

# Miniflex<sup>®</sup> in TuffDuct<sup>®</sup>

## Cable-in-Microduct (CIMD)



### Features & Benefits

- Ultra tough and high crush resistant
- Very low friction & low static DVC lining aiding fiber removal and installation
- Compact size OD perfect for slot trenching
- Withstands high temperature (exposure to bitumen)
- Features Miniflex<sup>®</sup> technology (grooving increases flexibility/bend radius)
- Fire retardant and UV-stabilized cable options available
- Uses industry-standard fiber
- Lightweight/small diameter fiber cable

### Compatibility:

- High install tension suitable for all direct bury methods
- Slot cut trenching methods
- ITU-T G.657 & G.651
- Field splice and lab terminations



### Overview

Miniflex Cable in TuffDuct<sup>®</sup> is a flexible cable in PPC's patented microduct made from a crush-resistant material for underground, outdoor applications.

TuffDuct Direct Buried Microduct has an ultra low-friction & low static DVC lining to assist in pulling, blowing and pushing of fiber or cable. TuffDuct is an ultra tough 10 mm microduct for routing fiber optic cables underground. TuffDuct is suitable for direct bury deployment due to the special HDPE polymer that it is constructed from. It is available with a tone-wire if required for locating purposes.

Miniflex fiber cable is a flexible, pushable fiber optic cable made from a crush resistant, durable polymer. It has exceptionally low weight for the level of strength and protection it provides. Miniflex standard fiber cable is available with many different counts & types of fiber, including G.657A1 singlemode and G.651 OM3 multimode.

### Applications

- FTTH/FTTX Indoor and Outdoor
- Telcom Networks
- Data Infrastructure
- Military
- Rural Broadband
- Transportation
- DAS / FTTA

# Miniflex<sup>®</sup> in TuffDuct<sup>®</sup> Cable-in-Microduct (CIMD)



## Technical Data | TuffDuct<sup>®</sup> Microduct

### Microduct Specifications

Toneable	Color	OD	ID	Crush	Tension	Nominal Weight	*Bend Radius
		<i>mm</i>	<i>mm</i>	<i>N</i>	<i>N</i>		
Yes	Orange	10.0	6.0	2000	800	42 lbs/kft	20x OD
No	Orange	10.0	6.0	2000	800	38 lbs/kft	20x OD

\*This is the minimum radius to which the TuffDuct should be subject once it is installed.

### Environmental Specifications

Operating Temperature	Installation Temperature
°C (°F)	°C (°F)
-40 to 70 (-40 to 158)	-10 to 60 (14 to 140)

ISO9001 Production, REACH, ROHS, Certificate of Origin, EN 50411-6-1, IEC 60794-5

## Technical Data | Miniflex<sup>®</sup> Fiber Cable

### Cable Material

Fiber Count	Weight	O.D.	Sheath Thickness	Tension Strength	Minimum Bend Radius		Crush
					Installation	Operation	
<i>250µm</i>	<i>kg/km (lbs/kft)</i>	<i>mm (in)</i>	<i>mm (in)</i>	<i>n</i>	<i>mm (in)</i>	<i>mm (in)</i>	<i>n</i>
1, 2, 4, 6, 8 & 12	8.1 (5.4)	3.0 (.1)	0.8 (.03)	100	15 (.6)	30 (1.2)	950
1 (900 µm)	8.1 (5.4)	3.0 (.1)	0.8 (.03)	100	15 (.6)	30 (1.2)	950
24	9.2 (6.1)	4.0 (.15)	0.7 (.027)	100	20 (.8)	40 (1.6)	650
Material	Properties			Best for		Color	
PBT	Hardest & toughest outdoor material, some UV resistance			Indoor – (FR) & Outdoor – (UV stable)		Black*	
<i>*Other colors available upon request</i>							
Operating Temp				Installation Temp			
°C (°F)				°C (°F)			
-40 to 70 (-40 to 158)				-20 to 60 (-4 to 140)			

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### Technical Data | Miniflex® Fiber Cable

#### Fiber Transmission Performance Specification

Item	Single-mode	Single-mode 900µm	Multi-mode
Specification	G657 A1	G657 A2	OM3
Attenuation (850 / 1300 nm)	n/a	n/a	3.5/1.5 dB/km
Attenuation (1310 / 1550 nm)	0.4/0.3 dB/km	0.4/0.3 dB/km	n/a
Attenuation at 1383nm	≤ 0.32 dB/km	n/a	n/a
Attenuation at 1625 nm	< 0.24 dB/km	< 0.24 dB/km	n/a
Refractive Index at 1310nm, 1550nm	1.467, 1.468	1.467, 1.468	n/a
Refractive Index at 850nm, 1300nm	n/a	n/a	1.482, 1.477
Proof test	0.69 GPa (100 kpsi), 1% min.	0.69 GPa (100 kpsi), 1% min.	0.69 GPa (100 kpsi), 1% min.
Cladding diameter	125 ± 0.7µm	125 ± 0.7 µm	125 ± 1.0µm
Coated diameter	235µm to 245µm	235µm to 245µm	237µm to 247µm
Core/Cladding concentricity error	≤ 0.5µm	≤ 0.5 µm	≤ 1.0µm
Coating concentricity error	≤ 12µm	≤ 12µm	≤ 6µm
Macro bend loss	(1550 nm)	(1550 nm)	(850 and 1300 nm)
10 turns at 50mm diameter	≤ 0.01 dB	n/a	≤ 0.2 dB
10 turns at 15 mm diameter	≤ 0.2 dB	≤ 0.03 dB	n/a
1 turn at 10mm diameter	≤ 0.2 dB	≤ 0.10 dB	n/a
1 turn at 7.5mm diameter	n/a	≤ 0.50 dB	n/a
Temp. range (operation) -60°C to 85°C (-76°F to 185°F)	max attenuation change ≤ 0.05 dB/km		max attenuation change ≤ 0.1 dB/km
Coating Strip Force	1.3 to 8.9 N		1.3 to 8.9 N

### Ordering Information

Part Number	Product Code	Fiber Count	Fiber Size	Reel Length	SKU Weight
10-1548FT	10mm TuffDuct – 3mm PBT Miniflex	2	250um	3280ft / 1km	77.1kg
10-1548FT-1000	10mm TuffDuct – 3mm PBT Miniflex	2	250um	1000ft / 305m	19.5kg
10-1549FT	10mm TuffDuct w/ Toning Wire – 3mm PBT Miniflex	2	250um	3280ft / 1km	77.1kg
10-1549FT-1000	10mm TuffDuct w/ Toning Wire – 3mm PBT Miniflex	2	250um	1000ft / 305m	19.5kg
10-1501FT	10mm TuffDuct w/ Toning Wire – 3mm PBT Miniflex	1	900um	3280ft / 1km	77.1kg
10-1501FT-1000	10mm TuffDuct w/ Toning Wire – 3mm PBT Miniflex	1	900um	1000ft / 305m	19.5kg
10-1502FT	10mm TuffDuct – 3mm PBT Miniflex	1	900um	3280ft / 1km	77.1kg
10-1502FT-1000	10mm TuffDuct – 3mm PBT Miniflex	1	900um	1000ft / 305m	19.5kg