	228	(Prefix)-18-LR09	23½	597	(Prefix)-18-SR09	19	482	(Prefix)-18-RR09	23½	597
		12	305	(Prefix)-18-LR12	20½	521	(Prefix)-18-SR12	17½	444	(Prefix)-18-RR12	20½	521
24	609	6	152	(Prefix)-24-LR06	32½	825	(Prefix)-24-SR06	23½	597	(Prefix)-24-RR06	32½	825
		9	228	(Prefix)-24-LR09	29½	749	(Prefix)-24-SR09	22	559	(Prefix)-24-RR09	29½	749
		12	305	(Prefix)-24-LR12	26½	673	(Prefix)-24-SR12	20½	521	(Prefix)-24-RR12	26½	673
		18	457	(Prefix)-24-LR18	20½	521	(Prefix)-24-SR18	17½	444	(Prefix)-24-RR18	20½	521
30	762	6	152	(Prefix)-30-LR06	38½	978	(Prefix)-30-SR06	26½	673	(Prefix)-30-RR06	38½	978
		9	228	(Prefix)-30-LR09	35½	902	(Prefix)-30-SR09	25	635	(Prefix)-30-RR09	35½	902
		12	305	(Prefix)-30-LR12	32½	825	(Prefix)-30-SR12	23½	597	(Prefix)-30-RR12	32½	825
		18	457	(Prefix)-30-LR18	26½	673	(Prefix)-30-SR18	20½	521	(Prefix)-30-RR18	26½	673
		24	609	(Prefix)-30-LR24	20½	521	(Prefix)-30-SR24	17½	444	(Prefix)-30-RR24	20½	521
36	914	6	152	(Prefix)-36-LR06	44½	1130	(Prefix)-36-SR06	29½	749	(Prefix)-36-RR06	44½	1130
		9	228	(Prefix)-36-LR09	41½	1054	(Prefix)-36-SR09	28	711	(Prefix)-36-RR09	41½	1054
		12	305	(Prefix)-36-LR12	38½	978	(Prefix)-36-SR12	26½	673	(Prefix)-36-RR12	38½	978
		18	457	(Prefix)-36-LR18	32½	825	(Prefix)-36-SR18	23½	597	(Prefix)-36-RR18	32½	825
		24	609	(Prefix)-36-LR24	26½	673	(Prefix)-36-SR24	20½	521	(Prefix)-36-RR24	26½	673
		30	762	(Prefix)-36-LR30	20½	521	(Prefix)-36-SR30	17½	444	(Prefix)-36-RR30	20½	521

Dimensions in parentheses are in millimeters unless otherwise specified.

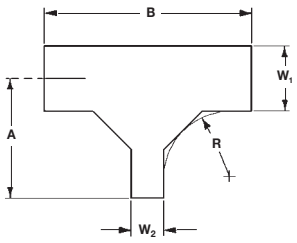
Horizontal Reducing Tee (HT)



Two pair of splice plates with SS6 hardware included.



(Prefix) See page GRP-25 for catalog number prefix.
Dimensions for reference only, when critical contact factory.



Mitered
(For dimensions, see chart on page GRP-34)

For 3” Fittings

(Radius 12” only
W1 ladder widths - 9”, 12”, 18” & 24”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All are mitered

For 4” Fittings

(Radius 12”, 24” & 36”
W1 ladder widths - 9” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 6” Fittings

(Radius 12”, 24” & 36”
W1 ladder widths - 9” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 8” Fittings

(Radius 12”, 24” & 36”
W1 ladder widths - 9” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

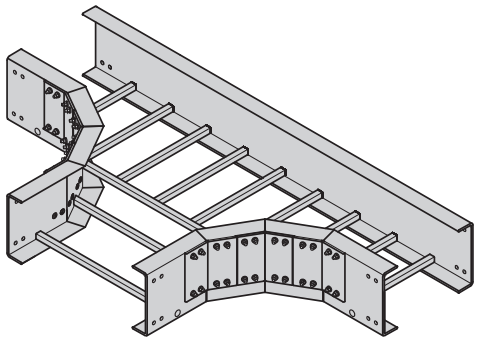
Horizontal Reducing Tee (HT)

Mitered Fittings

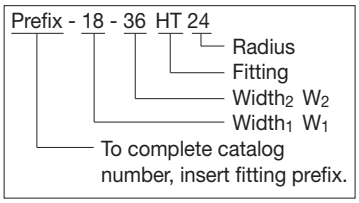
Ladder Width W_1 in.	W_1 mm	W_2 in.	W_2 mm	Catalog No. * Insert radius (12", 24" or 36")	12" Radius (305) A in.	A mm	B in.	B mm	24" Radius (609) A in.	A mm	B in.	B mm	36" Radius (914) A in.	A mm	B in.	B mm
9	228	6	152	(Prefix)-09-06-HT*	20¾	527	38½	978	32¾	832	62½	1587	44¾	1137	86½	2197
12	305	6	152	(Prefix)-12-06-HT*	22¼	565	38½	978	34¼	870	62½	1587	46¼	1175	86½	2197
		9	228	(Prefix)-12-09-HT*	22¼	565	41½	1054	34¼	870	65½	1664	46¼	1175	89½	2273
18	457	6	152	(Prefix)-18-06-HT*	25¼	641	38½	978	37¼	946	62½	1587	49¼	1251	86½	2197
		9	228	(Prefix)-18-09-HT*	25¼	641	41½	1054	37¼	946	65½	1664	49¼	1251	89½	2273
		12	305	(Prefix)-18-12-HT*	25¼	641	44½	1130	37¼	946	68½	1740	49¼	1251	92½	2350
24	609	6	152	(Prefix)-24-06-HT*	28¼	717	38½	978	40¼	1022	62½	1587	52¼	1327	86½	2197
		9	228	(Prefix)-24-09-HT*	28¼	717	41½	1054	40¼	1022	65½	1664	52¼	1327	89½	2273
		12	305	(Prefix)-24-12-HT*	28¼	717	44½	1130	40¼	1022	68½	1740	52¼	1327	92½	2350
		18	457	(Prefix)-24-18-HT*	28¼	717	50½	1283	40¼	1022	74½	1892	52¼	1327	98½	2502
30	762	6	152	(Prefix)-30-06-HT*	31¼	794	38½	978	43¼	1098	62½	1587	55¼	1403	86½	2197
		9	228	(Prefix)-30-09-HT*	31¼	794	41½	1054	43¼	1098	65½	1664	55¼	1403	89½	2273
		12	305	(Prefix)-30-12-HT*	31¼	794	44½	1130	43¼	1098	68½	1740	55¼	1403	92½	2350
		18	457	(Prefix)-30-18-HT*	31¼	794	50½	1283	43¼	1098	74½	1892	55¼	1403	98½	2502
		24	609	(Prefix)-30-24-HT*	31¼	794	56½	1435	43¼	1098	80½	2045	55¼	1403	104½	2654
36	914	6	152	(Prefix)-36-06-HT*	34¼	870	38½	978	46¼	1175	62½	1587	58¼	1480	86½	2197
		9	228	(Prefix)-36-09-HT*	34¼	870	41½	1054	46¼	1175	65½	1664	58¼	1480	89½	2273
		12	305	(Prefix)-36-12-HT*	34¼	870	44½	1130	46¼	1175	68½	1740	58¼	1480	92½	2350
		18	457	(Prefix)-36-18-HT*	34¼	870	50½	1283	46¼	1175	74½	1892	58¼	1480	98½	2502
		24	609	(Prefix)-36-24-HT*	34¼	870	56½	1435	46¼	1175	80½	2045	58¼	1480	104½	2654
		30	762	(Prefix)-36-30-HT*	34¼	870	62½	1587	46¼	1175	86½	2197	58¼	1480	110½	2807

Dimensions in parentheses are in millimeters unless otherwise specified.

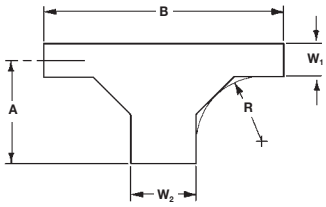
Horizontal Expanding Tee (HT)



Two pair of splice plates with SS6 hardware included.



(Prefix) See page GRP-25 for catalog number prefix.
Dimensions for reference only, when critical contact factory.



Mitered

(For dimensions, see chart on page GRP-36)

For 3” Fittings

(Radius 12” only
W1 ladder widths - 6” thru 18”
W2 ladder widths - 9” thru 24”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All are mitered

For 4” Fittings

(Radius 12”, 24” & 36”
W1 ladder widths - 6” thru 30”)
W2 ladder widths - 9” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 6” Fittings

(Radius 12”, 24” & 36”
W1 ladder widths - 6” thru 30”)
W2 ladder widths - 9” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 8” Fittings

(Radius 12”, 24” & 36”
W1 ladder widths - 6” thru 30”)
W2 ladder widths - 9” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

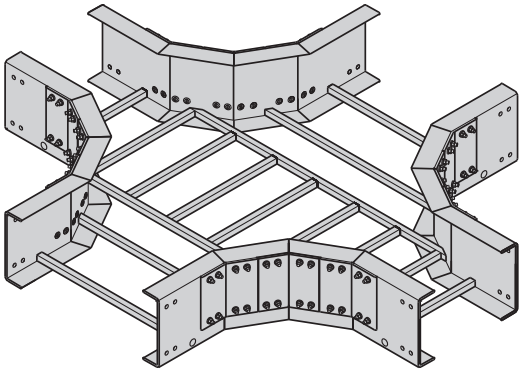
Horizontal Expanding Tee (HT)

Mitered Fittings

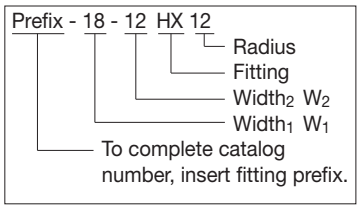
Ladder Width W_1 in.	W_1 mm	W_2 in.	W_2 mm	Catalog No. * Insert radius (12", 24" or 36")	12" Radius (305) A in.	A mm	B in.	B mm	24" Radius (609) A in.	A mm	B in.	B mm	36" Radius (914) A in.	A mm	B in.	B mm
6	152	9	228	(Prefix)-06-09-HT*	19¼	489	41½	1054	31¼	794	65½	1664	43¼	1098	89½	2273
		12	305	(Prefix)-06-12-HT*	19¼	489	44½	1130	31¼	794	68½	1740	43¼	1098	92½	2349
		18	457	(Prefix)-06-18-HT*	19¼	489	50½	1283	31¼	794	74½	1892	43¼	1098	98½	2502
		24	609	(Prefix)-06-24-HT*	19¼	489	56½	1435	31¼	794	80½	2045	43¼	1098	104½	2654
		30	762	(Prefix)-06-30-HT*	19¼	489	62½	1587	31¼	794	86½	2197	43¼	1098	110½	2807
		36	914	(Prefix)-06-36-HT*	19¼	489	68½	1740	31¼	794	92½	2349	43¼	1098	116½	2959
9	228	12	305	(Prefix)-09-12-HT*	20¾	527	44½	1130	32¾	832	68½	1740	44¾	136	92½	2349
		18	457	(Prefix)-09-18-HT*	20¾	527	50½	1283	32¾	832	74½	1892	44¾	136	98½	2502
		24	609	(Prefix)-09-24-HT*	20¾	527	56½	1435	32¾	832	80½	2045	44¾	136	104½	2654
		30	762	(Prefix)-09-30-HT*	20¾	527	62½	1587	32¾	832	86½	2197	44¾	136	110½	2807
		36	914	(Prefix)-09-36-HT*	20¾	527	68½	1740	32¾	832	92½	2349	44¾	136	116½	2959
12	305	18	457	(Prefix)-12-18-HT*	22¼	565	50½	1283	34¼	870	74½	1892	46¼	1175	98½	2502
		24	609	(Prefix)-12-24-HT*	22¼	565	56½	1435	34¼	870	80½	2045	46¼	1175	104½	2654
		30	762	(Prefix)-12-30-HT*	22¼	565	62½	1587	34¼	870	86½	2197	46¼	1175	110½	2807
		36	914	(Prefix)-12-36-HT*	22¼	565	68½	1740	34¼	870	92½	2349	46¼	1175	116½	2959
18	457	24	609	(Prefix)-18-24-HT*	25¼	641	56½	1435	37¼	946	80½	2045	49¼	1251	104½	2654
		30	762	(Prefix)-18-30-HT*	25¼	641	62½	1587	37¼	946	86½	2197	49¼	1251	110½	2807
		36	914	(Prefix)-18-36-HT*	25¼	641	68½	1740	37¼	946	92½	2349	49¼	1251	122½	3111
24	609	30	762	(Prefix)-24-30-HT*	28¼	717	62½	1587	40¼	1022	86½	2197	52¼	1327	110½	2807
		36	914	(Prefix)-24-36-HT*	28¼	717	68½	1740	40¼	1022	92½	2349	52¼	1327	116½	2959
30	762	36	914	(Prefix)-30-36-HT*	31¼	794	68½	1740	43¼	1098	92½	2349	55¼	1403	116½	2959

Dimensions in parentheses are in millimeters unless otherwise specified.

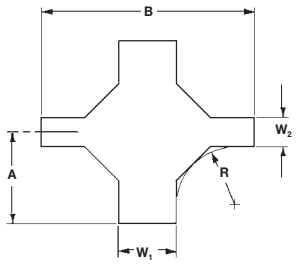
Horizontal Expanding/Reducing Cross (HX)



Three pair of splice plates with SS6 hardware included.



(Prefix) See page GRP-25 for catalog number prefix.
Dimensions for reference only, when critical contact factory.



Mitered

(For dimensions, see chart on page GRP-38)

For 3” Fittings

(Radius 12” only
W1 ladder widths - 9” thru 24”
W2 ladder widths - 6” thru 18”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All are mitered

For 4” Fittings

(Radius 12”, 24” & 36”
W1 ladder widths - 9” thru 36”)
W2 ladder widths - 6” thru 30”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 6” Fittings

(Radius 12”, 24” & 36”
W1 ladder widths - 9” thru 36”)
W2 ladder widths - 6” thru 30”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 8” Fittings

(Radius 12”, 24” & 36”
W1 ladder widths - 9” thru 36”)
W2 ladder widths - 6” thru 30”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

Horizontal Expanding/Reducing Cross (HX)

Mitered Fittings

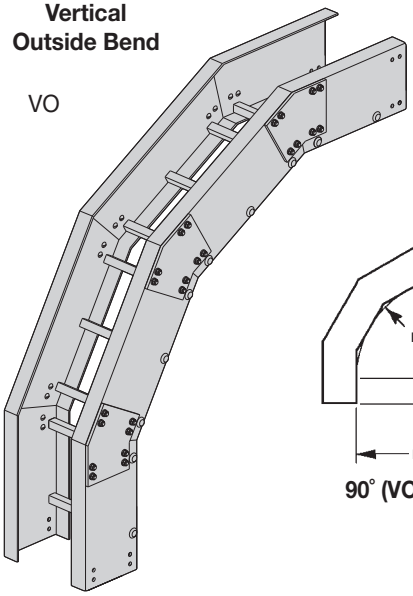
Ladder Width W_1 in.	W_1 mm	W_2 in.	W_2 mm	Catalog No. * Insert radius (12", 24" or 36")	12" Radius (305) A in.	A mm	B in.	B mm	24" Radius (609) A in.	A mm	B in.	B mm	36" Radius (914) A in.	A mm	B in.	B mm
9	228	6	152	(Prefix)-09-06-HT*	19¼	489	41½	1054	31¼	794	65½	1664	43¼	1098	89½	2273
12	305	6	152	(Prefix)-12-06-HT*	19¼	489	44½	1130	31¼	794	68½	1740	43¼	1098	92½	2350
		9	228	(Prefix)-12-09-HT*	20¾	527	44½	1130	32¾	832	68½	1740	44¾	1136	92½	2350
18	457	6	152	(Prefix)-18-06-HT*	19¼	489	50½	1283	31¼	794	74½	1892	43¼	1098	98½	2502
		9	228	(Prefix)-18-09-HT*	20¾	527	50½	1283	32¾	832	74½	1892	44¾	1136	98½	2502
		12	305	(Prefix)-18-12-HT*	22¼	565	50½	1283	34¼	870	74½	1892	46¼	1175	98½	2502
24	609	6	152	(Prefix)-24-06-HT*	19¼	489	56½	1435	31¼	794	80½	2045	43¼	1098	104½	2654
		9	228	(Prefix)-24-09-HT*	20¾	527	56½	1435	32¾	832	80½	2045	44¾	1136	104½	2654
		12	305	(Prefix)-24-12-HT*	22¼	565	56½	1435	34¼	870	80½	2045	46¼	1175	104½	2654
		18	457	(Prefix)-24-18-HT*	25¼	641	56½	1435	37¼	946	80½	2045	49¼	1251	104½	2654
30	762	6	152	(Prefix)-30-06-HT*	19¼	489	62½	1587	31¼	794	86½	2197	43¼	1098	110½	2807
		9	228	(Prefix)-30-09-HT*	20¾	527	62½	1587	32¾	832	86½	2197	44¾	1136	110½	2807
		12	305	(Prefix)-30-12-HT*	22¼	565	62½	1587	34¼	870	86½	2197	46¼	1175	110½	2807
		18	457	(Prefix)-30-18-HT*	25¼	641	62½	1587	37¼	946	86½	2197	49¼	1251	110½	2807
		24	609	(Prefix)-30-24-HT*	28¼	717	62½	1587	40¼	1022	86½	2197	52¼	1327	110½	2807
36	914	6	152	(Prefix)-36-06-HT*	19¼	489	68½	1740	31¼	794	104½	2654	43¼	1098	128½	3264
		9	228	(Prefix)-36-09-HT*	20¾	527	68½	1740	32¾	832	104½	2654	44¾	1136	128½	3264
		12	305	(Prefix)-36-12-HT*	22¼	565	68½	1740	34¼	870	104½	2654	46¼	1175	128½	3264
		18	457	(Prefix)-36-18-HT*	25¼	641	68½	1740	37¼	946	104½	2654	49¼	1251	128½	3264
		24	609	(Prefix)-36-24-HT*	28¼	717	68½	1740	40¼	1022	104½	2654	52¼	1327	128½	3264
		30	762	(Prefix)-36-30-HT*	31¼	794	68½	1740	43¼	1098	104½	2654	55¼	1403	128½	3264

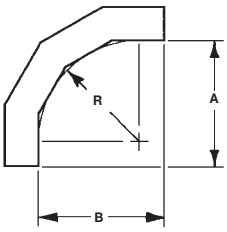
Dimensions in parentheses are in millimeters unless otherwise specified.

Vertical Bends 90° (VO) (VI)

Vertical Outside Bend

VO

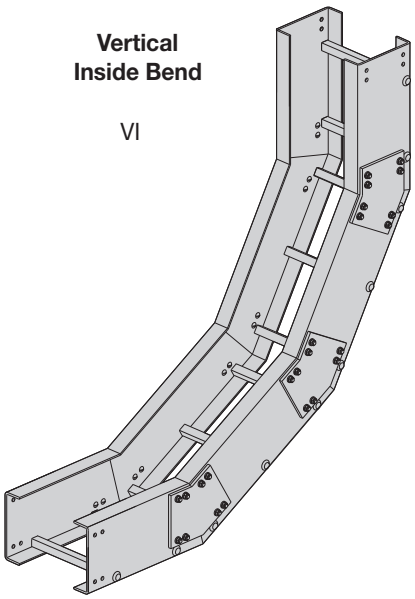


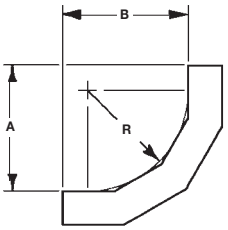


90° (VO) Mitered

Vertical Inside Bend

VI





90° (VI) Mitered

One pair of splice plates with SS6 hardware included.

Prefix - 06 - 90 VO 24
- Radius
- Fitting
- Angle
- Width
- To complete catalog number, insert fitting prefix.

Prefix - 06 - 90 VI 24
- Radius
- Fitting
- Angle
- Width
- To complete catalog number, insert fitting prefix.

(Prefix) See page GRP-25 for catalog number prefix.
Dimensions for reference only, when critical contact factory.

For 3” Fittings

(Radius 12” only
Ladder widths - 6” thru 24”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All are mitered

For 6” Fittings

(Radius 12”, 24” & 36”
Ladder widths - 6” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 4” Fittings

(Radius 12”, 24” & 36”
Ladder widths - 6” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 8” Fittings

(Radius 12”, 24” & 36”
Ladder widths - 6” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

Vertical Bends 90° (VO) (VI)

- R - Bend Radius		Ladder Width		Catalog No.	90° Mitered							
					Vertical Outside Bend				Vertical Inside Bend			
					A		B		A		B	
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm	in.	mm
12	305	6	152	(Prefix)-06-90(*)12	20 5/8	524	20 5/8	524	20 5/8	524	20 5/8	524
		9	228	(Prefix)-09-90(*)12								
		12	305	(Prefix)-12-90(*)12								
		18	457	(Prefix)-18-90(*)12								
		24	609	(Prefix)-24-90(*)12								
		30	762	(Prefix)-30-90(*)12								
		36	914	(Prefix)-36-90(*)12								
24	609	6	152	(Prefix)-06-90(*)24	28 31/32	735	28 31/32	735	28 31/32	735	28 31/32	735
		9	228	(Prefix)-09-90(*)24								
		12	305	(Prefix)-12-90(*)24								
		18	457	(Prefix)-18-90(*)24								
		24	609	(Prefix)-24-90(*)24								
		30	762	(Prefix)-30-90(*)24								
		36	914	(Prefix)-36-90(*)24								
36	914	6	152	(Prefix)-06-90(*)36	37 15/16	963	37 15/16	963	37 15/16	963	37 15/16	963
		9	228	(Prefix)-09-90(*)36								
		12	305	(Prefix)-12-90(*)36								
		18	457	(Prefix)-18-90(*)36								
		24	609	(Prefix)-24-90(*)36								
		30	762	(Prefix)-30-90(*)36								
		36	914	(Prefix)-36-90(*)36								

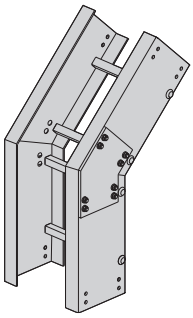
(*) Insert 'VO' for Vertical Outside Bend or 'VI' for Vertical Inside Bend.

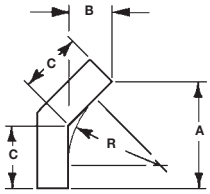
Dimensions in parentheses are in millimeters unless otherwise specified.

Vertical Bends 45° (VO) (VI)

Vertical Outside Bend

VO

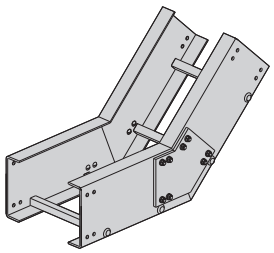


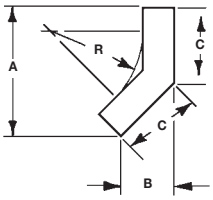


45° (VO) Mitered

Vertical Inside Bend

VI





45° (VI) Mitered

One pair of splice plates with SS6 hardware included.

Prefix - 06 - 45 VO 24
- Radius
- Fitting
- Angle
- Width
- To complete catalog number, insert fitting prefix.

Prefix - 06 - 45 VI 24
- Radius
- Fitting
- Angle
- Width
- To complete catalog number, insert fitting prefix.

(Prefix) See page GRP-25 for catalog number prefix.
Dimensions for reference only, when critical contact factory.

For 3” Fittings

(Radius 12” only
Ladder widths - 6” thru 24”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All are mitered

For 6” Fittings

(Radius 12”, 24” & 36”
Ladder widths - 6” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 4” Fittings

(Radius 12”, 24” & 36”
Ladder widths - 6” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 8” Fittings

(Radius 12”, 24” & 36”
Ladder widths - 6” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

Vertical Bends 45° (VO) (VI)

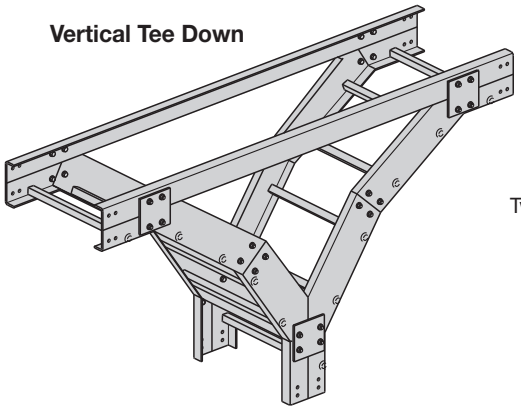
- R - Bend Radius		Ladder Width		Catalog No.	45° Mitered											
					Vertical Outside Bend						Vertical Inside Bend					
					A		B		C		A		B		C	
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		6	152	(Prefix)-06-45(*)12												
		9	228	(Prefix)-09-45(*)12												
		12	305	(Prefix)-12-45(*)12												
12	305	18	457	(Prefix)-18-45(*)12	20 1/2	521	8 1/2	216	12	305	26 5/32	664	10 27/32	275	15 5/16	389
		24	609	(Prefix)-24-45(*)12												
		30	762	(Prefix)-30-45(*)12												
		36	914	(Prefix)-36-45(*)12												
		6	152	(Prefix)-06-45(*)24												
		9	228	(Prefix)-09-45(*)24												
		12	305	(Prefix)-12-45(*)24												
24	609	18	457	(Prefix)-18-45(*)24	28 31/32	736	12	305	16 31/32	431	36 1/16	916	14 15/16	379	21 1/8	537
		24	609	(Prefix)-24-45(*)24												
		30	762	(Prefix)-30-45(*)24												
		36	914	(Prefix)-36-45(*)24												
		6	152	(Prefix)-06-45(*)36												
		9	228	(Prefix)-09-45(*)36												
		12	305	(Prefix)-12-45(*)36												
36	914	18	457	(Prefix)-18-45(*)36	37 7/16	951	15 1/2	394	21 15/16	557	46	1168	19 1/32	483	26 15/16	684
		24	609	(Prefix)-24-45(*)36												
		30	762	(Prefix)-30-45(*)36												
		36	914	(Prefix)-36-45(*)36												

(*) Insert 'VO' for Vertical Outside Bend or 'VI' for Vertical Inside Bend.
60° and 30° vertical bends available in mitered construction.

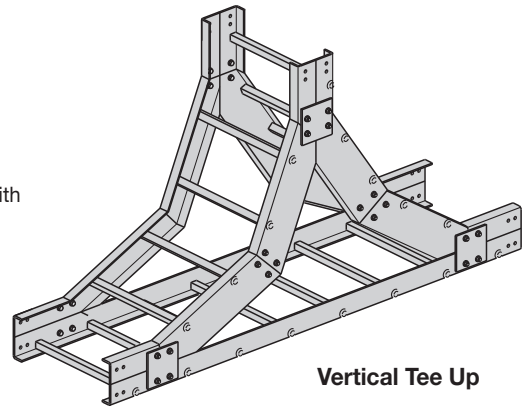
Dimensions in parentheses are in millimeters unless otherwise specified.

Vertical Tee Up (VTU)
Vertical Tee Down (VT)

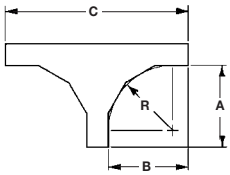
Vertical Tee Down



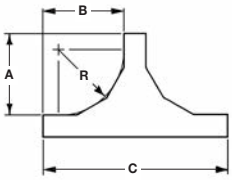
Two pair of splice plates with SS6 hardware included.



Vertical Tee Up



(VT) Mitered



(VTU) Mitered

C Dimension =
2 x B + Side Rail Height

C Dimension =
2 x B + Side Rail Height

(Prefix) See page GRP-25 for catalog number prefix.
Dimensions for reference only, when critical contact factory.

Prefix - 06 - VT 24

- Radius
- Fitting
- Width
- To complete catalog number, insert fitting prefix.

For 3” Fittings

(Radius 12” only
Ladder widths - 6” thru 24”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All are mitered

For 6” Fittings

(Radius 12”, 24” & 36”
Ladder widths - 6” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 4” Fittings

(Radius 12”, 24” & 36”
Ladder widths - 6” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

For 8” Fittings

(Radius 12”, 24” & 36”
Ladder widths - 6” thru 36”)
Polyester, Vinyl Ester, Zero Halogen/Dis-Stat
All radius are mitered

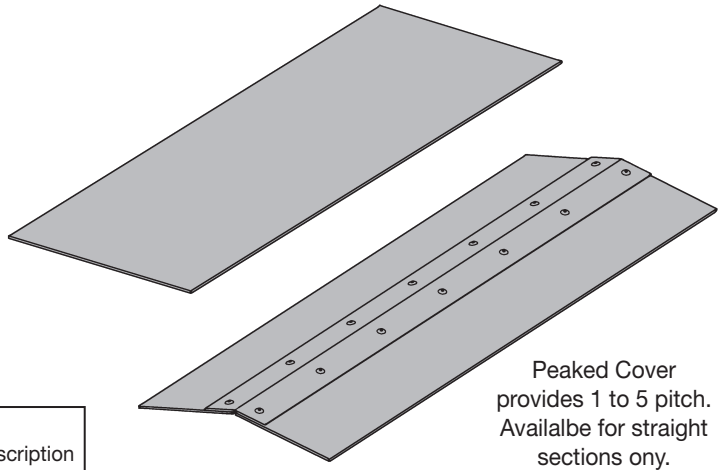
Vertical Tee Up (VTU)
Vertical Tee Down (VT)

- R - Bend Radius		Ladder Width		Mitered							
				Catalog No.	Vertical Tee Down				Vertical Tee Up			
					A		B		A		B	
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm	in.	mm
12	305	6	152	(Prefix)-06-(*)12	20 5/8	524	20 5/8	524	20 5/8	524	20 5/8	524
		9	228	(Prefix)-09-(*)12								
		12	305	(Prefix)-12-(*)12								
		18	457	(Prefix)-18-(*)12								
		24	609	(Prefix)-24-(*)12								
		30	762	(Prefix)-30-(*)12								
24	609	6	152	(Prefix)-06-(*)24	29	736	29	736	29	736	29	736
		9	228	(Prefix)-09-(*)24								
		12	305	(Prefix)-12-(*)24								
		18	457	(Prefix)-18-(*)24								
		24	609	(Prefix)-24-(*)24								
		30	762	(Prefix)-30-(*)24								
36	914	6	152	(Prefix)-06-(*)36	37 15/16	963	37 15/16	963	37 15/16	963	37 15/16	963
		9	228	(Prefix)-09-(*)36								
		12	305	(Prefix)-12-(*)36								
		18	457	(Prefix)-18-(*)36								
		24	609	(Prefix)-24-(*)36								
		30	762	(Prefix)-30-(*)36								

(*) Insert 'VT' for Vertical Tee Down or 'VTU' for Vertical Tee Up.

Dimensions in parentheses are in millimeters unless otherwise specified.

Covers



Peaked Cover provides 1 to 5 pitch. Availalbe for straight sections ony.

Material Thickness: ⅛" (3mm)

Cover Length: 10' (3m)

Standard Mounting Hardware:
(10 each) #10 x ½" stainless, self drilling screws provided with each section

Covers F - C - 24 - 120
- 120 = Length or fitting description
- 24 = Width
- C = Rail design
- F = Material

F - C - 24 - 120	=	Flat polyester
FV - C - 24 - 120	=	Flat vinyl ester
FA - C - 24 - 120	=	Flat zero halogen/Dis-Stat
FP - C - 24 - 120	=	Peaked polyester
FVP - C - 24 - 120	=	Peaked vinyl ester
FAP - C - 24 - 120	=	Peaked zero halogen/Dis-Stat

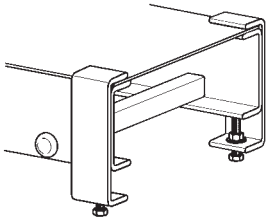
Peaked covers available for straight sections only.

Quantity of Standard Cover Clamps Required	
Straight Section 60" or 72"	4 pcs.
Straight Section 120" or 144"	6 pcs.
Horizontal/Vertical Bends	4 pcs.
Tees	6 pcs.
Crosses	8 pcs.

Note: When using the Heavy Duty Cover Clamp, only one-half the number of clamps stated above is required.

Standard Cover Clamp

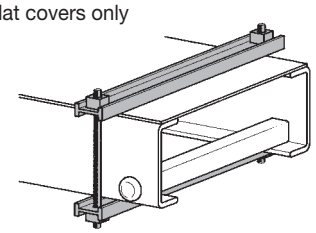
- Used to splice to existing cable ladder systems.
- Furnished in pairs with hardware.



Catalog No.	Side Rail Height	
	in.	mm
9(Δ)-9013	3	76
9(Δ)-9014	4	101
9(Δ)-9016	6	152

Heavy Duty Cover Clamp

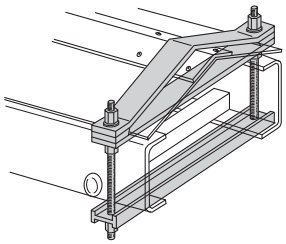
Recommended for outdoor service.
- W = ladder width
- Heavy duty cover clamp available for flat covers only



Catalog No.	Side Rail Height	
	in.	mm
9F-W-9034	3	76
9F-W-9044	4	101
9F-W-9064	6	152
9F-W-9084	8	203

Peaked Cover Clamp

- W = ladder width

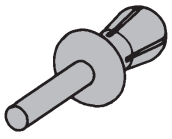


Catalog No.	Side Rail Height	
	in.	mm
9F-W-9034P	3	76
9F-W-9044P	4	101
9F-W-9064P	6	152
9F-W-9084P	8	203

Material Designations
(Δ) Insert one of the following material designations when required.
F = Polyester Resin (Example: 9F-9013)
FV = Vinyl Ester Resin (Example: 9FV-9013)
FA = Zero Halogen/Dis-Stat Resin (Example: 9FA-9013)

Thermo Plastic Drive Rivet

Shipped in packages of 25 pcs.



Catalog No.	TPDR

Part Number with Hardware Explanation

Note: All hardware is 3/8”

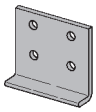
Hardware Option	316 Stainless Steel
	SS6

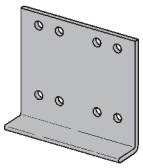
Example: 9F-4004 SS6: pair of 4-hole splice plates for 4" (101) system with stainless steel hardware
9FV-8006 SS6: pair of 8-hole vinyl ester splice plates for 6" (152) system with stainless steel hardware

Standard Lay-In Splice Plates

Included in needed quantities with ladder section.

- Furnished in pairs
- Order only pairs of splice plates needed for field fabrication.
- SS6 hardware supplied as standard - use SS6 suffix.
- Other hardware available, specify by hardware suffix. Hardware other than SS6 is considered special.





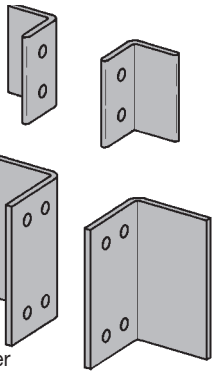
Material	Height	Catalog No.
Fiberglass	3" (76)	9(Δ)-4003*
	4" (101)	9(Δ)-4004*
	6" (152)	9(Δ)-8006*
	8" (203)	9(Δ)-8008*

* Hardware suffix needed to complete part number

Ladder to Box Splice Plates

These plates are used to attach the end of a ladder run to a distribution box or control center.

- Furnished in pairs



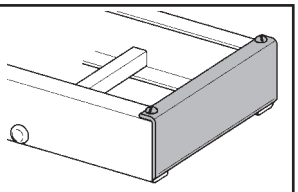
Material	Height	Catalog No.
Fiberglass	3" (76)	9(Δ)-4053*
	4" (101)	9(Δ)-4054*
	6" (152)	9(Δ)-8056*
	8" (203)	9(Δ)-8058*

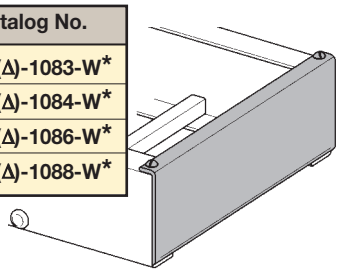
* Hardware suffix needed to complete part number

Blind End Plate

This plate forms a closure for any ladder that dead ends.

- Furnished as one plate
- W = ladder width





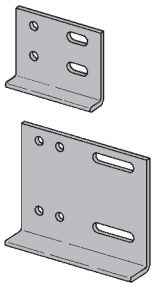
Material	Height	Catalog No.
Fiberglass	3" (76)	9(Δ)-1083-W*
	4" (101)	9(Δ)-1084-W*
	6" (152)	9(Δ)-1086-W*
	8" (203)	9(Δ)-1088-W*

* Hardware suffix needed to complete part number

Expansion Splice Plate

L-shaped, lay-in style

- Furnished in pairs



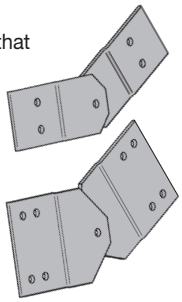
Material	Height	Catalog No.
Fiberglass	3" (76)	9(Δ)-4013*
	4" (101)	9(Δ)-4014*
	6" (152)	9(Δ)-8016*
	8" (203)	9(Δ)-8018*

* Hardware suffix needed to complete part number

Vertical Adjustable Splice Plates

These plates provide for changes in elevation that do not conform to standard vertical fittings.

- Furnished in pairs



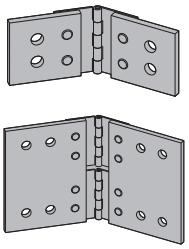
Material	Height	Catalog No.
Fiberglass	3" (76)	9(Δ)-4023*
	4" (101)	9(Δ)-4024*
	6" (152)	9(Δ)-8026*
	8" (203)	9(Δ)-8028*

* hardware suffix needed to complete part number

Horizontal Adjustable Splice Plates

These plates provide for changes in the horizontal direction that do not conform to standard fittings.

- Furnished in pairs
- Stainless steel hinges, FRP body



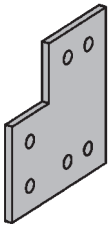
Material	Height	Catalog No.
Fiberglass	3" (76)	9(Δ)-4033*
	4" (101)	9(Δ)-4034*
	6" (152)	9(Δ)-8036*
	8" (203)	9(Δ)-8038*

* Hardware suffix needed to complete part number

Step Down Splice Plates

These splice plates provide for changes in side rail heights.

- Furnished in pairs



Material	Height	Catalog No.
Fiberglass	8" to 6" (203 to 152)	9(Δ)-8086*
	8" to 4" (203 to 101)	9(Δ)-8084*
	6" to 3" (152 to 76)	9(Δ)-8063*
	6" to 4" (152 to 101)	9(Δ)-8064*
	4" to 3" (101 to 76)	9(Δ)-4043*

* Hardware suffix needed to complete part number

(Δ) See page GRP-43 for material selection

Dimensions shown in parentheses are in millimeters, unless otherwise specified.

Dimensions in parentheses are in millimeters unless otherwise specified.

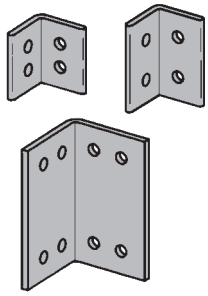
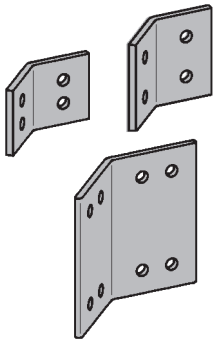
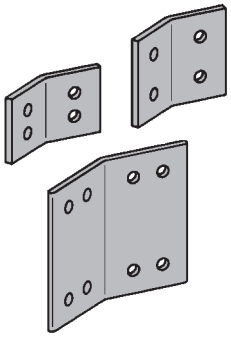
Horizontal and Vertical Splice Plates

* Hardware suffix needed to complete part number
All splice plate hardware is ⅜".

Hardware Suffix:
SS6 - 316SS
MO - Monel
SB - Silicon Bronze
FR - Fiberglass

Horizontal Splice Plates

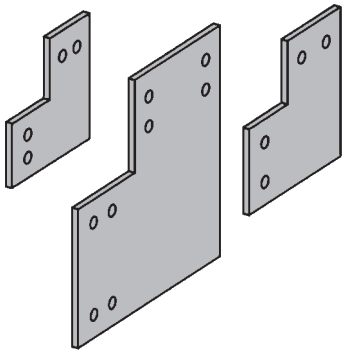
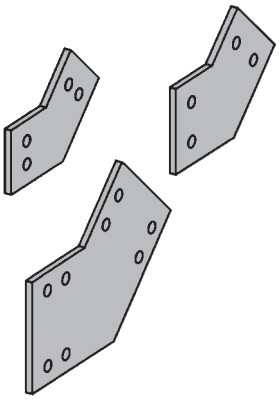
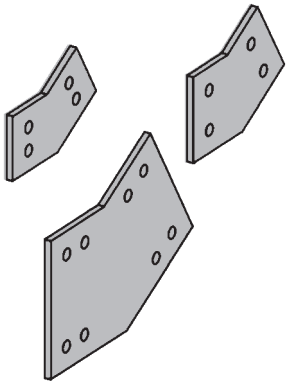
• Furnished in pairs
* Hardware suffix needed to complete part number

Catalog No. 90°	Catalog No. 45°	Catalog No. 30°
9(Δ)-4903H*	9(Δ)-4453H*	9(Δ)-4303H*
9(Δ)-4904H*	9(Δ)-4454H*	9(Δ)-4304H*
9(Δ)-8906H*	9(Δ)-8456H*	9(Δ)-8306H*
9(Δ)-8908H*	9(Δ)-8458H*	9(Δ)-8308H*

Vertical Splice Plates

• Furnished in pairs
* Hardware suffix needed to complete part number

Catalog No. 90°	Catalog No. 45°	Catalog No. 30°
9(Δ)-4903V*	9(Δ)-4453V*	9(Δ)-4303V*
9(Δ)-4904V*	9(Δ)-4454V*	9(Δ)-4304V*
9(Δ)-8906V*	9(Δ)-8456V*	9(Δ)-8306V*
9(Δ)-8908V*	9(Δ)-8458V*	9(Δ)-8308V*

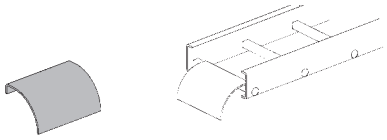
Standard lay-in splice plates with SS6 hardware included with ladder sections.
Splice Plates are available in pairs and are a separate order item. They are not automatically supplied with ladder sections.

(Δ) See page GRP-43 for material selection

Ladder Drop-Out

Specially-designed Ladder Drop-Outs provide a rounded surface with adequate radius to protect cable as it exits from the ladder, preventing damage to insulation.

- 4" (101) radius
- W = ladder width

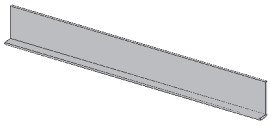


Catalog No.
9(Δ)-1104-W

Barriers

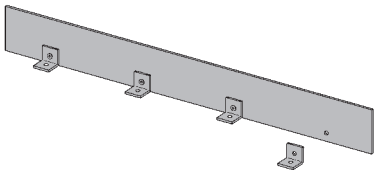
- Furnished with #10 x ½" self-drilling stainless steel screws

Catalog No.	Side Rail Height in.	mm
72(Δ)-120	3"	(76)
73(Δ)-120	4"	(101)
75(Δ)-120	6"	(152)
77(Δ)-120	8"	(203)



Flexible Horizontal Barrier Kit

One kit allows up to a 36" (914) radius position of the barrier.



Kit Contents:

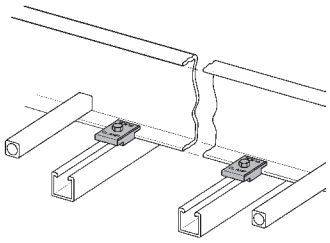
1 pc — 72" (1829) Straight Barrier
4 pc — 9F-9002 Barrier Strip Clip
8 pc — Thermo Plastic Drive Rivet
4 pc — #10 x ¾" Stainless Steel Self-Drilling Screw

Assembly required — directions included.

Catalog No.	Side Rail Height in.	mm
72(Δ)-90HBFL	3"	(76)
73(Δ)-90HBFL	4"	(101)
75(Δ)-90HBFL	6"	(152)
77(Δ)-90HBFL	8"	(203)

Clamp/Guide - Fiberglass

- Nonmetallic
- Designed for ⅜" hardware - not included
- Combination hold down clamp and guide
- Material: Glass reinforced polyurathane
- Sold in pairs



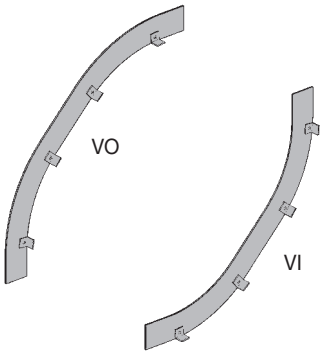
Catalog No.
9F-1208

Vertical Bend Barriers

7* (Δ) - 90 VO 24

- Radius
- VI or VO
- Angle
- Material
- Barrier Size

* Insert 2 for 3" (76) siderail height
3 for 4" (101) siderail height
5 for 6" (152) siderail height

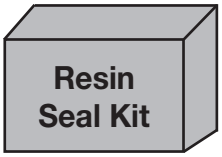


Resin Seal Kit

To reseal fiberglass after field modifications.

- 1 pint (473ml)

Contents: Sealant and Applicator.

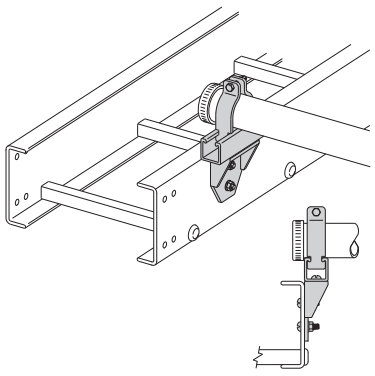


Catalog No.
RSK-010

Fiberglass Conduit to Cable Ladder Adapter

- For rigid or PVC conduit
- Standard hardware is 316 stainless steel
- Add 'N' to end of part number if non-metallic hardware is preferred

Catalog No.	Conduit Size in.	mm
9FV-2008	0.50	15
9FV-2009	0.75	20
9FV-2010	1.00	25
9FV-2011	1.25	32
9FV-2012	1.50	40
9FV-2013	2.00	50
9FV-2014	2.50	65
9FV-2015	3.00	80
9FV-2016	3.50	90
9FV-2017	4.00	100



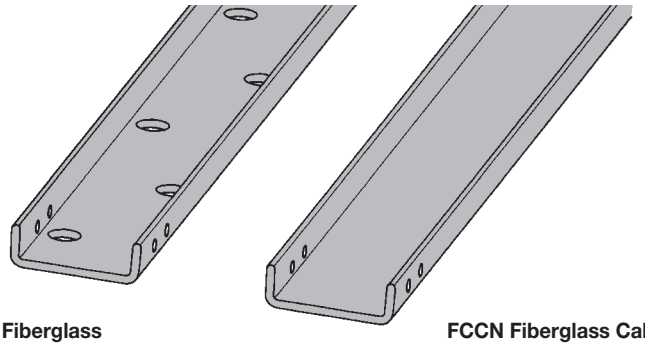
Dimensions shown in parentheses are in millimeters, unless otherwise specified.

(Δ) See page GRP-43 for material selection

Fiberglass

Straight Section

- Load data was interpolated from CSA testing.
- Loads shown are for FCCN series.
- Loads shown are for 6 ft. (1.83m) span with deflection of .7 (18.26) inches.



FCC Fiberglass Cable Channel Ventilated

FCCN Fiberglass Cable Channel Non-Ventilated

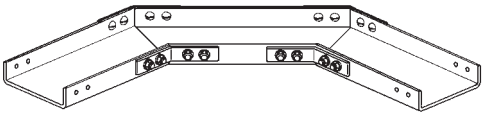
One pair of splice plates included with each straight section.

Catalog No.		Width		Length		Height		Load	
Ventilated	Non-Ventilated	in.	mm	ft.	m	in.	mm	Lbs/Ft	kg/m
(*)-03-120	(*)N-03-120	3	76	10	3	1	25	8	12
(*)-03-240	(*)N-03-240	3	76	20	6				
(*)-04-120	(*)N-04-120	4	101	10	3	1 1/8	28	12	18
(*)-04-240	(*)N-04-240	4	101	20	6				
(*)-06-120	(*)N-06-120	6	152	10	3	1 5/8	35	58	86
(*)-06-240	(*)N-06-240	6	152	20	6				
(*)-08-120	(*)N-08-120	8	203	10	3	2 3/16	55	87	129
(*)-08-240	(*)N-08-240	8	203	20	6				

(*) Insert material type straight sections
FCC for Polyester Resin
FCCV for Vinyl Ester Resin
FCCA for Zero Halogen/Dis-Stat Resin

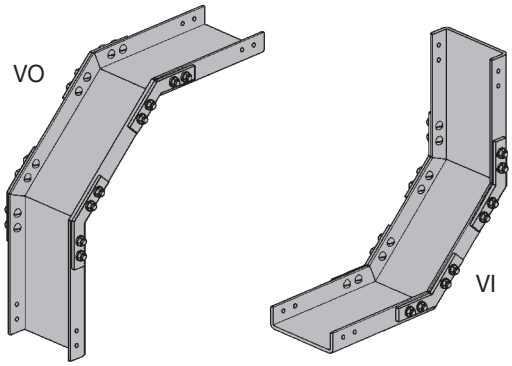
Cable Channel Fittings

All fittings are of mitered construction with 12" (305) radius.



One pair of splice plates included.

Horizontal	3" series	4" series	6" series	8" series
90˚	(†)N-03-90HB12	(†)N-04-90HB12	(†)N-06-90HB12	(†)N-08-90HB12
45˚	(†)N-03-45HB12	(†)N-04-45HB12	(†)N-06-45HB12	(†)N-08-45HB12



(†) Insert material type for fittings
FCC for Polyester Resin
FCCV for Vinyl Ester Resin
FCCA for Zero Halogen/Dis-Stat Resin

Vertical	3" series	4" series	6" series	8" series
90˚	(†)N-03-90V*12	(†)N-04-90V*12	(†)N-06-90V*12	(†)N-08-90V*12
45˚	(†)N-03-45V*12	(†)N-04-45V*12	(†)N-06-45V*12	(†)N-08-45V*12

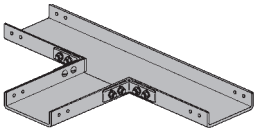
One pair of splice plates included.

Dimensions in parentheses are in millimeters unless otherwise specified.

Cable Channel Fittings

All fittings are of mitered construction with 12" (305) radius.

Horizontal Tees

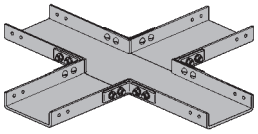


Two pair of splice plates included.

Catalog No.	Width in.	Width mm
FCC(†)N-03-HT12	3	76
FCC(†)N-04-HT12	4	101
FCC(†)N-06-HT12	6	152
FCC(†)N-08-HT12	8	203

(†) See page fitting material selection bottom of page GRP-47

Horizontal Crosses



Three pair of splice plates included.

Catalog No.	Width in.	Width mm
FCC(†)N-03-HX12	3	76
FCC(†)N-04-HX12	4	101
FCC(†)N-06-HX12	6	152
FCC(†)N-08-HX12	8	203

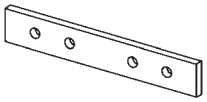
(†) See page fitting material selection bottom of page GRP-47

Cable Channel Splice Plates

Splice Plates

(pairs)

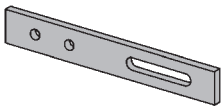
Included with ladder sections.



Catalog No.
9(Δ)-1001 SS6

Expansion Splice Plates

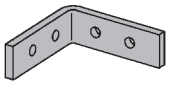
(pairs)



Catalog No.
9(Δ)-1013 SS6

Horizontal 90° Splice Plates

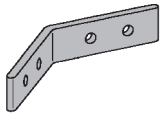
(pairs)



Catalog No.
9(Δ)-1901H SS6

Horizontal 45° Splice Plates

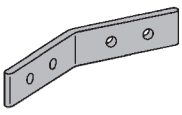
(pairs)



Catalog No.
9(Δ)-1451H SS6

Horizontal 30° Splice Plates

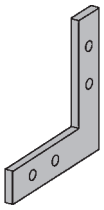
(pairs)



Catalog No.
9(Δ)-1301H SS6

Vertical 90° Splice Plates

(pairs)



Catalog No.
9(Δ)-1901V SS6

Splice plates included with cable channel sections.
Standard hardware for splice plates is 1/4"-20 (316SS).

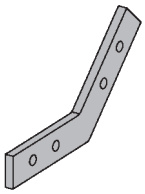
(Δ) See page GRP-43 for material selection

Fiberglass

Dimensions in parentheses are in millimeters unless otherwise specified.

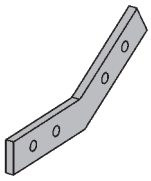
Cable Channel Splice Plates

Vertical 45° Splice Plates
(pairs)



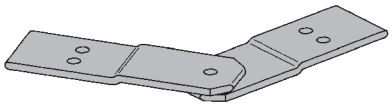
Catalog No.
9(Δ)-1451V SS6

Vertical 30° Splice Plates
(pairs)



Catalog No.
9(Δ)-1301V SS6

Horizontal Adjustable Splice Plates

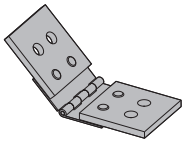


Catalog No.
9(Δ)-1023 SS6

Uses 3/8"-16 hardware.

Vertical Adjustable Splice Plates

Stainless steel hinge FRP body



Catalog No.
9(Δ)-1033 SS6

Uses 3/8"-16 hardware.

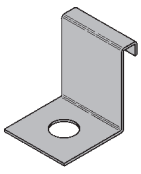
Splice plates included with cable channel sections.
Standard hardware for splice plates is 1/4"-20 (316SS). Hardware for adjustable splice plates is 3/8"-16 (316SS).

(Δ) See page GRP-43 for material selection

Cable Channel Clamps

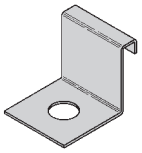
Expansion Guide Clamp
(one clamp)
• Order 1/2" hardware separately

Catalog No.	Width in.	Width mm
9SS6-1248-3	3	76
9SS6-1248-4	4	101
9SS6-1248-6	6	152
9SS6-1248-8	8	203

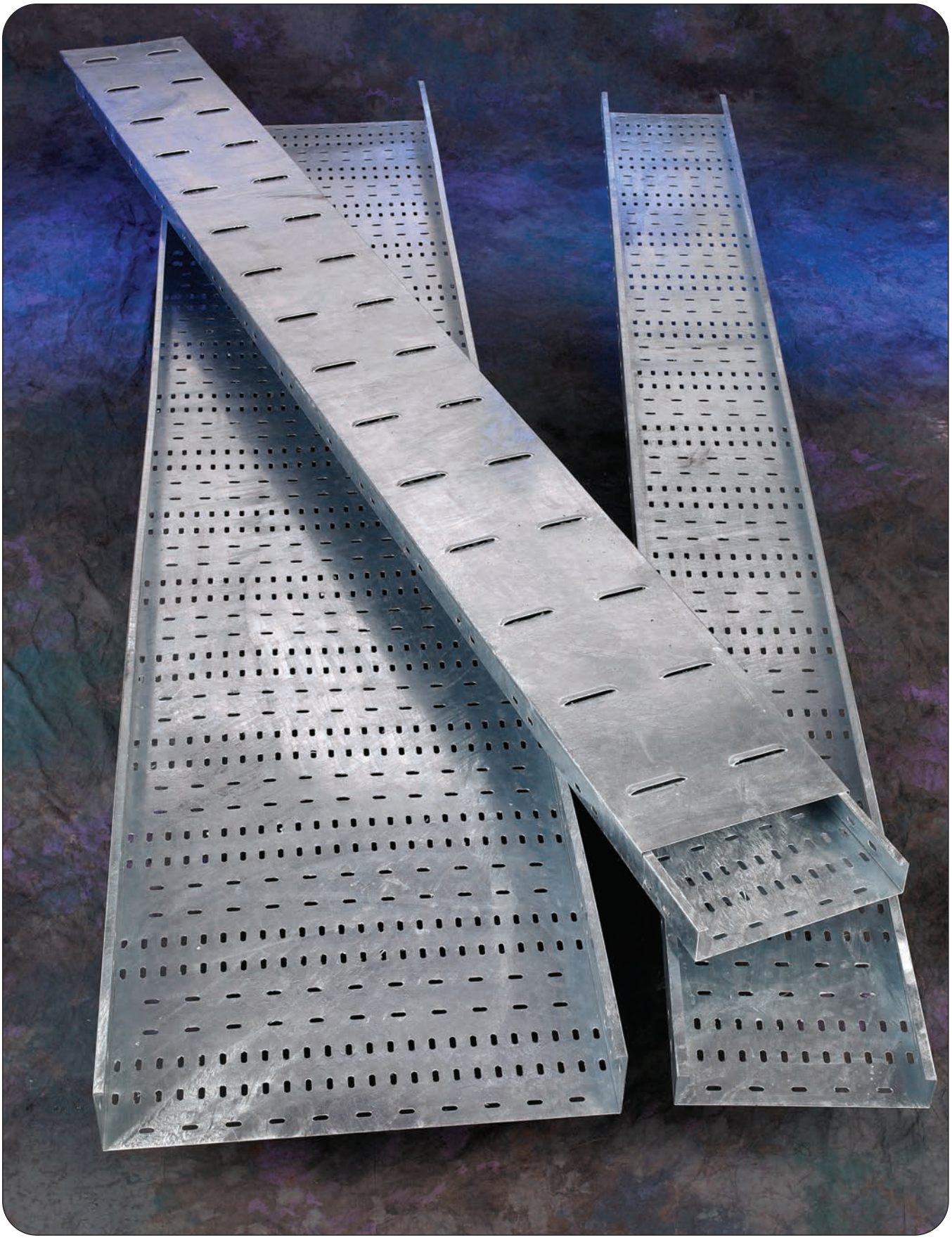


Hold-Down Clamp
(one clamp)
• Order 1/2" hardware separately

Catalog No.	Width in.	Width mm
9SS6-1247-3	3	76
9SS6-1247-4	4	101
9SS6-1247-6	6	152
9SS6-1247-8	8	203



Cable Tray



Cable Tray

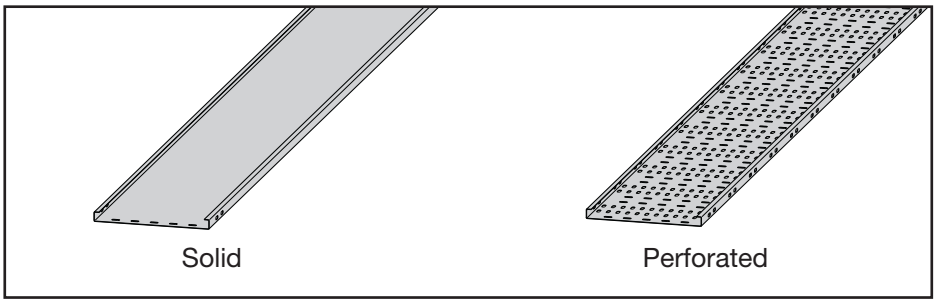
Light Duty - 25mm Height Straight Sections

Straight Section Part Numbering

Example: **T 025 V G 10 - 050 - 3**

Tray	Height	Tray Type	Material	Thickness △	Width	Length
Cable Tray	025 = 25mm	V = Perforated S = Solid	G = Hot Dip Galvanized After Fabrication P = Pre-Galvanized Steel SS4 = 304 Stainless Steel SS6 = 316 Stainless Steel A = Aluminum	See Charts Below	050 = 50mm 100 = 100mm 150 = 150mm 300 = 300mm 400 = 400mm 600 = 600mm	**3** = 3m

See table below for standard product configurations.



Steel

Part Number	Height In.	Height mm	Width In.	Width mm	Material Thickness △ In.	Material Thickness △ mm
T025 * †10-050-3	1	25	2	50	19 ga.	1.0
T025 * †10-100-3	1	25	4	100	19 ga.	1.0
T025 * †10-150-3	1	25	6	150	19 ga.	1.0
T025 * †10-300-3	1	25	12	300	19 ga.	1.0
T025 * †10-400-3	1	25	16	400	19 ga.	1.0
T025 * †12-600-3	1	25	24	600	18 ga.	1.2

Aluminum

Part Number	Height In.	Height mm	Width In.	Width mm	Material Thickness △ In.	Material Thickness △ mm
T025 * A10-050-3	1	25	2	50	0.040	1.0
T025 * A10-100-3	1	25	4	100	0.040	1.0
T025 * A10-150-3	1	25	6	150	0.040	1.0
T025 * A10-300-3	1	25	12	300	0.040	1.0
T025 * A15-400-3	1	25	16	400	0.060	1.5
T025 * A15-600-3	1	25	24	600	0.060	1.5

All dimensions are in millimeters unless otherwise specified
* Insert tray type, V or S
† Insert material type (G, P, SS4, SS6)

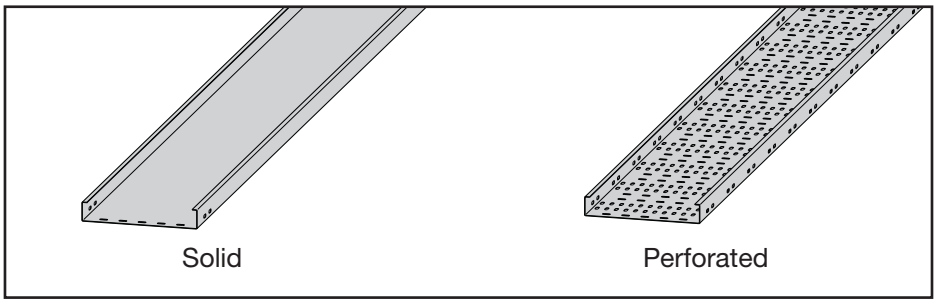
Medium Duty - 50mm Height Straight Sections

Straight Section Part Numbering

Example: **T 050 V G 12 - 100 - 3**

Tray	Height	Tray Type	Material	Thickness △	Width	Length
Cable Tray	050 = 50mm	V = Perforated S = Solid	G = Hot Dip Galvanized After Fabrication P = Pre-Galvanized Steel SS4 = 304 Stainless Steel SS6 = 316 Stainless Steel A = Aluminum	See Charts Below	050 = 50mm 100 = 100mm 150 = 150mm 300 = 300mm 400 = 400mm 600 = 600mm 900 = 900mm	**3** = 3m

See table below for standard product configurations.



Steel

Part Number	Height In.	Height mm	Width In.	Width mm	Material Thickness △ In.	Material Thickness △ mm
T050 * †10-050-3	2	50	2	50	19 ga.	1.0
T050 * †10-100-3	2	50	4	100	19 ga.	1.0
T050 * †10-150-3	2	50	6	150	19 ga.	1.0
T050 * †12-300-3	2	50	12	300	18 ga.	1.2
T050 * †12-400-3	2	50	16	400	18 ga.	1.2
T050 * †15-600-3	2	50	24	600	16 ga.	1.5
T050 * †15-900-3	2	50	36	900	16 ga.	1.5

Aluminum

Part Number	Height In.	Height mm	Width In.	Width mm	Material Thickness △ In.	Material Thickness △ mm
T050 * A15-050-3	2	50	2	50	0.060	1.5
T050 * A15-100-3	2	50	4	100	0.060	1.5
T050 * A15-150-3	2	50	6	150	0.060	1.5
T050 * A15-300-3	2	50	12	300	0.060	1.5
T050 * A20-400-3	2	50	16	400	0.080	2.0
T050 * A20-600-3	2	50	24	600	0.080	2.0
T050 * A20-900-3	2	50	36	900	0.080	2.0

All dimensions are in millimeters unless otherwise specified
* Insert tray type, V or S
† Insert material type (G, P, SS4, SS6)

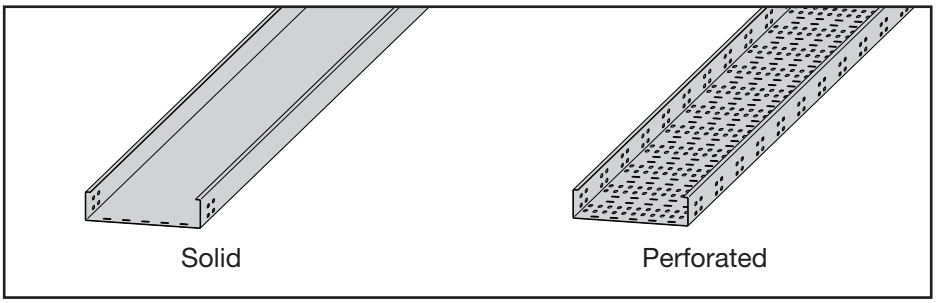
Heavy Duty - 75mm Height Straight Sections

Straight Section Part Numbering

Example: **T 075 V G 12 - 300 - 3**

Tray	Height	Tray Type	Material	Thickness △	Width	Length
Cable Tray	075 = 75mm	V = Perforated S = Solid	G = Hot Dip Galvanized After Fabrication P = Pre-Galvanized Steel SS4 = 304 Stainless Steel SS6 = 316 Stainless Steel A = Aluminum	See Charts Below	100 = 100mm 150 = 150mm 300 = 300mm 400 = 400mm 600 = 600mm 900 = 900mm	**3** = 3m

See table below for standard product configurations.



Steel

Part Number	Height In.	Height mm	Width In.	Width mm	Material Thickness △ In.	Material Thickness △ mm
T075 * †12-100-3	3	75	4	100	18 ga.	1.2
T075 * †12-150-3	3	75	6	150	18 ga.	1.2
T075 * †12-300-3	3	75	12	300	18 ga.	1.2
T075 * †12-400-3	3	75	16	400	18 ga.	1.2
T075 * †15-600-3	3	75	24	600	16 ga.	1.5
T075 * †15-900-3	3	75	36	900	16 ga.	1.5

Aluminum

Part Number	Height In.	Height mm	Width In.	Width mm	Material Thickness △ In.	Material Thickness △ mm
T075 * A20-100-3	3	75	4	100	0.080	2.0
T075 * A20-150-3	3	75	6	150	0.080	2.0
T075 * A25-300-3	3	75	12	300	0.100	2.5
T075 * A25-400-3	3	75	16	400	0.100	2.5
T075 * A30-600-3	3	75	24	600	0.120	3.0
T075 * A30-900-3	3	75	36	900	0.120	3.0

All dimensions are in millimeters unless otherwise specified
* Insert tray type, V or S
† Insert material type (G, P, SS4, SS6)

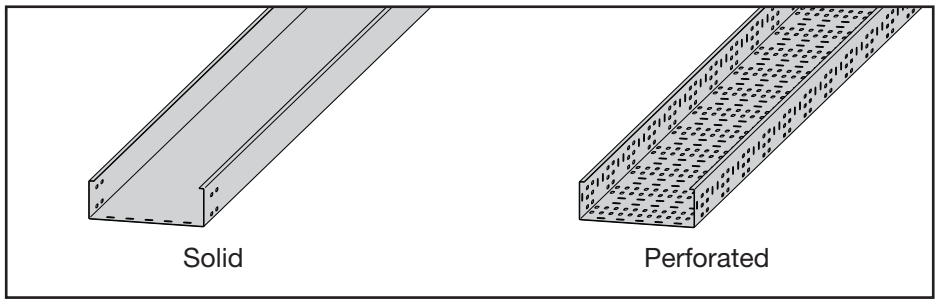
Extra Heavy Duty - 100mm Height Straight Sections

Straight Section Part Numbering

Example: **T 100 V G 15 - 450 - 3**

Tray	Height	Tray Type	Material	Thickness △	Width	Length
Cable Tray	100 = 100mm	V = Perforated S = Solid	G = Hot Dip Galvanized After Fabrication P = Pre-Galvanized Steel SS4 = 304 Stainless Steel SS6 = 316 Stainless Steel A = Aluminum	See Charts Below	100 = 100mm 150 = 150mm 300 = 300mm 400 = 400mm 600 = 600mm 900 = 900mm	**3** = 3m

See table below for standard product configurations.



Steel

Part Number	Height In.	Height mm	Width In.	Width mm	Material Thickness △ In.	Material Thickness △ mm
T100 * †12-100-3	4	100	4	100	18 ga.	1.2
T100 * †12-150-3	4	100	6	150	18 ga.	1.2
T100 * †12-300-3	4	100	12	300	18 ga.	1.2
T100 * †15-400-3	4	100	16	400	16 ga.	1.5
T100 * †15-600-3	4	100	24	600	16 ga.	1.5
T100 * †15-900-3	4	100	36	900	16 ga.	1.5

Aluminum

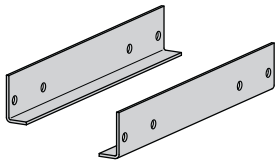
Part Number	Height In.	Height mm	Width In.	Width mm	Material Thickness △ In.	Material Thickness △ mm
T100 * A20-100-3	4	100	4	100	0.080	2.0
T100 * A20-150-3	4	100	6	150	0.080	2.0
T100 * A25-300-3	4	100	12	300	0.100	2.5
T100 * A25-400-3	4	100	16	400	0.100	2.5
T100 * A30-600-3	4	100	24	600	0.120	3.0
T100 * A30-900-3	4	100	36	900	0.120	3.0

All dimensions are in millimeters unless otherwise specified
* Insert tray type, V or S
† Insert material type (G, P, SS4, SS6)

Cable Tray

Standard Splice Plates

- Furnished in pairs with M6 hardware.
- Material thckness: Steel - 2.5mm Aluminum - 3.0mm
- Not included with straight sections or fittings - order separately

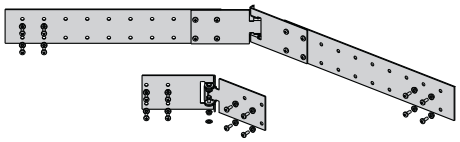


Cable Tray Series	Catalog No.
T025	**TSP025***
T050	**TSP050***
T075	**TSP075***
T100	**TSP100***

* Insert material type

Horizontal Adjustable Splice Plates

- Furnished in pairs with M6 hardware.
- Material thckness: Steel - 2.5mm Aluminum - 3.0mm

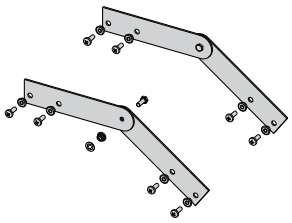


Cable Tray Series	Catalog No.
T025	**THA025***
T050	**THA050***
T075	**THA075***
T100	**THA100***

* Insert material type

Vertical Adjustable Splice Plates

- Furnished in pairs with M6 hardware.
- Material thckness: Steel - 2.5mm Aluminum - 3.0mm

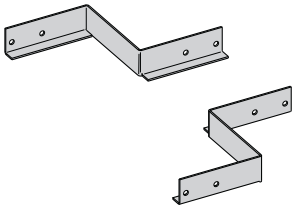


Cable Tray Series	Catalog No.
T025	**TVA025***
T050	**TVA050***
T075	**TVA075***
T100	**TVA100***

* Insert material type

Straight Reducing Splice Plates

- Furnished in pairs with M6 hardware.
- Material thckness: Steel - 2.5mm Aluminum - 3.0mm

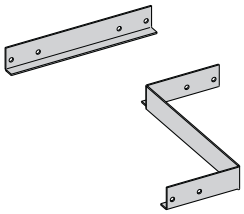


Cable Tray Series	Catalog No.
T025	**TRS025*-††**
T050	**TRS050*-††**
T075	**TRS075*-††**
T100	**TRS100*-††**

* Insert material type †† Insert width reduction

Left Reducing Splice Plates

- Furnished in pairs with M6 hardware.
- Material thckness: Steel - 2.5mm Aluminum - 3.0mm

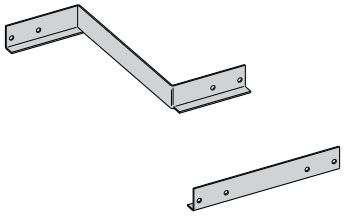


Cable Tray Series	Catalog No.
T025	**TLR025*-††**
T050	**TLR050*-††**
T075	**TLR075*-††**
T100	**TLR100*-††**

* Insert material type †† Insert width reduction

Right Reducing Splice Plates

- Furnished in pairs with M6 hardware.
- Material thckness: Steel - 2.5mm Aluminum - 3.0mm



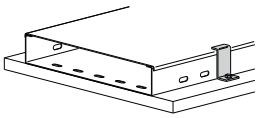
Cable Tray Series	Catalog No.
T025	**TRR025*-††**
T050	**TRR050*-††**
T075	**TRR075*-††**
T100	**TRR100*-††**

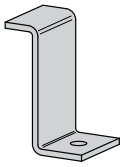
* Insert material type †† Insert width reduction

* G = Hot Dip Galvanized after Fabrication, P = Pre-Galvanized, SS4 = 304 Stainless Steel, 316 = 316 Stainless Steel, A = Aluminum

Hold-Down Clip

- Sold individually with M6 hardware.
- Material thckness:
  Steel - 2.5mm
  Aluminum - 3.0mm



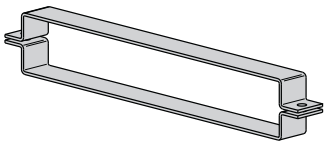


Cable Tray Series	Catalog No.
T025	**THD025*-M6**
T050	**THD050*-M6**
T075	**THD075*-M6**
T100	**THD100*-M6**

* Insert material type

Cover Clamp

- Sold individually (as shown) with M6 hardware.
- Material thckness:
  Steel - 2.5mm
  Aluminum - 3.0mm

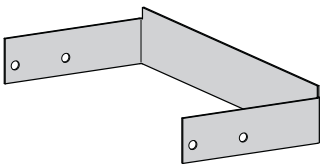


Cable Tray Series	Catalog No.
T025	**TCL025*-††**
T050	**TCL050*-††**
T075	**TCL075*-††**
T100	**TCL100*-††**

* Insert material type †† Insert tray width

Blind End

- Sold individually with M6 hardware.
- Material thckness:
  Steel - 2.5mm
  Aluminum - 3.0mm



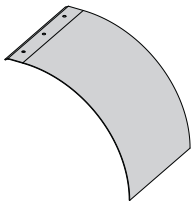
Cable Tray Series	Available Tray Widths mm	Catalog No.
T025	50, 100, 150, 300, 400, 600	**TBE025*†**
T050	50, 100, 150, 300, 400, 600, 900	**TBE050*†**
T075	100, 150, 300, 400, 600, 900	**TBE075*†**
T100	100, 150, 300, 400, 600, 900	**TBE100*†**

* Insert material type
† Insert tray width

Tray Width
mm to inches
50 = 2”
100 = 4”
150 = 6”
300 = 12”
400 = 16”
600 = 24”
900 = 36”

End Drop-Out

- Sold individually with M6 hardware.
- Material thckness:
  Steel - 1.5mm
  Aluminum - 3.0mm



Cable Tray Series	Catalog No.
50	**TDO*-050**
100	**TDO*-100**
150	**TDO*-150**
300	**TDO*-300**
400	**TDO*-400**
600	**TDO*-600**
900	**TDO*-900**

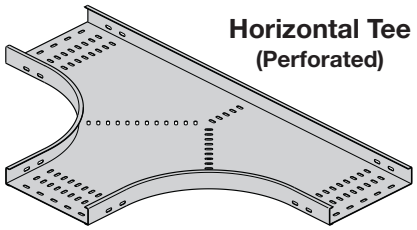
* Insert material type

Tray Width
mm to inches
50 = 2”
100 = 4”
150 = 6”
300 = 12”
400 = 16”
600 = 24”
900 = 36”

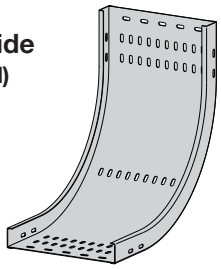
* G = Hot Dip Galvanized after Fabrication, P = Pre-Galvanized,
SS4 = 304 Stainless Steel, 316 = 316 Stainless Steel, A = Aluminum

Cable Tray Fittings

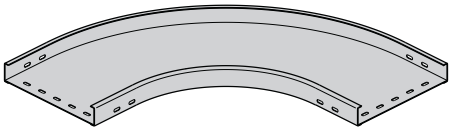
Horizontal Tee
(Perforated)



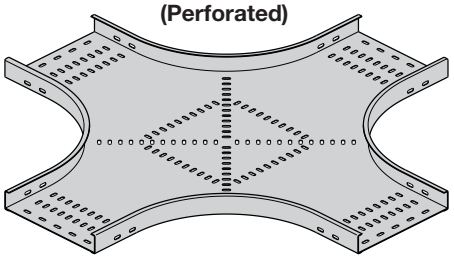
Vertical Inside
(Perforated)



Horizontal Bend
(Solid)



Horizontal Cross
(Perforated)



Fittings Part Numbering

Prefix

Example: **T 050 V G 15 - 300 - 90 HB 300**

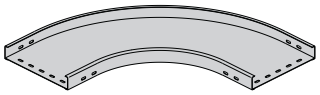
Series	Height	Tray Type	Material	Thickness	Width	Angle	Type	Radius
Cable Tray	025 = 25mm 050 = 50mm 075 = 75mm 100 = 100mm	V = Perforated S = Solid	G = Hot Dip Galvanized After Fabrication P = Pre-Galvanized Steel SS4 = Stainless Steel 304 SS6 = Stainless Steel 316 A = Aluminum	15 = 1.5mm (Steel) 30 = 3.0mm (Aluminum)	050 = 50mm 100 = 100mm 150 = 150mm 300 = 300mm 400 = 400mm 600 = 600mm 900 = 900mm	45 = 45° 90 = 90°	HB = Horizontal Bend *HT = Horizontal Tee *HX = Horizontal Cross VI=Vertical Inside Bend VO = Vertical Outside Bend	300 = 300mm 600 = 600mm

*Angle not required on HT & HX

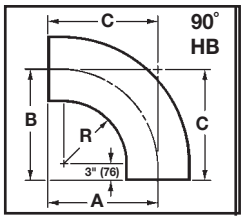
Horizontal Bend 90° (HB)

Steel

Bend Radius R		Tray Width		90° Horizontal Bend							
				Catalog No.	Dimensions						
					A		B		C		
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm	
12	(300)	2	(50)	(Prefix)-050-90HB300	18 1/4	(463.5)	18 1/4	(463.5)	18 1/4	(463.5)	
		4	(100)	(Prefix)-100-90HB300	19 1/4	(488.5)	19 1/4	(488.5)	19 1/4	(488.5)	
		6	(150)	(Prefix)-150-90HB300	20 3/16	(513.5)	20 3/16	(513.5)	20 3/16	(513.5)	
		12	(300)	(Prefix)-300-90HB300	23 3/16	(588.5)	23 3/16	(588.5)	23 3/16	(588.5)	
		16	(400)	(Prefix)-400-90HB300	25 1/8	(638.5)	25 1/8	(638.5)	25 1/8	(638.5)	
		24	(600)	(Prefix)-600-90HB300	29 1/16	(738.5)	29 1/16	(738.5)	29 1/16	(738.5)	
		36	(900)	(Prefix)-700-90HB300	35	(888.5)	35	(888.5)	35	(888.5)	
24	(600)	2	(50)	(Prefix)-050-90HB600	30 1/16	(763.5)	30 1/16	(763.5)	30 1/16	(763.5)	
		4	(100)	(Prefix)-100-90HB600	31 1/32	(788.5)	31 1/32	(788.5)	31 1/32	(788.5)	
		6	(150)	(Prefix)-150-90HB600	32 1/32	(813.5)	32 1/32	(813.5)	32 1/32	(813.5)	
		12	(300)	(Prefix)-300-90HB600	35	(888.5)	35	(888.5)	35	(888.5)	
		16	(400)	(Prefix)-400-90HB600	36 15/16	(938.5)	36 15/16	(938.5)	36 15/16	(938.5)	
		24	(600)	(Prefix)-600-90HB600	40 7/8	(1038.5)	40 7/8	(1038.5)	40 7/8	(1038.5)	
		36	(900)	(Prefix)-900-90HB600	46 25/32	(1188.5)	46 25/32	(1188.5)	46 25/32	(1188.5)	



90° Horizontal Bend
Solid Shown



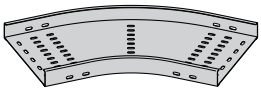
Aluminum

Bend Radius R		Tray Width		90° Horizontal Bend							
				Catalog No.	Dimensions						
					A		B		C		
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm	
12	(300)	2	(50)	(Prefix)-050-90HB300	18 3/16	(462.0)	18 3/16	(462.0)	18 3/16	(462.0)	
		4	(100)	(Prefix)-100-90HB300	19 3/16	(487.0)	19 3/16	(487.0)	19 3/16	(487.0)	
		6	(150)	(Prefix)-150-90HB300	20 5/32	(512.0)	20 5/32	(512.0)	20 5/32	(512.0)	
		12	(300)	(Prefix)-300-90HB300	23 1/8	(587.0)	23 1/8	(587.0)	23 1/8	(587.0)	
		16	(400)	(Prefix)-400-90HB300	25 1/16	(637.0)	25 1/16	(637.0)	25 1/16	(637.0)	
		24	(600)	(Prefix)-600-90HB300	29	(737.0)	29	(737.0)	29	(737.0)	
		36	(900)	(Prefix)-700-90HB300	34 15/16	(887.0)	34 15/16	(887.0)	34 15/16	(887.0)	
24	(600)	2	(50)	(Prefix)-050-90HB600	30	(762.0)	30	(762.0)	30	(762.0)	
		4	(100)	(Prefix)-100-90HB600	30 31/32	(787.0)	30 31/32	(787.0)	30 31/32	(787.0)	
		6	(150)	(Prefix)-150-90HB600	31 31/32	(812.0)	31 31/32	(812.0)	31 31/32	(812.0)	
		12	(300)	(Prefix)-300-90HB600	34 15/16	(887.0)	34 15/16	(887.0)	34 15/16	(887.0)	
		16	(400)	(Prefix)-400-90HB600	36 7/8	(937.0)	36 7/8	(937.0)	36 7/8	(937.0)	
		24	(600)	(Prefix)-600-90HB600	40 13/16	(1037.0)	40 13/16	(1037.0)	40 13/16	(1037.0)	
		36	(900)	(Prefix)-900-90HB600	46 23/32	(1187.0)	46 23/32	(1187.0)	46 23/32	(1187.0)	

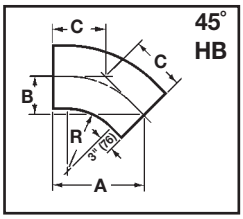
(Pre) See page CT-9 for catalog number prefix.

All dimensions in parentheses are in millimeters unless otherwise specified.
Manufacturing tolerances apply to all dimensions.

Horizontal Bend 45° (HB)



45° Horizontal Bend
Perforated Shown



Steel

Bend Radius R		Tray Width		45° Horizontal Bend							
				Catalog No.	Dimensions						
					A		B		C		
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm
12	(300)	2	(50)	(Prefix)-050-45HB300	18 13/32	(467.7)	7 5/8	(193.8)	10 25/32	(274.0)
		4	(100)	(Prefix)-100-45HB300	19 1/8	(485.4)	7 29/32	(201.1)	11 3/16	(284.4)
		6	(150)	(Prefix)-150-45HB300	19 13/16	(503.1)	8 3/16	(208.4)	11 19/32	(294.7)
		12	(300)	(Prefix)-300-45HB300	21 7/8	(556.1)	9 1/16	(230.4)	12 13/16	(325.8)
		16	(400)	(Prefix)-400-45HB300	23 1/4	(591.5)	9 5/8	(245.0)	13 5/8	(346.5)
		24	(600)	(Prefix)-600-45HB300	26 1/16	(662.2)	10 25/32	(274.3)	15 9/32	(387.9)
		36	(900)	(Prefix)-700-45HB300	30 1/4	(768.3)	12 17/32	(318.2)	17 23/32	(450.0)
24	(600)	2	(50)	(Prefix)-050-45HB600	26 3/4	(679.9)	11 1/16	(281.6)	15 11/16	(398.3)
		4	(100)	(Prefix)-100-45HB600	27 15/32	(697.6)	11 3/8	(288.9)	16 3/32	(408.6)
		6	(150)	(Prefix)-150-45HB600	28 5/32	(715.2)	11 21/32	(296.3)	16 1/2	(419.0)
		12	(300)	(Prefix)-300-45HB600	30 1/4	(768.3)	12 17/32	(318.2)	17 23/32	(450.0)
		16	(400)	(Prefix)-400-45HB600	31 5/8	(803.6)	13 1/8	(332.9)	18 17/32	(470.8)
		24	(600)	(Prefix)-600-45HB600	34 13/32	(874.3)	14 1/4	(362.2)	20 5/32	(512.2)
		36	(900)	(Prefix)-900-45HB600	38 9/16	(980.4)	16	(406.1)	22 5/8	(574.3)

Aluminum

Bend Radius R		Tray Width		45° Horizontal Bend							
				Catalog No.	Dimensions						
					A		B		C		
in.	mm	in.	mm		in.	mm	in.	mm	in.	mm
12	(300)	2	(50)	(Prefix)-050-45HB300	18 3/8	(466.7)	7 5/8	(193.8)	10 25/32	(273.4)
		4	(100)	(Prefix)-100-45HB300	19 1/8	(485.4)	7 29/32	(201.1)	11 3/16	(284.4)
		6	(150)	(Prefix)-150-45HB300	19 13/16	(503.1)	8 3/16	(208.4)	11 19/32	(294.7)
		12	(300)	(Prefix)-300-45HB300	21 7/8	(556.1)	9 1/16	(230.4)	12 13/16	(325.8)
		16	(400)	(Prefix)-400-45HB300	23 9/32	(591.5)	9 5/8	(245.0)	13 5/8	(346.5)
		24	(600)	(Prefix)-600-45HB300	26 1/16	(662.2)	10 25/32	(274.3)	15 9/32	(387.9)
		36	(900)	(Prefix)-700-45HB300	30 1/4	(768.3)	12 17/32	(318.2)	17 23/32	(450.0)
24	(600)	2	(50)	(Prefix)-050-45HB600	26 3/4	(679.9)	11 1/16	(281.6)	15 11/16	(398.3)
		4	(100)	(Prefix)-100-45HB600	27 15/32	(697.6)	11 5/16	(288.9)	16 3/32	(408.6)
		6	(150)	(Prefix)-150-45HB600	28 5/32	(715.2)	11 21/32	(296.3)	16 1/2	(419.0)
		12	(300)	(Prefix)-300-45HB600	30 1/4	(768.3)	12 17/32	(318.2)	17 23/32	(450.0)
		16	(400)	(Prefix)-400-45HB600	31 5/8	(803.6)	13 1/8	(332.9)	18 17/32	(470.8)
		24	(600)	(Prefix)-600-45HB600	34 13/32	(874.3)	14 1/4	(362.2)	20 5/32	(512.2)
		36	(900)	(Prefix)-900-45HB600	38 9/16	(980.4)	16	(406.1)	22 5/8	(574.3)

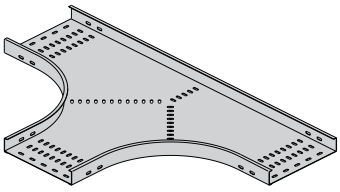
(Pre) See page CT-9 for catalog number prefix.

All dimensions are millimeters unless otherwise specified.
Manufacturing tolerances apply to all dimensions.

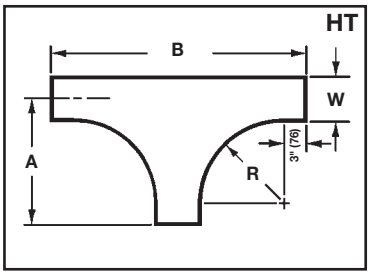
Horizontal Tee (HT)

Steel

Bend Radius R		Tray Width		Horizontal Tee				
				Catalog No.	Dimensions			
					A		B	
in.	mm	in.	mm		in.	mm	in.	mm
12	(300)	2	(50)	**(Prefix)-050-HT300**	18 1/4	(463.5)	36 1/2	(927.0)
		4	(100)	**(Prefix)-100-HT300**	19 1/4	(488.5)	38 1/2	(977.0)
		6	(150)	**(Prefix)-150-HT300**	20 3/16	(513.5)	40 3/8	(1027.0)
		12	(300)	**(Prefix)-300-HT300**	23 3/16	(588.5)	46 3/8	(1177.0)
		16	(400)	**(Prefix)-400-HT300**	25 1/8	(638.5)	50 1/4	(1277.0)
		24	(600)	**(Prefix)-600-HT300**	29 1/16	(738.5)	58 1/8	(1477.0)
		36	(900)	**(Prefix)-900-HT300**	35	(888.5)	70	(1777.0)
24	(600)	2	(50)	**(Prefix)-050-HT600**	30 1/16	(763.5)	60 1/8	(1527.0)
		4	(100)	**(Prefix)-100-HT600**	31 1/32	(788.5)	62 1/16	(1577.0)
		6	(150)	**(Prefix)-150-HT600**	32 1/32	(813.5)	64 1/8	(1627.0)
		12	(300)	**(Prefix)-300-HT600**	35	(888.5)	70	(1777.0)
		16	(400)	**(Prefix)-400-HT600**	36 15/16	(938.5)	73 7/8	(1877.0)
		24	(600)	**(Prefix)-600-HT600**	40 7/8	(1038.5)	81 3/4	(2077.0)
		36	(900)	**(Prefix)-900-HT600**	46 25/32	(1188.5)	93 9/16	(2377.0)



Perforated Shown



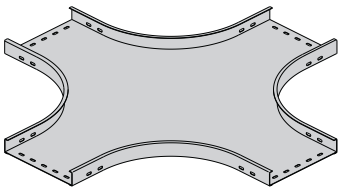
Aluminum

Bend Radius R		Tray Width		Horizontal Tee				
				Catalog No.	Dimensions			
					A		B	
in.	mm	in.	mm		in.	mm	in.	mm
12	(300)	2	(50)	**(Prefix)-050-HT300**	18 3/16	(462.0)	36 3/8	(924.0)
		4	(100)	**(Prefix)-100-HT300**	19 3/16	(487.0)	38 3/8	(974.0)
		6	(150)	**(Prefix)-150-HT300**	20 5/32	(512.0)	40 1/4	(1024.0)
		12	(300)	**(Prefix)-300-HT300**	23 1/8	(587.0)	46 1/4	(1174.0)
		16	(400)	**(Prefix)-400-HT300**	25 1/16	(637.0)	50 1/8	(1274.0)
		24	(600)	**(Prefix)-600-HT300**	29	(737.0)	58	(1474.0)
		36	(900)	**(Prefix)-900-HT300**	34 15/16	(887.0)	69 7/8	(1774.0)
24	(600)	2	(50)	**(Prefix)-050-HT600**	30	(762.0)	60	(1524.0)
		4	(100)	**(Prefix)-100-HT600**	30 31/32	(787.0)	61 15/16	(1574.0)
		6	(150)	**(Prefix)-150-HT600**	31 31/32	(812.0)	64	(1624.0)
		12	(300)	**(Prefix)-300-HT600**	34 15/16	(887.0)	69 7/8	(1774.0)
		16	(400)	**(Prefix)-400-HT600**	36 7/8	(937.0)	73 3/4	(1874.0)
		24	(600)	**(Prefix)-600-HT600**	40 13/16	(1037.0)	81 5/8	(2074.0)
		36	(900)	**(Prefix)-900-HT600**	46 23/32	(1187.0)	93 7/16	(2374.0)

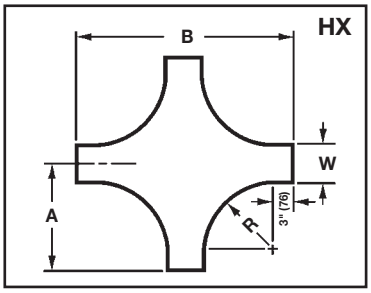
(Prefix) See page CT-9 for catalog number prefix.

All dimensions in parentheses are in millimeters unless otherwise specified.
Manufacturing tolerances apply to all dimensions.

Horizontal Cross (HX)



Solid Shown



Steel

Bend Radius R		Tray Width		Horizontal Cross				
				Catalog No.	Dimensions			
					A		B	
in.	mm	in.	mm		in.	mm	in.	mm
12	(300)	2	(50)	(Prefix)-050-HX300	18 1/4	(463.5)	36 1/2	(927.0)
		4	(100)	(Prefix)-100-HX300	19 1/4	(488.5)	38 1/2	(977.0)
		6	(150)	(Prefix)-150-HX300	20 3/16	(513.5)	40 3/8	(1027.0)
		12	(300)	(Prefix)-300-HX300	23 3/16	(588.5)	46 3/8	(1177.0)
		16	(400)	(Prefix)-400-HX300	25 1/8	(638.5)	50 1/4	(1277.0)
		24	(600)	(Prefix)-600-HX300	29 1/16	(738.5)	58 1/8	(1477.0)
		36	(900)	(Prefix)-900-HX300	35	(888.5)	70	(1777.0)
24	(600)	2	(50)	(Prefix)-050-HX600	30 1/16	(763.5)	60 1/8	(1527.0)
		4	(100)	(Prefix)-100-HX600	31 1/32	(788.5)	62 1/16	(1577.0)
		6	(150)	(Prefix)-150-HX600	32 1/32	(813.5)	64 1/8	(1627.0)
		12	(300)	(Prefix)-300-HX600	35	(888.5)	70	(1777.0)
		16	(400)	(Prefix)-400-HX600	36 15/16	(938.5)	73 7/8	(1877.0)
		24	(600)	(Prefix)-600-HX600	40 7/8	(1038.5)	81 3/4	(2077.0)
		36	(900)	(Prefix)-900-HX600	46 25/32	(1188.5)	93 9/16	(2377.0)

Aluminum

Bend Radius R		Tray Width		Horizontal Cross				
				Catalog No.	Dimensions			
					A		B	
in.	mm	in.	mm		in.	mm	in.	mm
12	(300)	2	(50)	(Prefix)-050-HX300	18 3/16	(462.0)	36 3/8	(924.0)
		4	(100)	(Prefix)-100-HX300	19 3/16	(487.0)	38 3/8	(974.0)
		6	(150)	(Prefix)-150-HX300	20 5/32	(512.0)	40 1/4	(1024.0)
		12	(300)	(Prefix)-300-HX300	23 1/8	(587.0)	46 1/4	(1174.0)
		16	(400)	(Prefix)-400-HX300	25 1/16	(637.0)	50 1/8	(1274.0)
		24	(600)	(Prefix)-600-HX300	29	(737.0)	58	(1474.0)
		36	(900)	(Prefix)-900-HX300	34 15/16	(887.0)	69 7/8	(1774.0)
24	(600)	2	(50)	(Prefix)-050-HX600	30	(762.0)	60	(1524.0)
		4	(100)	(Prefix)-100-HX600	30 31/32	(787.0)	61 15/16	(1574.0)
		6	(150)	(Prefix)-150-HX600	31 31/32	(812.0)	64	(1624.0)
		12	(300)	(Prefix)-300-HX600	34 15/16	(887.0)	69 7/8	(1774.0)
		16	(400)	(Prefix)-400-HX600	36 7/8	(937.0)	73 3/4	(1874.0)
		24	(600)	(Prefix)-600-HX600	40 13/16	(1037.0)	81 5/8	(2074.0)
		36	(900)	(Prefix)-900-HX600	46 23/32	(1187.0)	93 7/16	(2374.0)

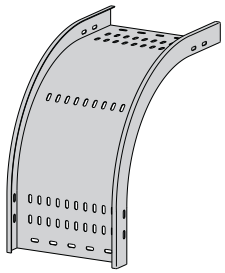
(Prefix) See page CT-9 for catalog number prefix.

All dimensions are in millimeters unless otherwise specified.
Manufacturing tolerances apply to all dimensions.

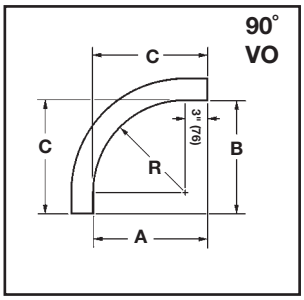
Vertical Outside Bend 90° (VO)

Steel

90° Vertical Outside Bend								
Bend Radius R		Width		Catalog No.	VO Dimensions for Side Rail Heights 25mm - 100mm		
in.	mm	in.	mm		A	B	C
12	(300)	2	(50)	(Pre)-050-90VO300	17 1/4" (438.5)	17 1/4" (438.5)	17 1/4" (438.5)
		4	(100)	(Pre)-100-90VO300			
		6	(150)	(Pre)-150-90VO300			
		12	(300)	(Pre)-300-90VO300			
		16	(400)	(Pre)-400-90VO300			
		24	(600)	(Pre)-600-90VO300			
		36	(900)	(Pre)-900-90VO300			
24	(600)	2	(50)	(Pre)-050-90VO600	29 1/16" (738.5)	29 1/16" (738.5)	29 1/16" (738.5)
		4	(100)	(Pre)-100-90VO600			
		6	(150)	(Pre)-150-90VO600			
		12	(300)	(Pre)-300-90VO600			
		16	(400)	(Pre)-400-90VO600			
		24	(600)	(Pre)-600-90VO600			
		36	(900)	(Pre)-900-90VO600			



90° Vertical Outside
Perforated Shown



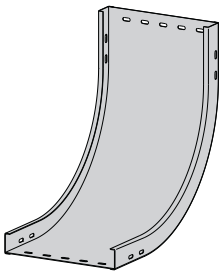
Aluminum

90° Vertical Outside Bend								
Bend Radius R		Width		Catalog No.	VO Dimensions for Side Rail Heights 25mm - 100mm		
in.	mm	in.	mm		A	B	C
12	(300)	2	(50)	(Pre)-050-90VO300	17 7/32" (437.0)	17 7/32" (437.0)	17 7/32" (437.0)
		4	(100)	(Pre)-100-90VO300			
		6	(150)	(Pre)-150-90VO300			
		12	(300)	(Pre)-300-90VO300			
		16	(400)	(Pre)-400-90VO300			
		24	(600)	(Pre)-600-90VO300			
		36	(900)	(Pre)-900-90VO300			
24	(600)	2	(50)	(Pre)-050-90VO600	29 1/32" (737.0)	29 1/32" (738.5)	29 1/32" (738.5)
		4	(100)	(Pre)-100-90VO600			
		6	(150)	(Pre)-150-90VO600			
		12	(300)	(Pre)-300-90VO600			
		16	(400)	(Pre)-400-90VO600			
		24	(600)	(Pre)-600-90VO600			
		36	(900)	(Pre)-900-90VO600			

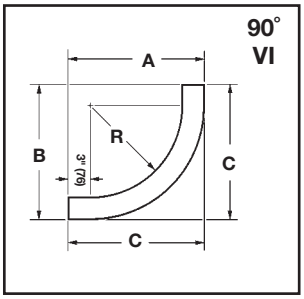
(Prefix) See page CT-9 for catalog number prefix.

All dimensions are millimeters unless otherwise specified.
Manufacturing tolerances apply to all dimensions.

Vertical Inside Bend 90° (VI)



90° Vertical Inside
Solid Shown



Steel

90° Vertical Inside Bend

Bend Radius R in.	Bend Radius R mm	Width in.	Width mm	Catalog No.	VI Dimensions for Side Rail Heights 25mm A	25mm B	25mm C	50mm A	50mm B	50mm C	75mm A	75mm B	75mm C	100mm A	100mm B	100mm C
12	(300)	2	(50)	(Pre)-050-90VI300												
		4	(100)	(Pre)-100-90VI300												
		6	(150)	(Pre)-150-90VI300	18 7/32"	18 7/32"	18 7/32"	19 9/32"	19 9/32"	19 9/32"	20 9/32"	20 9/32"	20 9/32"	21 1/4"	21 1/4"	21 1/4"
		12	(300)	(Pre)-300-90VI300												
		16	(400)	(Pre)-400-90VI300	(465.0)	(465.0)	(465.0)	(490.0)	(490.0)	(490.0)	(515.0)	(515.0)	(515.0)	(540.0)	(540.0)	(540.0)
		24	(600)	(Pre)-600-90VI300												
		36	(900)	(Pre)-900-90VI300												
24	(600)	2	(50)	(Pre)-050-90VI600												
		4	(100)	(Pre)-100-90VI600												
		6	(150)	(Pre)-150-90VI600	30 1/8"	30 1/8"	30 1/8"	31 1/8"	31 1/8"	31 1/8"	32 3/32"	32 3/32"	32 3/32"	33 1/16"	33 1/16"	33 1/16"
		12	(300)	(Pre)-300-90VI600												
		16	(400)	(Pre)-400-90VI600	(765.0)	(765.0)	(765.0)	(790.0)	(790.0)	(790.0)	(815.0)	(815.0)	(815.0)	(840.0)	(840.0)	(840.0)
		24	(600)	(Pre)-600-90VI600												
		36	(900)	(Pre)-900-90VI600												

Aluminum

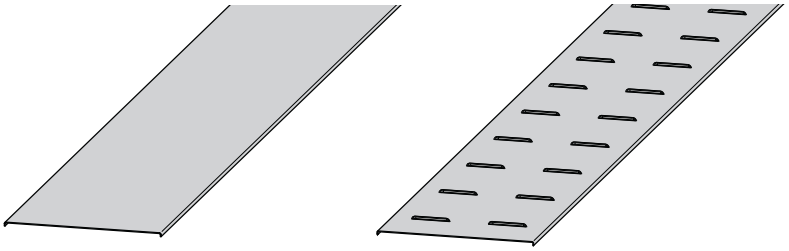
90° Vertical Inside Bend

Bend Radius R in.	Bend Radius R mm	Width in.	Width mm	Catalog No.	VI Dimensions for Side Rail Heights 25mm A	25mm B	25mm C	50mm A	50mm B	50mm C	75mm A	75mm B	75mm C	100mm A	100mm B	100mm C
12	(300)	2	(50)	(Pre)-050-90VI300												
		4	(100)	(Pre)-100-90VI300												
		6	(150)	(Pre)-150-90VI300	18 5/16"	18 5/16"	18 5/16"	19 5/16"	19 5/16"	19 5/16"	20 9/32"	20 9/32"	20 9/32"	21 1/4"	21 1/4"	21 1/4"
		12	(300)	(Pre)-300-90VI300												
		16	(400)	(Pre)-400-90VI300	(465.0)	(465.0)	(465.0)	(490.0)	(490.0)	(490.0)	(515.0)	(515.0)	(515.0)	(540.0)	(540.0)	(540.0)
		24	(600)	(Pre)-600-90VI300												
		36	(900)	(Pre)-900-90VI300												
24	(600)	2	(50)	(Pre)-050-90VI600												
		4	(100)	(Pre)-100-90VI600												
		6	(150)	(Pre)-150-90VI600	30 1/8"	30 1/8"	30 1/8"	31 1/8"	31 1/8"	31 1/8"	32 3/32"	32 3/32"	32 3/32"	33 1/16"	33 1/16"	33 1/16"
		12	(300)	(Pre)-300-90VI600												
		16	(400)	(Pre)-400-90VI600	(765.0)	(765.0)	(765.0)	(790.0)	(790.0)	(790.0)	(815.0)	(815.0)	(815.0)	(840.0)	(840.0)	(840.0)
		24	(600)	(Pre)-600-90VI600												
		36	(900)	(Pre)-900-90VI600												

(Prefix) **See page CT-9 for catalog number prefix.**

All dimensions are in millimeters unless otherwise specified.
Manufacturing tolerances apply to all dimensions.

Covers



Solid Flanged

Ventilated Flanged

A full range of covers is available for straight sections and fittings.

Solid covers should be used when maximum enclosure of the cable is desired and no accumulation of heat is expected.
Ventilated covers provide an overhead cable shield yet allow heat to escape.
B-Line recommends that covers be placed on vertical cable tray runs to a height of 6 ft. (1.83 m) to 8 ft. (2.44 m) above the floor to isolate both cables and personnel.
Flanged covers have a 1/4 in. (6.3 mm) flange. Cover clamps are not included with the cover and must be ordered separately.

Cover Part Numbering

Example: **TC F L G 15 - 300 - 3**

Series
Cable Tray Cover

Cover Edge
F = Flanged

Cover Style
L = Ventilated
S = Solid

Material
G = Hot Dip Galvanized After Fabrication
P = Pre-Galvanized Steel
SS4 = 304 Stainless Steel
SS6 = 316 Stainless Steel
A = Aluminum

Thickness
15 = 1.5mm (Steel)
30 = 3.0mm (Aluminum)

Width
50 = 50mm
100 = 100mm
150 = 150mm
300 = 30mm
400 = 400mm
600 = 600mm
900 = 900mm

Cover Type
3 = 3m Straight Section

Horizontal Bands
45HB300 = 45°, 300mm radius
45HB600 = 45°, 600mm radius
90HB300 = 90°, 300mm radius
90HB600 = 90°, 600mm radius

Horizontal Tees
HT300 = 300mm radius
HT600 = 600mm radius

Horizontal Crosses
HX300 = 300mm radius
HX600 = 600mm radius

90° Vertical Bend - Inside
90VI300 = 300mm radius
90VI600 = 600mm radius
90VI300 = 300mm radius
90VI600 = 600mm radius
90VI300 = 300mm radius
90VI600 = 600mm radius
90VI300 = 300mm radius
90VI600 = 600mm radius

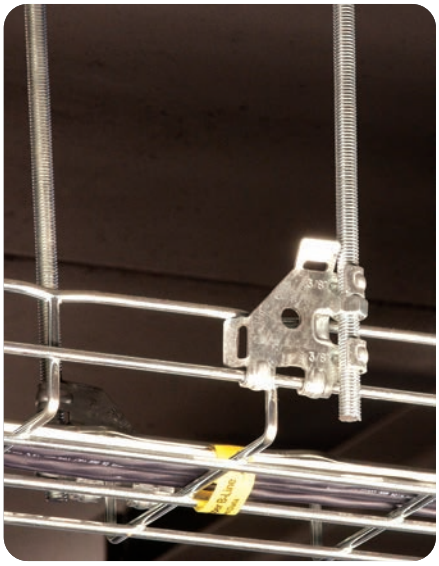
90° Vertical Bend - Outside
90VO300-025 = 300mm radius, 25mm height
90VO600-025 = 600mm radius, 25mm height
90VO300-050 = 300mm radius, 50mm height
90VO600-050 = 600mm radius, 50mm height
90VO300-075 = 300mm radius, 75mm height
90VO600-075 = 600mm radius, 75mm height
90VO300-100 = 300mm radius, 100mm height
90VO600-100 = 600mm radius, 100mm height

FLEXTRAY™

Flextray is a flexible, field-adaptable way to manage cables throughout your project. The tray itself can be cut and bent to the needs of the installer on the jobsite, allowing cable runs to be adjusted as needed. The wide range of sizes offered by B-Line makes Flextray an ideal option for small cable drops to a large trunk of cables. "T" weld safety edge helps protect both the cable and the installer during cable installation. Flextray is also UL Classified as an equipment grounding conductor.









Finish Information

Flextray Cable Tray and Accessories are available in a wide variety of finishes to meet the environmental or aesthetic requirements of customer installations. Use the list below to find the finish and suffix that will meet your needs.
Available product finishes will be listed on individual pages throughout the catalog.
Finish codes shown in bold type are the standard for that product.

EG (ZN)
Electroplated Zinc Galvanized Finish applied after fabrication
Recommended applications: Controlled interior
UL/CSA Classified as an equipment ground conductor when spliced as recommended
ASTM B633 - Average thickness of 0.3 mils (8 microns)

HD (HDG)
Hot Dip Galvanized Finish applied after fabrication
Recommended applications: Exterior, corrosive
UL/CSA Classified as an equipment ground conductor when spliced as recommended
ASTM A123 - Average thickness of 2.4 mils (60 microns) to 3.2 mils (80 microns)

GS (GLV)
Pre-Galvanized Zinc Finish applied before fabrication
Recommended applications: Limited industrial & interior
UL/CSA Classified as an equipment ground conductor when spliced as recommended
ASTM A641

BLE (FB)
Black Powder Coat Finish applied after fabrication
Recommended applications: Controlled interior
UL/CSA Classified as an equipment ground conductor when coating has been removed at splice contact points
Average paint thickness of 1.2 mils (30 microns) to 3.0 mils (75 microns)

BLO
Black Oxide Finish
Recommended applications: Controlled interior
ASTM D769

SPC
Custom Powder Coat Finish applied after fabrication
Recommended applications: Controlled interior
UL/CSA Classified as an equipment ground conductor when coating has been removed at splice contact points
No Specification

304S (SS4)
304L Stainless Steel
Recommended applications: Food preparation, wash-down areas
ASTM A580

316S (SS6)
316L Stainless Steel
Recommended applications: Highly corrosive applications & marine environments
ASTM A580

Grounding Information

Statement for all UL Classified products:

This product is classified by Underwriters Laboratories, Inc. as to its suitability as an equipment grounding conductor only. 556E

Most sizes of FLEXTRAY are UL Classified to serve as an Equipment Ground Conductor. The ground path can be achieved in one of two ways listed on page 11:

Grounding Information (cont.)

1. Use the recommended quantity of UL Classified splices to connect sections and at places where the tray is cut.
2. Run an appropriately sized ground wire alongside the tray and attach it to each tray section and on both sides of a cut in the tray. (This method is recommended by NEMA VE-2 Installation Manual.)

NEMA Load & Fill Chart

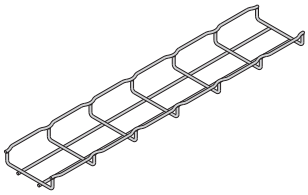
Flextray Series Part Number	Size height x width	Support Span / Loading Capacity* Lbs/Ft (max) 5'-0"	6'-0"	7'-0"	8'-0"	Cable Fill (50% fill)** Actual Area Inside Tray (in²)	Number of CAT 5e Cables***	Number of CAT 6 Cables***
FT1.5X12	1 1/2" x 12"	29	17	14	11	12.2	176	124
FT2X2	2" x 2"	34	28	24	20	4.3	61	43
FT2X4	2" x 4"	52	43	35	27	8.2	118	83
FT2X6	2" x 6"	66	47	35	27	12.1	175	123
FT2X8	2" x 8"	66	47	35	27	16.1	231	163
FT2X12	2" x 12"	68	47	35	27	23.9	345	243
FT2X16	2" x 16"	68	47	35	27	31.8	459	324
FT2X18	2" x 18"	68	47	35	27	35.8	516	364
FT2X20	2" x 20"	68	47	35	27	39.7	573	404
FT2X24	2" x 24"	68	47	35	27	47.5	686	484
FT2X30	2" x 30"	68	47	35	27	59.8	862	608
FT2X32	2" x 32"	77	53	39	30	63.3	914	645
FT4X4	4" x 4"	58	49	42	36	15.8	227	160
FT4X6	4" x 6"	93	77	60	46	23.6	341	240
FT4X8	4" x 8"	94	78	61	47	31.5	454	321
FT4X12	4" x 12"	119	83	61	47	47.5	686	484
FT4X16	4" x 16"	119	83	61	47	63.5	917	647
FT4X18	4" x 18"	119	83	61	47	71.5	1032	728
FT4X20	4" x 20"	119	83	61	47	79.5	1148	810
FT4X24	4" x 24"	128	89	65	50	95.5	1379	973
FT4X30	4" x 30"	128	89	65	50	119.5	1725	1217
FT6X8	6" x 8"	111	77	57	43	47.3	682	481
FT6X12	6" x 12"	124	86	63	48	71.6	1034	729
FT6X16	6" x 16"	128	89	65	50	95.3	1375	970
FT6X18	6" x 18"	128	89	65	50	107.3	1549	1092
FT6X20	6" x 20"	141	98	72	55	118.9	1716	1211
FT6X24	6" x 24"	154	107	78	60	143.3	2068	1459

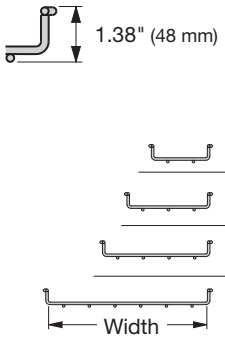
* Published load chart has not been tested with Flexmate splice. Please consult the factory for load information when using the Flexmate option.

** Flextray fill capacity is based on NEC allowable fill of 50%. The NEC rule requires that the cable cross-sectional areas together may not exceed 50% of the tray area (width x depth = fill). Cables will nearly completely fill the cable tray when reaching the 50% cable fill, due to empty space between the surface of the cables. TIA recommends 40% fill ratio. Flextray loads shown in the loading chart will not be exceeded at 50% fill.

*** CAT 5e 4-pr non-plenum approximated at .21 in. diameter, CAT 6 4-pr non-plenum approximated at .25 in. diameter. Actual diameters vary by cable manufacturer.

1.5” Deep Flextray



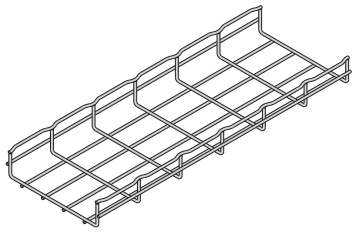


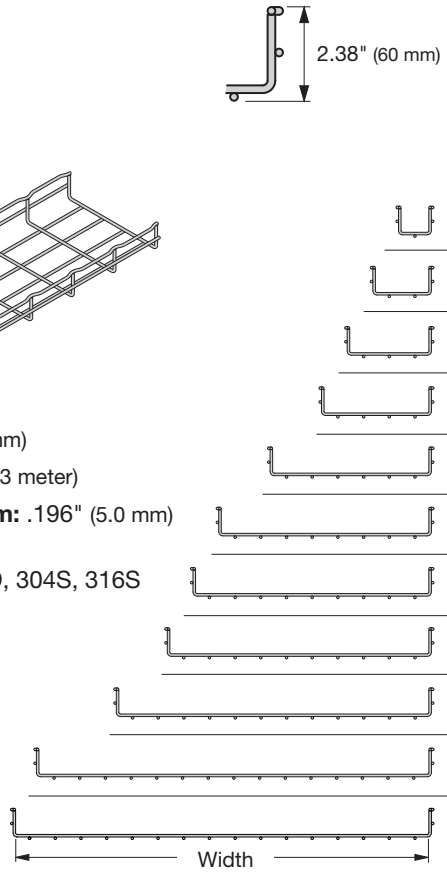
Height: 1.38" (35 mm)
Length: 118.312" (3 meter)
Wire Dia. Minimum: .196" (5.0 mm)
Finishes:
EG, GS, **BLE**, HD, 304S, 316S

Part Number	Width in.	Width mm	Wt. Per Pc. lbs.	Wt. Per Pc. kg
FT1.5X4X10	4	100	5.8	2.63
FT1.5X6X10	6	150	7.4	3.35
FT1.5X8X10	8	200	9.0	4.08
FT1.5X12X10	12	300	12.1	5.49

Only FT1.5X12 (12” wide) is UL Classified

2” Deep Flextray





Height: 2.38" (60 mm)
Length: 118.312" (3 meter)
Wire Dia. Minimum: .196" (5.0 mm)
Finishes:
EG, GS, **BLE**, HD, 304S, 316S

Part Number	Width in.	Width mm	Wt. Per Pc. lbs.	Wt. Per Pc. kg
FT2X2X10	2	50	6.6	2.99
FT2X4X10	4	100	8.2	3.72
FT2X6X10	6	150	9.7	4.40
FT2X8X10	8	200	11.2	5.08
FT2X12X10	12	300	14.3	6.48
FT2X16X10	16	400	17.4	7.89
FT2X18X10	18	450	18.9	8.57
FT2X20X10	20	500	20.4	9.25
FT2X24X10	24	600	23.5	10.66
FT2X30X10	30	750	28.1	12.74
FT2X32X10	32	800	29.7	13.47

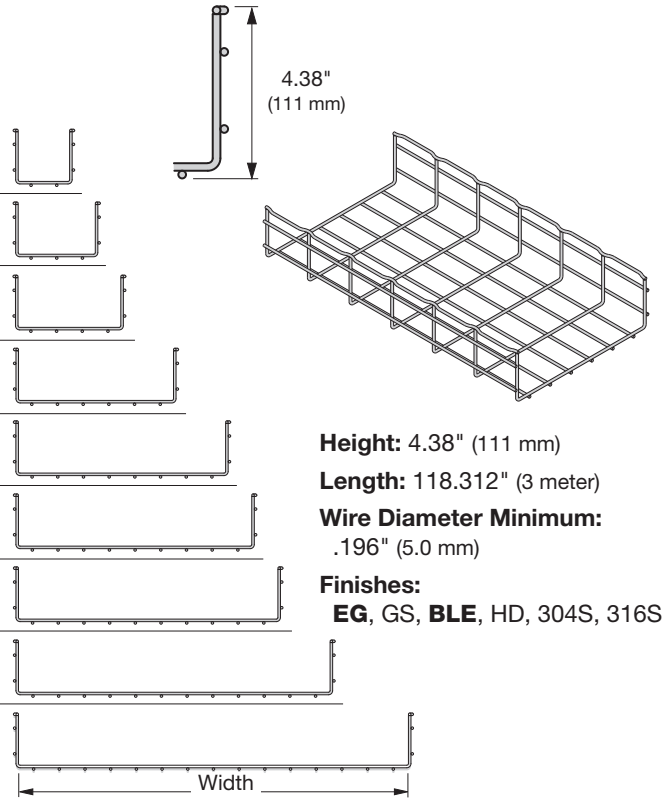
FT2X6 (6” wide) through FT2X32 (32” wide) are UL Classified

See page - WB-2 for finish information

4” Deep Flextray

Part Number	Width in.	Width mm	Wt. Per Pc. lbs.	Wt. Per Pc. kg
FT4X4X10	4	100	11.25	5.10
FT4X6X10	6	150	12.79	5.80
FT4X8X10	8	200	14.32	6.49
FT4X12X10	12	300	17.39	7.89
FT4X16X10	16	400	20.45	9.27
FT4X18X10	18	450	21.99	9.97
FT4X20X10	20	500	23.52	10.67
FT4X24X10	24	600	26.59	12.06
FT4X30X10	30	750	31.19	14.15

All 4” deep Flextrays are UL Classified

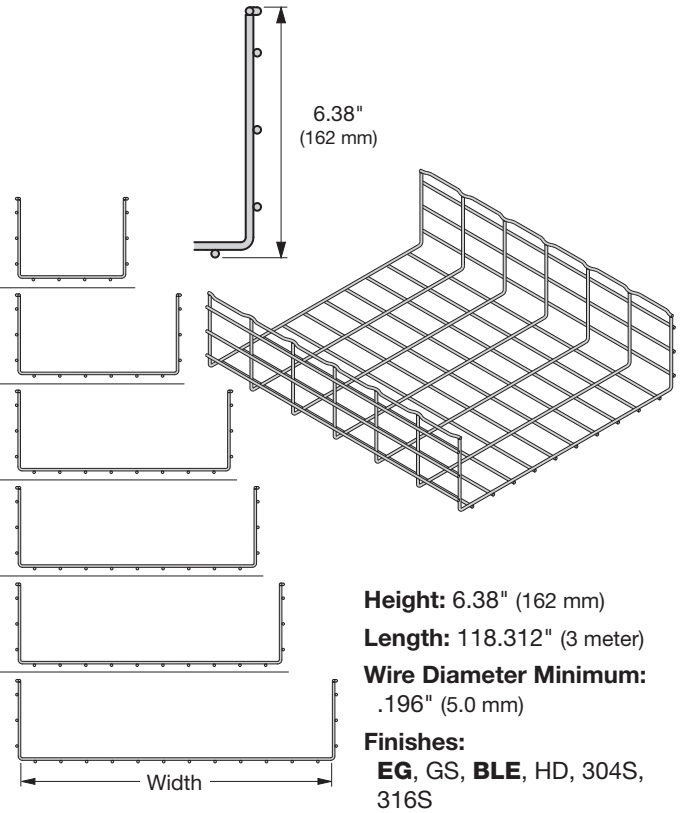


Height: 4.38" (111 mm)
Length: 118.312" (3 meter)
Wire Diameter Minimum: .196" (5.0 mm)
Finishes: **EG**, GS, **BLE**, HD, 304S, 316S

6” Deep Flextray

Part Number	Width in.	Width mm	Wt. Per Pc. lbs.	Wt. Per Pc. kg
FT6X8X10	8	200	17.39	7.89
FT6X12X10	12	300	20.45	9.27
FT6X16X10	16	400	23.52	10.67
FT6X18X10	18	450	25.06	11.37
FT6X20X10	20	500	26.59	12.06
FT6X24X10	24	600	29.66	13.45

All 6” deep Flextrays are UL Classified



Height: 6.38" (162 mm)
Length: 118.312" (3 meter)
Wire Diameter Minimum: .196" (5.0 mm)
Finishes: **EG**, GS, **BLE**, HD, 304S, 316S

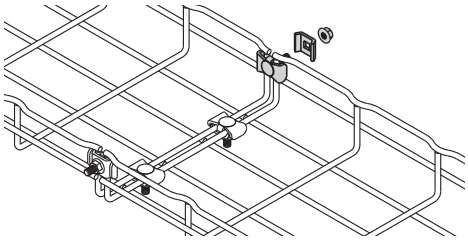
See page - WB-2 for finish information

Washer Splice Kit

- Washer is staked to bolt, holding part stationary during installation
- Fewer parts to handle
- For use with all tray widths and sizes
- Finishes __: **EG**, **BLE**

BLE suffix indicates black zinc finish for this part only

Part Number	Description	Qty./Box	Wt./Box lbs.	Wt./Box kg
WASHER SPL KIT__	Assembly of Staked Washer Stud/Washer & Finned Nut	50	4.5	2.04



Splicing Chart (number of splices required for UL Classification)

Tray Height	Tray Width - number of splices 2" (50mm)	4" (100mm)	6" (150mm)	8" (200mm)	12" (300mm)	16" (400mm)	18" (450mm)	20" (500mm)	24" (600mm)
2"	NC	NC	4	4	4	4	4	5	5
4"	NM	4	5	6	6	7	7	7	8
6"	NM	NM	NM	6	6	7	7	7	8

NC = Not UL Classified in this size NM = Flextray is not manufactured in this size

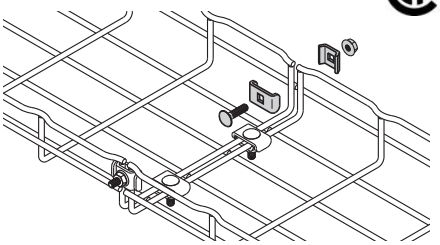
Splice Hardware Components

- Works with all splicing needs
- For use with all tray widths and sizes
- Components are sold separately
- Finishes __: **EG**, **BLE-BLO**, 304S, 316S

FTHDWE 1/4 not available in **BLE**.

TOP WASHER & BTM WASHER not available in **BLO**.

Part Number	Description	Qty./Box	Wt./Box lbs.	Wt./Box kg
FTHDWE 1/4__	1/4" x 1" Carriage Bolt & Finned nut	50	1.2	0.54
TOP WASHER__	1" Square Splice Washer	50	1.4	0.63
BTM WASHER __	1 3/16" Square Splice Washer	50	2.0	0.91



BTM WASHER

FTHDWE1/4

TOP WASHER

Splicing Chart (number of splices required for UL Classification)

Tray Height	Tray Width - number of splices 2" (50mm)	4" (100mm)	6" (150mm)	8" (200mm)	12" (300mm)	16" (400mm)	18" (450mm)	20" (500mm)	24" (600mm)
2"	NC	NC	4	4	4	4	4	5	5
4"	NM	4	5	6	6	7	7	7	8
6"	NM	NM	NM	6	6	7	7	7	8

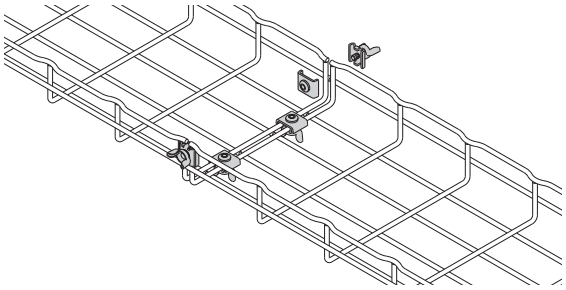
NC = Not UL Classified in this size NM = Flextray is not manufactured in this size

See page - WB-2 for finish information

Wing Splice

Part Number	Description	Qty./Box	Wt./Box lbs.	Wt./Box kg
FTSWN__	Wing Splice	50	3.0	1.38

- Two piece design for easy handling
- Tool-less installation
- Reduces installation time, especially when used on fittings and bends
- Finish__: **ZN**



Splicing Chart (number of splices required for UL Classification)

Tray Height	Tray Width - number of splices 2" (50mm)	4" (100mm)	6" (150mm)	8" (200mm)	12" (300mm)	16" (400mm)	18" (450mm)	20" (500mm)	24" (600mm)
2"	NC	NC	4	4	4	4	4	5	5
4"	NM	4	5	6	6	7	7	7	8
6"	NM	NM	NM	6	6	7	7	7	8

NC = Not UL Classified in this size

NM = Flextray is not manufactured in this size

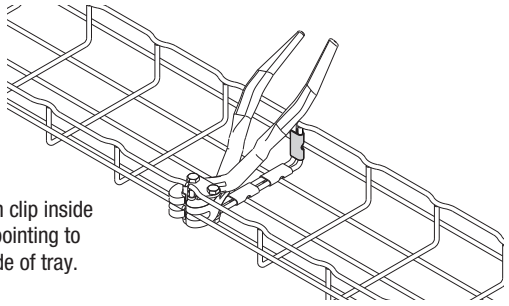
Flexmate Splice System

Part Number	Description	Qty./Box	Wt./Box lbs.	Wt./Box kg
FLEXMATE2__	Flexmate Splice Clips	50	1.0	0.45
FLEXMATE TOOL	Flexmate Splice Tool	1	0.7	0.32

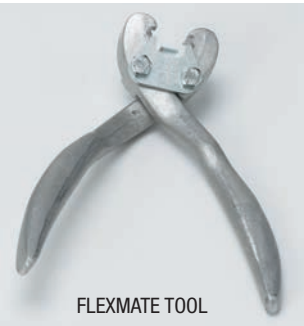
- Fastest splice connection method available in the industry
- For use with 4" (100mm) to 12" (300mm) wide tray
- Flexmate clips and tool sold separately
- Finishes __: **GS**, BLE

Note: Please contact B-Line when using Flexmates on tray widths larger than 12" (300mm) for specific requirements.
B-Line recommends that splice/supports comply with NEMA VE-2 installation requirements

FLEXMATE2



Position clip inside tool, pointing to outside of tray.



FLEXMATE TOOL

Flexmate Tool is used to install splices quickly.

Splicing Chart (number of splices required for UL Classification)

Tray Height	Tray Width - number of splices 2" (50mm)	4" (100mm)	6" (150mm)	8" (200mm)	12" (300mm)
2"	NC	NC	5	5	5
4"	NM	5	6	7	7
6"	NM	NM	NM	7	7

NC = Not UL Classified in this size

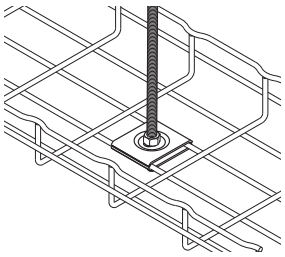
NM = Flextray is not manufactured in this size

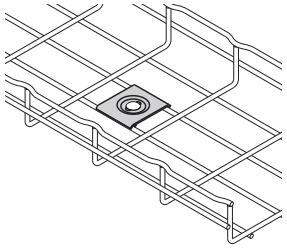
See page - WB-2 for finish information

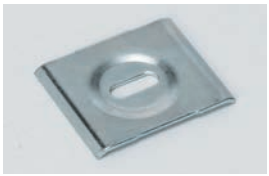
Hold Down Plate

- Easy way to mount 4" (100mm) wide tray for raceway run.
- Use 1/4" screws to attach SUPT WASHER to your specific wall/stud application (hardware sold separately).
- FTA6HD can be used in pairs to create a center-hung support using 3/8" rod.
- To complete 3/8" center hanger assembly use:
  2 - FTA6HD
  2 - HN 3/8"-16 hex nuts
- Finish: **ZN**, SS6

Part Number	Slot Size	Qty./Box	Wt./Box lbs.	Wt./Box kg
SUPT WASHER__	.28" x .70"	50	4.7	2.13
FTA6HD__	.40" x .70"	50	3.5	1.59



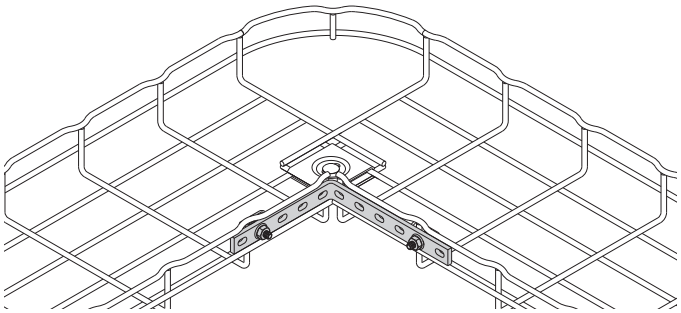




90 Degree Kit

- For fast assembly of 90° turns and tee fittings
- For use with all tray widths and sizes
- One kit will make two 90° turns or one tee fitting
- 90 DEGREE KIT: includes: two (2) 90° splice bars and eight (8) FTSCH
- Finishes __: **EG**, BLE, 316S

Part Number	Description	Qty./Box	Wt./Box lbs.	Wt./Box kg
90 DEGREE KIT__	90 degree splice bar & hardware	1	1.3	0.59



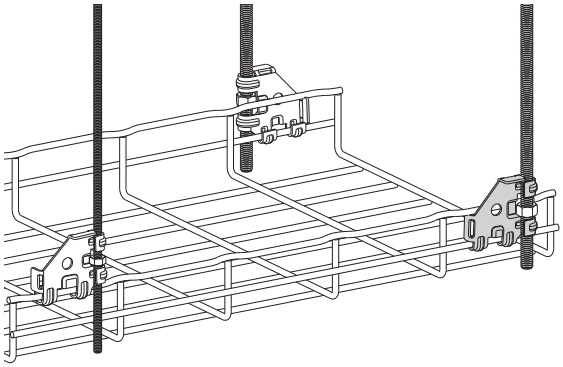
See page - WB-2 for finish information

Flip Clip™

Part Number	Description	Qty./Box	Wt./Box lbs.	Wt./Box kg
WB46H__	Flip Clip	50	5.2	2.36

- Accommodates 1/4" and 3/8" rod sizes
- Installs quickly with a screwdriver or pliers thus reducing installation time
- Requires only one hex nut (not included) to hang and level the Flextray
- Retainer tabs can be bent over to lock-in the threaded rod and wire basket
- Finishes __: **ZN**, FB, SS6

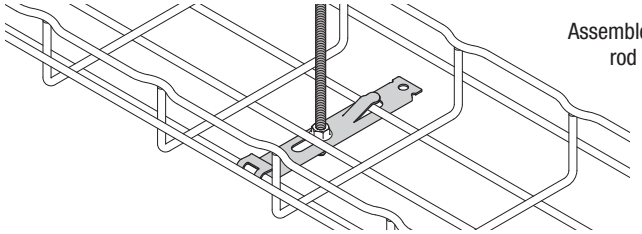
Snap retainer stops in place after cable is loaded.



Center Hung Clip

Part Number	Description	Qty./Box	Wt./Box lbs.	Wt./Box kg
CTR HUNG CLP__	Light Duty Center Hanger	50	4.0	1.81

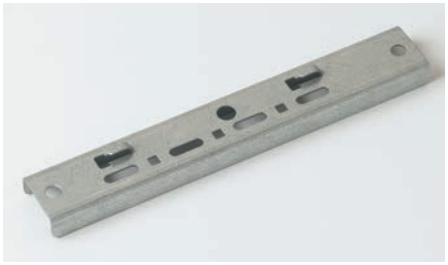
- Use for light duty cabling applications
- For use with 1 1/2" (38mm) & 2" (51mm) deep tray with 4" (100mm) and 6" (150mm) widths
- Built-in hold down tab
- Accepts 1/4" threaded rod
- Threaded rod and nuts sold separately
- Finishes __: **GS**, BLE



Assemble with 1/4" threaded rod and finned nut

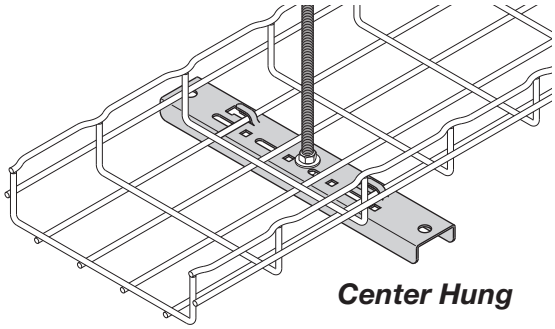
See page - WB-2 for finish information

Center Trapeze Hanger

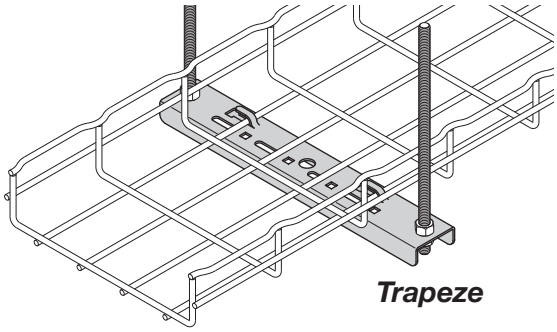


- Can be installed as center-hung or traditional trapeze hanger
- Multiple options to secure Flextray to hanger
  - Built in hold down tabs (use screwdriver to bend down tab)
  - Compatible with TOOLLESS CLIP with snap-in locking pin
  - Compatible with WBUHD hold down clip when tray crosswire is aligned over top of hanger
  - Slots and holes for optional hardware attachment
- Corrosion resistant pre-galvanized zinc finish (other finishes available upon request)
- Center hole for up to 1/2" rod
- Hole on each end for up to 3/8" rod

Part Number	Maximum Tray Width in.	mm	Actual Length in.	mm	Wt./Pc. lbs.	kg
FTB06CT	6"	150	9.78"	248	0.61	0.27
FTB08CT	8"	200	11.75"	298	0.74	0.33
FTB12CT	12"	300	15.69"	398	0.98	0.44
FTB16CT	16"	400	19.63"	498	1.61	0.73
FTB18CT	18"	450	21.59"	548	1.77	0.80
FTB20CT	20"	500	23.56"	598	1.93	0.87
FTB24CT	24"	600	27.50"	698	2.25	1.02



Center Hung



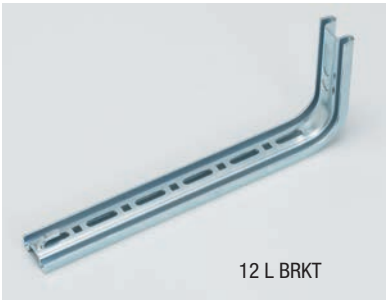
Trapeze

See page - WB-2 for finish information

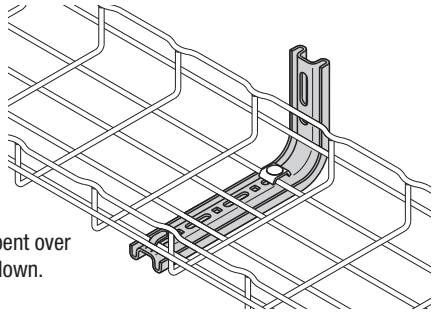
L Brackets

Part Number	Use With Tray Width	Qty./Box	Wt./Box lbs.	Wt./Box kg
4 L BRKT__	4" (150mm)	1	0.6	0.27
8 L BRKT__	6" (150mm) & 8" (200mm)	1	0.8	0.36
12 L BRKT__	12" (300mm)	1	1.3	0.59
16 L BRKT__	16" (400mm)	1	1.4	0.63
20 L BRKT__	18" & 24" (450 & 500mm)	1	2.0	0.91
24 L BRKT__	24" (600mm)	1	2.3	1.04

- Installs tray to wall cleanly
- Built-in tab for hold down (not available in stainless steel)
- For use with 4" (100mm) to 24" (600mm) wide trays
- Use with pedestal clamp in raised floor applications
- Hardware sold separately
- Finishes __: **EG**, HD, BLE, 316S



12 L BRKT



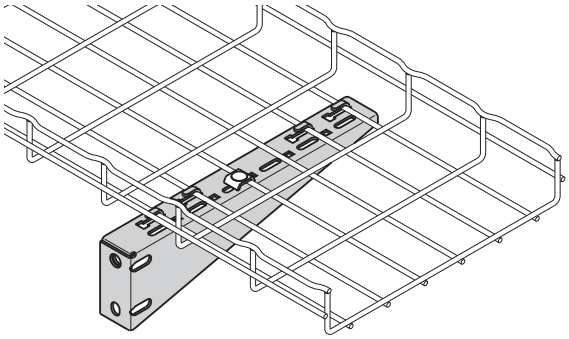
Tab can be bent over for hold down.

Shelf Brackets

Part Number	Use With Tray Width	Qty./Box	Wt./Box lbs.	Wt./Box kg
FTB06CS__	6" (150mm)	1	0.5	0.22
FTB08CS__	8" (200mm)	1	0.6	0.27
FTB12CS__	12" (300mm)	1	1.2	0.54
FTB16CS __	16" (400mm)	1	1.7	0.77
FTB18CS __	18" (450mm)	1	1.9	0.86
FTB20CS __	20" (500mm)	1	2.6	1.18
FTB24CS __	24" (600mm)	1	3.2	1.45

- Heavy-duty support bracket
- For use with 6" (150mm) to 24" (600mm) wide trays
- Built-in tab for hold down
- Optional hardware sold separately
- Finishes __: **GLV**, HDG, SS6

FTB24CS shown

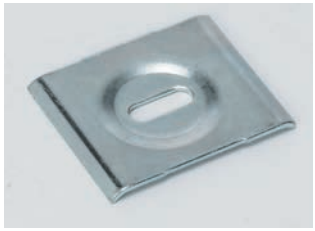


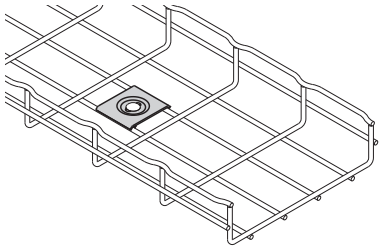
See page - WB-2 for finish information

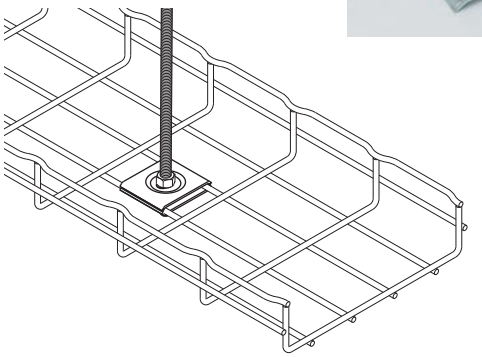
Hold Down Plate

- Easy way to mount 4" (100mm) wide tray for raceway run.
- Use 1/4" screws to attach SUPT WASHER to your specific wall/stud application (hardware sold separately).
- FTA6HD can be used in pairs to create a center-hung support using 3/8" rod.
- To complete 3/8" center hanger assembly use:
  2 - FTA6HD
  2 - HN 3/8"-16 hex nuts
- Finish: **ZN**, SS6

Part Number	Slot Size	Qty./Box	Wt./Box lbs.	Wt./Box kg
SUPT WASHER__	.28" x .70"	50	4.7	2.13
FTA6HD__	.40" x .70"	50	3.5	1.59



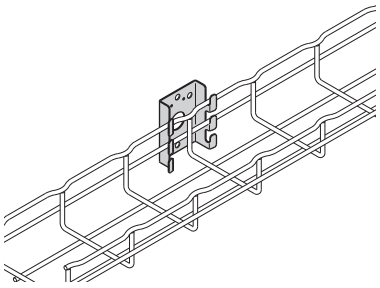




Wall Supports

- Use to attach 2" (50mm) or 4" (100mm) trays to walls, struts or cabinets
- Use for raceway mounting
- Mount to metal framing for vertical support
- Tabs are built in for tray hold down
- Mount to side rail for electrical box connection
- Finishes __: **GLV**

Part Number	Description	Qty./Box	Wt./Box lbs.	Wt./Box kg
FTA050CC__	Wall Support Bracket	1	0.8	0.36



See page - WB-2 for finish information

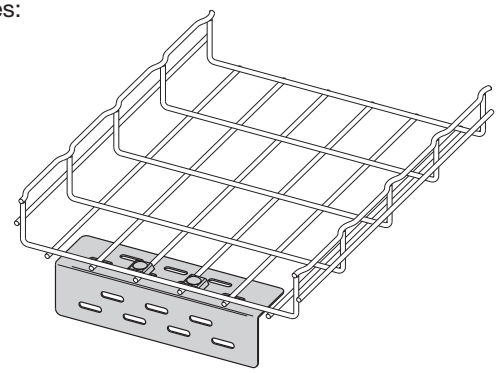
Wall Termination Kit

Part Number	Length	Qty./Box	Wt./Box lbs.	Wt./Box kg
FTA9WTK__	9”	1	1.3	0.59

- Kit includes all hardware necessary to support Flextray when terminated at a wall
- Mount slotted angle to wall with up to 3/8" hardware (not included)
- Finishes __: **ZN**, FB, SS6

Wall Termination Kit includes:

1 - Angle with Slots
2 - FTSCH

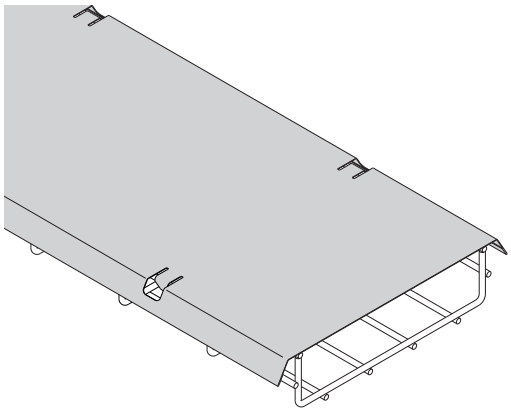


See page - WB-2 for finish information

Covers

- Protects cable from debris and dust
- Adds security to cable installation
- Easy bend-over tabs secure cover to trays
- Available for 2" (50mm) to 24" (600mm) wide trays
- Comes in 118" (2997mm) length
- Finishes __: **GS,** BLE, 304S, 316S

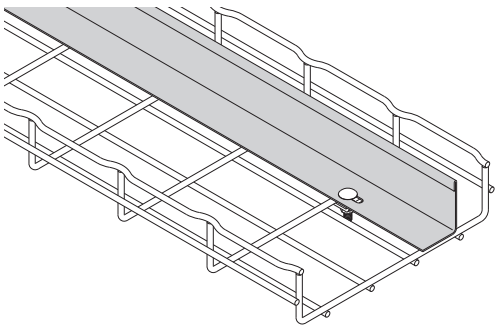
Part Number	Use With Tray Width	Qty./Box	Wt./Box lbs.	Wt./Box kg
2 IN COVER__	2" (50mm)	1	3.8	1.72
4 IN COVER__	4" (100mm)	1	5.7	2.58
6 IN COVER__	6" (150mm)	1	6.7	3.04
8 IN COVER__	8" (200mm)	1	8.7	3.94
12 IN COVER__	12" (300mm)	1	11.6	5.26
16 IN COVER__	16" (400mm)	1	15.6	7.07
18 IN COVER__	18" (450mm)	1	17.0	7.71
20 IN COVER__	20" (500mm)	1	18.5	8.39
24 IN COVER__	24" (600mm)	1	22.0	9.98



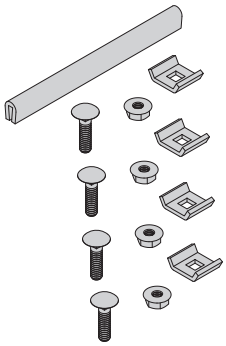
Dividers

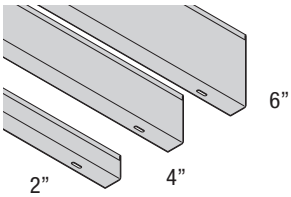
- Allows cable separation within a single tray
- Hemmed/rounded edge provides cable jacket safety
- Hardware included
- Field miter for bends and turns
- Dual slots every 24" (609mm) for field cutting
- Available in 2" (50mm), 4" (100mm) and 6" (150mm) heights
- Comes in 118.125" (3000mm) length
- Finishes __: **GS,** BLE, 304S, 316S

Part Number	Use With Tray Depth	Qty./Box	Wt./Box lbs.	Wt./Box kg
2 IN DIVIDER__	2" (50mm) Deep	1	3.5	1.59
4 IN DIVIDER __	4" (100mm) Deep	1	9.6	4.35
6 IN DIVIDER __	6" (150mm) Deep	1	14.5	6.58



Dividers include hardware shown below



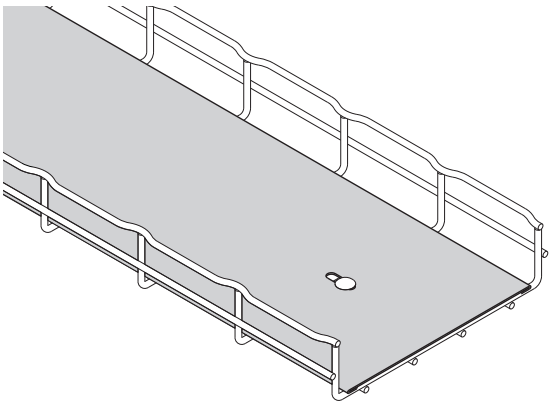


See page - WB-2 for finish information

Solid Bottom Inserts

Part Number	Use With Tray Width	Qty./Box	Wt./Box lbs.	Wt./Box kg
INSERT 4X118__	4" (100mm)	1	6.8	3.08
INSERT 6X118__	6" (150mm)	1	9.8	4.44
INSERT 8X118__	8" (200mm)	1	13.3	6.03
INSERT 12X118__	12" (300mm)	1	21.6	9.80
INSERT 16X118__	16" (400mm)	1	26.4	11.97
INSERT 18X118__	18" (450mm)	1	32.4	14.69
INSERT 20X118__	20" (500mm)	1	32.9	14.92
INSERT 24X118__	24" (600mm)	1	39.3	17.82

- Continuous support for sensitive cables
- Security of cable in high-traffic areas
- Hardware included
- Available for 2" (50mm) to 24" (600mm) wide trays
- Comes in 118" (2997mm) length
- Finishes __: **GS,** BLE, 304S, 316S



Attach with FTHDWE 1/4 & Top Washer

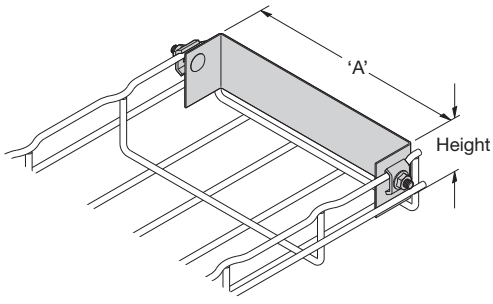
Blind Ends

Part Number	'A' in.	'A' mm	Height in.	Height mm	Box Quantity
FT BE 2X2	2"	50	2"	50	1
FT BE (*)X4	4"	100	(*)	(*)	1
FT BE (*)X6	6"	150	(*)	(*)	1
FT BE (**)X8	8"	200	(*)	(*)	1
FT BE (**)X12	12"	300	(**)	(**)	1
FT BE (**)X16	16"	400	(**)	(**)	1
FT BE (**)X18	18"	450	(**)	(**)	1
FT BE (**)X20	20"	500	(**)	(**)	1
FT BE (**)X24	24"	600	(**)	(**)	1

- Forms a closure for a dead-end Flextray
- Hardware included
- Finish: **GLV,** SS6

(*) Insert: 2 = 2" (50 mm), 4 = 4" (100 mm) for height

(**) Insert: 2 = 2" (50 mm), 4 = 4" (100 mm), 6 = 6" (150 mm) for height

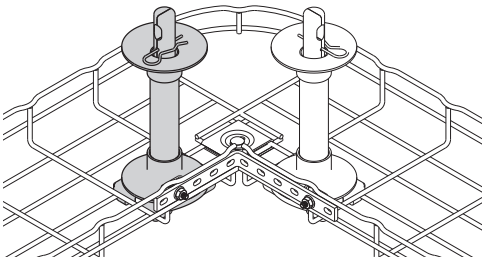


See page - WB-2 for finish information

Cable Roller

- Protects and maintains recommended cable radii for Cat 5, Cat 5E, Cat 6, Cat 6A, Fiber, etc.
- Height of roller can be adjusted to tray depth
- Installs in seconds with no tools
- Reduces cable installation time
- Prevents migration of cables
- For use with 4" (100mm) to 32" (800mm) tray widths
- Finish: Cast Aluminum

Part Number	Description	Qty./Box	Wt./Box lbs.	Wt./Box kg
CABLE ROLLER	Cable Roller	1	1.0	0.45

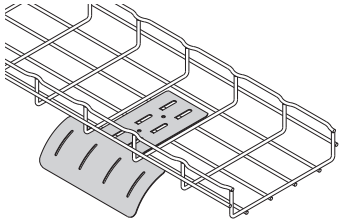


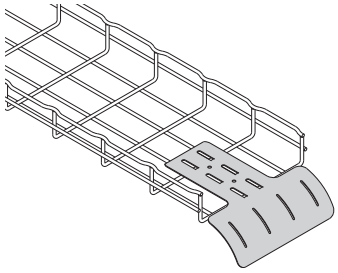
Quick, snap-together design

Drop Out Fitting

- Keeps cable radius secure at drop point
- For use with 4" (100mm) to 32" (800mm) wide trays
- Attaches to tray without hardware
- Drop outs can be attached at bottom, side or ends of tray
- Hold down tabs on bottom of drop out to secure tray (tabs not available on stainless steel drop out)
- Finishes __: **EG**, BLE

Part Number	Description	Qty./Box	Wt./Box lbs.	Wt./Box kg
DROP OUT__	Drop Out Fitting	1	0.5	0.22

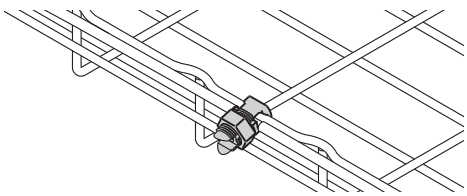




Ground Bolt

- Attaches up to #1 ground wire to each tray section when separate ground wire is required
- Used for UL grounding compliance.
- When using color powder coated finish or paint, coating must be removed at the points of contact.
- Finish: Copper Plated

Part Number	Description	Qty./Box	Wt./Box lbs.	Wt./Box kg
GROUND BOLT	Ground Bolt	1	0.11	0.05



See page - WB-2 for finish information

Flextray Cutters

Part Number	Description	Qty./Box	Wt./Box lbs.	Wt./Box kg
CLEANSHEAR	Cleanshear Cutting Tool	1	4.3	1.95

- Exclusive, patented Cleanshear™ cuts tray fast
- No sharp edges
- Designed specifically for cutting Flextray
- Safely cut and bend Flextray into any configuration

Patented

1 Face tray up. Slide cutter next to vertical wire and cut.

2 Turn tray to the side with open side facing you. Repeat step 1 to cut wire.

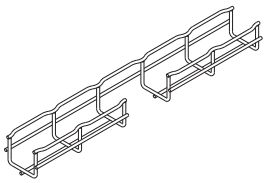
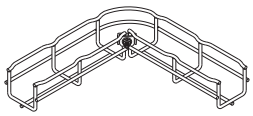
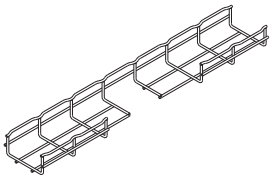
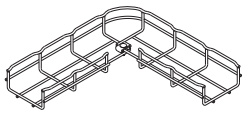
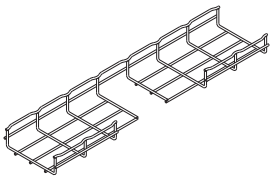
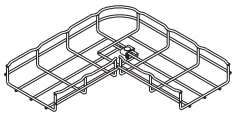
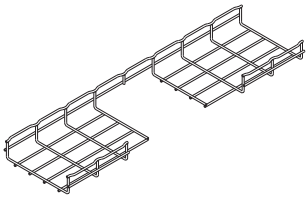
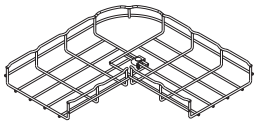
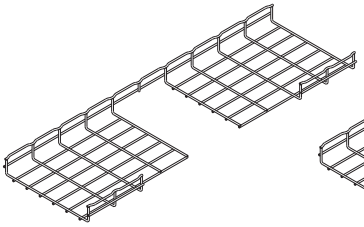
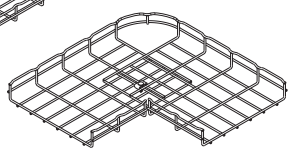
3 Finish cutting all side wires.

4 Turn tray open-side down and cut wires from bottom of tray.

5 Finish cutting by moving to other side of tray to cut remaining wires,

90° Horizontal Bends (Short Radius)

- Make your own field cut horizontal bends using Clearshear™ to make safe, smooth cuts
- Can be made from any tray width and depth with any available finish
- SUPT WASHER & FTHDWE 1/4 hardware may be used on bottom of tray instead of WASHER SPL KIT where desired

2" (50mm) Tray Width

Flextray Depth	Required Hardware Description	Quantity
2" (50mm)	WASHER SPL KIT	1

4" (100mm) Tray Width

Flextray Depth	Required Hardware Description	Quantity
1 1/2" (38mm)	WASHER SPL KIT	1
2" (50mm)	WASHER SPL KIT	1
4" (100mm)	WASHER SPL KIT	1

6" (150mm) Tray Width

Flextray Depth	Required Hardware Description	Quantity
1 1/2" (38mm)	WASHER SPL KIT	1
2" (50mm)	WASHER SPL KIT	1
4" (100mm)	WASHER SPL KIT	1

8" (200mm) Tray Width

Flextray Depth	Required Hardware Description	Quantity
1 1/2" (38mm)	WASHER SPL KIT	1
2" (50mm)	WASHER SPL KIT	1
4" (100mm)	WASHER SPL KIT	1
6" (150mm)	WASHER SPL KIT	1

12" (300mm) Tray Width

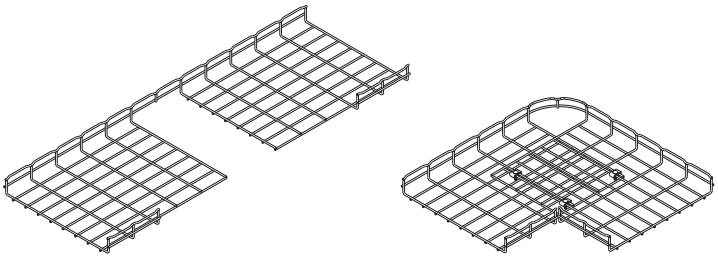
Flextray Depth	Required Hardware Description	Quantity
1 1/2" (38mm)	WASHER SPL KIT	1
2" (50mm)	WASHER SPL KIT	1
4" (100mm)	WASHER SPL KIT	1
6" (150mm)	WASHER SPL KIT	1

90° Horizontal Bends (Short Radius)

- Make your own field cut horizontal bends using Clearshear™ to make safe, smooth cuts
- Can be made from any tray width and depth with any available finish
- SUPT WASHER & FTHDWE 1/4 hardware may be used on bottom of tray instead of WASHER SPL KIT where desired

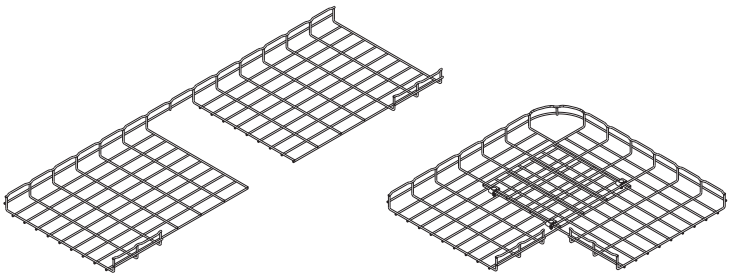
16" (400mm) Tray Width

Flextray Depth	Required Hardware Description	Quantity
2" (50mm)	WASHER SPL KIT	3
4" (100mm)	WASHER SPL KIT	3
6" (150mm)	WASHER SPL KIT	3



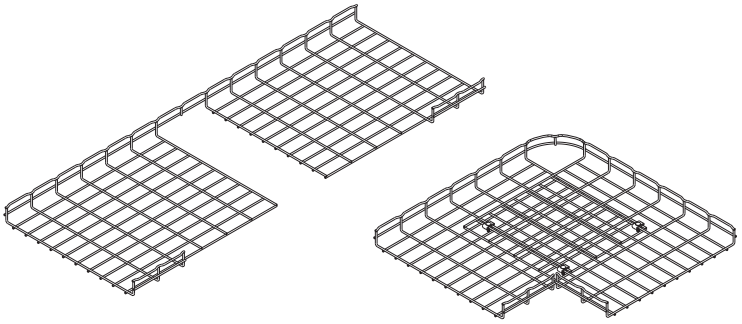
18" (450mm) Tray Width

Flextray Depth	Required Hardware Description	Quantity
2" (50mm)	WASHER SPL KIT	3
4" (100mm)	WASHER SPL KIT	3
6" (150mm)	WASHER SPL KIT	3



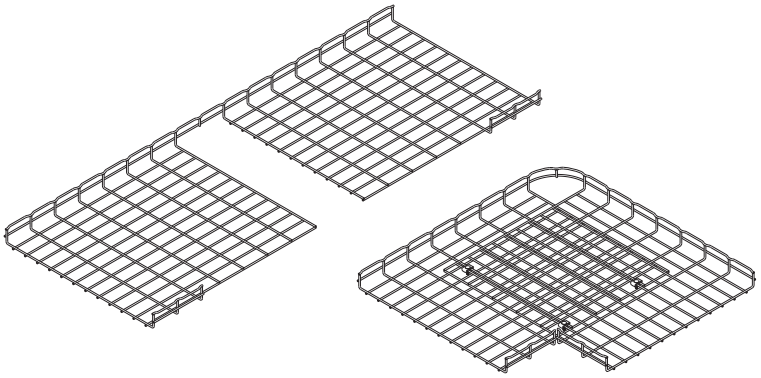
20" (500mm) Tray Width

Flextray Depth	Required Hardware Description	Quantity
2" (50mm)	WASHER SPL KIT	3
4" (100mm)	WASHER SPL KIT	3
6" (150mm)	WASHER SPL KIT	3



24" (600mm) Tray Width

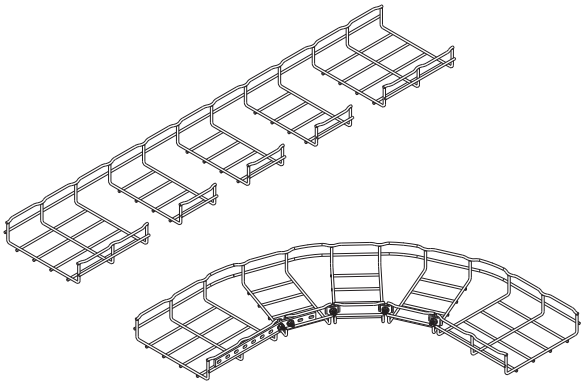
Flextray Depth	Required Hardware Description	Quantity
2" (50mm)	WASHER SPL KIT	3
4" (100mm)	WASHER SPL KIT	3
6" (150mm)	WASHER SPL KIT	3



90° Horizontal Bends (Long Radius)

- Make your own field cut horizontal sweeps using Clearshear™ to make safe, smooth cuts
- Can be made from any tray width and depth with any available finish
- Cut as many Segments as required to control sweep radius (use chart for recommendations)
- One (1) WASHER SPL KIT is required to connect each cut segment minus one, this segment uses one (1) SPLICE BAR, two (2) FTHDWE 1/4 and two (2) BTM WASHER

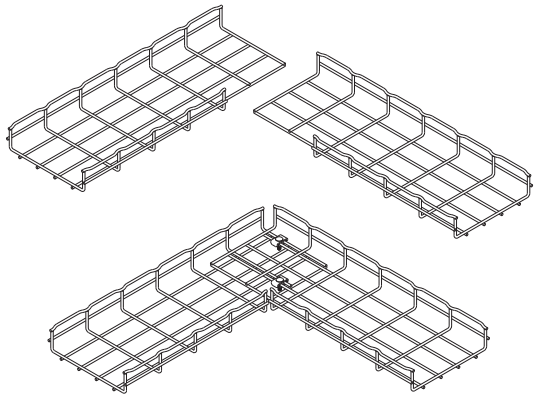
- Illustration shown below is for a 8" (200mm) width
- 1.5" deep Flextray has only one (1) side wire
  2" deep Flextray has two (2) side wires - shown
  4" deep Flextray has three (3) side wires
  6" deep Flextray has four (4) side wires



Flextray Width	Segments To Be Removed	Component Qty.		
		WASHER SPL KIT	FTHDWE 1/4 & BTM WASHER	SPLICE BAR
4" (100mm)	2	1	2	1
6" (150mm)	3	2	2	1
8" (200mm)	4	3	2	1
12" (300mm)	6	5	2	1
16" (400mm)	7	6	2	1
18" (450mm)	8	7	2	1
20" (500mm)	10	9	2	1
24" (600mm)	11	10	2	1
30" (750mm)	13	12	2	1
32" (800mm)	13	12	2	1

90° Horizontal Bend From (2) Straight Sections

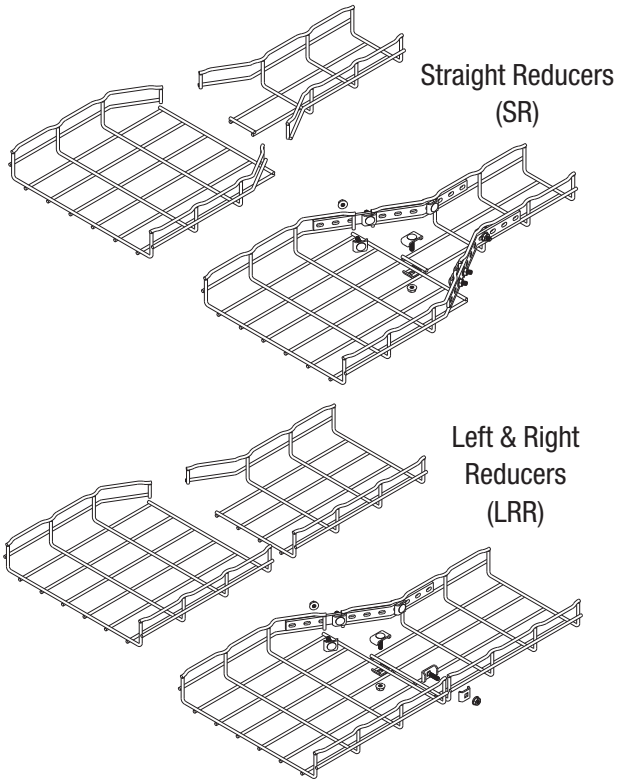
- Cut required number of wire side sections listed in chart per the illustration below (Illustration is for a 8" (200mm) width)
- 1.5" deep Flextray has only one (1) side wire
  2" deep Flextray has two (2) side wires - shown
  4" deep Flextray has three (3) side wires
  6" deep Flextray has four (4) side wires



Flextray Width	Side Sections To Be Removed	WASHER SPL KIT Qty.
4" (100mm)	1	2
6" (150mm)	2	2
8" (200mm)	2	2
12" (300mm)	3	2
16" (400mm)	4	3
18" (450mm)	5	3
20" (500mm)	5	3
24" (600mm)	6	4
30" (750mm)	8	4
32" (800mm)	8	4

Reducers

Large Flextray Width	Component Qty. WASHER SPL KIT (SR)	(LRR)	FTHDWE 1/4 & BTM WASHER (SR)	(LRR)	SPLICE BAR (SR)	(LRR)
4" (100mm)	-	1	-	2	-	1
6" (150mm)	-	2	-	2	-	1
8" (200mm)	1	2	4	2	2	1
12" (300mm)	2	3	4	2	2	1
16" (400mm)	2	3	4	2	2	1
18" (450mm)	2	3	4	2	2	1
20" (500mm)	3	3	4	2	2	1
24" (600mm)	3	3	4	2	2	1
30" (750mm)	3	3	4	2	2	1
32" (800mm)	3	3	4	2	2	1



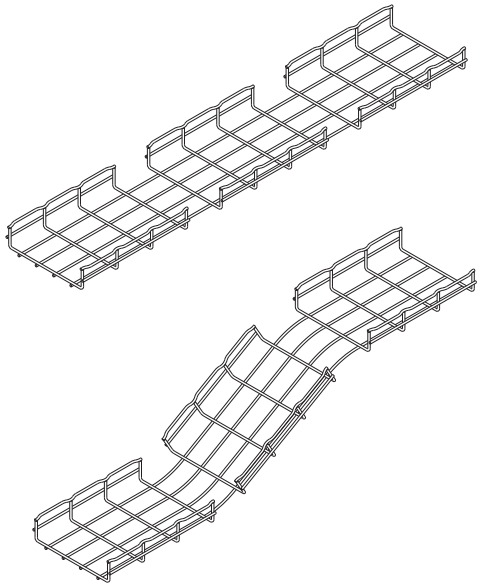
Straight Reducers (SR)

Left & Right Reducers (LRR)

- 1.5" deep Flextray has only one (1) side wire
  2" deep Flextray has two (2) side wires - shown
  4" deep Flextray has three (3) side wires
  6" deep Flextray has four (4) side wires

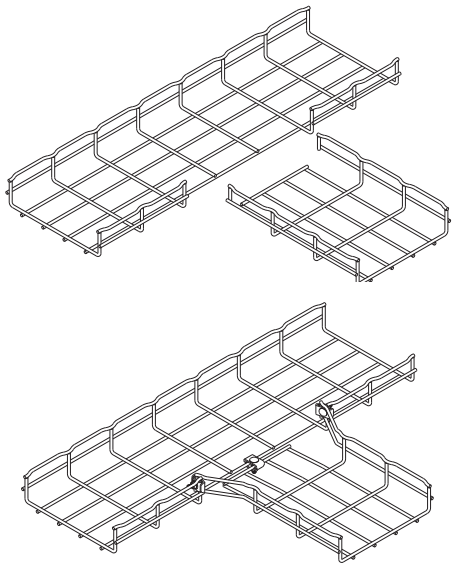
Vertical Inside & Outside Bends

- Cut wire section as shown and bend to desired angle
- 1.5" deep Flextray has only one (1) side wire
  2" deep Flextray has two (2) side wires - shown
  4" deep Flextray has three (3) side wires
  6" deep Flextray has four (4) side wires



Horizontal Tees (and crosses)

- Cut wire side sections as shown in the illustration below (Illustration is for a 8" (200mm) width)
- 1.5" deep Flextray has only one (1) side wire
  2" deep Flextray has two (2) side wires - shown
  4" deep Flextray has three (3) side wires
  6" deep Flextray has four (4) side wires
- For crosses, duplicate process on opposite side

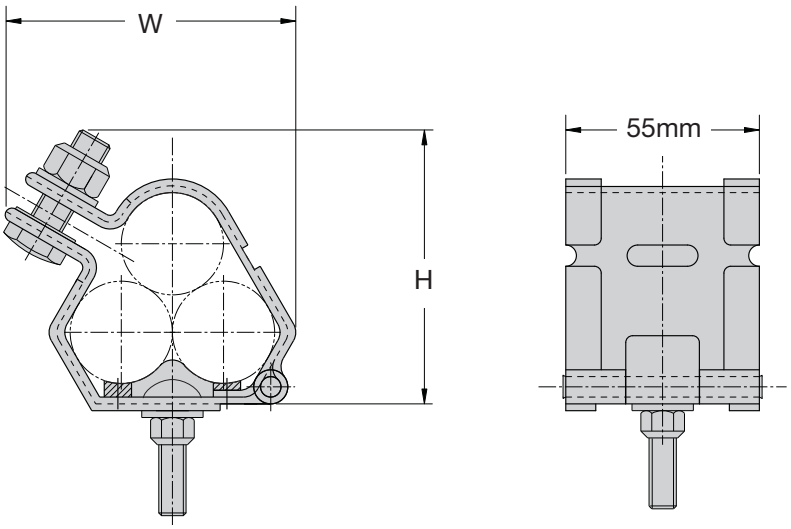


Flextray Width	WASHER SPL KIT Qty.
2" (50mm)	2
4" (100mm)	2
6" (150mm)	3
8" (200mm)	3
12" (300mm)	4
16" (400mm)	4
18" (450mm)	4
20" (500mm)	4
24" (600mm)	4
30" (750mm)	5
32" (800mm)	5

Cable Cleats

Trefoil Cable Cleat with LSF Pad

1. Recommended for installations where the highest levels of short circuit withstand are required.
2. Short circuit current tested in accordance with BS EN 50368:2003 standard.
3. Available for single and trefoil cable applications.
4. LSF-pad incorporate an integral low smoke, low fume, zero halogen pad.
5. Hardware to attach cleat to rung attachment bracket is included with cleat. Bracket must be ordered separately.



BS EN 50368:2003 (Cable Cleats for Electric Installations) Classification	
Cleat Type	Composite
Resistance to Electromechanical Force	130 kA peak / 50 kA RMS 600 mm spacing
Lateral Load Test	3.439 kg average
Axial Load Test	Pass
Operating Temperature Range	-40°C to +60°C
Impact Resistance	Very Heavy
Needle Flame Test	30 seconds

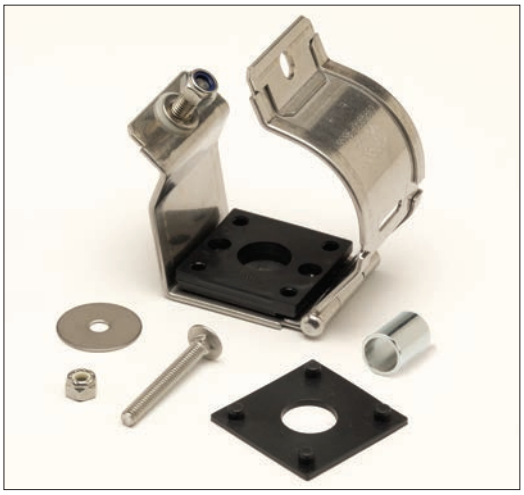
Technical Specifications	
Frame	50mm x 2mm Marine grade, Non-magnetic 316L
Closure Hardware	Captive 316 Stainless Steel M8 or M10 (M12 available) bolt and nylon-lock nut (Optional Hex Flange Lock Nut available)
Integral Pad	Low Smoke, Low Fume, Zero Halogen
Tools Required	Impact Wrench
Mounting Bolt	Provided with Cable Cleat

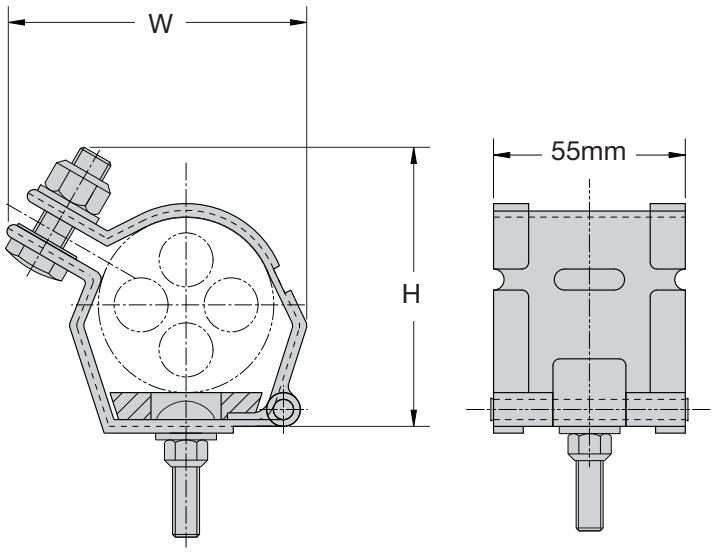
Part No.	Cable Range (mm)		Dimensions (mm)	
	Min. Dia.	Max. Dia.	H	W
9SS6-CCT1323	13	22	74	66
9SS6-CCT2125	21	25	77	70
9SS6-CCT2329	23	29	81	78
9SS6-CCT2531	25	31	84	81
9SS6-CCT2733	27	33	86	83
9SS6-CCT2935	29	35	90	89
9SS6-CCT3238	32	38	94	95
9SS6-CCT3541	35	41.5	98	100
9SS6-CCT3844	38	44.5	101	104
9SS6-CCT4248	42	48	105	111
9SS6-CCT4551	45	51	109	117
9SS6-CCT4753	47	53	111	120
9SS6-CCT4955	49	55	114	124
9SS6-CCT5157	51	57	116	127
9SS6-CCT5359	53	59	119	133
9SS6-CCT5561	55	61	127	137
9SS6-CCT5763	57	63	126	140
9SS6-CCT5965	59	65	128	144
9SS6-CCT6167	61	67	132	147
9SS6-CCT6369	63	69	136	150

Part No.	Cable Range (mm)		Dimensions (mm)	
	Min. Dia.	Max. Dia.	H	W
9SS6-CCT6571	65	71	140	153
9SS6-CCT6773	67	73	143	156
9SS6-CCT6975	69	75	147	160
9SS6-CCT7177	71	77	151	163
9SS6-CCT7379	73	79	154	166
9SS6-CCT7581	75	81	158	169
9SS6-CCT7783	77	83	161	173
9SS6-CCT7985	79	85	164	176
9SS6-CCT8187	81	87	169	179
9SS6-CCT8389	83	89	173	182
9SS6-CCT8692	86	92	177	187
9SS6-CCT8896	88	96	181	192
9SS6-CCT9199	91	99	185	196
9SS6-CCT96103	96	103	190	201
9SS6-CCT99107	99	107	194	202
9SS6-CCT103111	103	111	199	204
9SS6-CCT107115	107	115	203	208
9SS6-CCT111119	111	119	208	213
9SS6-CCT115123	115	123	213	217
9SS6-CCT119128	119	128	217	221

Single Cable Cleat with LSF Pad

1. Recommended for installations where the highest levels of short circuit withstand are required.
2. Short circuit current tested in accordance with BS EN 50368:2003 standard.
3. Available for single and trefoil cable applications.
4. LSF-pad incorporate an integral low smoke, low fume, zero halogen pad.
5. Hardware to attach cleat to rung attachment bracket is included with cleat. Bracket must be ordered separately.





BS EN 50368:2003 (Cable Cleats for Electric Installations) Classification	
Cleat Type	Composite
Resistance to Electromechanical Force	130 kA peak / 50 kA RMS 600 mm spacing
Lateral Load Test	3.439 kg average
Axial Load Test	Pass
Operating Temperature Range	-40°C to +60°C
Impact Resistance	Very Heavy
Needle Flame Test	30 seconds

Technical Specifications	
Frame	50mm x 2mm Marine grade, Non-magnetic 316L
Closure Hardware	Captive 316 Stainless Steel M8 or M10 (M12 available) bolt and nylon-lock nut (Optional Hex Flange Lock Nut available)
Integral Pad	Low Smoke, Low Fume, Zero Halogen
Tools Required	Impact Wrench
Mounting Bolt	Provided with Cable Cleat

Part No.	Cable Range (mm)		Dimensions (mm)	
	Min. Dia.	Max. Dia.	H	W
9SS6-CCS2832	28	32	61	55
9SS6-CCS3034	30	34	63	57
9SS6-CCS3236	32	36	65	59
9SS6-CCS3438	34	38	67	61
9SS6-CCS3640	36	40	17	63
9SS6-CCS3842	38	42	69	65
9SS6-CCS4044	40	44	71	67
9SS6-CCS4246	42	46	72	69
9SS6-CCS4448	44	48	74	71
9SS6-CCS4650	46	50	75	73
9SS6-CCS4852	48	52	77	75
9SS6-CCS5054	50	54	79	77
9SS6-CCS5256	52	56	80	79
9SS6-CCS5458	54	58	81	81
9SS6-CCS5660	56	60	83	83
9SS6-CCS5862	58	62	85	85
9SS6-CCS6064	60	64	86	87
9SS6-CCS6266	62	66	88	89
9SS6-CCS6468	64	68	90	91
9SS6-CCS6670	66	70	91	93

Part No.	Cable Range (mm)		Dimensions (mm)	
	Min. Dia.	Max. Dia.	H	W
9SS6-CCS6872	68	72	93	95
9SS6-CCS7074	70	74	95	97
9SS6-CCS7276	72	76	97	99
9SS6-CCS7478	74	78	99	101
9SS6-CCS7680	76	80	101	103
9SS6-CCS7682	76	82	103	105
9SS6-CCS8084	80	84	105	107
9SS6-CCS8286	82	86	107	109
9SS6-CCS8488	84	88	109	111
9SS6-CCS8690	86	90	110	113
9SS6-CCS8892	88	92	113	117
9SS6-CCS9094	90	94	116	120
9SS6-CCS9296	92	96	126	127
9SS6-CCS94104	94	104	135	133
9SS6-CCS100112	100	112	140	139
9SS6-CCS106118	106	118	145	145
9SS6-CCS112124	112	124	153	155
9SS6-CCS118130	118	130	162	165
9SS6-CCS127139	127	139	161	167
9SS6-CCS132144	132	144	165	173
9SS6-CCS138150	138	150	170	179

Step 1: Know Your Cables

- What type of cable is being used?
  - Single or Multi-conductor
- What is the outside diameter of the cable(s)?
- What is the cable arrangement (single conductor cables only)?
  - Flat or Trefoil
- If a ground wire will be installed within the cleat, you will need the ground wire outside diameter.

Step 2: Know Your System

- What is the available short circuit current (RMS or i_p (peak))?
- What type of B-Line cable ladder is installed?

Step 3: Select Your Cable Cleats

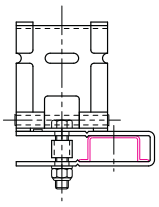
- See Pages CC-2 & CC-3

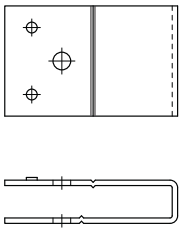
Step 4: Select Your Mounting Bracket

Mounting brackets are used to attach cable cleats to the rungs of the ladder type cable ladders. Your ladder type will determine the mounting bracket used.

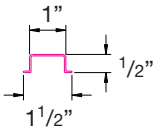
B-Line Ladder Types	Mounting Bracket
Aluminum welded rung ladders with standard rungs. Steel Series 2, 3, 4 or 5, ladders with standard rungs Fiberglass ladders with standard rungs	9SS6-CCB-C
Steel ladders with strut rungs Aluminum ladders with “Marine Rungs”	9SS6-CCB-B
Steel Series 1 ladders with standard rungs	9SS6-CCB-A

9SS6-CCB-A

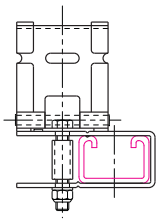


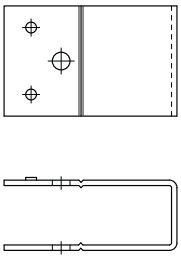


Use with rungs

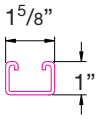


9SS6-CCB-B

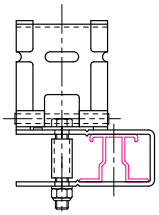


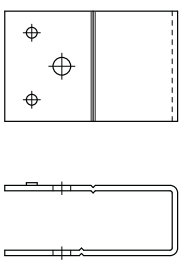


Use with rungs

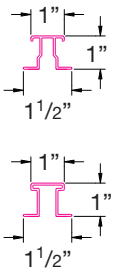


9SS6-CCB-C





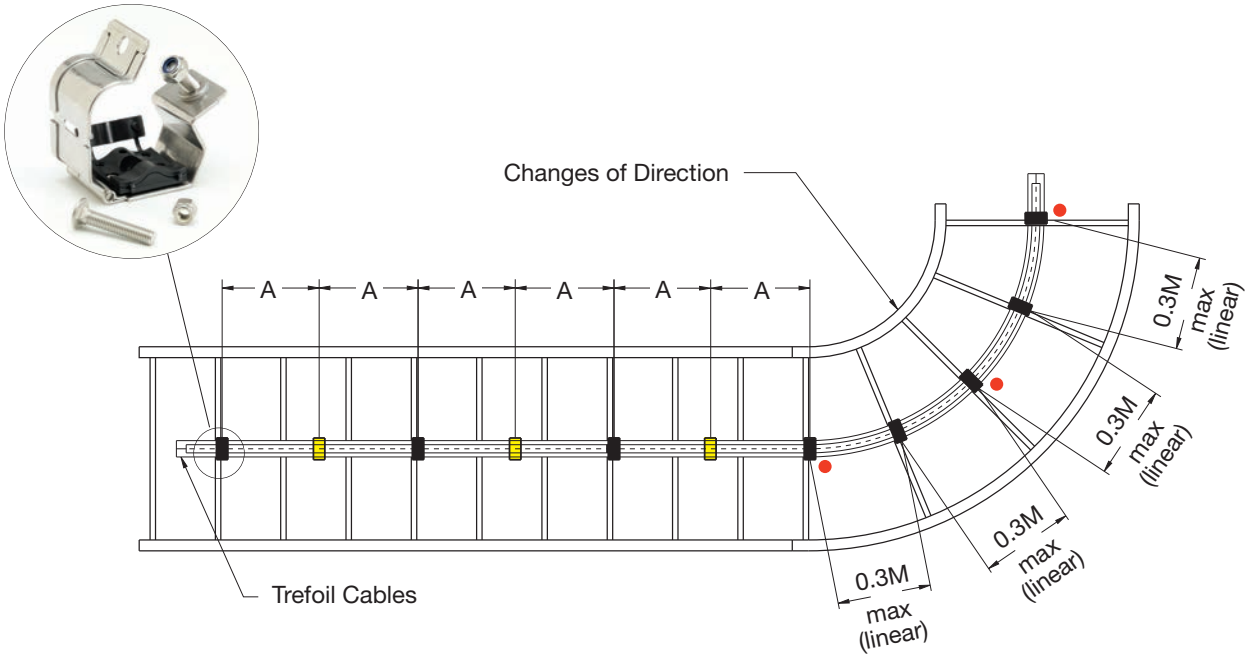
Use with rungs



Step 5: Determine Cleat Spacing for Installation

Your cable diameter is equal to the spacing between conductor centers shown below. Find your cable diameter at the top of the table and look down at the column below it. Find the value equal to or greater than the available short circuit for your system.

Single Conductor Short Circuit Withstand Table													
Max. Cable Cleat Spacing (A)		Spacing Between Conductor Centers (mm)											
		23	25	27	29	31	33	35	37	39	41	43	45
mm	In.	i_p peak (kA)											
225	9	179	187	194	203	209	216	220	229	234	240	246	250
300	12	155	163	168	174	181	187	192	198	203	209	214	215
450	18	128	133	137	144	148	152	157	161	165	170	174	178
600	24	110	115	119	124	128	132	135	139	143	148	150	153
675	27	104	108	113	117	121	124	128	132	135	139	143	147
900	36	89	93	97	102	104	108	110	115	117	121	124	127



IMPORTANT: Recommended Installation Procedures

It is important that the cleats are installed properly to secure your cables:

- It is not necessary for every cleat to be attached to the ladder. Every other cleat (▮) must be attached to the ladder system to mount cable in ladder. Unattached cleats (▯) provide additional restraint to keep cables bundled.
- The bend radius should be 8 to 12 times the cable diameter.
- Cleats should always be installed at the beginning, middle and end of a bend (●), and at no time should the distance between cleats on a bend be more than 0.3M center to center.

Index

Cable Tray Straight Sections

NEMA 12B Aluminum Cable Ladder

Prefix
Example: RWI * A 09 SL - 12 - 120
① ② ③ ④ ⑤ ⑥ ⑦

① Series
② Height
③ Material
④ Bottom Type
⑤ Construction
⑥ Width
⑦ Length

Catalog No.	Page
RWI 04 A ④ SL - ⑥ - ⑦	AL-2
RWI 05 A ④ SL - ⑥ - ⑦	AL-2
RWI 06 A ④ SL - ⑥ - ⑦	AL-2
RWI 07 A ④ SL - ⑥ - ⑦	AL-2

Materials
A = Aluminum

Series 2, 3, 4, & 5 Aluminum Cable Ladder

Prefix
Example: 24 A 12 - 24 - 144
① ② ③ ④ ⑤

① Series
② Material
③ Rung Spacing
④ Width
⑤ Length

Catalog No.	Page
24A ③ - ④ - ⑤	AL-21 & AL-22
25A ③ - ④ - ⑤	AL-23 & AL-24
26A ③ - ④ - ⑤	AL-25 & AL-26
34A ③ - ④ - ⑤	AL-21 & AL-22
35A ③ - ④ - ⑤	AL-23 & AL-24
36A ③ - ④ - ⑤	AL-25 & AL-26
37A ③ - ④ - ⑤	AL-27 & AL-28
46A ③ - ④ - ⑤	AL-25 & AL-26
47A ③ - ④ - ⑤	AL-27 & AL-28
57A ③ - ④ - ⑤	AL-27 & AL-28
H46A ③ - ④ - ⑤	AL-25 & AL-26
H47A ③ - ④ - ⑤	AL-27 & AL-28

Material
A = Aluminum

Steel Pan Cable Tray

Prefix
Example: T 050 V * 12 - 100 - 3
① ② ③ ④ ⑤ ⑥

① Series Height
② Tray Type
③ Material
④ Thickness
⑤ Width
⑥ Length

Catalog No.	Page
T025 ② ③ ④ - ⑤ - ⑥	CT-3
T050 ② ③ ④ - ⑤ - ⑥	CT-4
T075 ② ③ ④ - ⑤ - ⑥	CT-5
T100 ② ③ ④ - ⑤ - ⑥	CT-6

Materials
G = Hot Dipped Galvanized Steel
P = Pre-Galvanized Steel
SS4 = 304 Stainless Steel
SS6 = 316 Stainless Steel
A = Aluminum

Series 1 Steel Cable Ladder

Prefix
Example: 148 * 12 - 24 - 144
① ② ③ ④ ⑤

① Series
② Material
③ Rung Spacing
④ Width
⑤ Length

Catalog No.	Page
148 G ③ - ④ - ⑤	LDS-3 & LDS-4
148 P ③ - ④ - ⑤	LDS-3 & LDS-4
156 G ③ - ④ - ⑤	LDS-3 & LDS-4
156 P ③ - ④ - ⑤	LDS-3 & LDS-4
166 G ③ - ④ - ⑤	LDS-3 & LDS-4
166 P ③ - ④ - ⑤	LDS-3 & LDS-4
176 G ③ - ④ - ⑤	LDS-3 & LDS-4
176 P ③ - ④ - ⑤	LDS-3 & LDS-4

Materials
G = Hot Dipped Galvanized Steel
P = Pre-Galvanized Steel

Series 2, 3, 4, & 5 Steel Cable Ladder

Prefix
Example: 356 * 09 SL DN - 24 - 144
① ② ③ ④ ⑤ ⑥ ⑦

① Series
② Material
③ Rung Spacing
④ Rung Type
⑤ Rung Orientation
⑥ Width
⑦ Length

Catalog No.	Page
356 G ③ ④ ⑤ - ⑥ - ⑦	HDS-3 & HDS-4
356 P ③ ④ ⑤ - ⑥ - ⑦	HDS-3 & HDS-4
366 G ③ ④ ⑤ - ⑥ - ⑦	HDS-5 & HDS-6
366 P ③ ④ ⑤ - ⑥ - ⑦	HDS-5 & HDS-6
454 G ③ ④ ⑤ - ⑥ - ⑦	HDS-3 & HDS-4
454 P ③ ④ ⑤ - ⑥ - ⑦	HDS-3 & HDS-4
464 G ③ ④ ⑤ - ⑥ - ⑦	HDS-5 & HDS-6
464 P ③ ④ ⑤ - ⑥ - ⑦	HDS-5 & HDS-6
476 G ③ ④ ⑤ - ⑥ - ⑦	HDS-7 & HDS-8
476 P ③ ④ ⑤ - ⑥ - ⑦	HDS-7 & HDS-8
574 G ③ ④ ⑤ - ⑥ - ⑦	HDS-7 & HDS-8
574 P ③ ④ ⑤ - ⑥ - ⑦	HDS-7 & HDS-8

Materials
G = Hot Dipped Galvanized Steel
P = Pre-Galvanized Steel

Series 2, 3, 4, & 5 Stainless Steel Cable Ladder

Prefix
Example: 348 * 09 SL DN - 24 - 144
① ② ③ ④ ⑤ ⑥ ⑦

① Series
② Material
③ Rung Spacing
④ Rung Type
⑤ Rung Orientation
⑥ Width
⑦ Length

Catalog No.	Page
348SS4 ③ ④ ⑤ - ⑥ - ⑦	SS-3 & SS-4
348SS6 ③ ④ ⑤ - ⑥ - ⑦	SS-3 & SS-4
358SS4 ③ ④ ⑤ - ⑥ - ⑦	SS-3 & SS-4
358SS6 ③ ④ ⑤ - ⑥ - ⑦	SS-3 & SS-4
464SS4 ③ ④ ⑤ - ⑥ - ⑦	SS-3 & SS-4
464SS6 ③ ④ ⑤ - ⑥ - ⑦	SS-3 & SS-4

Materials
SS4 = Stainless Steel 304
SS6 = Stainless Steel 316

Cable Ladder Straight Sections

Prefix
Example: 24 * 09 - 24 - 144
① ② ③ ④ ⑤

① Series
② Material
③ Rung Spacing
④ Width
⑤ Length

Materials
F = Polyester Resin
FA = Zero Halogen/Dis-Stat Resin
FV = Vinyl Ester Resin

Cable Channel Straight Sections

Prefix
Example: F CC - 06 - 144
① ② ③ ④

① Material
② Series
③ Width
④ Length

Fiberglass Cable Channel

Materials
FCC* = Polyester Resin
FCCA* = Zero Halogen/Dis-Stat Resin
FCCV* = Vinyl Ester Resin

CC = Ventilated
* Added N = Non-Ventilated

Flextray

Prefix
Example: FT 2 X 12 X 10
① ② ③ ④

① Flextray
② loading Height
③ Width
④ Length 118”

Flextray Straight Sections

Index

Cable Tray Fittings

Prefix
Example: **RWI 04 A09 HB - 12 - 45 R24**
① ② ③ ④ ⑤ ⑥ ⑦

① Series
② Height
③ Material & Rung Spacing
④ Type
⑤ Width
⑥ Angle
⑦ Radius

Prefix
Example: **T 050 V G 15 - 300 - 90 HB 300**
① ②③④ ⑤ ⑥ ⑦ ⑧

① Tray Height
② Tray Type
③ Material
④ Thickness
⑤ Width
⑥ Angle
⑦ Type (HB, VI, VO)
⑧ Radius

Prefix
Example: **1 4 P SL - 24 - 90 HB 24**
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Series
② Height
③ Material
④ Rung Type
⑤ Width
⑥ Angle
⑦ Type (HB, VI, VO)
⑧ Radius

Catalog No.	Page

NEMA 12B Aluminum Cable Ladder Fittings

Materials
A = Aluminum
(†) = Insert 4 for 4", 5 for 5", 6 for 6" or 7 for 7" side rail heights

Prefix
Example: **4 A - 24 - 90 HB 24**
① ② ③ ④ ⑤ ⑥

① Series/Height
② Material
③ Width
④ Angle
⑤ Type (HB, VI, VO)
⑥ Radius

Catalog No.	Page

Series 2, 3, 4, & 5 Aluminum Cable Ladder Fittings

Materials
A = Aluminum
(†) = Insert 4 for 4", 5 for 5", 6 for 6" or 7 for 7" side rail heights

Catalog No.	Page

Steel Pan Cable Tray Fittings

Materials
G = Hot Dipped Galvanized Steel
P = Pre-Galvanized Steel
SS4 = 304 Stainless Steel
SS6 = 316 Stainless Steel
A = Aluminum

Catalog No.	Page

Series 1 Steel Ladder Fittings

Materials
G = Hot-Dipped Galvanized Steel
P = Pre-Galvanized Steel
(†) = Insert 4 for 4", 5 for 5", or 6 for 6" side rail heights

Cable Ladder Fittings

Prefix
Example: 4 G SLDN - 24 - 90 HB 24
① ② ③ ④ ⑤ ⑥ ⑦

① Height
② Material
③ Rung Type & Orientation
④ Width
⑤ Angle
⑥ Type (HB, VI, VO)
⑦ Radius

Prefix
Example: 4 SS4 SLDN - 24 - 90 HB 24
① ② ③ ④ ⑤ ⑥ ⑦

① Height
② Material
③ Rung Type & Orientation
④ Width
⑤ Angle
⑥ Type (HB, VI, VO)
⑦ Radius

Catalog No.	Page

Series 2, 3, 4, & 5 Steel Cable Ladder Fittings

Materials
G = Hot-Dipped Galvanized Steel
P = Pre-Galvanized Steel

① = Insert 4 for 4", 5 for 5", 6 for 6" or 7 for 7" side rail heights

Catalog No.	Page

Series 2, 3, 4, & 5 Stainless Steel Cable Ladder Fittings

Materials
SS4 = Stainless Steel 304
SS6 = Stainless Steel 316

① = Insert 4 for 4", 5 for 5", 6 for 6" or 7 for 7" side rail heights

Index

Cable Tray Fittings

Prefix
Example: **4 F - 12 - 90 HB 12**
① ② ③ ④ ⑤ ⑥

① Series/Height
② Material
③ Width
④ Angle
⑤ Type (HB, VI, VO)
⑥ Radius

Catalog No.	Page

Fiberglass Cable Ladder Fittings

Materials
F = Polyester Resin
FA = Zero Halogen/ Dis-Stat Resin
FV = Vinyl Ester Resin

① = Insert 3 for 3”, 4 for 4”, 6 for 6”
or 8 for 8” side rail heights

Cable Channel Fittings

Prefix
Example: **FCC * N - 04 - 45 VI 12**
① ② ③ ④ ⑤ ⑥

① Series
② Material
③ Width
④ Angle
⑤ Type (HB, VI, VO)
⑥ Radius

Catalog No.	Page

Fiberglass Cable Channel Fittings

Materials ②
Leave Blank for Polyester Resin
Insert A for Zero Halogen/ Dis-Stat
Insert V for Vinyl Ester Resin

Widths ④
Insert 03 for 3”, 04 for 4”,
06 for 6” or 08 for 8” side rail heights

Cable Ladder Covers

Prefix
Example: 867 A 40 SL - 24 - 144
① ② ③ ④ ⑤ ⑥

① Series
② Material
③ Thickness
④ Cover Style
⑤ Width
⑥ Length

Prefix
Example: TC F L G 15 - 300 - 3
① ② ③ ④ ⑤ ⑥

① Cover Edge
② Cover Style
③ Material
④ Thickness
⑤ Width
⑥ Cover Type

Prefix
Example: 802 P 20 - 24 - 144
① ② ③ ④ ⑤

① Series
② Material
③ Thickness
④ Width
⑤ Length or Fitting Type

Catalog No.	Page

NEMA 12B Aluminum Cable Ladder Covers

Materials
A = Aluminum

Contact B-Line Engineering for fitting cover information.
See page AL-3 for fitting cover examples.

Prefix
Example: 806 A 40 - 24 - 144
① ② ③ ④ ⑤

① Series
② Material
③ Thickness
④ Width
⑤ Length or Fitting Type

Catalog No.	Page

Series 2, 3, 4, & 5 Aluminum Cable Ladder Covers

Materials
A = Aluminum

Contact B-Line Engineering for fitting cover information.
See page AL-38 for fitting cover examples.

Catalog No.	Page

Steel Pan Cable Ladder Covers

Materials
G = Hot Dipped Galvanized Steel
P = Pre-Galvanized Steel
SS4 = Stainless Steel 304
SS6 = Stainless Steel 316
A = Aluminum

Contact B-Line Engineering for fitting cover information.
See page CT-16 for fitting cover examples.

Prefix
Example: 801 G 18 - 24 - 144
① ② ③ ④ ⑤

① Series
② Material
③ Thickness
④ Width
⑤ Length or Fitting Type

Catalog No.	Page

Series 1 Steel Cable Ladder Covers

Materials
G = Hot Dipped Galvanized Steel
P = Pre-Galvanized Steel

Contact B-Line Engineering for fitting cover information.
See page LDS-10 for fitting cover examples.

Catalog No.	Page

Series 2, 3, 4, & 5 Steel Cable Ladder Covers

Materials
G = Hot Dipped Galvanized Steel
P = Pre-Galvanized Steel

Contact B-Line Engineering for fitting cover information.
See page HDS-18 for fitting cover examples.

Cable Ladder Covers

Prefix
Example: 802 * 20 - 24 - 144
① ② ③ ④ ⑤

① Series
② Material
③ Thickness
④ Width
⑤ Length or Fitting Type

Prefix
Example: FA - * - 24 - 144
① ② ③ ④

① Series & Material
② Rail Design
③ Width
④ Length or Fitting Type

NEMA 12B Aluminum Cable Ladder Accessories

Not all accessories for aluminum cable ladder are aluminum only.
Those finishes and part numbers will be listed in this section.

Index

Series 2, 3, 4, & 5 Aluminum Cable Ladder Accessories

Not all accessories for aluminum cable ladder are aluminum only.
Those finishes and part numbers will be listed in this section.

continued on next page

Steel Light Duty Cable Ladder Accessories

Not all accessories for aluminum cable ladder are aluminum only. Those finishes and part numbers will be listed in this section.

Materials

A = Aluminum
G = Hot-Dipped Galvanized
GRN = Dura-Green Painted
P = Pre-Galvanized Steel
SS = Stainless Steel 304
SS4 = Stainless Steel 304
SS6 = Stainless Steel 316
ZN = Zinc Plated

Pan Cable Tray Accessories

Pan Cable Tray Accessories

Materials

A = Aluminum
G = Hot-Dipped Galvanized
P = Pre-Galvanized Steel
SS4 = Stainless Steel 304
SS6 = Stainless Steel 316

Index

Series 1 Steel Cable Ladder Accessories

Not all accessories for steel cable ladder are steel only. Those finishes and part numbers will be listed in this section.

Light Duty Cable Ladder Accessories

Materials

A = Aluminum
G = Hot-Dipped Galvanized
P = Pre-Galvanized Steel
SS4 = Stainless Steel 304
ZN = Zinc Plated

Series 2, 3, 4, & 5 Steel Cable Ladder Accessories

Not all accessories for steel cable ladder are steel only.
Those finishes and part numbers will be listed in this section.

Index

Series 2, 3, 4, & 5 Steel Cable Ladder Accessories

Not all accessories for steel cable ladder are steel only.
Those finishes and part numbers will be listed in this section.

Materials

A = Aluminum
G = Hot-Dipped Galvanized
GRN = Dura-Green Painted
P = Pre-Galvanized Steel
SS4 = Stainless Steel 304
SS6 = Stainless Steel 316
ZN = Zinc Plated

Series 2, 3, 4, & 5 Stainless Steel Cable Ladder Accessories

Not all accessories for steel cable ladder are steel only.
Those finishes and part numbers will be listed in this section.

Index

Series 2, 3, 4, & 5 Stainless Steel Cable Ladder Accessories

Not all accessories for steel cable ladder are steel only.
Those finishes and part numbers will be listed in this section.

Materials

G = Hot-Dipped Galvanized

SS4 = Stainless Steel 304

SS6 = Stainless Steel 316

Catalog No.	Page

Index

Fiberglass Cable Ladder Accessories

Cable Channel Accessories

Materials

SS6 = Stainless Steel 316

(x) = Insert F for Polyester Resin
Insert FA for Zero Halogen/ Dis-Stat Resin
Insert FV for Vinyl Ester Resin

Materials

(x) = Insert F for Polyester Resin
Insert FA for Zero Halogen/ Dis-Stat Resin
Insert FV for Vinyl Ester Resin

Index

Flextray Accessories

Cable Cleats & Accessories

Miscellaneous - Metric Conversions

METRIC CONVERSION CHART

To Convert From	To	Multiply By
Angle		
degree	radian (rad)	0.01745329
radian (rad)	degree	57.29578
Area		
foot^2	square meter (m^2)	0.09290304
inch^2	square meter (m^2)	0.00064516
circular mil	square meter (m^2)	0.0000000005067075
sq. centimeter (cm^2)	square inch (in^2)	0.1550003
square meter (m^2)	foot^2	10.76391
square meter (m^2)	inch^2	1550.003
square meter (m^2)	circular mil	1973523000.0
Temperature		
degree Fahrenheit	degree Celsius	t^{oC}=(t^{oF} -32)/1.8
degree Celsius	degree Fahrenheit	t^{oF}=1.8t^{oC}+32
Force		
pounds-force (lbf)	newtons (N)	4.448222

To Convert From	To	Multiply By
Length		
foot (ft)	meter (m)	0.3048
inch (in)	meter (m)	0.0254
mil	meter (m)	0.0000254
inch (in)	micrometer (µm)	25400.00
meter (m)	foot (ft)	3.280840
meter (m)	inch (in)	39.37008
meter (m)	mil	39370.08
micrometer (µm)	inch (in)	0.00003937008
Volume		
foot^3	cubic meter (m^3)	0.02831685
inch^3	cubic meter (m^3)	0.00001638706
cubic centimeter (cm^2)	cubic inch (in^3)	0.06102374
cubic meter (m^3)	foot^3	35.31466
cubic meter (m^3)	inch^3	61023.76
gallon (U.S. liquid)	cubic meter (m^3)	0.003785412
Section Properties		
section modulus S (in^3)	S (m^3)	0.00001638706
moment of inertia I (in^4)	I (m^4)	0.0000004162314
modulus of elasticity E (psi)	E (Pa)	6894.757
section modulus S (m^3)	S (in^3)	61023.74
moment of inertia I (m^4)	I (in^4)	2402510.0
modulus of elasticity E (Pa)	E (psi)	0.0001450377

To Convert From	To	Multiply By
Bending Moment or Torque		
lbf • ft	newton meter (N•m)	1.355818
lbf • in	newton meter (N•m)	0.1129848
N•m	lbf • ft	0.7375621
N•m	lbf • in	8.850748
Mass		
ounce (avoirdupois)	kilogram (kg)	0.02834952
pound (avoirdupois)	kilogram (kg)	0.4535924
ton (short, 2000 lb)	kilogram (kg)	907.1847
ton (long, 2240 lb)	kilogram (kg)	1016.047
kilogram (kg)	ounce (avoirdupois)	35.27396
kilogram (kg)	pound (avoirdupois)	2.204622
kilogram (kg)	ton (short, 2000 lb)	0.001102311
kilogram (kg)	ton (long, 2240 lb)	0.0009842064
Mass Per Unit Length		
lb/ft	kilogram per meter (kg/m)	1.488164
lb/in	kilogram per meter (kg/m)	17.85797
kg/m	lb/ft	0.6719689
kg/m	lb/in	0.5599741
Mass Per Unit Volume		
lb/ft^3	kilogram per cubic meter (kg/m^3)	16.01846
lb/in^3	kilogram per cubic meter (kg/m^3)	27679.9
kg/m^3	lb/ft^3	0.06242797
kg/m^3	lb/in^3	0.0000361273
lbs/ft^3	lbs/in^3	1728.0
Mass Per Unit Area		
lb/ft^2	kilogram per square meter (kg/m^2)	4.882428
kg/m^2	pound per square foot (lb/ft^2)	0.2048161
Pressure or Stress		
lbf/in^2 (psi)	pascal (Pa)	6894.757
kip/in^2 (ksi)	pascal (Pa)	6894757.0
lbf/in^2 (psi)	megapascals (MPa)	0.006894757
pascal (Pa)	pound-force per square inch (psi)	0.0001450377
pascal (Pa)	kip per square inch (ksi)	0.0000001450377
megapascals (MPa)	lbf/in^2 (psi)	145.0377

Abbreviations

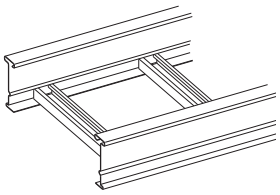
Defl. = Deflection
S.F. = Safety Factor
Ft. = Feet
Pre-galv. = Pre-galvanized Steel
K Factor = Deflection ÷ load in Lbs./Ft.
o.c. = On Center
PVC = Poly Vinyl Chloride
In. = Inch
psi = Pounds per Square Inch
wt./c = Weight pre 100 pieces

Metric Symbols

m = meter
cm = centimeter
mm = millimeter
µm = micrometer
kg = kilogram
N = newton
kN = kilonewton
Pa = pascal
MPa = megapascal

These options are in addition to the Standard Ladder Rungs, Ventilated Trough and Solid Trough type Cable Trays.

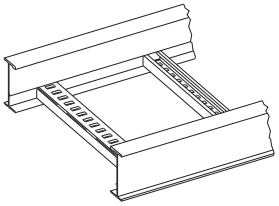
Ladder with Strut Rungs



- B44 strut installed as rungs.
- Strut orientation may be channel opening up, channel opening down, or alternating - standard is alternating unless specified otherwise.
- Strut may be solid back or with slotted hole pattern "SH".
- The B-Line strut rung system offers additional cable clamping options relative to the chosen slot orientation.

Examples: 248G09B44-12-144
Strut rung on 9" centers with alternating slot orientation.
248G12B44SHDN-12-144
"SH" Strut rung on 12" centers with channel opening down (Note: replace "DN" with "UP" for channel opening up.)

Marine Rung (Available in Aluminum, HDGAF Steel and Stainless Steel)



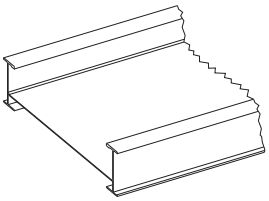
(Aluminum Shown)

- Designed for Series 2 or heavier systems.
- Special rung design to accommodate stainless steel banding of cables (U.S. Coast Guard requirement) with .25" x .69" slots.
- Has applications on land, vertical installation, any location where extra cable positioning/attachment is required.
- Rung strength - Aluminum supports 499 lbs. per rung on 36" wide system with a 1.5 safety factor. Steel supports 755 lbs. per rung on 36" wide system with a 1.5 safety factor.
- New design provides combination of strut fastening and marine rung fastening.

Example: 46A12MR-36-288 or 464G12MR-36-288

Special Rung Spacings: 4" & 18" rung spacing available upon request.

Non-Ventilated



- Solid flat sheet welded into the Cable Tray above the rungs.
- Standard rung spacing is 12 inches.
- The flat sheet may be installed under the rungs, if preferred.
- The flat sheet may be installed over B54 rungs “slot down”.

Examples: 24ASB-36-144
Flat sheet bottom over standard rung on 12" spacing.
24ASBB54-36-144
Flat sheet bottom over B54 strut rung slot down on 12" spacing.

Notes

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