

Pipe Conduit Subterranean (Series 16UP)

Technical Datasheet

Description

Corrugated Conduit pipe, red color, bendable, with double wall, type S, is identified by a white emblem line, has an essentially smooth interior wall.

Manufactured from virgin high-density polyethylene (HDPE) compounds, presented in rolls, for underground electrical systems; meets the specifications, requirements and test methods of IEC 61386-24 and CFE DF110-23.

Scope

This datasheet describes bendable electrical tubes ranging from the nominal diameter of 38 mm to 150 mm (1.5 inches to 6 inches) based on the inside diameter, used in underground electrical wiring systems in low and medium voltage.

Characteristics

- The double-walled structure (smooth interior and corrugated exterior) optimizes the performance of the most important mechanical characteristics, such as impact, compression, bending, etc.
- Resistant to moisture and to chemical and corrosive agents in the soil, which ensures a long service life and durability.
- Low coefficient of friction, between 0.15 and 0.20, for easy wiring.

Application

In underground electrical systems built by open-air channeling (trench), either with excavation material filling or concrete formwork, applicable in:

- Low and medium voltage electrical systems in commercial and industrial facilities, public lighting, housing developments, logistics and industrial parks, hotels, etc.; the electrical installation standard NOM-001-SEDE-2012 (NFPA 70: National Electrical Code) allows the use of pipes from 38 to 150 mm.
- In low and medium voltage electrical distribution systems, the CFE DCCSSUBT 2015 underground system construction specification allows the use of 50 to 100 mm pipes.
- High-voltage transmission electrical systems, the underground transmission line design specification CFE DCDLTS01 allows to use 150 to 300 mm tubes.
- In aerial-underground transitions of electrical distribution and transmission systems. In low and medium voltage distribution, the CFE DCCSSUBT 2015 underground system construction specification allows the use of 50 to 100 mm pipes; In high-voltage transmission, the underground transmission line design specification CFE DCDLTS01 allows to use 150 to 300 mm tubes.

Material Properties

The pipe is manufactured from virgin high-density resin (HDPE) that complies with the following:

- The exterior wall meets a minimum cell rating of 435420E (see table 1), has a 12-month weather resistance warranty after the date of manufacture.

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Table 1. Raw material properties.

Physical Property	Sorting Cell	Specification	Test Method
Absolute density	4	0.947 g/cm ³ a 0.955 g/cm ³	NMX-E-004-CNCP-2004 NMX-E-166-CNCP-2016
Flow Index	3	0.4 a 0.15 g/10 min * a 190 °C y 2.16 kg*	NMX-E-135-CNCP-2004
	1	≥ 1.0 g/10 min a 190 °C y 2.16 kg	
Bending Modulus	5	758 MPa a 1103 MPa*	NMX-E-183-CNCP-2010
Tensile Stress	4	21 MPa a 24 MPa	NMX-E-082-CNCP-2010
Resistance to environmental stress cracking	2	Condition B, 100% Igepal (24 h y 50% of failure)	NMX-E-184-SCFI-2003
Hydrostatic design base	0	Not applicable	-
Color and UV Stabilizer	E	Red color with UV stabilizer with weather resistance for 1 year*	NMX-E-034-CNCP-2014

Dimensions

Table 2. Dimensional characteristics.

Nominal Diameter		Minimum Inside Diameter	Average Outside Diameter	Minimum total area available	Compressive Strength	Bending Resistance	Useful length
mm	inch	mm	mm	mm ²	N		m
38	1 ½	38	49.7	1 134	250	Bendable	100
50	2	51	64.3	1 963	250	Bendable	100
75	3	76	93.5	4 417	250	Bendable	100
100	4	102	121.9	7 854	250	Bendable	100
150	6	152	176.4	17 671	450	Bendable	100

Specifications

The flexible Conduit tubes manufactured by ADS Mexicana comply with the specifications, requirements and test methods of the IEC 61386-24 standard (table 3 of this technical datasheet).

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Table 3. Tube Compliance with Specifications

Specification	Classification, type or specification	Specification Requirements	Test Method	
Impact resistance	Normal	No exhibits cracks and passes the bullet freely when it hits the next energy:	Section 10.3 of the Standard IEC 61386-24	
		Diameter (mm)		Energy (J)
		38 and 50		15
		75		20
		100		28
		150	40	
Compressive Strength	Type N250 (1.5", 2", 3", 4")	No exhibits cracks when compressed to a 5% deflection and the force is at least 250 Newton	Sección 10.2 de la norma IEC 61386-24	
	Type N450 (6", 8")	No exhibits cracks when compressed to a 5% deflection and the force is at least 450 Newton		
Electrical properties	Insulation Features	Dielectric strength: the leakage current is less than 100 mA when a voltage of 2,000 Vac is applied for 15 min.	Section 11.3 of the Standard IEC 61386-1	
		Insulation resistance: greater than 100 M when a voltage of 500 Vdc is applied for 1 min.		
Bending Resistance	Bendable (1.5", 2", 3", 4")	Passing the ball through with a diameter of 95% of the minimum inside diameter of the tube when the tube is bent at 90°	Section 10.4 of the Standard IEC 61386-24	
Flame Spread Resistance	Propagator of The flame	No Requirement and/or Test	Section 13.1.3 of the Standard IEC 61386-1	
External influences 1: protection against solids penetration	Hermetically sealed to dust (IP68)	No dust ingress when exposed inside a chamber for 8 hours	Section 14.1.2 of the Standard IEC 61386-1 and Sections 13.4 and 13.6 of the standard IEC 60529	
External influences 2: protection against water penetration	Temporary immersion in water (IP68)	No water ingress when submerged inside a tank for 30 minutes	Section 14.1.3 of IEC 61386-1 and Section 14.2.7 of IEC 60529	
3 External Influences: Corrosion Resistance	High	No requirement and/or test for non-metallic tubes	Section 14.2 of the Standard IEC 61386-1	
Low temperature	No requirement for buried pipes; however, it is considered -5 °C.	No Requirement and/or Test	No reference	
High temperature	No requirement for buried pipes; however, 90 °C is considered.	Gauge step after heating the tube to 90°C for 4 hours and then subjecting it to a load of about 2 kg for 24 hours, then allowed to cool to room temperature	Section 12 of the Standard IEC 61386-1	

Installation

Installation must be performed in accordance with the provisions set forth in the specifications of ASTM D2321-20 and the installation recommendations issued in the ADS Mexicana Installation Manual. Download this manual from the ADS Mexicana website.