

Outdoor HDPE Armoured Multitube Cable

Single-Mode G.652.D (OS2) | Multitube (Dry-Core) (MT) | Armoured | UV-Stabilised HDPE Outer Sheath | Variants: 12F + 24F + 48F + 96F

1. Product Description

Single-Mode G.652.D (OS2) fibres are housed in gel-filled, colour-coded PBT loose tubes SZ-stranded around a central FRP strength member. The dry-core design uses water swellable yarns and tape instead of flooding compound, enabling fast, clean mid-span access. A corrugated ECCS steel tape armour provides rodent resistance and crush protection. A UV-stabilised black HDPE sheath completes the construction. Suitable for duct and direct-buried installation.

- Direct-buried backbone in rodent-prone or high-risk environments
- Underground duct installation requiring crush and mechanical protection
- Medium- and long-haul terrestrial backbone
- Urban and suburban fibre-to-the-kerb / fibre-to-the-building feeders
- High fibre-count feeder cables for data centre campus interconnects

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.

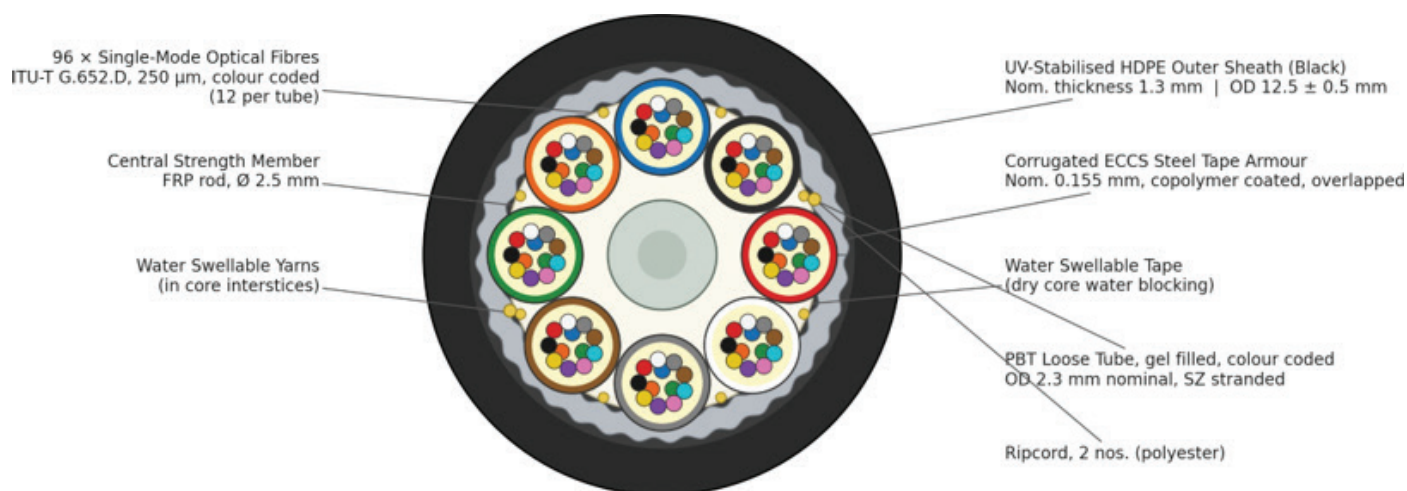


Figure — 96F Multitube Armoured Cross-Section (OD 12.5 ± 0.5 mm, 8 tubes x 12F + 0 filler rods)

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; 12-colour scheme	24 fibres × 250 µm
2	Central strength member	Fibre reinforced plastic (FRP) rod	Ø 2.0 mm
3	Loose tubes	PBT, gel filled, colour coded, SZ stranded (6F per tube)	4 nos. × OD 2.0 mm
4	Filler rods	Solid polyethylene	1 nos.
5	Core water blocking	Water swellable yarns + tape (dry core)	—
6	Armour	ECCS steel tape, corrugated, copolymer coated, overlapped	0.155 mm
7	Ripcords	Polyester	2 nos.

3.2 Variant-Specific Physical Dimensions

Parameter	12F	24F	48F	96F
Fibre count	12	24	48	96
Tubes (active)	4	4	4	8
Fibres per tube	6	6	12	12
Filler rods	1	1	1	0
Element count	5	5	5	8
Cable OD (nominal)	9.5 ± 0.3 mm	9.5 ± 0.3 mm	9.5 ± 0.3 mm	12.5 ± 0.5 mm
Cable weight (approx.)	95 kg/km	95 kg/km	100 kg/km	145 kg/km
Tensile load S/T	2000 N	2000 N	2000 N	2500 N
Tensile load L/T	800 N	800 N	800 N	1000 N
Min. bend radius — dynamic	20 × OD (190 mm)	20 × OD (190 mm)	20 × OD (190 mm)	20 × OD (250 mm)
Min. bend radius — static	10 × OD (95 mm)	10 × OD (95 mm)	10 × OD (95 mm)	10 × OD (125 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

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.

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	MTE - Muti tube, ECCS	012
			024
			048
			096

EXAMPLE:

TF-S2OD-MTE-012	DHRUVA Connect – TVARA FIBER, Single-mode Out door, Multitube armored, 12 Fiber optic cable.
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