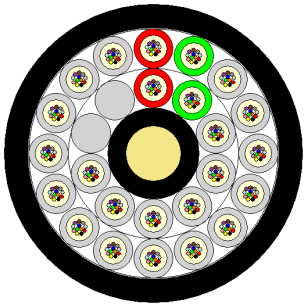
QXXE – Outdoor Optical Cables

Cable Design

IEC/EN 60794



- not to scale -

- **Central Strength Member (CSM):** glass fibre reinforced plastic rod (FRP) with plastic oversheathing when needed.
- **Loose Tube:** thermoplastic material, containing optical fibres and filled with a suitable water tightness compound.
- **Filler Elements:** thermoplastic rods, where needed.
- **Stranding:** loose tubes (and fillers), SZ stranded around the CSM.
- **Longitudinal Water Tightness:** dry core with water swellable elements.
- **Outer Sheath:** HDPE, one ripcord beneath.

Technical data

No. of Fibres		**12**	**24**	**48**	**96**	**144**	**288**
No. tubes x no. fibres/tube		1 x 12	2 x 12	4 x 12	8 x 12	12 x 12	(8+16) x 12
Loose Tube / Filler - Ø	mm	2.5					
CSM / Oversheathing – Ø	mm	2.6 / -			3.0 / 4.2	3.5 / 7.5	3.5 / 5.8
Outer Sheath Thickness	mm	1.5					
Cable Diameter	mm	10.6			12.2	15.5	18.8
Cable Weight	kg / km	85			120	190	275

Minimum Bending Radius	mm	Without Tension 15 x Cable-Ø		Under Maximum Tension 20 x Cable-Ø
Temperature Range	ºC	Installation -10 to +60	Transport & Storage -40 to +70	Operation -40 to +60

Please refer to our General Installation, Safety & Handling recommendations before handling.

Main characteristics

Test	**Test Standard**	**Specified Value**	**Acceptance Criteria**
Max. Installation Tension	IEC 60794–1–2-E1	2000 N	$\Delta\alpha$ reversible, fibre strain $\leq$ 0.33%
Max. Operation Tension	IEC 60794–1–2-E1	1000 N	$\Delta\alpha \leq$ 0.05 dB , no fibre strain
Crush	IEC 60794–1–2-E3	3000 N / 100 mm, max. 15 min	$\Delta\alpha \leq$ 0.05 dB after the test
		1500 N / 25 mm Ø, max. 15 min	$\Delta\alpha \leq$ 0.05 dB after the test
Impact	IEC 60794–1–2-E4	20 Nm, 3 impacts, R= 300 mm	$\Delta\alpha \leq$ 0.05 dB after the test
Cable Bend	IEC 60794–1–2-E11	R=20 x D, 4 turns, 3 cycles	$\Delta\alpha \leq$ 0.05 dB, no damage
Temperature Cycling	IEC 60794–1–2-F1	-40°C to +60°C	$\Delta\alpha \leq$ 0.05 dB/km
Water Penetration	IEC 60794–1–2-F5B	sample=3m, water column=1m	no water leakage in 24h

All optical measurements at 1550 nm (SM) and 1300 nm (MM). Acceptance criteria for MM fibres $\leq$ 0.2 dB for all mechanical test and $\leq$ 0.5 dB/km for temperature cycling, instead of 0.05 dB (SM).

Optical Characteristics

See the attached cabled optical fibre data sheet.

Identification

Fibre Colours

No.	1	2	3	4	5	6	7	8	9	10	11	12
Color	white	red	yellow	green	blue	grey	brown	black	violet	aqua	orange	pink

Buffer Tube Colours

1st layer

Tube	1	2	3	4	5	6	7	8	9	10	11	12
Colour	red	green	white	white	white	white	white	white	white	white	white	white

2nd layer (if present)

Tube	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Colour	red	green	white	white	white	white	white	white	white	white	white	white	white	white	white	white

Filler Elements Colours:

All filler elements are uncoloured (natural).

Sheath Colour:

The outer sheath colour is black.

Sheath Marking:

The outer sheath is marked in 1 meter intervals as follows:

<Manufacturer> <year of manufacture> <cable type> <F. number>
<cable ID> <length marking in m>

Logistic

Packing:

Wooden drums with protection.

Delivery Length:

Standard delivery lengths is 4 km with a tolerance of -1% / +3%

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