

### 1. Scope

This document specifies single jacket loose tube cable with a dielectric central strength member, reinforced with glass yarns and polyethylene jacket. The cable is supplied in UV resistant high density polyethylene (HDPE) duct.

Once placed inside the HDPE duct, the product is suitable for outdoors, indoors, and direct burial applications.

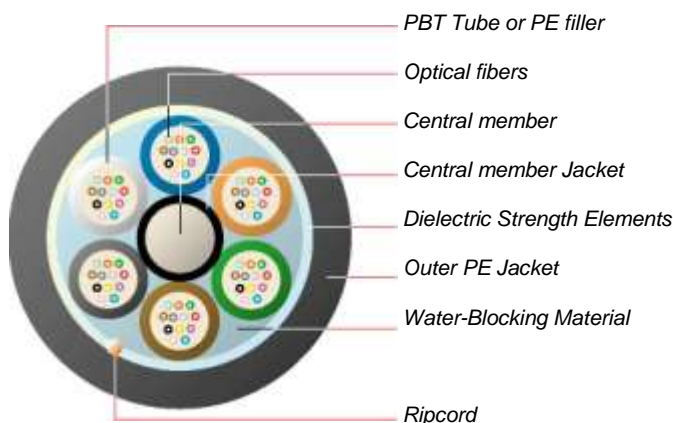
WTEC supplies the finished product with the fiber optic cable inside the HDPE duct.

### 2. Application

The cable is designed for outdoor applications, for direct installations in duct. The finished product with cable inside the duct is suitable for outdoors, indoors, and direct burial.

### 3. Cable Description

- Up to 12 optical fibers are enclosed in a polybutylene terephthalate (PBT) tubes.
- Up to 24 tubes are stranded around jacketed dielectric central member together with PE fillers to form the cable core.
- The fibers and tubes are color coded for easy identification.
- All the interstices in the cable core are filled with a water blocking materials to prevent water penetration.
- Water swelling glass yarns are laid over the cable core to serve as peripheral dielectric strength members.
- A polyethylene jacket extruded over the glass yarns provides the final cable shape and protection. A ripcord is provided under the jacket to facilitate its removal.
- The cable is inserted into UV resistant high density polyethylene duct for wide range of uses including extreme temperatures, abrasive and high tension applications in underground installations.



**Picture: Cross-Section of single jacket loose tube cable (before inserting in duct)**

### 4. Cable nominal dimensions and weight

Fiber count		2-60	61-72	73-96	97-120	121-144	145-216	217-240	241-288
Cable outer diameter	inch	0.4	0.42	0.49	0.56	0.62	0.61	0.64	0.71
	mm	10.1	10.7	12.5	14.1	15.7	15.4	16.2	18
Cable weight	lb/kft	47	53	69	97	112	97	109	134

Revision	Description	WTEC part number	Date	Submitted By
<b>D</b>	<b>revised</b>	<b>FOCxMxx-xJ</b>	<b>06/17/2010</b>	<b>OM</b>
F	Option of 4 stripes		06/24/2011	SS

# PRODUCT DATA SHEET

## Fiber Optic cable in Duct

One Bridge Plaza North Suite 260 | Fort Lee, NJ 07024 | Tel 201 242 9906 | Fax 201 242 9926

	kg/km	70	79	103	145	166	145	162	200
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Tested per Applicable requirements of ANSI/ICEA S-87-640 and Telcordia GR-20-CORE Issue 2

### 5. Cable Handling:

- Minimum bend radius with load – 15 x OD
- Minimum bend radius with no load – 10 x OD
- Minimum bend radius, storage coils – 10 x OD
- Maximum rated cable load (MRCL) – 600 lbs (2700 N)
- Maximum long term load - 180 lbs (800 N)
- Temperature range:
  - installation -30°C to 60°C (-22°F to 140°F)
  - operation -60°C to 70°C (-76°F to 158°F)
  - storage -40°C to 75°C (-40°F to 167°F)

### 6. Fiber Characteristics

	Type	Single mode	Multi mode	
<b>PHYSICAL Characteristics</b>				
Core Diameter	µm		50/125	62.5/125
Clad Diameter	µm	125.0 ± 0.7	125.0 ± 1.0	125.0 ± 1.0
Core/Clad Concentricity Error (Offset)	µm	≤ 0.5, <0.2 typical	≤ 1.0	≤ 1.0
Coating diameter	µm	235-245	245 ± 10	245 ± 10
Tensile proof test	kpsi	100	100	100
<b>OPTICAL CHARACTERISTICS</b>				
Attenuation for Wavelength at 1310 nm	dB/km	≤0.34 (max), ≤0.32 typical		
Attenuation for Wavelength at 1550 nm	dB/km	≤0.21 (max), ≤0.19 typical		
Attenuation for Wavelength at 850 nm	dB/km		≤ 2.3	≤ 0.9
Attenuation for Wavelength at 1300 nm	dB/km		≤ 0.6	≤ 0.6
Zero Dispersion Wavelength (λ <sub>0</sub> )	Nm	1302-1322	1295-1340	1320-1365
<b>MODE FIELD DIAMETER</b>				
for wavelength 1310 nm	µm	9.2 ± 0.4		
for wavelength 1550 nm	µm	10.4 ± 0.5		
Cut-off wavelength (λ <sub>cc</sub> )	nm	≤ 1260		

### 7. Fibers and Tubes Color-Code per TIA/EIA 598A

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Fiber No.	1	2	3	4	5	6	7	8	9	10	11	12
Color	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Rose	Aqua

Alternative color codes are available. Please contact us for details.

### 8. Polyethylene duct characteristics:

#### 8.1 General specification

- The duct is manufactured from virgin high density polyethylene
- The duct are supplied with smooth walls and come either in orange color or in black with 3 (120 degrees apart) or 4 (90 degrees apart) orange stripes.
- The duct is capable of being coiled in continuous lengths, transported, stored outdoors and subsequently uncoiled for installation – without affecting its properties or performance.
- The duct performs in underground and above-ground installation an ambient temperature range of minus 30°F to 130°F.
- The duct specified for areal installations is ultraviolet light-resistant by UV light stabilizer protecting the duct for a minimum of 12 months in direct sunlight.
- The duct is bended to a minimum (supported) radius of 10 outer diameters.

#### 8.2 Tests on finishing duct are performed in accordance with:

- ASTM D3035: Polyethylene Plastic Pipe Based on Controlled Outside Diameter
- ASTM D1248: Polyethylene Plastics Molding and Extrusion Materials (Type III, Class A, B or C, Category 5, grade P34)
- ASTM D1693: Environmental Stress Cracking of Ethylene Plastics (Cond. B, F20/96 HRS)
- ASTM D1238: Flow Rates of Thermoplastics by extrusion Plastometer.
- ASTM D638: Tensile properties of Plastics
- ASTM D3350 Polyethylene Plastic Pipe and Fitting Materials (Cell #335440)
- NEMA TC 7: Smooth-wall Coilable Polyethylene Electrical Plastic Duct.

#### 8.3 Duct dimension specification

Duct	SDR	Nominal	Minimal	Min. wall	Max. wall	Weight	mean wall	Tensile
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code	rating	O.D. inch	I.D. inch	inch	inch	lbs/ft	inch	lbs
P100	13.5	1.315	1.08	0.097	0.117	0.167	0.107	1299
P125	13.5	1.66	1.374	0.123	0.143	0.263	0.133	2042
P150	13.5	1.9	1.579	0.141	0.161	0.342	0.151	2655
P200	13.5	2.375	1.981	0.176	0.197	0.527	0.186	4093

### 8.4 Typical Physical Properties of HDPE Duct:

Property	Test Method	Units	Value
Vicat Softening Temperature	ASTM D 1525	°F	255
Heat Distortion Temperature	ASTM D 648	°F	172
Thermal Expansion	ASTM D 696	in/in/°F	1x10 <sup>-4</sup>
Thermal Conductivity	ASTM C 177	BTU, in/ft <sup>2</sup> /hrs/°C	4.7
Volume Resistivity	DIN 53282	Ω/cm	>10 <sup>16</sup>
Surface Resistance	DIN 53282	Ω	>10 <sup>13</sup>
Dielectric Strength	DIN 53281	KV/cm	700-850
Density (Black)	ASTM D 1505	g/cm <sup>3</sup>	0.955
Melting point	ASTM DSC	°F	261
melt Index i2.16	ASTM D 1238(E)	gm/10 min	0.11
Tensile Yield Strength	ASTM D 638	psi	3300
Elongation at Break	ASTM D 638	%	800
Tensile Module of Elasticity	ASTM D 638	psi	113,000
Flexural Modulus	ASTM D 790	psi	136,000
Brittleness Temperature	ASTM D 746	°F	103
Rockwell Hardness L	ASTM D 785	-----	49
Shore Hardness D	ASTM D 2240	-----	68

### 8. Cable in Duct Marking

The cable is marked with white embossed characters, as follows:

**WTEC - F.O. Cable - Cable Type - Feet Mark.**

The length mark is printed every meter or 2 feet with an accuracy of ± 1%. Other text options are available according to customer request.

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