

Outdoor HDPE Armoured Unitube Cable

Single-Mode G.652.D (OS2) | Unitube (UT) | Armoured | UV-Stabilised HDPE Outer Sheath | Variants: 6F + 12F

1. Product Description

Single-Mode G.652.D (OS2) fibres housed in a single gel-filled PBT loose tube, protected by a water swellable tape, a corrugated ECCS steel tape armour, two diametrically embedded galvanised steel wire strength members, and a UV-stabilised black HDPE outer sheath. The cable is fully water-blocked and all-dielectric (excluding the steel elements) — designed for duct, sub-duct, and direct-buried installation in access networks, FTTx backhaul, campus backbones and last-mile links.

- Aerial, duct and direct-buried last-mile and access network links
- FTTx backhaul, GPON/XGS-PON feeder cables
- Campus backbone and inter-building links
- Underground conduit — single micro-duct or sub-duct installation

2. Product Cross-Sections

All variants share the same material build; only fibre count, tube/ring arrangement and cable OD differ. Cross-sections shown below to a common scale.

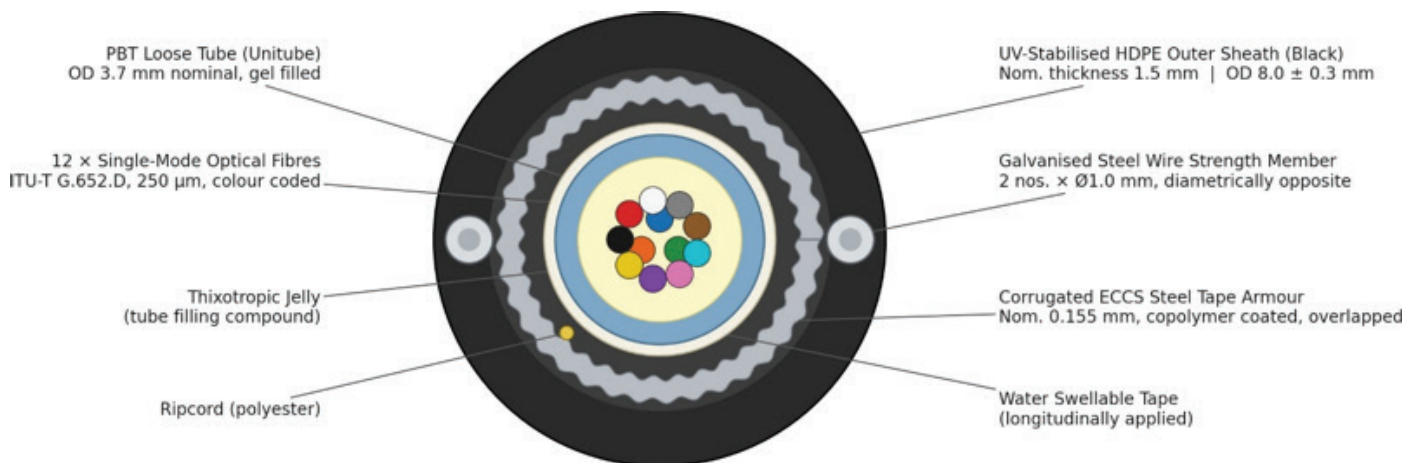


Figure — 12F Unitube Armoured Cross-Section (OD 8.0 ± 0.3 mm, single loose tube, 2-wire SM)

3. Cable Construction Details

All variants share the same material specification. Construction tables below are representative of the series; variant-specific dimensions are in Section 3.2.

3.1 Common Construction — All Variants

S. No.	Element	Material / Description	Nominal Value
1	Optical fiber	Single-mode, ITU-T G.652.D / IEC 60793-2-50 B-652.D (OS2 per ISO/IEC 11801); 250 µm dual-layer UV-curable acrylate coating; colour coded per TIA-598-D (Blue, Orange, Green, Brown, Slate, White)	6 fibres × 250 µm
2	Tube filling compound	Thixotropic jelly, hydrogen-scavenging, non-dripping	100% void fill
3	Loose tube (unitube)	Polybutylene terephthalate (PBT)	OD 3.7 mm / ID 2.7 mm
4	Water blocking	Water swellable tape, longitudinally applied with overlap	0.25 mm
5	Armour	ECCS steel tape, corrugated, copolymer coated both sides, overlapped	0.155 mm
6	Strength member	Galvanised steel wire, 2 nos., diametrically opposite, embedded in sheath	Ø 1.0 mm each
7	Ripcord	Polyester, placed under armour	1 no.
8	Outer sheath	UV-stabilised HDPE, black (carbon black ≥ 2.3%), sequentially marked	1.5 mm thick
9	Cable OD	Overall	8.0 ± 0.3 mm
10	Cable weight	Approximate	75 kg/km

3.2 Variant-Specific Physical Dimensions

Parameter	6F	12F
Fibre count	6	12
Loose tube lay-up	Single unitube	Single unitube
Fibre count per tube	6	12
Cable OD (nominal)	8.0 ± 0.3 mm	8.0 ± 0.3 mm
Cable weight (approx.)	75 kg/km	75 kg/km
Tensile load S/T	1500 N	1500 N
Tensile load L/T	600 N	600 N
Min. bend radius — dynamic	20 × OD (160 mm)	20 × OD (160 mm)
Min. bend radius — static	10 × OD (80 mm)	10 × OD (80 mm)

4. Optical Characteristics — ITU-T G.652.D / OS2 (Common to All Variants)

Optical performance is identical across all variants; only the construction changes.

Parameter	Condition	Specified Value
Fibre type	-	Single-mode, ITU-T G.652.D / IEC 60793-2-50 B-652.D (OS2 per ISO/IEC 11801)
Attenuation (cabled)	@ 1310 nm @ 1383 nm (water-peak) @ 1550 nm @ 1625 nm	≤ 0.36 dB/km ≤ 0.40 dB/km ≤ 0.22 dB/km ≤ 0.25 dB/km
Mode field diameter (MFD)	@ 1310 nm @ 1550 nm	9.2 ± 0.4 μm 10.4 ± 0.8 μm
Cladding diameter	-	125.0 ± 0.7 μm
Core/cladding concentricity error	-	≤ 0.5 μm
Cable cut-off wavelength (λ _{cc})	-	≤ 1260 nm
Zero dispersion wavelength (λ ₀)	-	1300 – 1324 nm
Zero dispersion slope (S ₀)	-	≤ 0.092 ps/(nm ² ·km)
Chromatic dispersion	@ 1550 nm @ 1625 nm	≤ 18 ps/(nm·km) ≤ 22 ps/(nm·km)
PMD (link design value, PMDQ)	-	≤ 0.20 ps/√km
Macrobend loss	100 turns, Ø 60 mm @ 1550 nm 100 turns, Ø 60 mm @ 1625 nm	≤ 0.10 dB ≤ 0.20 dB
Proof test level	-	≥ 0.69 GPa (≥ 1% strain)
CWDM / DWDM compatibility	-	All ITU-T G.694.1/G.694.2 channels; C+L-band DWDM

5. Mechanical Characteristics

Values vary by fibre count and cable OD — see Section 3.2 for per-variant tensile and bend radius figures. Crush and impact values are common.

Parameter	Test Method (IEC 60794-1-21)	Value
Crush resistance	Method E3	2000 N / 100 mm
Impact resistance	Method E4	3 Nm, 3 impacts

Acceptance criteria: fibre attenuation change ≤ 0.05 dB at test wavelength during and after each test; no fibre breakage; no sheath cracking

6. Environmental Characteristics

Common to all variants.

Parameter	Test Method	Specified Value
Operating temperature	IEC 60794-1-22, F1	-40 °C to +70 °C
Installation temperature	—	-10 °C to +50 °C
Storage / transport temperature	—	-40 °C to +70 °C
Temperature cycling	IEC 60794-1-22, F1 (2 cycles)	$\Delta\alpha \leq 0.05$ dB/km @ 1310 nm and 1550 nm
Water penetration	IEC 60794-1-22, F5B	No leakage, 3 m / 1 m head / 24 h
Compound flow (tube jelly)	IEC 60794-1-21, E14	No drip @ +70 °C, 24 h
UV resistance (HDPE sheath)	Carbon black $\geq 2.3\%$, ASTM D1603	Well dispersed
Environmental stress cracking	ASTM D1693	No cracking
RoHS compliance	EU Directive 2011/65/EU	Fully compliant

7. Packing and Delivery

Standard delivery: 2,000 m / 4,000 m ($\pm 5\%$) on returnable wooden drums. Both cable ends sealed with end caps. Drum flange marked with product code, fibre type, variant (fibre count), length, gross weight, drum number, direction of rotation and traceability code. Non-standard lengths available on request.

8. ORDERING DETAILS

TVARA FIBER CONNECTOR HOUSING - LIU PANNEL ORDERING DETAILS			
AA	BBBBB	CCC	DDD
↓	↓	↓	↓
TVARA FIBER	Out Door (OD) Type Single mode	Cable Type	Fiber count
TF	S2OD	UTE - Unit tube, ECCS	006
			012

EXAMPLE:

TF-S2OD-UTE-006	DHRUVA Connect – TVARA FIBER, Single-mode Out door, Unitube armored, 6 Fiber optic cable.
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