Carlon® P&C® Duct

Carlon P&C (Power & Communications) Duct and fittings are designed and formulated specifically for concrete encased and direct burial applications of power utility primaries, secondaries, street lighting and distribution systems. Carlon P&C Duct complies with NEMA Standard TC-6 & 8, and ASTM F-512 for utility duct. Both EB and DB duct are rated for use with 90°C conductors. P&C Duct fittings comply with NEMA TC-9 Standard.

Carlon Telephone Duct complies with NEMA TC-10. Bellcore CAO 8546, GT8343, and other applicable telephone standards.

Advantages:

- Manufactured for high modulus C-250 compound
- High impact strength
- Excellent structural strength
- Superior load bearing
- Multiple duct banks can be pre-assembled and lowered into trench
- No special cutting or tapering devices required
- Provides easy bending around obstructions minimizing the need for special angle couplings and sweeps
- Superior aging and weathering characteristics

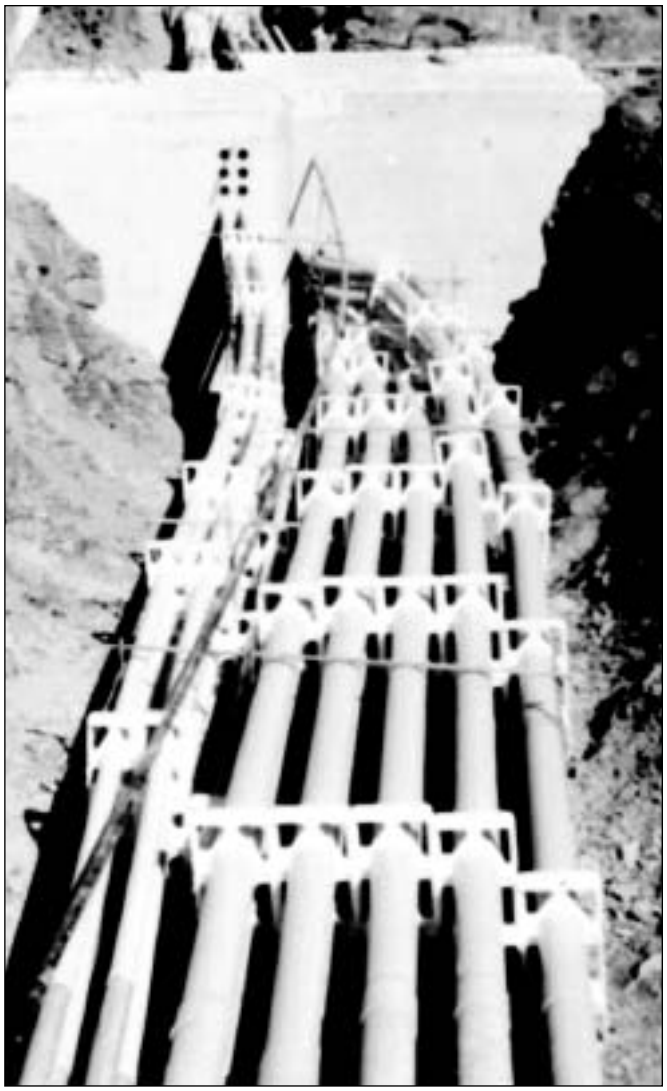
Features:

- Heat resistant
- Fire resistant
- Conforms to NEMA Standard TC-6 & 8 and ASTM Standard F-512 for utility duct*
- Carlon P&C Duct Type EB-20 is ETL Listed
- Low coefficient of expansion
- Continuous rigid control
- Smooth inner wall and smooth transition between joints

Engineering Features:

Chemical Inertness resists water absorption and is totally immune to galvanic or electrolytic attacks.

Solvent Cemented Joints provide leakproof duct runs tested at 25 psi. This type of joint eliminates the need for costly mechanical rodding procedure. Carlon P&C Duct can be rodded pneumatically.



Carlon® P&C® Duct Type EB

Carlon nonmetallic P&C Duct Type EB is manufactured from Carlon's exclusive high modulus C-600 compound, developed especially for power and communications applications, and is designed for use in concrete encased installations. Type EB is rated for 90°C Cable.

RUS Listed

ETL Listed to UL 651A in compliance to the NEC

P&C Duct Type EB-20

Meets NEMA Standard TC-6 & 8
EB-20/ASTM F-512

Nom. Size	Part Number 10'	Part Number 20'	Std. Crate Qty. 10'	Std. Crate Qty. 20'	Approx. Wt. per 100 ft.	O.D.	*Min. Wall
2	–	48711-020	–	2,800	36	2.375	.060
3	–	48713-020	–	2,000	59	3.500	.061
4	48715-010	48715-020	570	1,140	98	4.500	.082
5	48716-010	48716-020	380	760	148	5.563	.103
6	48717-010	48717-020	260	520	212	6.625	.125

*Min. wall thickness relates to 500,000 modulus
Note: One belled end per 20' length

P&C Duct Type EB-35 Heavy Wall

Meets NEMA Standard TC-6 & 8
EB-35/ASTM F-512

Nom. Size	Part Number 10'	Part Number 20'	Std. Crate Qty. 10'	Std. Crate Qty. 20'	Approx. Wt. per 100 ft.	O.D.	*Min. Wall
2	–	68711-020	–	2,800	39	2.375	.060
3	–	68713-020	–	2,000	72	3.500	.076
4	–	68715-020	–	1,140	116	4.500	.100
5	68716-010	68716-020	380	760	177	5.563	.126
6	–	68717-020**	–	520	251	6.625	.152

*Min. wall thickness relates to 500,000 modulus
**Special order item
Note: One belled end per 20' length

Use DB Sweeps with EB Duct.

Carlon® P&C® Duct Type DB

RUS Listed

Carlon nonmetallic P&C Duct Type DB is manufactured from Carlon's exclusive high modulus C-600 compound, developed especially for power and communications applications, and is designed for use in direct burial or concrete encased installations. Type DB is rated for 90°C Cable.

Trenching:

Trench should be graded true and free from stones and soft spots. Backfill should also be free of stones and be firmly tamped around the sides of the conduit, to develop maximum supporting strength. Tamping on top of the conduit is not recommended.

Backfill:

In rocky soil where it is impossible to have an even trench bottom, a selected backfill should be put in before laying the conduit. Selected backfill (not tamped) at least 6" over the top of the conduit is recommended. After final backfill is placed, tamping may be used to finish the grade.

The method of direct burial varies with soil condition, load conditions, and engineering preferences. A common practice is to lay one tier at a time, backfill, and repeat with the desired spacing of ducts being made as ducts are layered.

Many companies have used the heavier wall Type DB-120 in a duct-to-duct formation. Where limited loads occur, this type of installation has proven satisfactory.

P&C Duct Type DB-60

Meets NEMA Standard TC-6 & 8
DB-60/ASTM F-512

Nom. Size	Part Number	Std. Crate Qty.	Approx. Wt. per 100 ft.	O.D.	*Min. Wall
2	48811-020	2,800	38	2.375	.060
3	48813-020	2,000	81	3.500	.092
3 1/2	48814-020	2,000	108	4.000	.107
4	48815-020	1,140	133	4.500	.121
5	48816-020	760	202	5.563	.152
6	48817-020	520	288	6.625	.182

*Min. wall thickness relates to 500,000 modulus
Note: One belled end per 20' length

P&C Duct Type DB-120 Heavy Wall

Meets NEMA Standard TC-6 & 8
DB-120/ASTM F-512

Nom. Size	Part Number 10'	Part Number 20'	Std. Crate Qty. 10'	Std. Crate Qty. 20'	Approx. Wt. per 100 ft.	O.D.	*Min. Wall
1	–	48808-020	–	8,000	18	1.315	.060
1 1/2	–	48810-020	–	4,500	28	1.900	.060
2	–	68811-020	–	2,800	47	2.375	.077
3	–	68813-020	–	2,000	99	3.500	.118
4	–	68815-020	–	1,140	165	4.500	.154
5	–	68816-020	–	760	251	5.563	.191
6	68817-010	68817-020	260	520	356	6.625	.227

*Min. wall thickness relates to 500,000 modulus
Note: One belled end per 20' length

Carlon Special California Rigid Nonmetallic DB-100 P&C® Duct & Sweeps

RUS Listed

Carlon DB-100 nonmetallic P&C Duct Type DB is manufactured to NEMA Standard TC-6 & 8 and to specifications that exist within the State of California, and is designed for use in direct burial or concrete encased installations. Rated for use with 90°C cable.

P&C Duct Type DB-100

Meets NEMA Standard TC-6 & 8 and ASTM F-512

Nom. Size	Part Number	Std. Crate Qty.	Approx. Wt. per 100 ft.	O.D.	*Min. Wall
4	68915-020	1,140	154	4.500	.155
5	68916-020	760	237	5.563	.192
6	68917-020	520	337	6.625	.229

*Min. wall thickness relates to 500,000 modulus
Note: One belled end per 20' length

P&C Duct Type DB-100 DWP Approved

Meets NEMA Standard TC-6 & 8 and ASTM F-512

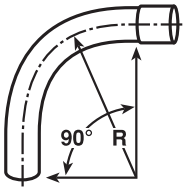
Nom. Size	Part Number	Std. Crate Qty.	Approx. Wt. per 100 ft.	O.D.	*Min. Wall
3	68913D-020	2,000	95	4.500	.155
4	68915D-020	1,140	156	5.563	.192
5	68916D-020	760	237	6.625	.229

*Min. wall thickness relates to 500,000 modulus

DB-100 Sweeps – Belled

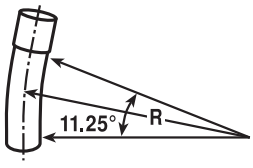
*Consult factory for additional sizes

90° Sweep – 48" Radius



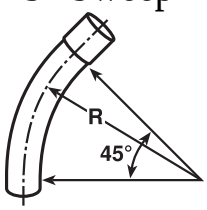
Part No.	Size	Std. Ctn. Qty.
PE9HN	4"	1
PE9HP	5"	1

11¼° Sweep – 150" Radius



Part No.	Size	Std. Ctn. Qty.
PE3SP	5"	1

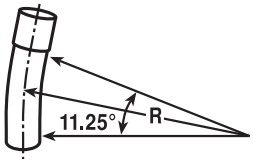
45° Sweep – 150" Radius



Part No.	Size	Std. Ctn. Qty.
PE7SP	5"	1

11¼° Sweep – 150" Radius

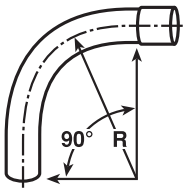
(Segmented sweeps)

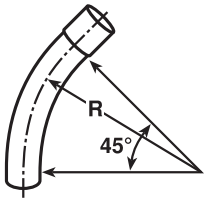


Part No.	Size	Std. Ctn. Qty.
PE3SNS	4"	1
PE3SPS	5"	1
PE3SRS	6"	1

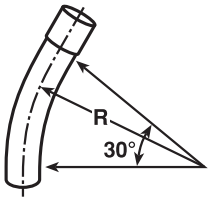
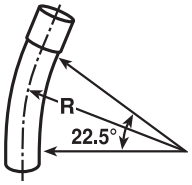
DB-60 Sweeps

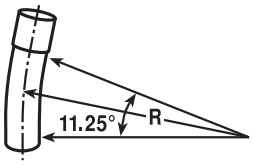
*Consult factory for additional sizes/configurations

Segment	Part No.	Size	Radius (in.)	Std. Ctn. Qty.
90° Sweep 	PF9CH	1 1/2"	18"	1
	PF9CJ	2"	18"	1
	PF9CL	3"	18"	1
	PF9CN	4"	18"	1
	PF9DF	1"	24"	1
	PF9DH	1 1/2"	24"	1
	PF9DJ	2"	24"	1
	PF9DL	3"	24"	1
	PF9DN	4"	24"	1
	PF9DP	5"	24"	1
	PF9FF	1"	36"	1
	PF9FJ	2"	36"	1
	PF9FL	3"	36"	1
	PF9FN	4"	36"	1
	PF9FP	5"	36"	1
	PF9FR	6"	36"	1
	PF9HL	3"	48"	1
	PF9HN	4"	48"	1
	PF9HP	5"	48"	1
	PF9HR	6"	48"	1
	PF9IL	3"	60"	1
	PF9IN	4"	60"	1
	PF9IP	5"	60"	1
	PF9IR	6"	60"	1
	PF9SH	1 1/2"	150"	1
	PF9SJ	2"	150"	1
	PF9SL	3"	150"	1
	PF9SR	6"	150"	1
	PF9VL	3"	300"	1
	PF9VN	4"	300"	1
	PF9VP	5"	300"	1

Segment	Part No.	Size	Radius (in.)	Std. Ctn. Qty.
45° Sweep 	PF7CF	1"	18"	1
	PF7CH	1 1/2"	18"	1
	PF7CJ	2"	18"	1
	PF7CL	3"	18"	1
	PF7DF	1"	24"	1
	PF7DH	1 1/2"	24"	1
	PF7DJ	2"	24"	1
	PF7DL	3"	24"	1
	PF7DN	4"	24"	1
	PF7FF	1"	36"	1
	PF7FH	1 1/2"	36"	1
	PF7FJ	2"	36"	1
	PF7FL	3"	36"	1
	PF7FN	4"	36"	1
	PF7FP	5"	36"	1
	PF7FR	6"	36"	1
	PF7HJ	2"	48"	1
	PF7HL	3"	48"	1
	PF7HN	4"	48"	1
	PF7HP	5"	48"	1
	PF7HR	6"	48"	1
	PF7IL	3"	60"	1
	PF7IP	5"	60"	1
	PF7NN	4"	120"	1
	PF7SH	1 1/2"	150"	1
	PF7SJ	2"	150"	1
	PF7SL	3"	150"	1
	PF7SN	4"	150"	1
	PF7SP	5"	150"	1
	PF7SR	6"	150"	1
	PF7VN	4"	300"	1
	PF7VP	5"	300"	1
	PF7VR	6"	300"	1

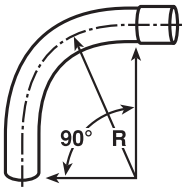
DB-60 Sweeps *Consult factory for additional sizes/configurations

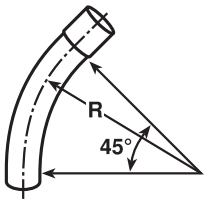
Segment	Part No.	Size	Radius (in.)	Std. Ctn. Qty.
30° Sweep	PF6CJ	2"	18"	1
	PF6CL	3"	18"	1
	PF6DL	3"	24"	1
	PF6DN	4"	24"	1
	PF6DP	5"	24"	1
	PF6CH	1 1/2"	30"	1
	PF6FJ	2"	36"	1
	PF6FL	3"	36"	1
	PF6FN	4"	36"	1
	PF6FR	6"	36"	1
	PF6HJ	2"	48"	1
	PF6HN	4"	48"	1
	PF6HP	5"	48"	1
	PF6HR	6"	48"	1
	PF6IN	4"	60"	1
	PF6IP	5"	60"	1
	PF6SJ	2"	150"	1
	PF6SN	4"	150"	1
	PF6SP	5"	150"	1
	PF6VJ	2"	300"	1
	PF6VN	4"	300"	1
	PF6VR	6"	300"	1
22 1/2° Sweep	PH5DL	3"	24"	1
	PF5DN	4"	24"	1
	PF5DP	5"	24"	1
	PF5FF	1"	36"	1
	PF5FL	3"	36"	1
	PF5FN	4"	36"	1
	PF5FP	5"	36"	1
	PF5FR	6"	36"	1
	PF5HL	3"	48"	1
	PF5HN	4"	48"	1
	PF5HR	6"	48"	1
	PF5IJ	2"	60"	1
	PF5IL	3"	60"	1
	PF5IP	5"	60"	1
	PF5IR	6"	60"	1
	PF5SL	3"	150"	1
	PF5SN	4"	150"	1
	PF5SP	5"	150"	1
	PF5SR	6"	150"	1
	PF5VN	4"	300"	1
	PF5VP	5"	300"	1
	PF5VR	6"	300"	1

Segment	Part No.	Size	Radius (in.)	Std. Ctn. Qty.
11 1/4° Sweep	PF3CJ	2"	18"	1
	PF3CL	3"	18"	1
	PF3DF	1"	24"	1
	PF3DH	1 1/2"	24"	1
	PF3DP	5"	24"	1
	PF3FJ	2"	36"	1
	PF3FL	3"	36"	1
	PF3FN	4"	36"	1
	PF3FP	5"	36"	1
	PF3FR	6"	36"	1
	PF3HL	3"	48"	1
	PF3HN	4"	48"	1
	PF3HP	5"	48"	1
	PF3HR	6"	48"	1
	PF3IJ	2"	60"	1
	PF3IR	6"	60"	1
	PF3SJ	2"	150"	1
	PF3SN	4"	150"	1
	PF3SP	5"	150"	1
	PF3SR	6"	150"	1
	PF3VJ	2"	300"	1
	PF3VL	3"	300"	1
	PF3VN	4"	300"	1
	PF3VP	5"	300"	1

DB-120 Sweeps

*Consult factory for additional sizes/configurations

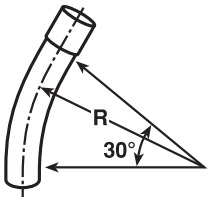
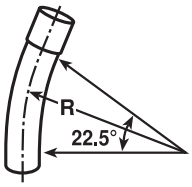
Segment	Part No.	Size	Radius (in.)	Std. Ctn. Qty.
90° Sweep 	PH9CJ	2"	18"	1
	PH9CL	3"	18"	1
	PH9CN	4"	18"	1
	PH9DJ	2"	24"	1
	PH9DL	3"	24"	1
	PH9DN	4"	24"	1
	PH9DP	5"	24"	1
	PH9FJ	2"	36"	1
	PH9FL	3"	36"	1
	PH9FN	4"	36"	1
	PH9FP	5"	36"	1
	PH9FR	6"	36"	1
	PH9HJ	2"	48"	1
	PH9HL	3"	48"	1
	PH9HN	4"	48"	1
	PH9HP	5"	48"	1
	PH9HR	6"	48"	1
	PH9IJ	2"	60"	1
	PH9IL	3"	60"	1
	PH9IN	4"	60"	1
	PH9IR	6"	60"	1
	PH9OJ	2"	66"	1
	PH9SJ	2"	150"	1
	PH9SL	3"	150"	1
	PH9SN	4"	150"	1
	PH9SP	5"	150"	1
	PH9SR	6"	150"	1
	PH9VN	4"	300"	1
	PH9VP	5"	300"	1
	PH9VR	6"	300"	1

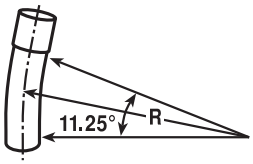
Segment	Part No.	Size	Radius (in.)	Std. Ctn. Qty.
45° Sweep 	PH7CJ	2"	18"	1
	PH7CL	3"	18"	1
	PH7CN	4"	18"	1
	PH7DJ	2"	24"	1
	PH7DL	3"	24"	1
	PH7DN	4"	24"	1
	PH7DP	5"	24"	1
	PH7FJ	2"	36"	1
	PH7FL	3"	36"	1
	PH7FN	4"	36"	1
	PH7FP	5"	36"	1
	PH7FR	6"	36"	1
	PH7HJ	2"	48"	1
	PH7HL	3"	48"	1
	PH7HN	4"	48"	1
	PH7HP	5"	48"	1
	PH7HR	6"	48"	1
	PH7IJ	2"	60"	1
	PH7IL	3"	60"	1
	PH7IP	5"	60"	1
	PH7IR	6"	60"	1
	PH7SJ	2"	150"	1
	PH7SN	4"	150"	1
	PH7SP	5"	150"	1
	PH7SR	6"	150"	1

DB-120 Sweeps

Note: For Nom. Diameter of 1": use 1" DB-60 Sweeps
For Nom. Diameter of 1 1/2": use 1 1/2" DB-60 Sweeps

*Consult factory for additional sizes/configurations

Segment	Part No.	Size	Radius (in.)	Std. Ctn. Qty.
30° Sweep	PH6CJ	2"	18"	1
	PH6CL	3"	18"	1
	PH6CN	4"	18"	1
	PH6DJ	2"	24"	1
	PH6DN	4"	24"	1
	PH6DP	5"	24"	1
	PH6FJ	2"	36"	1
	PH6FL	3"	36"	1
	PH6FN	4"	36"	1
	PH6FP	5"	36"	1
	PH6FR	6"	36"	1
	PH6HN	4"	48"	1
	PH6HR	6"	48"	1
	PH6IN	4"	60"	1
	PH6SL	3"	150"	1
22 1/2° Sweep	PH5CJ	2"	18"	1
	PH5CL	3"	18"	1
	PH5CN	4"	18"	1
	PH5DJ	2"	24"	1
	PH5DL	3"	24"	1
	PH5DP	5"	24"	1
	PH5FJ	2"	36"	1
	PH5FL	3"	36"	1
	PH5FN	4"	36"	1
	PH5FP	5"	36"	1
	PH5HL	3"	48"	1
	PH5HN	4"	48"	1
	PH5HP	5"	48"	1
	PH5HR	6"	48"	1
	PH5IJ	2"	60"	1
	PH5IL	3"	60"	1
	PH5IR	6"	60"	1
	PH5SN	4"	150"	1
	PH5SP	5"	150"	1
	PH5SR	6"	150"	1
	PH5VJ	2"	300"	1
	PH5VN	4"	300"	1

Segment	Part No.	Size	Radius (in.)	Std. Ctn. Qty.
11 1/4° Sweep	PH3CJ	2"	18"	1
	PH3CN	4"	18"	1
	PH3DJ	2"	24"	1
	PH3DN	4"	24"	1
	PH3DP	5"	24"	1
	PH3FJ	2"	36"	1
	PH3FL	3"	36"	1
	PH3FN	4"	36"	1
	PH3FP	5"	36"	1
	PH3FR	6"	36"	1
	PH3HN	4"	48"	1
	PH3IN	4"	60"	1
	PH3IP	5"	60"	1
	PH3IR	6"	60"	1
	PH3SJ	2"	150"	1
	PH3SL	3"	150"	1
	PH3SN	4"	150"	1
	PH3SP	5"	150"	1
	PH3SR	6"	150"	1
	PH3VR	6"	300"	1

Couplings

(Use same type fittings for Type EB and DB)

Sleeve Coupling (for repair work)

No internal stop

Part No.	Size	Std. Ctn. Qty.
E200J	2"	30
E200L	3"	25
E200M	3 1/2"	20
E200N	4"	15
E200P	5"	8
E200R	6"	5

Coupling

Part No.	Size	Std. Ctn. Qty.
E940H	1 1/2"	25
E940J	2"	30
E940K	2 1/2"	20
E240L	3"	30
E240N	4"	15
E240P	5"	20
E240RF	6"	5

*Sizes 1 1/2" - 2 1/2" order part numbers E940_

Long Line Coupling

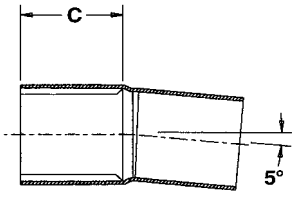
*Consult factory for additional sizes

Part No.	Size	Std. Ctn. Qty.
E941H	1 1/2"	40
E941J	2"	25
E941K	2 1/2"	15
E241L	3"	15
E241N	4"	10

*Sizes 1 1/2" - 2 1/2" order part numbers E941_

5° Angle Coupling BxS (Bell x Spigot)

Part No.	Size	C	Std. Ctn. Qty.
E244J	2"	2.13	15
E244L	3"	3.25	5
E244NF	4"	3.50	15
E244NF5 (short)	4"	1.87	25
E244PF	5"	4.13	10
E244PF5 (short)	5"	2.00	20
E244RF	6"	5.13	5
E244RF5 (short)	6"	2.25	10



5° Angle Coupling BxB (Bell x Bell)

Part No.	Size	Std. Ctn. Qty.
E2440NF	4"	15
E2440PF	5"	10
E2440RF	6"	5

5° Angle Coupling BxB (Swedged)

Part No.	Size	Std. Ctn. Qty.
E245J	2"	20
E245N	4"	10
E245P	5"	10
E245R	6"	5

Plugs

Plug

Part No.	Size	Std. Ctn. Qty.
P258H	1 1/2"	50
P258K	2 1/2"	50

Plug with Pull Tab

Part No.	Size	Std. Ctn. Qty.
P258JT	2"	60
P258LT	3"	30
P258NT	4"	48
P258PT	5"	30
P258RT	6"	30

Swedge Coupling

Part No.	Size	Std. Ctn. Qty.
E242J	2"	48

5° Angle Coupling S x S

Part No.	Size	Std. Ctn. Qty.
E2440N5	4"	15
E2440P5	5"	20

Adapters

Male Adapter

Part No.	Size	Std. Ctn. Qty.
E943F	1"	50
E943H	1 1/2"	25
E943J	2"	50
E943L-CAR	3"	5
E943N-CAR	4"	5
E943P	5"	5
E943R	6"	10

Female Adapter

Part No.	Size	Std. Ctn. Qty.
E942F	1"	50
E942H	1 1/2"	25
E942J	2"	30
E942L-CAR	3"	3
E942N-CAR	4"	7
E942P	5"	8
E942R	6"	6

Reducers

Swedge Reducer (Male x Male)

Part No.	Size	Std. Ctn. Qty.
E252LJ	3" x 2"	50
E252NJS	4" x 2"	25
E252NL	4" x 3"	25
E252PN	5" x 4"	20
E252RNS	6" x 4"	6
E252RP	6" x 5"	10

Markers

Cable Marker

Part No.	Size	Std. Ctn. Qty.
E299JM	2" x 42"	1
E299JP	2" x 56"	1
E299JR	2" x 78"	1
E299LF	3" x 36"	1
E299LR	3" x 60"	1
E299NX7	4" x 84"	1

End Bells

End Bell

Part No.	Size	Std. Ctn. Qty.
E997F-CAR	1"	15
E997H-CAR	1 1/2"	10
E997J-CAR	2"	10
E997L-CAR	3"	10
E997N	4"	30
E997P	5"	15
E997R	6"	10

Molded End Bell

(For use with P&C Duct only)

Part No.	Size	Std. Ctn. Qty.
E297J	2"	40
E297L	3"	50
E297N	4"	30
E297P	5"	15

Fabricated End Bell

(For use with P&C Duct only)

*Consult factory for additional sizes

Part No.	Size	Std. Ctn. Qty.
E297JN	2" x 4"	25
E297LR	3" x 6"	20
E297NT	4" x 10"	15
E297PS	5" x 8"	10
E297PT	5" x 10"	10
E297RF	6" x 5"	10
E297RT	6" x 10"	6

Long Length End Bell P&C Duct

Part No.	Size	Std. Ctn. Qty.
E297RR	6"(6" long)	10

Note: for manhole terminations

Physical Properties of P&C® Duct by ASTM Test Methods

Property	ASTM No.	Typical Values P&C® Duct	Telephone Duct
Tensile strength, psi	D638	4,800	4,800
Modulus of elasticity in tension, psi	D638	500,000	500,000
Flexural strength, psi	D790	11,000	11,000
Deflection temp under load at 265 psi deg. C	D648	72°C	72°C
Coefficient of thermal expansion in/in/°F	D696	3.30×10^{-5}	3.30×10^{-5}
Coefficient of static friction		.20	.20

Collapse Pressure of P&C Duct Materials (PSI)

2" EB-20	–	11.2	5" EB-20	–	5.9
2" EB-35	–	11.2	5" EB-35	–	10.3
2" DB-60	–	11.2	5" DB-60	–	18.9
2" DB-120	–	26.6	5" DB-120	–	38.2
3" EB-20	–	6.6			
3" EB-35	–	8.2	6" EB-20	–	6.1
3" DB-60	–	15.2	6" EB-35	–	11.2
3" DB-120	–	34.0	6" DB-60	–	19.6
4" EB-20	–	6.7	6" DB-120	–	38.0
4" EB-35	–	9.2			
4" DB-60	–	17.0			
4" DB-120	–	36.6			

Collapse Pressure of Telephone Duct Materials (PSI)

Type B Duct	–	9.2
Type C Duct	–	36.6
Type D Duct	–	36.6

Performance Properties of P&C Duct as Indicated per NEMA Standard TC-6 & 8 and ASTM F-512

Pipe Stiffness lb/in/in

Conduit Series	Minimum Pipe Stiffness (F/Δy), all sizes
EB-20	20
EB-35	35
DB-60	60
DB-100	100
DB-120	120

Minimum Impact Resistance at 0°C (32°F) ft • lbf

Nominal Size	Conduit Series EB-20	EB-35	DB-60	DB-100	DB-120
1	–	–	–	–	10
1 1/2	–	–	10	–	15
2	20	20	20	–	25
3	20	30	40	45	50
3 1/2	20	35	50	60	65
4	25	40	60	70	80
5	30	55	85	100	110
6	40	75	120	135	150

Performance Properties of Telephone Duct as Indicated per NEMA Standard TC-10

Pipe Stiffness F/Δy lb/in/in

Nominal Size	B-Duct	HWB	C-Duct	D-Duct
All	30	40	120	120

Minimum Impact Resistance at 32°C

B-Duct ft. lb.	C-Duct ft. lb.	D-Duct ft. lb.
25	50	50

Typical Installation Practices for P&C® Duct Type EB and Telephone Duct Type B

RUS Listed

Trenching:

Whenever possible the walls of the trench for P&C Duct should act as forms for concrete encasement. The trench should be made no wider than necessary to provide the nominal size concrete thickness.

Duct Spacing:

Duct spacing, both vertical and horizontal, is accomplished with the use of Carlon PVC Snap-Loc® Spacers. Recommended interval between spacer assemblies is 8 to 10 feet.

Terminating:

For smooth cable pulling and properly engineered terminations into manholes, Carlon P&C Duct end bells should be used.

Concrete:

The concrete used with P&C Duct should be 3/8" aggregate with a nominal compressive strength of 2,500 lbs. per square inch. The slump should be at the upper end of the range, preferably 7 to 8 inches. It should have just enough slump to flow to the bottom of the formation and yet not be so wet as to cause the ducts to float. In placing concrete around P&C Duct, adjust the delivery chute so the fall of the concrete into the trench is minimal. Use a splash board to divert the flow of concrete away from the trench sides and avoid dislodging soil and stones.

Pressure Grouting:

This technique is used for ducts in a casing or bored construction. Hydraulic pressure exceeding 25 psi is common and thus dictates the use of a P&C Duct Type DB-120 or a Schedule 40® product. (See collapse pressure chart). Hydraulic pressure from grouting is a function of the line pressure at the nozzle and back pressure created by pumping. If the exhaust nozzle isn't withdrawn properly, the back pressure will rapidly build and equal the line pressure. Depending on the type casing and pumping distance, line pressures will go up to 90 psi.

Hydraulic Pressure:

The primary consideration for duct selection is the height of the duct bank. Since concrete exerts a force of 1.03 psi per foot of height, to determine the correct duct selection, consider the following examples:

1. 16 way duct bank, 5" conduit, 4 x 4 configuration with 3" separation, and 3" concrete cover

Concrete Height – 4 x 5.563" + 4 x 3 =
22.5 + 12" = 34.2"

Hydraulic Pressure – (34.2"/12) x 1.03 = 2.9 psi

In this instance the maximum force on the bottom ducts would be 2.9 psi, therefore, 5" EB-20 would be a satisfactory choice.

2. 16 way duct bank, 5" conduit, 8 x 2 configuration with 3" separation, and 3" concrete cover.

Concrete Height – 8 x 5.563" + 8 x 3 =
44.5 + 24" = 68.5"

Hydraulic Pressure — (68.5"/12) x 1.03 = 5.9 psi

In this instance the hydraulic force is equal to the theoretical collapse pressure of 5" EB-20, therefore, the use of 5" EB-35 or DB-60 would be a satisfactory choice.

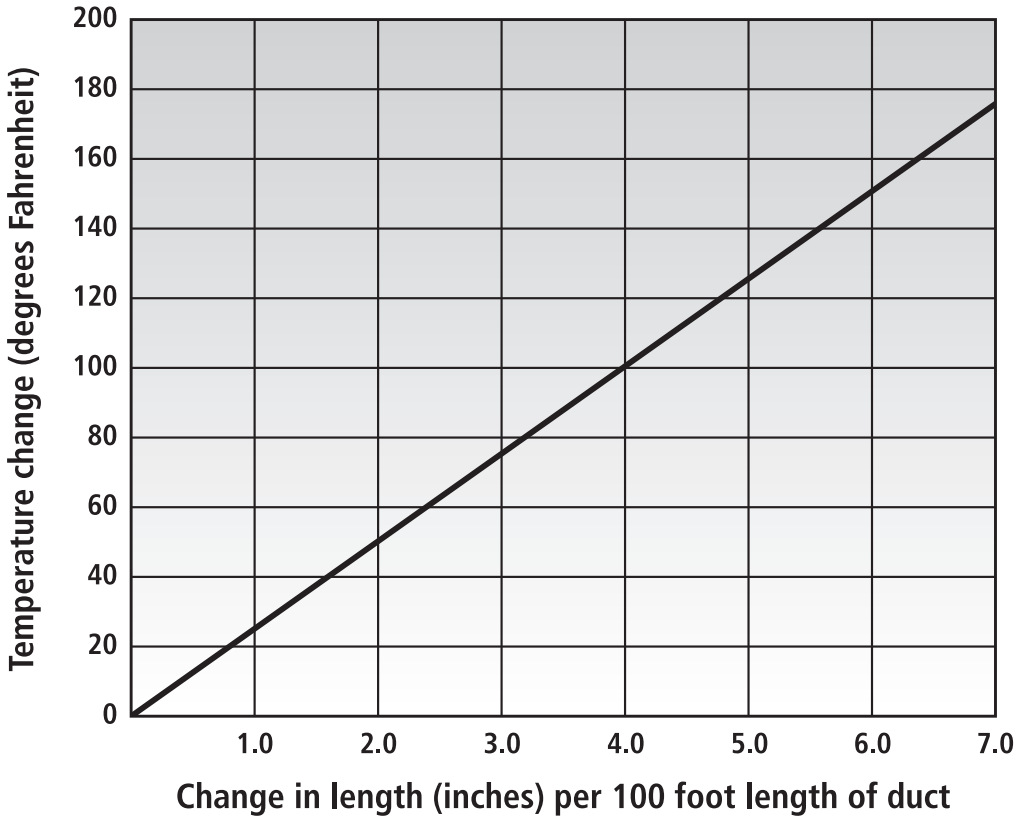
Another alternative would be to use a sequential pour technique. Pour approximately 1/2 the height, allow the concrete to set-up, and then pour the remaining distance. Using this method, 5" EB-20 would be satisfactory, since the hydraulic pressure has been reduced by 50%.

Expansion & Contraction

When duct temperature variations are anticipated during the installation of Carlon P&C® Duct and Telephone Duct, allow extra duct footage at each tie-in for contraction. Terminated duct runs should be covered with backfill from tie-in point toward the end of the duct run. If the trench must be left open, don't terminate the run. All plastic duct may expand or contract as concrete is poured and cured. When placing concrete encasement, always encase from one end of the duct section toward the other end of the section, to allow the free end to move. Never encase from each end of the section toward the center.

The coefficient of thermal expansion of Carlon P&C Duct and Telephone Duct is 3.30 x 10^{-5} in/in/°F. The following chart indicates what expansion or contraction can be expected at various temperature changes.

Expansion/Contraction Chart



Bridge Crossings and Exposed Applications

Type D Telephone Duct is designated specifically for use in bridge crossings and exposed applications. Using the expansion/contraction chart, calculate the number of expansion joints required. Expansion joints provide a 6" allowance for expansion/contraction. Utilize one expansion joint for each 100 feet of exposed length for most installations. The duct should be free to move during expansion/contraction; the barrel should be securely clamped and the piston should be aligned properly with the barrel for easy movement.