

Optical cable

Stranded loose tube design for pulling installation in ducts

Cable design

1. Central strength member (CSM)

FRP resp. FRP covered with thermoplastic material

2. Loose tubes

tubes of thermoplastic material filled with thixotropic compound, containing up to 12 fibres

3. Cable core

required number of loose tubes and if necessary PE filler elements are SZ stranded around the central element. Water blocking by swellables

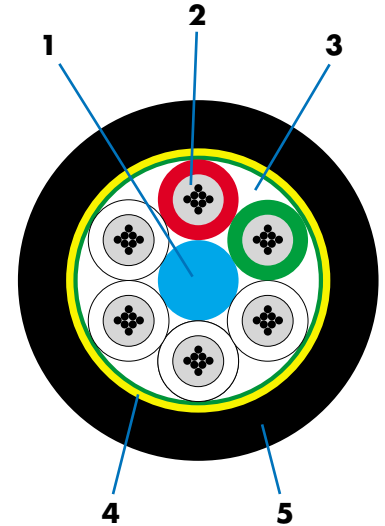
4. Strain bearing elements

aramid yarns

5. Sheath

PE, black, nominal radial thickness: 1.2 mm;
two ripcords beneath the sheath

Figure shows:
cable with 48 fibres



Cable dimensions and main mechanical characteristics

Max. no. of loose tubes x max. fibre count per tube	Max. fibre count	Cable O.D.	Cable weight	Tensile performance installation/operation	Bending radius installation/operation	CSM O.D.	Loose tubes O.D.
		[mm]	[kg/km]	[N]	[mm]	[mm]	[mm]
6 x 4	24	7.5	40	800/300	150/115	1.5	1.4
6 x 8	48	9.0	60	1200/400	180/135	2.1	2.0
5 x 12	60	9.5	65	1300/450	190/145	1.8	2.3
6 x 12	72	10.0	75	1500/500	200/150	2.4	2.3
8 x 12	96	11.5	100	2000/700	230/175	3.0/3.9	2.3
10 x 12	120	13.0	125	2500/850	260/195	3.0/5.4	2.3
12 x 12	144	14.5	160	3200/1100	290/220	3.0/7.0	2.3
18 x 12 (2 layers)	216	15.0	160	3200/1100	300/225	2.4	2.3
24 x 12 (2 layers)	288	17.5	215	4300/1450	350/265	3.0/4.8	2.3

All sizes and values without tolerances are reference values

Standard delivery length

2 km, 4 km or 6 km

Temperature performance

Operation: -15°C up to +60°C

Transport and storage: -40°C up to +70°C

Installation: -5°C up to +50°C

Main mechanical and environmental characteristics

Test	Test standard	Specified value	Acceptance criteria
Tensile performance	EN 187000, 501	kilometric weight * 2 [N] = T_{max} kilometric weight * 2 [N] / 3 = T_0	$\Delta\alpha$ reversible $\Delta\alpha \leq 0.05$ dB/100 m
Crush	EN 187000, 504	1.5 kN/100 mm, 15 min	$\Delta\alpha \leq 0.05$ dB
Impact	EN 187000, 505	25 Nm, r = 300 mm, 3 impacts	$\Delta\alpha$ reversible
Repeated bending	EN 187000, 507	r = 20 x cable O.D. , 1000x	no damage
Torsion	EN 187000, 508	1 m, $\pm 360^\circ$, 100 N	$\Delta\alpha \leq 0.1$ dB/fibre
Cable bend	EN 187000, 513	r = 15 x cable O.D. , 5 turns	$\Delta\alpha \leq 0.05$ dB
Temperature cycling	EN 187000, 601	-15°C ... +60°C -25°C ... +70°C	$\Delta\alpha \leq 0.05$ dB/km $\Delta\alpha \leq 0.1$ dB/km
Water penetration	EN 187000, 605	3 m cable, 1 m water, 72 h	no water leakage

Identification

Outer sheath marking

The outer cable sheath is marked in white or yellow with:

- length marking
- manufacturers name ("ALCATEL")
- year of manufacture
- number and type of fibres

in regular intervals of 1 m.

Remark: other markings upon request.

Identification of loose tubes and fillers within cable core

1. tube: red (marker)
 2. tube: green (direction)
- all other tubes: white

PE filler elements: nature

Remark: other colour codes upon request.

Identification of fibres within loose tube

Fibre no.	Colour of fibre	Fibre no.	Colour of fibre	Fibre no.	Colour of fibre
1	blue	5	grey	9	yellow
2	orange	6	white	10	violet
3	green	7	red	11	pink
4	brown	8	black	12	turquoise

All sizes and values without tolerances are reference values