

Flame Retardant Multi Loose Tube Fiber Optic Cables

APPLICATION

The multi loose tube non metallic cables are designed for outside plant, which is prone to electrical interference. They are mainly installed inside buildings, tunnels, subways or closed areas in general, specially designed to guarantee the signal transmission even in case of fire. The cable can also be used for direct burial for armoured version.

STANDARDS

Basic design adapted to Telcordia GR-20 / RUS 7 CFR 1755.900 (REA PE-90) / ICEA S 87-640

FIRE PERFORMANCE

Flame Retardance (Single Vertical Wire Test)**	EN 60332-1-2; IEC 60332-1-2; BS EN 60332-1-2; VDE 0482-332-1 ; NBN C 30-004 (cat. F1); NF C32-070-2.1(C2); CEI 20-35/1-2; EN 50265-2-1*; DIN VDE 0482-265-2-1*
Reduced Fire Propagation (Vertically-mounted bundled wires & cable test)**	EN 60332-3-24 (cat. C); IEC 60332-3-24; BS EN 60332-3-24; VDE 0482-332-3; NBN C 30-004 (cat. F2); NF C32-070-2.2(C1); CEI 20-22/3-4; EN 50266-2-4*; DIN VDE 0482-266-2-4

Note: Asterisk ** denotes that the standard compliance is optional, depending on the oxygen index of the PVC compound and the cable design.

CABLE CONSTRUCTION

Fibers: Singlemode and multimode fibers, with loose tube technology.

Structure: The cable consists of 5 to 36 fibers containing tubes or fillers stranded in up to 3 layers around a central strength member and bound under a PVC sheath. Each tube contains 4 -12 fibers, which is filled with water blocking gel.

Central Strength Member: Solid or stranded steel wire coated with polyethylene is usually used as central strength member. Fiber glass reinforced plastics (FRP) will be used as central strength member if non metallic construction is required.

Water Blocking: The jelly filled tube is waterblocked by using swellable tape and thread.

Reinforcement: Either aramid yarn or fiber glass is wound around the tube to provide physical protection and tensile strength, with added fire protection.

Inner Sheath (optional): The cable can be jacketed with either PE or Thermoplastic PVC inner sheath. PE is the preferred option in outdoor environment for water protection purpose.

Armouring(optional): For direct burial, either galvanized steel wire braid, corrugated steel tape armour or galvanized steel wire armour is applied over an inner polyethylene or PVC sheath. For steel tape armour, the 0.15mm thick steel tape is coated with a copolymer and applied with an overlap. For steel wire braid or armour, single layer of galvanized steel wire braid or armour is applied.

Moisture Barrier Tape (optional): An aluminum moisture tape can be incorporated under the



sheath for water blocking and shielding purpose.

Ripcord (optional): An optional ripcord can be located under the jacket to facilitate jacket removal.

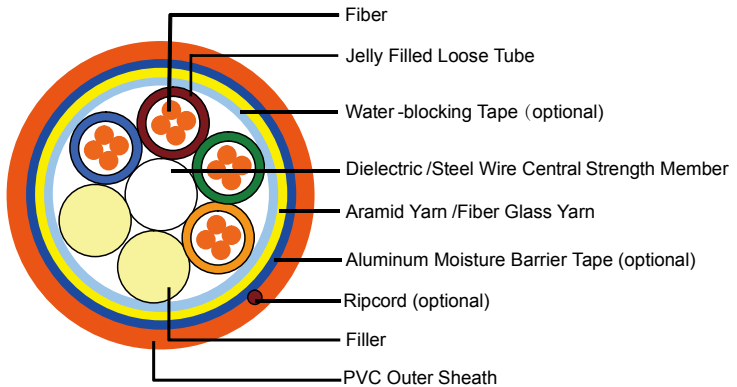
Outer Sheath: Thermoplastic PVC compound. UV resistance, hydrocarbon resistance, oil resistance, anti rodent and anti termite properties can be offered as option. Compliance to fire performance standard (IEC 60332-1, IEC 60332-3, UL 1581, UL 1666 etc) depends on the oxygen index of the PVC compound and the overall cable design. LSPVC can also be provided upon request.

FIBER COLOUR CODE

Fiber colour code	1	Red	7	Brown
	2	Green	8	Violet
	3	Blue	9	Turquoise
	4	Yellow	10	Black
	5	White	11	Orange
	6	Grey	12	Pink

CONSTRUCTION

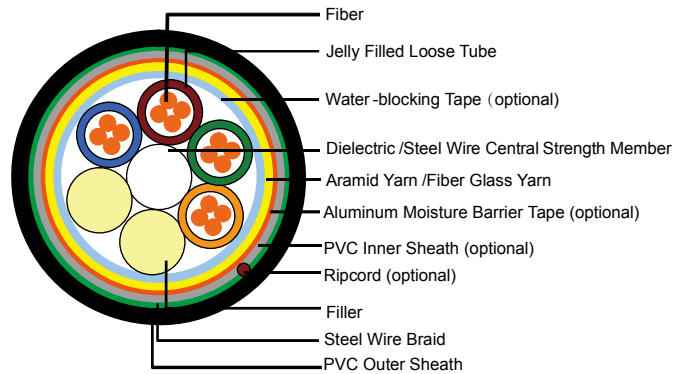
UNARMoured TYPE



CONSTRUCTION PARAMETERS

Cable Code	Fiber Count	Tube Diameter	Nominal Overall Diameter	Approx. Weight	Tension load	Crush
	(n°)	mm	mm	kg/km	N	N/100mm
MLA-B-C×D-F-Y-J	72	2.5	15.0	230	4000	3000
MLA-B-C×D-F-Y-J	96	2.5	16.5	250	4000	3000
MLA-B-C×D-F-Y-J	144	2.5	20.5	280	4000	3000

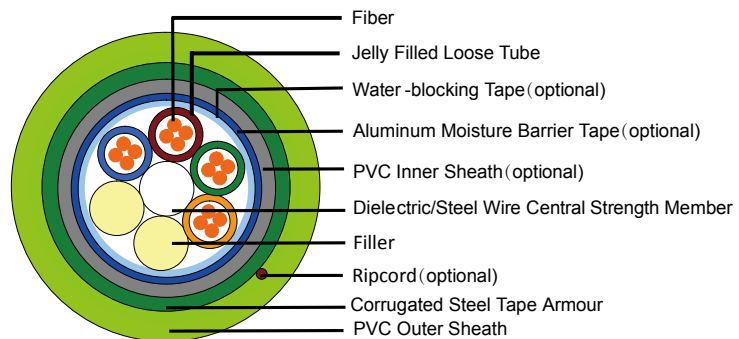
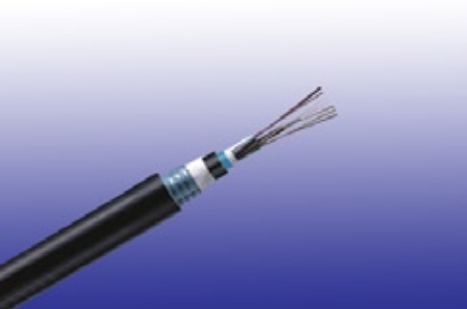
STEEL WIRE BRAID



CONSTRUCTION PARAMETERS

Cable Code	Fiber Count	Tube Diameter	Nominal Overall Diameter	Approx. Weight	Tension load	Crush
	(n°)	mm	mm	kg/km	N	N/100mm
MLA-B-C×D-F-2Y(SWB)Y-J	72	2.5	15.0	280	3000	3500
MLA-B-C×D-F-2Y(SWB)Y-J	96	2.5	17.5	310	3000	3500
MLA-B-C×D-F-2Y(SWB)Y-J	144	2.5	21.5	350	3500	3500

CORRUGATED STEEL TAPE ARMOUR

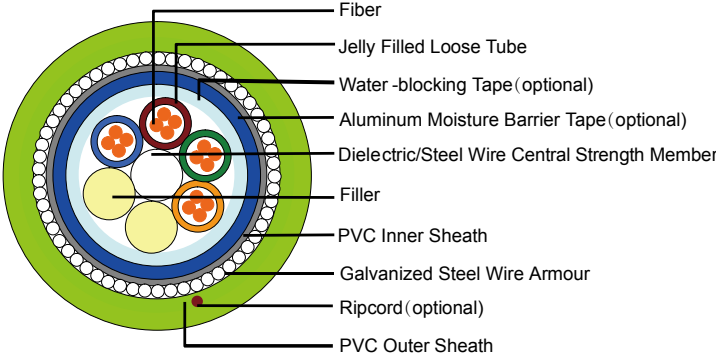
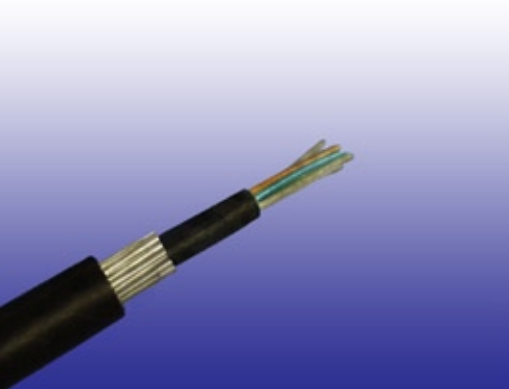


CONSTRUCTION PARAMETERS

Cable Code	Fiber Count	Tube Diameter	Nominal Overall Diameter	Approx. Weight	Tension load	Crush
	(n°)	mm	mm	kg/km	N	N/100mm
MLA-B-C×D-F-2Y(STA)Y-J	72	2.5	16.5	290	3000	7500
MLA-B-C×D-F-2Y(STA)Y-J	96	2.5	18.5	350	3000	7500
MLA-B-C×D-F-2Y(STA)Y-J	144	2.5	22.5	450	3500	7500



STEEL WIRE ARMOUR



CONSTRUCTION PARAMETERS

Cable Code	Fiber Count	Tube Diameter	Nominal Overall Diameter	Approx. Weight	Tension load	Crush
	(n°)	mm	mm	kg/km	N	N/100mm
MLA-B-C×D-F-2Y(SWA)Y-J	72	2.0	15.0	360	3500	5000
MLA-B-C×D-F-2Y(SWA)Y-J	96	2.0	16.5	390	4000	5000
MLA-B-C×D-F-2Y(SWA)Y-J	144	2.0	18.5	430	4500	5000

PHYSICAL AND THERMAL PROPERTIES

Temperature range during operation (fixed state): -20°C - +60°C
Temperature range during installation (mobile state): 0°C - +50°C
Minimum Installation Bending Radius: 20 times the outer diameter
Minimum Operation Bending Radius: 10 times the outer diameter for unarmoured cables
20 times the outer diameter for armoured cables

MECHANICAL PROPERTIES

Maximum Compressive Load:	4000N for unarmoured cables 6000N for armoured cables
Repeated Impact:	4.4 N.m (J)
Twist (Torsion):	180×10 times, 125×OD
Cyclic Flexing:	25 cycles for armoured cables 100 cycles for unarmoured cables
Crush Resistance:	220N/cm(125lb/in)

FIBER COMPLIANCE

Temperature Cycling	IEC60794-1-2-F2
Tensile Strength	IEC60794-1-2-E1A
Crush	IEC60794-1-2-E3
Impact	IEC60794-1-2-E4
Repeated Bending	IEC60794-1-2-E6
Torsion	IEC60794-1-2-E7
Kink	IEC60794-1-2-E10
Cable Bend	IEC60794-1-2-E11
Cool Bend	IEC60794-1-2-E11





TYPE CODES

MLA-B-CxD-E-F-G-H-I

Water blocking gel in tubes

X: No water-blocking J: Water blocking gel between jackets;

D: Dry water-blocking between cable jackets

Outer Sheath

Y: PVC

Armour

Blank: No armour

STA: Corrugated steel tape

SWA: Steel wire

SWB: Armour steel wire braided

Inner Sheath

2Y: PE

Y: PVC

Central strength member

S: Solid steel

SR: Stranded steel

F: Fiber reinforced plastic(FRP)

Fiber per Tubes: 2-12

C No of tubes: 1-36

Fiber Type

4: 50/125 um(OM3) 7: NZDS SM fiber per ITU-T G.656

5: 50/125 um(OM2) 8: NZDS SM fiber per ITU-T G.655

6: 62.5/125um(OM1) 9: Standard SM fiber per ITU-T G.652.D

Loose Tube Diameter

A: 2.0mm D: 3.0mm

B: 2.5mm E: 3.2mm

C: 2.8mm



Standard



Standard



Flame Retardancy**
NF C32-070-2.1(C2)
IEC60332-1-2/EN50265-2-1



Reduced Fire Propagation**
NF C32-070-2.2(C1)
IEC60332-3-24/EN50266-2-4