



CONDUIT - HIGH DENSITY POLYETHYLENE

Continuous Coil

IPS

05-01-23
M 18-450-F
 PAGE 1 OF 4

USE : Non-conductive, direct buried or concrete encased raceway for the underground installation of cables by plowing, trenching, and guided boring techniques

PREVIOUS REVISION
 07-01-19

ORIGINATED
 03-95

PREVIOUS NUMBER

LATEST REVISION : Added orange HDPE continuous coil for the installation of optical fiber cables.
 Added 1", 1-1/4", 2" SDR-11 conduit on Table 13-1 for optical fiber cables.

REFERENCE: (All references are latest revision; unless noted)

ANSI/TIA 472D000: Standard for Optical Fiber Outside Plant Communications Cable

ANSI/TIA 590: Standard for Physical Location and Protection of Below Ground Fiber Optic Cable Plant

ASTM D3035: Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter

ASTM D1248: Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable

ASTM D3350: Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

ASTM D2513: Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings

NEMA TC7: Solid-Wall Coilable and Straight Electrical Polyethylene Conduit

SPECIFICATIONS:

1. GENERAL:

Conduit to meet all requirements of above referenced specifications, where applicable, unless otherwise noted below.

2. DUCT:

2.1. For both electrical and optical fiber cables, the duct shall be made from High Density, High Molecular Weight Polyethylene, Type III or IV.

2.2. For electrical cables, the duct shall be Black with Three or Four Red Stripes and with smooth walls.

2.3. For fiber optic cables, the duct shall be solid orange in color with smooth walls.

2.4. The duct shall be capable of being coiled (reeled) in continuous lengths, transported, stored outdoors, and subsequently uncoiled for installation, without affecting its properties or performance.



CONDUIT - HIGH DENSITY POLYETHYLENE

Continuous Coil
IPS

05-01-23

M 18-450-F

PAGE 2 OF 4

2.5. Polyethylene Cell Classification Limits:

2.5.1. The Polyethylene duct shall have a minimum Cell Classification of PE335430 per ASTM D3350.
The primary properties are as follows:

Cell Class	Property	ASTM Test Method	Test Value
2	Density	D1505	0.941 - 0.955 g/cm ³
3	Melt Index (Condition E)	D1238	< 04. to 0.15.
5	Flexural Modulus	D790	110,00 to 160,000 psi
4	Tensile Strength at Yield	D638	3,000 to < 3,500 psi
3	Environmental Stress Crack Resistance	D1693	Test Condition = C Test Duration = 192 Hours Failure, Max % = 20%
0	Hydrostatic Design Basis	D2837	Not Pressure Rated

Table 2

3. ENVIRONMENTAL PERFORMANCE:

The duct shall perform in underground and above-ground installations in an ambient temperature range of -30°F to 130°F without degradation of material properties. It shall be possible to bend the duct to a minimum (supported) radius of 10 diameters.

4. WORKMANSHIP:

The duct shall be free of visible cracks, holes or other physical defects that would degrade its performance. It shall be as uniform as practicable in respect to overall dimensions, color, density, thickness, etc.

5. COLOR:

5.1. For electrical cables, the duct shall be black and have a minimum of 2% carbon black incorporated for ultraviolet protection.

5.2. For optical fiber cables, the duct shall be orange and have a minimum of 2% carbon black incorporated for ultraviolet protection.

6. MARKINGS:

The duct shall have a durable identification showing the name or trade mark of the manufacturer, duct size (i.e., 2" IPS SDR-13.5), sequential footage markings, date and reference code. For electrical cables, the duct shall have three (3) or four (4) red stripes co-extruded into the conduit surface during extrusion. For fiber optic cables the duct shall be solid orange.

7. CAPPING:

The open ends of each length of reeled duct shall be sealed by plastic caps to prevent the entrance of dirt and/or moisture.

8. DIMENSIONS:



The dimensions of the duct shall be as per ASTM-D3035. Wall thickness to be identified by Standard Dimension Ratio (SDR) ratings and shall have a rating of SDR-13.5. SDR Ratings are directly proportional to the O.D. of the pipe. We consider the HDPE pipe classification as follows: SDR-13.5 = Regular Duty, and SDR-11=Heavy Duty.

$$\text{SDR} = \frac{\text{O.D.}}{\text{Min. Wall}} \text{ or } \text{Min. Wall} = \frac{\text{O.D.}}{\text{SDR}}$$

9. OVALITY:

Maximum duct ovality per ASTM D2513 shall not exceed 5% for applicable sizes.

$$\text{Ovality} = \frac{\text{Maximum O.D.} - \text{Minimum O.D.}}{\text{Maximum O.D.} + \text{Minimum O.D.}} \times 200$$

10. PACKAGING :

The duct shall be provided on reels of the size specified on page 3 . The duct shall have no joints or splices. The reels and duct shall be capable of being transported and paid out on standard cable reel trailers. Manufacturer shall provide a method acceptable to NIPSCO to recycle, reuse, or return reels to the manufacturer without a disposal or return charge.

11. CORROSION :

The duct shall be resistant to most harsh chemicals and/or protected against degradation due to oxidation or general corrosion.

12. INSTALLATION:

The duct shall be capable of being direct buried by plowing, trenching, or guided boring with no special consideration to using selective backfill. The duct shall also be capable of being encased in concrete.

13. CONTINUOUS COIL ELECTRIC DUCT:



CONDUIT - HIGH DENSITY POLYETHYLENE

Continuous Coil IPS

05-01-23
M 18-450-F
PAGE 4 OF 4

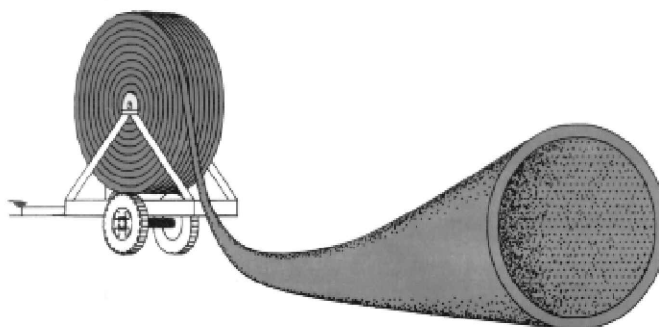


Figure 13-1

Electric Duct Dimensional Specifications

Size (IPS)	Wall Thickness (SDR)	Nominal O.D. (inches)	Minimum I.D. (inches)	Minimum Wall (inches)	Wall Tolerance (+)	Nominal Weight (lbs / ft)	Maximum Reel Size (H x W)	Stores Item Number
2"	13.5	2.375	2.002	0.176	0.021	0.52	8' x 5'	361023
3"	13.5	3.5	2.950	0.259	0.031	1.15	8' x 5'	361024
4"	13.5	4.5	3.794	0.333	0.040	1.90	9-1/2' x 5'	361025
5"	13.5	5.5625	4.689	0.412	0.049	2.90	10' x 5'	361020
6"	13.5	6.625	5.584	0.491	0.059	4.03	10' x 5'	361018
6" Note 1	11	6.625	5.348	0.602	0.072	4.99	10' x 5'	361068

Optical Fiber Cable Duct Dimensional Specifications

1"	11	1.315	1.035	0.120	0.020	0.199	8' x 3.8'	361090
1-1/4"	11	1.6600	1.318	0.151	0.020	0.312	8' x 4'	361091
2"	11	2.375	1.891	0.216	0.026	0.636	8' x 4'	361092

Table 13-1

Note 1: Ordered per project. For use in rough soil conditions or for crossings to avoid the use of a protective sleeve where permitted.

14. APPROVED MANUFACTURERS:

Manufacturers and catalog numbers shall be approved by NIPSCO Electric Standards and are maintained in the current NIPSCO Procurement System.



**CONDUIT - HIGH DENSITY
POLYETHYLENE
Continuous Coil**

12-10-24
M 18-450-F
PAGE 1 OF 1

Approved Manufacturer and Catalog Number Supplement

This Supplement is provided in electronic format only (.pdf), and supersedes previous published catalog numbers.

Latest Revision Republish all Material Standard supplements to include SAP material numbers and SINs. No other changes

MATL#: 300059688

SIN: 361018

CONDUIT, HIGH DENSITY, POLYETHYLENE, 6 IN., BLACK
W' RED STRIPE, 450' LENGTH, 4' X 10' REEL,
CONTINUOUS COIL,

BLUE DIAMOND #BDI614BK-RDS
DURALINE #10007993
P N A #P600-SDR 13.5
PLEXCO #APP06S13.5
WL PLASTIC #UC0600DR135S12080X00450T00 1-BKRD

MATL#: 300059695

SIN: 361025

CONDUIT, HIGH DENSITY, POLYETHYLENE, 4 IN., BLACK
W' RED STRIPE, 500' LENGTH, 4' X 8' REEL, CONTINUOUS
COIL,

BLUE DIAMOND #BDI414BK-RDS
DURALINE #10003624
P N A #P400-SDR 13.5
PLEXCO #APP04S13.5
WL PLASTIC #UC0400DR135S09660X00500T00 1-BKRD

MATL#: 300059690

SIN: 361020

CONDUIT, HIGH DENSITY, POLYETHYLENE, 5 IN., BLACK
W' RED STRIPE, 500' LENGTH, 4' X 10' REEL,
CONTINUOUS COIL,

BLUE DIAMOND #BDI514BK-RDS
DURALINE #10007975
P N A #P500-SDR 13.5
PLEXCO #APP05S13.5
WL PLASTIC #UC0500DR135S12080X00500T00 1-BKRD

MATL#: 300059730

SIN: 361068

CONDUIT, HIGH DENSITY, POLYETHYLENE, 6 IN. HEAVY
WALL, BLACK W' RED STRIPE, 450' LENGTH, 4' X 10'
REEL, CONTINUOUS COIL,

BLUE DIAMOND #BDI1613BK-RDS
DURALINE #10012869
P N A #P600-SDR 11
PLEXCO #APP06S11
WL PLASTIC #UC0600DR110S12080X00450T00 1-BKRD

MATL#: 300059693

SIN: 361023

CONDUIT, HIGH DENSITY, POLYETHYLENE, 2 IN., BLACK
W' RED STRIPE, 3000' LENGTH, 4' X 8' REEL,
CONTINUOUS COIL,

BLUE DIAMOND #BDI214BK-RDS
DURALINE #10007836
P N A #P200-SDR 13.5
PLEXCO #APP02S13.5
WL PLASTIC #UC0200DR135S08430X03000T00 1-BKRD

MATL#: 300059734

SIN: 361090

CONDUIT, HIGH DENSITY, POLYETHYLENE, 1IN.,
SOLID ORANGE, SDR11, CONTINUOUS COIL, 5000'
LENGTH, STEEL REEL

BLUE DIAMOND #BDI113OR-T12.5
DURALINE #10007392

MATL#: 300059694

SIN: 361024

CONDUIT, HIGH DENSITY, POLYETHYLENE, 3 IN., BLACK
W' RED STRIPE, 1000' LENGTH, 4' X 10' REEL,
CONTINUOUS COIL,

BLUE DIAMOND #BDI314BK-RDS
DURALINE #10007901
P N A #P300-SDR 13.5
PLEXCO #APP03S13.5
WL PLASTIC #UC0300DR135S09660X01000T00 1-BKRD

MATL#: 300059735

SIN: 361091

CONDUIT, HIGH DENSITY, POLYETHYLENE, 1-1/4IN.,
SOLID ORANGE, SDR11, CONTINUOUS COIL, 5000'
LENGTH, STEEL REEL

BLUE DIAMOND #BDI133OR-T12.5
DURALINE #10005527

MATL#: 300059736

SIN: 361092

CONDUIT, HIGH DENSITY, POLYETHYLENE, 2IN.,
SOLID ORANGE, SDR11, CONTINUOUS COIL, 4000'
LENGTH, STEEL REEL

BLUE DIAMOND #BDI213OR-T12.5
DURALINE #2037069130