PBN

Optical Buried Unfilled Cable

Single Mode Cable

(OBUC-SM)

B1-000

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1. General

1.1. Scope

This specification covers the design and performance standards of the Optical Buried Unfilled Cable (OBUC) with single mode fiber (ITU-G652D). In the following, Optical, constructional, and mechanical properties of the cable are discussed. All properties are completely compatible with last edition of TCI technical specification.

1.2. Cable description

PBN OBUC-SM is an optical fiber buried cable, capable to be buried directly under the ground, constructed single mode fiber according to ITU/TIA G652D. The cable is UV-resistant due to using black high-density polyethylene (HDPE), and corrugated steel tape armoring respectively. This cable is well suited to use in backbone applications, applicable with 2-144 optical fiber cores.

1.3. Features

- Water-proof
- UV-resistant
- Corrugated steel tape Armored
- Full rodent protection
- Direct burial
- Double Jacket
- single mode fiber

2. Optical Fiber:

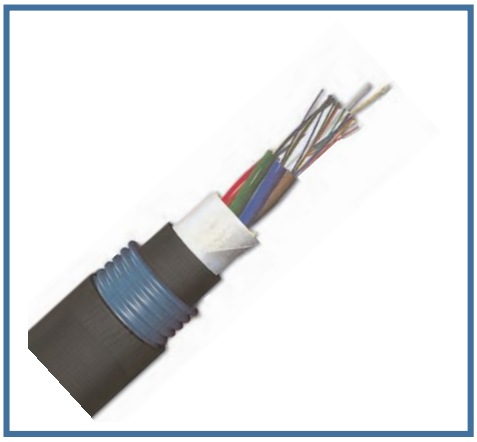
• The fibers are single mode fiber Shifted fibers according to ITU-T G652D and contain the following parameters:

Optical characteristics		
Fiber attenuation:	@ 1310 nm	≤ 0.34 dB/Km
	@ 1550 nm	≤ 0.22 dB/km
	@ 1625 nm	≤ 0.24 dB/km
Effective area:		≥ 72 µm
Mode field diameter (MFD):	@ 1310 nm	9.2 ± 0.4 um
	@ 1550 nm	10.4 ±0.8 um
Cable cut-off (λ_{cc}):		≤ 1260 nm
PMD @ 1550 nm:		≤ 0.2 $ps/\sqrt{km}$

Physical characteristics	
Core diameter	Typ 9 µm
Core non-circularity	≤ 6%
Core-clad offset	≤ 0.5 µm
Clad diameter	125 ±0.7 µm
Clad non-circularity	≤ 7%
Coating diameter	245 ± 5 µm

3. Construction:

- Optical Fiber
- Central strength member
- Loose tube
- Filler (if applicable)
- Swellable yarn and Tape for waterproofness
- Inner Jacket
- Corrugated Steel Tape as Armor
- Outer Jacket



3.1. Central Strength member

Fiber reinforced polymer (FRP) with minimum 2.5 um diameter is used as central strength member. The young modulus of FRP is 50,000 N/mm2 and water absorption of maximum 0.1%. FRP may be coated with PE layers for compatibility of diameters.

3.2. Loose tube

The loose tubes are made of Polybutene terephtalat (PBT) with minimum thickness of 0.4 mm. Fibers are helically placed in the loose tube to be capable of expansion and contraction of the fibers. In order to prevent water penetration, the loose tubes are filled with Thixotropic Jelly known as cold jell.

3.3. Cable Core

Loose tubes and fillers (if applicable) will be stranded over central strength member. The filler are PE rods which are used for roundness of cable core if needed. A water swellable yarn is wounded around central strength member for waterproofness purposes. At the end, a binder yarn is wounded helically around them to keep the core straight.

3.4. Swellable Tape

For waterproofness of the cable, the core is wrapped by swellable tape. The swellable tape also consists of corrosion inhibitors.

3.5. Inner Jacket

A layer of black LDPE (Low density polyethylene) according to ASTM-1248 standard is used as inner jacket with 1.5 mm thickness.

3.6. Corrugated Steel

To protect cable against mechanical damages, a layer of corrugated copolymer coated steel tape is used as cable armor. Thickness of steel is 0.155 mm and each coating of copolymer has 0.05 mm thickness on the tape. The tape is corrugated with 0.8 mm amplitude.

3.7. Outer Jacket:

Black HDPE (High density polyethylene) according to ASTM-1248 standard covers the whole cable as outer jacket with thickness of 2mm.

3.8. Ripcord:

Under both inner jacket and outer jacket, two Ripcords are placed to help the operator in stripping the jacket.

4. PHYSICAL AND DIMENSIONAL PARAMETERS:

Number of cores	12	24		48		72	96
Configuration	(2x6)	(4x6)	(2x12)	(8x6)	(4x12)	(6x12)	(8x12)
Number of Loose tubes	2	4	2	8	4	6	8
Number of fillers	4	2	10	0	8	0	0
Number of cores per use tube	6	6	12	6	12	12	12
Installation Tensile (N)	2800	2800	2800	2800	2800	2800	2800
Operation Tensile (N)	2000	2000	2000	2000	2000	2000	2000
Outer diameter (mm)	15.6	15.6	15.6	17.26	15.6	15.6	17.26
Cable weight per meter (Kg/Km)	225	225	225	270	225	225	270

*. The diameters, weight and tensions are intended to be typical values.

5. TEST REPORTS:

ITEM	REFERENCE	CONDITION
TWIST / Torsion	EIA/TIA 455-85	2m, 2 cycle, ±2π
COMPRESSION / Crush	EIA/TIA 455-41	220 N/cm
FLEXING	EIA/TIA 455-104	25 cycles
IMPACT	EIA/TIA 455-25	2 Impact at 3 locations, 4.5 kg
LOW OR HIGH TEMPERATURE BEND	EIA/TIA 455-37	-30°c, +60°c, 4 turns
TEMPERATURE CYCLING	IEC ۶۰794-I-F1	10 cycles, -40°c to +85°c
Water penetration	FOTP-82	1m height, 1m length, 1 hour Retest: 1m height, 3m length, 24 hours