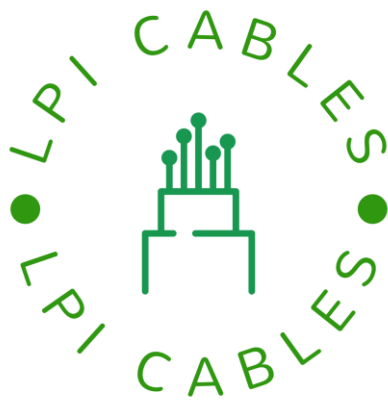


Linden Photonics, Inc.



# COMMUNICATIONS CABLING

**TACTICAL / STRUCTURED**  
Armored / Outdoor



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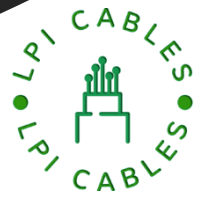
Part Number		
XXX	OOO	YYY
XXX	Fiber Count	
OOO	Fiber Type	
YYY	Product	

	Type
OS1	Singlemode
OS2	Singlemode
OM1	Multimode 62.5
OM2	Multimode 50
OM3	Multimode 50
OM4	Multimode 50

<b>CTU</b>	Central-Tube Unarmored	<b>SSA</b>	All Di-electric Self Supporting Aerial
<b>MSU</b>	Multi-Tube Single Sheath Unarmored	<b>S8A</b>	Single-Tube Figure-8 Type Aerial
<b>MDU</b>	Multi-Tube Double Sheath Unarmored	<b>M8A</b>	Multi-Tube Figure-8 Type Aerial
<b>MDL</b>	Multi-Tube Double Layer Unarmored	<b>HUA</b>	Hybrid Under Ground Armored
<b>CTA</b>	Central-Tube Armored	<b>ODC</b>	Drop Cable
<b>MSA</b>	Multi-Tube Single Sheath Armored	<b>IDC</b>	Indoor Drop Cable
<b>MDA</b>	Multi-Tube Double Sheath Armored	<b>CMC</b>	Central-Tube Micro Cable
<b>DRP</b>	Dielectric Rodent Protected	<b>MTM</b>	Multi-Tube Micro Cable
<b>MSW</b>	Multi-Tube Steel Wire Armored	<b>OIC</b>	Interconnect Cable
<b>MFR</b>	Multi-Tube FRP Rod Armored	<b>BBU</b>	Breakout Tight Buffered Unarmored
<b>MRT</b>	Multi-Tube Ribbon Type	<b>FBU</b>	Fan out Tight Buffered Unarmored

# OUTDOOR CABLES

## CENTRAL-TUBE UNARMORED CABLE (2-48 F)



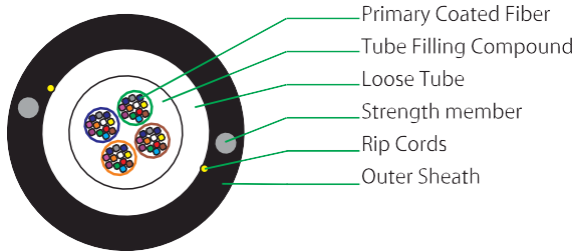
Part Number		
XXX	OOO	CTU
XXX Fiber Count		
OOO Fiber Type		

### Applications:

- Suitable for Duct Installation.
- For CATV application, aerial application along with messenger wire.



### Typical Cross Section of 48 Fiber



### Cable Construction Details

- Up to 48 enhance low water peak single mode fibers in full compliance with ITU-T G.652.D (also available with G655/G656/G657 SM Fiber and OM1/OM2/OM3 & OM4 MM Fiber).
- Metallic, anti-buckling Steel rod as Strength Member. embedded in outer sheath (also available with non-metallic strength member, FRP rod).
- Centrally located gel-filled loose tube.
- UV Stabilized PE outer sheath, black (also available with HFFR/FRPVC).

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 12F	6.0	40	1000	500	15D	20D	-10° to +50°C	-40° to +70°C
24F	8.0	60	1000	500	15D	20D	-10° to +50°C	-40° to +70°C
48 F	9.5	80	1000	500	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



\*For Fiber count more than 12F, bundles in multiple of 12F will be formed with color identification binder (Blue, Orange, Green & Brown)

### Special Features

- Light weight cable for faster and easier installation.

### Drum Length

2000/3000/4000 meters ± 5%

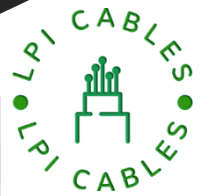
### Mechanical Characteristics

Repeated Bending (IEC 60794-1-2-E6)	30 Cycle, r= 20 XD, 5 Kg Load, D-Cable D
Torsion Resistance (IEC 60794-1-2-E7)	10 Cycle (+360°) 5 Kg Weight, L=2 Mtr
Crush Resistance (IEC 60794-1-2-E3)	1000 N (100 X 100mm) for 600 sec
Impact Resistance (IEC 60794-1-2-E4)	Height 100 mm, Weight = 5 Kg, 3 Nos
Kink Resistance (IEC 60794-1-2-E10)	10x D, D = Cable D
Water Penetration (IEC 60794-1-2-F5B)	1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours



# OUTDOOR CABLES

## MULTI-TUBE SINGLE SHEATH UNARMORED CABLE (2-144 F)



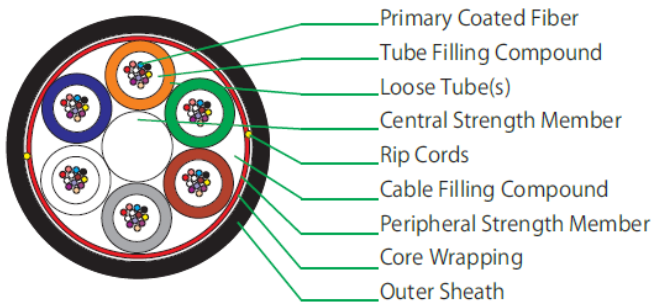
Part Number		
XXX	OOO	MSU
XXX	Fiber Count	
OOO	Fiber Type	

### Applications:

- Suitable for Duct Installation, pulled & blown.



### Typical Cross Section of 72 Fiber



### Cable Construction Details

- Up to 144 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- 2/4/6/8/12 fiber per tube combinations are available in 6/8/12
- Non-metallic, anti-buckling FRP rod as Central Strength Member (also available with steel rod).
- Loose buffer tubes fully filled, S-Z Stranded
- Cable core fully filled with gel (also available in dry core)
- Glass yarn can be used as peripheral strength member
- S-Z core wrapped with polyester tape / water swellable tape
- UV Stabilized PE outer sheath, black (also available with FR PVC & HFFR)

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 48F	9.2	74	1500	750	15D	20D	-10° to +50°C	-40° to +70°C
72F	9.6	80	1500	750	15D	20D	-10° to +50°C	-40° to +70°C
96F	10.9	100	1500	750	15D	20D	-10° to +50°C	-40° to +70°C
144F	13.4	150	2000	1000	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



### Special Features

- Single layer S-Z stranded construction.
- Flexible buffer tubes provide easy fiber routing inside closure.
- Light in weight, hence easy to install.

### Mechanical Characteristics

Repeated Bending (IEC 60794-1-2-E6)	30 Cycle, r= 20 X D, 5 kg Load, D = Cable D
Torsion Resistance (IEC 60794-1-2-E7)	10 Cycle (± 360°) 5 kg Weight, L= 2 Mtr
Crush Resistance (IEC 60794-1-2-E3)	2000 N (100 X 100mm) for 600 sec
Impact Resistance (IEC 60794-1-2-E4)	Height 500 mm, Weight = 5 kg, 3 Nos
Kink Resistance (IEC 60794-1-2-E10)	10 x D, D = Cable D
Water Penetration (IEC 60794-1-2-F5B)	1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours

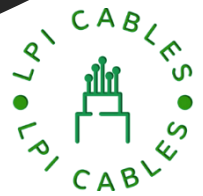
### Drum Length

2000/3000/4000 meters ± 5%



# OUTDOOR CABLES

## MULTI-TUBE DOUBLE SHEATH UNARMORED CABLE (2-144 F)



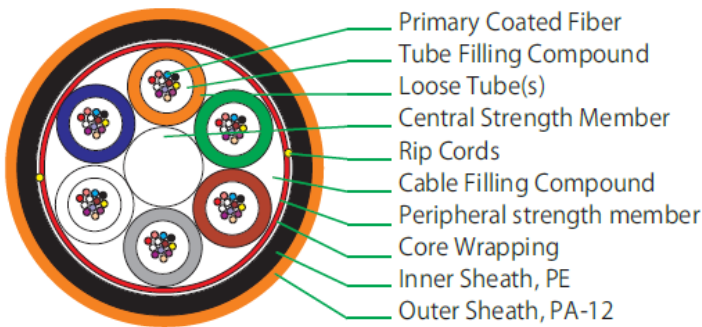
Part Number		
XXX	OOO	MDU
XXX	Fiber Count	
OOO	Fiber Type	

### Applications:

- Suitable for Duct Installation, pulled & blown



### Typical Cross Section of 48 Fiber



### Cable Construction Details

- Up to 144 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- 2/4/6/8/12 fiber per tube combinations are available in 6/8/12 element construction
- Non-metallic anti-buckling FRP rod as Central Strength Member (also available with Steel rod)
- Loose buffer tubes fully filled, S-Z Stranded
- Cable core fully filled with gel (also available in dry core)
- Glass yarn can be used as peripheral strength member
- S-Z core wrapped with polyester tape / water swellable tape
- UV Stabilized HDPE inner sheath, Black
- Insect & termite resistant PA-12 outer sheath, Orange

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 48F	10.2	90	1500	750	15D	20D	-10° to +50°C	-40° to +70°C
72F	10.6	95	1500	750	15D	20D	-10° to +50°C	-40° to +70°C
96F	11.9	120	1500	750	15D	20D	-10° to +50°C	-40° to +70°C
144F	14.4	170	2000	1000	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



### Special Features

- Single layer S-Z stranded construction
- Flexible buffer tubes provide easy fiber routing Inside closure
- Light in weight, hence easy to install
- Insect & termite resistant

### Drum Length

2000/3000/4000 meters ± 5%

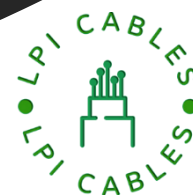
### Mechanical Characteristics

Repeated Bending (IEC 60794-1-2-E6)	30 Cycle, r= 20 X D, 5 Kg Load, D = Cable D
Torsion Resistance (IEC 60794-1-2-E7)	10 Cycle (± 360°) 5 Kg Weight, L= 2 Mtr
Crush Resistance (IEC 60794-1-2-E3)	2500 N (100 X 100mm) for 600 sec
Impact Resistance (IEC 60794-1-2-E4)	Height 500 mm, Weight = 5 Kg, 3 Nos
Kink Resistance (IEC 60794-1-2-E10)	10 x D, D = Cable D
Water Penetration (IEC 60794-1-2-F5B)	1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours



# OUTDOOR CABLES

## MULTI-TUBE DOUBLE LAYER UNARMORED CABLE (192-288F)



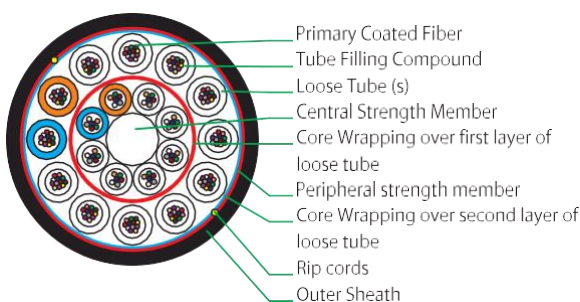
Part Number		
XXX	OOO	MDL
XXX Fiber Count		
OOO Fiber Type		

### Applications:

- Suitable for Duct Installation, pulled & blow.



### Typical Cross Section of 240 Fiber



### Cable Construction Details

- Up to 288 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D
- Non-metallic anti-buckling FRP rod as Central Strength Member
- Loose buffer tubes fully filled, S-Z Stranded in two layers
- Cable core fully filled (also available in dry core)
- S-Z core wrapped with polyester tape / water swellable tape
- UV Stabilized PE Outer sheath, black (also available with FR PVC & HFFR)

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (Kg/km) Nominal	TENSILE STRENGTH(N)		BENDING RADIUS(mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
192F	13.9	160	1000	2000	15D	20D	-10° to +50°C	-40° to +70°C
288F	16.3	225	1500	3000	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



\* Tube coding: Blue (Marker), Orange (Tracer), remaining all natural

### Special Features

- Double layer S-Z stranded construction
- Flexible buffer tubes provide easy fiber routing inside closure

### Drum Length

2000/ 3000 meters ± 5%

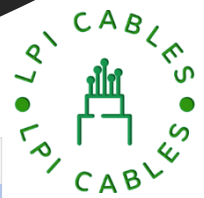
### Mechanical Characteristics

Repeated Bending (IEC 60794-1-2-E6)	30 Cycle, r= 20 X D, 5 Kg Load, D = Cable D
Torsion Resistance (IEC 60794-1-2-E7)	10 Cycle (± 360°) 5 Kg Weight, L= 2 Mtr
Crush Resistance (IEC 60794-1-2-E3)	2000 N (100 X 100mm) for 600 sec
Impact Resistance (IEC 60794-1-2-E4)	Height 500 mm, Weight = 5 Kg, 3 Nos
Kink Resistance (IEC 60794-1-2-E10)	15 x D, D = Cable D
Water Penetration (IEC 60794-1-2-F5B)	1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours



# OUTDOOR CABLES

## CENTRAL-TUBE ARMORED CABLE (2 - 48F)



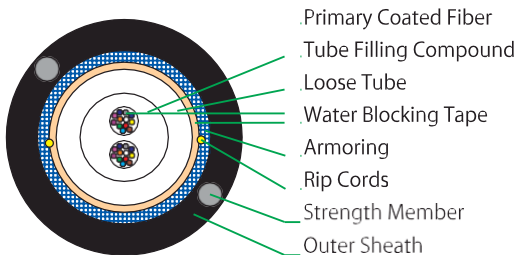
### Applications:

- In areas where high mechanical load is required
- Suitable in area of rodent menace
- Direct burial & Inside duct - PE Outer Sheath
- Inside duct - FR PVC / HFFR / LSZH Outer Sheath

Part Number		
XXX	OOO	CTA
XXX	Fiber Count	
OOO	Fiber Type	



### Typical Cross Section of 24 Fiber



### Cable Construction Details

- Up to 48 enhanced low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- Metallic anti-buckling steel rod as strength member. Embedded in outer sheath (also available with non-metallic strength member FRP rod)
- Loose buffer tube fully filled and centrally placed in the cable
- Water blocking tape wrapping
- Electrolyte chrome plated, corrugated steel tape armored
- UV Stabilized PE Outer sheath, black (also available with FR PVC & HFFR)

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
12F	8.3	75	1500	750	15D	20D	-10° to +50°C	-40° to +70°C
24F	9.8	100	1500	750	15D	20D	-10° to +50°C	-40° to +70°C
48 F	11.3	130	1500	750	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



For Fiber count more than 12F, bundles in multiple of 12F will be formed with color identification binder (Blue, Orange, Green & Brown)

### Special Features

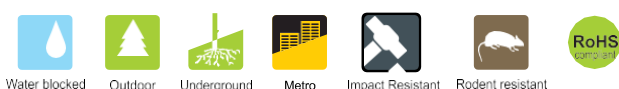
- Light weight cable for faster and easier installation
- Robust construction.
- Corrugated steel tape acts as protection against rodents and mechanical protection

### Mechanical Characteristics

Repeated Bending (IEC 60794-1-2-E6)	30 Cycle, r= 20 X D, 5 Kg Load, D = Cable D
Torsion Resistance (IEC 60794-1-2-E7)	10 Cycle (± 360°) 5 Kg Weight, L= 2 Mtr
Crush Resistance (IEC 60794-1-2-E3)	2000 N (100 X 100mm) for 600 sec
Impact Resistance (IEC 60794-1-2-E4)	Height 500 mm, Weight = 5 Kg, 3 Nos
Kink Resistance (IEC 60794-1-2-E10)	10 x D, D = Cable D
Water Penetration (IEC 60794-1-2-F5B)	1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours

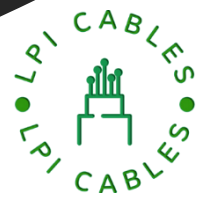
### Drum Length

2000/3000/4000 meters ± 5%



# OUTDOOR CABLES

## MULTI-TUBE SINGLE SHEATH ARMORED CABLE (2 - 144F)



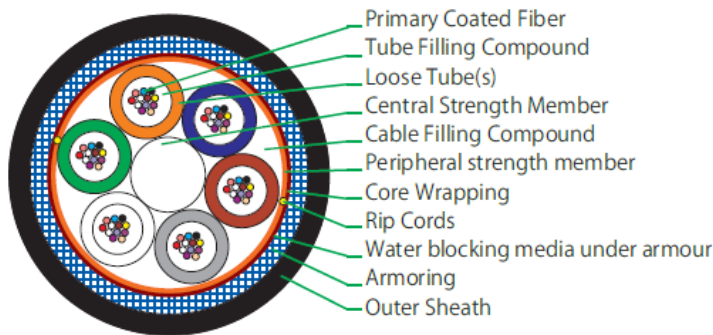
### Applications:

- In areas where high mechanical load is required
- Suitable in area of rodent menace
- Direct burial & Inside duct - PE Outer Sheath
- Inside duct - FR PVC / HFFR / LSZH Outer Sheath

Part Number		
XXX	OOO	MSA
XXX	Fiber Count	
OOO	Fiber Type	



### Typical Cross Section of 72 Fiber



### Cable Construction Details

- Up to 144 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- 2/4/6/8/12 fiber per tube combinations are available in 6/8/12 element construction
- Non-metallic anti-buckling FRP rod as Central Strength Member. (also available with metallic strength member)
- Cable core fully filled with Thixotropic gel (also available in dry core design)
- Glass yarn can be used as peripheral strength member
- Cable core is wrapped with polyester tape & water swellable tape
- Electrolytic chrome plated & Corrugated steel tape armoring
- UV Stabilized HDPE outer sheath, black (also available with FR PVC & HFFR)

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (Kg/km) Nominal	TENSILE STRENGTH(N)		BENDING RADIUS(mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 48F	10.9	120	2500	1250	15D	20D	-10° to +50°C	-40° to +70°C
72F	11.3	125	2500	1250	15D	20D	-10° to +50°C	-40° to +70°C
96F	12.6	155	2500	1250	15D	20D	-10° to +50°C	-40° to +70°C
144F	15.1	210	3000	1500	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



### Special Features

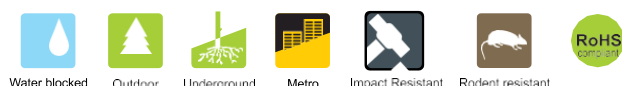
- Single layer S-Z stranded construction
- Corrugated steel tape acts as protection against rodents and mechanical damage.
- Robust construction
- Flexible buffer tubes provide easy fiber routing

### Drum Length

2000/3000/4000 meters ± 5%

### Mechanical Characteristics

- Repeated Bending (IEC 60794-1-2-E6) 30 Cycle, r= 20 X D, 5 Kg Load, D = Cable D
- Torsion Resistance (IEC 60794-1-2-E7) 10 Cycle (± 360°) 5 Kg Weight, L= 2 Mtr
- Crush Resistance (IEC 60794-1-2-E3) 3000 N (100 X 100mm) for 600 sec
- Impact Resistance (IEC 60794-1-2-E4) Height 500 mm, Weight = 5 Kg, 3 Nos
- Kink Resistance (IEC 60794-1-2-E10) 10 x D, D = Cable D

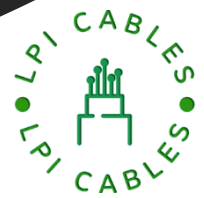


Water Penetration (IEC 60794-1-2-F5B) 1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours



# OUTDOOR CABLES

## MULTI-TUBE DOUBLE SHEATHED ARMORED CABLE (12-144)



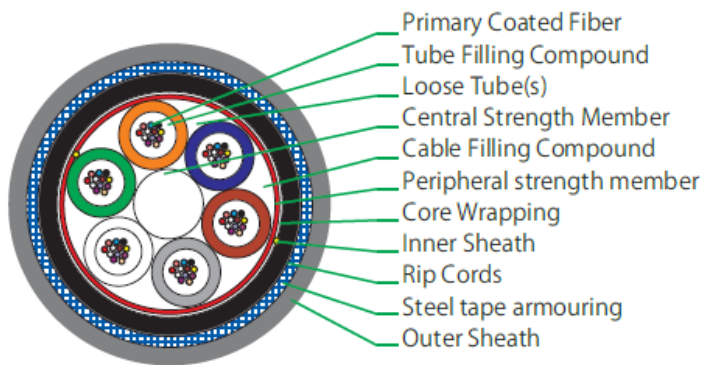
Part Number		
XXX	OOO	MDA
XXX	Fiber Count	
OOO	Fiber Type	

### Applications:

- In areas where high mechanical load is required
- Suitable in area of rodent menace
- Direct burial & Inside duct - PE Outer Sheath
- Inside duct - FR PVC / HFFR / LSZH Outer Sheath



### Typical Cross Section of 72 Fiber



### Cable Construction Details

- Up to 144 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- 2/4/6/8/12 fiber per tube combinations are available in 6/8/12 element construction
- Non-metallic anti-buckling FRP rod as Central Strength Member (also available with metallic strength member)
- Loose buffer tubes fully filled, S-Z Stranded
- Cable core fully filled with gel (also available in dry core design)
- Glass yarn can be used as peripheral strength member
- S-Z core wrapped with polyester tape /water swellable tape
- Electrolytic chrome plated & Corrugated steel tape armoring
- UV Stabilized HDPE outer sheath, black (also available with FR PVC & HFFR)

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 48F	12.6	155	2750	1375	15D	20D	-10° to +50°C	-40° to +70°C
72F	13.0	165	2750	1375	15D	20D	-10° to +50°C	-40° to +70°C
96F	14.3	195	2750	1375	15D	20D	-10° to +50°C	-40° to +70°C
144F	16.8	260	3350	1625	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



### Special Features

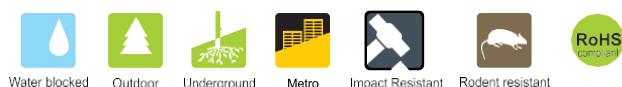
- Single layer S-Z stranded construction
- Corrugated steel tape acts as protection against rodents and mechanical damage.
- Robust construction
- Flexible buffer tubes provide easy fiber routing inside closure

### Drum Length

2000/3000/4000 meters ± 5%

### Mechanical Characteristics

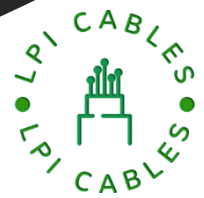
- Repeated Bending (IEC 60794-1-2-E6) 30 Cycle, r= 20 X D, 10 Kg Load, D = Cable D
- Torsion Resistance (IEC 60794-1-2-E7) 10 Cycle (± 360°) 10Kg Weight, L= 2 Mtr
- Crush Resistance (IEC 60794-1-2-E3) 4000 N (100 X 100mm) for 600 sec
- Impact Resistance (IEC 60794-1-2-E4) Height 500 mm, Weight = 5 Kg, 10 Nos
- Kink Resistance (IEC 60794-1-2-E10) 10 x D, D = Cable D



Water Penetration (IEC 60794-1-2-F5B) 1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours

# OUTDOOR CABLES

## DIELECTRIC RODENT PROTECTED CABLE (2-144 F)



### Applications:

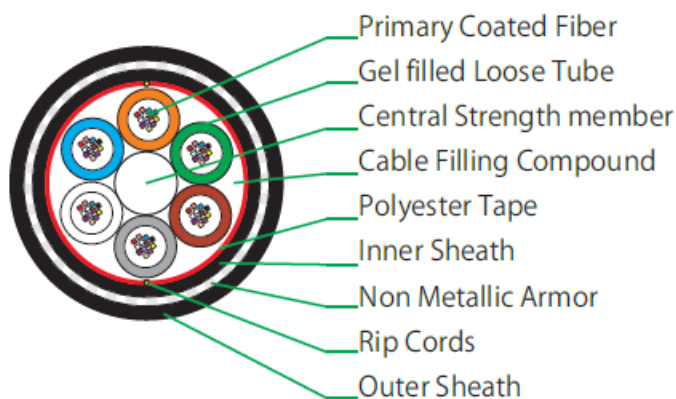
- Direct burial / Inside Duct
- In areas with particularly high mechanical loads
- In areas with rodents

### Part Number

XXX	OOO	DRP
XXX	Fiber Count	
OOO	Fiber Type	



### Typical Cross Section of 72 Fiber



### Cable Construction Details

- Up to 144 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- 2/4/6/8/12 fiber per tube combinations are available in 6/8/12 element construction
- Non-metallic and anti-buckling element FRP rod used as Central Strength Member.
- Loose buffer tubes fully filled Thixotropic gel
- Loose buffer tubes S-Z Stranded
- Cable core is fully filled with Thixotropic gel (also available in dry core design)
- Cable core is wrapped with Polyester Tape / Water swellable tape
- UV Stabilized PE inner sheath, Black
- Glass Yarns used as dielectric armor
- UV Stabilized PE outer sheath, Black

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 48F	12.6	135	3000	2000	15D	20D	-10° to +50°C	-40° to +70°C
72F	13.0	160	3000	2000	15D	20D	-10° to +50°C	-40° to +70°C
96F	14.3	195	3000	2000	15D	20D	-10° to +50°C	-40° to +70°C
144F	16.8	270	3000	2000	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



### Special Features

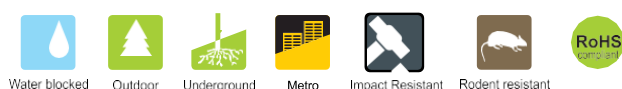
- Single layer stranded construction
- Particularly robust cable
- Flexible buffer tubes provide easy fiber routing
- All dielectric armored

### Mechanical Characteristics

- Repeated Bending (IEC 60794-1-2-E6) 30 Cycle, r= 20 X D, 5 Kg Load, D = Cable D
- Torsion Resistance (IEC 60794-1-2-E7) 10 Cycle (± 360°) 5 Kg Weight, L= 2 Mtr
- Crush Resistance (IEC 60794-1-2-E3) 2500 N (100 X 100mm) for 600 sec
- Impact Resistance (IEC 60794-1-2-E4) Height 500 mm, Weight = 5 Kg, 3 Nos
- Kink Resistance (IEC 60794-1-2-E10) 10 x D, D = Cable D
- Water Penetration (IEC 60794-1-2-F5B) 1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours

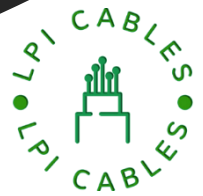
### Drum Length

2000/3000/4000 meters ± 5%



# OUTDOOR CABLES

## MULTI-TUBE STEEL WIRE ARMORED CABLE (2-144 F)



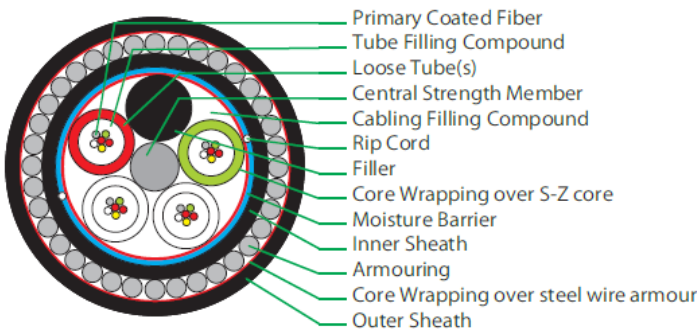
Part Number		
XXX	OOO	MSW
XXX	Fiber Count	
OOO	Fiber Type	

### Applications:

- In areas where high pulling force is required
- In areas where complex cable run is required
- Direct burial & Inside duct - PE Outer Sheath
- Inside duct - FR PVC / HFFR / LSZH Outer Sheath



### Typical Cross Section of 48 Fiber



### Cable Construction Details

- Up to 144 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- Phosphate coated metallic anti-buckling steel rod as central strength member (also available with non-metallic strength member, FRP rod)
- 2/4/6/8/12 fiber per tube combinations are available in 5/6/8/12 element constructions
- Loose buffer tubes fully filled S-Z Stranded
- Cable core fully filled with gel
- PE coated Aluminum foil as moisture barrier
- UV Stabilized PE inner sheath, black
- Galvanized Steel wire armor, wrapped with polyester tape
- UV stabilized HDPE outer sheath, black (also available with FR PVC & HFFR)

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (Kg/km) Nominal	TENSILE STRENGTH(N)		BENDING RADIUS(mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 60F	14.5	350	6000	3000	15D	20D	-10° to +50°C	-40° to +70°C
72F	15.0	375	6000	3000	15D	20D	-10° to +50°C	-40° to +70°C
96F	17.0	425	6000	3000	15D	20D	-10° to +50°C	-40° to +70°C
144F	18.7	520	10000	5000	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



### Special Features

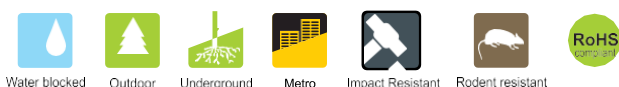
- Single layer S-Z stranded construction.
- Phosphate coating over steel wire CSM prevent Hydrogen generation.
- Aluminum Foils provides excellent protection against Moisture.
- Rugged & robust design

### Mechanical Characteristics

- Repeated Bending (IEC 60794-1-2-E6) 30 Cycle, 20 X D, 10 Kg Load, D = Cable D
- Crush Resistance (IEC 60794-1-2-E3) 6000 N (100 X 100 mm) for 600 sec
- Impact Resistance (IEC 60794-1-2-E4) Height 500 mm, Weight = 5 Kg, 10 Nos at Different Place
- Kink Resistance (IEC 60794-1-2-E10) 20 x D, D = Cable D
- Water Penetration (IEC 60794-1-2-F5B) 1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours

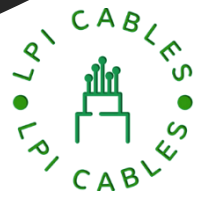
### Drum Length

2000/3000/4000 meters ± 5%



# OUTDOOR CABLES

## MULTI-TUBE FRP ROD ARMORED CABLE (2-144 F)



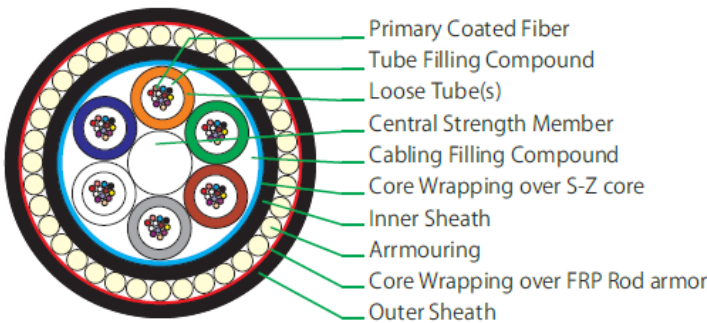
Part Number		
XXX	OOO	MFR
XXX	Fiber Count	
OOO	Fiber Type	

### Applications:

- In areas where high pulling force is required
- In areas where complex cable run is required
- Direct burial & Inside duct - PE Outer Sheath
- Inside duct - FR PVC / HFFR / LSZH Outer Sheath



### Typical Cross Section of 72 Fiber



### Cable Construction Details

- Up to 144 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- 2/4/6/8/12 fiber per tube combinations are available in 6/8/12 element construction
- Non-metallic anti-buckling FRP rod as Central Strength Member.
- Loose buffer tubes fully filled, S-Z Stranded
- Cable core is fully filled with Thixotropic gel (also available in dry core design)
- Cable core is wrapped with Polyester Tape and water swellable tape
- UV Stabilized PE inner sheath, black
- FRP rods for armoring
- UV stabilized PE outer sheath, black (also available with FR PVC & HFFR)

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 60F	14.0	180	5000	2500	15D	20D	-10° to +50°C	-40° to +70°C
72F	15.0	210	5000	2500	15D	20D	-10° to +50°C	-40° to +70°C
96F	16.5	240	5000	2500	15D	20D	-10° to +50°C	-40° to +70°C
144F	18.7	340	5000	2500	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



### Special Features

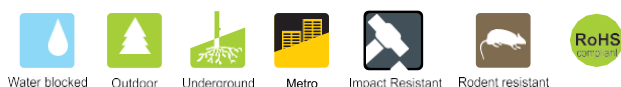
- Single layer S-Z stranded construction.
- Completely dielectric construction.
- Rugged & robust design.

### Drum Length

2000/3000/4000 meters ± 5%

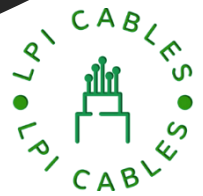
### Mechanical Characteristics

- Repeated Bending (IEC 60794-1-2-E6) 30 Cycle, 20 X D, 10 Kg Load, D = Cable D
- Torsion Resistance (IEC 60794-1-2-E7) 10 Cycle (± 360°) 5 Kg Weight, L= 2 Mtr
- Crush Resistance (IEC 60794-1-2-E3) 3000 N (100 X 100mm) for 600 sec
- Impact Resistance (IEC 60794-1-2-E4) Height 500 mm, Weight = 5 Kg, 10 Nos at Different Place
- Kink Resistance (IEC 60794-1-2-E10) 20 x D, D = Cable D
- Water Penetration (IEC 60794-1-2-F5B) 1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours



# OUTDOOR CABLES

## MULTI-TUBE RIBBON TYPE CABLE (48-576 F)



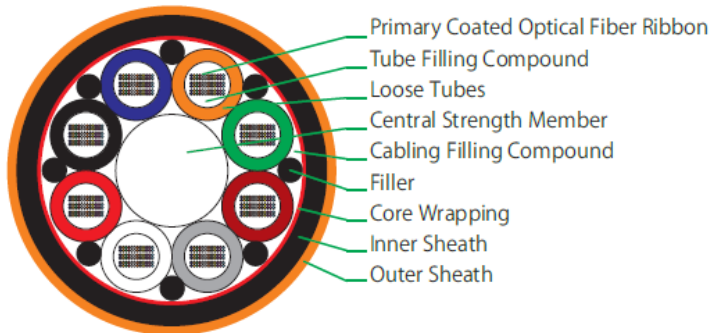
Part Number		
XXX	OOO	MRT
XXX Fiber Count		
OOO Fiber Type		

### Applications:

- Suitable for Duct Installation, pulled & blown



### Typical Cross section of 288 Fiber



### Cable Construction Details

- Up to 576 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D in 4/8/12 Fiber Ribbon (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- Non-metallic and anti-buckling FRP rod as Central Strength Member
- Loose buffer tubes fully filled, S-Z Stranded
- Cable core is fully filled with Thixotropic gel (also available in dry core design)
- S-Z core wrapped with polyester tape/water swellable tape
- UV Stabilized PE Inner sheath, Black
- Insect & termite resistance PA-12 outer sheath, Orange

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 60F	19.0	280	3000	1500	15D	20D	-10° to +50°C	-40° to +70°C
72F	20.5	340	3000	1500	15D	20D	-10° to +50°C	-40° to +70°C
96F	24.0	525	3000	1500	15D	20D	-10° to +50°C	-40° to +70°C
144F	30.0	740	3000	1500	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



\*Identification of ribbon in loose tube - 1 ribbon 1, 2 ribbon 2, 3 ribbon 3.....

### Special Features

- Single layer S-Z stranded construction
- Flexible buffer tubes provide easy fiber routing inside closure
- Insect & Termite resistant

### Drum Length

2000/3000/4000 meters ± 5%

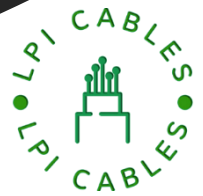
### Mechanical Characteristics

- Repeated Bending (IEC 60794-1-2-E6) 30 Cycle, r= 20 X D, 10 Kg Load, D = Cable D
- Torsion Resistance (IEC 60794-1-2-E7) 10 Cycle (± 360°) 10 Kg Weight, L= 2 Mtr
- Crush Resistance (IEC 60794-1-2-E3) 2500 N (100 X 100 mm) for 600 sec
- Impact Resistance (IEC 60794-1-2-E4) Height 500 mm, Weight = 5 Kg, 3 Nos
- Kink Resistance (IEC 60794-1-2-E10) 10 x D, D = Cable D
- Water Penetration (IEC 60794-1-2-F5B) 1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours



# OUTDOOR CABLES

## ALL DI-ELECTRIC SELF SUPPORTING AERIAL CABLE (2-144 F)



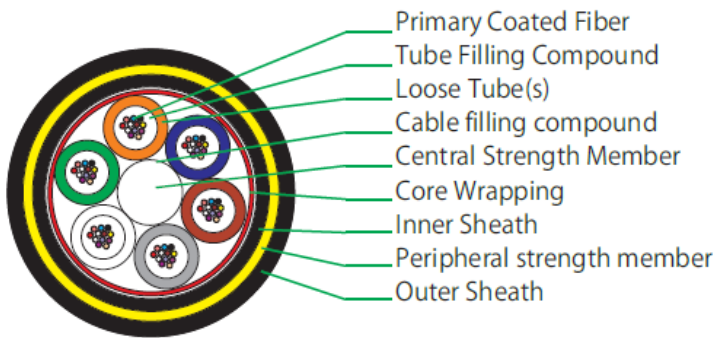
Part Number		
XXX	OOO	SSA
XXX	Fiber Count	
OOO	Fiber Type	

### Applications:

- Suitable for self-supporting aerial installation with rigorous load conditions, including heavy wind and ice
- Suitable for span length of 100 m (also available for other span length)



### Typical Cross Section of 72Fiber



### Cable Construction Details

- Up to 144 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- Non-metallic anti-buckling FRP rod as Central Strength Member
- Loose buffer tubes fully filled, S-Z Stranded
- Cable core fully filled (also available in dry core design)
- Cable core is wrapped with Polyester Tape/water swellable tape
- UV Stabilized PE inner sheath, Black
- High modulus, Aramid yarn peripheral strength member
- UV Stabilized PE Outer sheath, Orange

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (Kg/km) Nominal	TENSILE STRENGTH(N)		BENDING RADIUS(mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 48F	12.5	125	5000	2000	15D	20D	-10° to +50°C	-40° to +70°C
Up to 72F	13.5	145	5000	2000	15D	20D	-10° to +50°C	-40° to +70°C
96F	15.0	180	5000	2000	15D	20D	-10° to +50°C	-40° to +70°C
144F	18.0	250	5000	2000	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



### Special Features

- Single layer S-Z stranded construction
- Offers exceptional strength and corrosion resistance for aerial application
- Flexible buffer tubes provide easy fiber routing inside closure

### Drum Length

2000/3000/4000 meters ± 5%

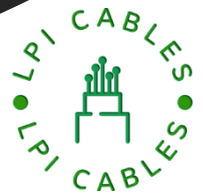
### Mechanical Characteristics

Repeated Bending (IEC 60794-1-2-E6)	30 Cycle, 20 X D, 5 Kg Load, D = Cable D
Torsion Resistance (IEC 60794-1-2-E7)	10 Cycle (± 180°) 5 Kg Weight, L= 2 Mtr
Crush Resistance (IEC 60794-1-2-E3)	3000 N (100 X 100 mm) for 600 sec
Impact Resistance (IEC 60794-1-2-E4)	Height 500 mm, Weight = 5 Kg, 3 Nos
Kink Resistance (IEC 60794-1-2-E10)	20 x D, D = Cable D
Water Penetration (IEC 60794-1-2-F5B)	1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours



# OUTDOOR CABLES

## SINGLE-TUBE FIGURE-8 TYPE AERIAL CABLE (2-24 F)



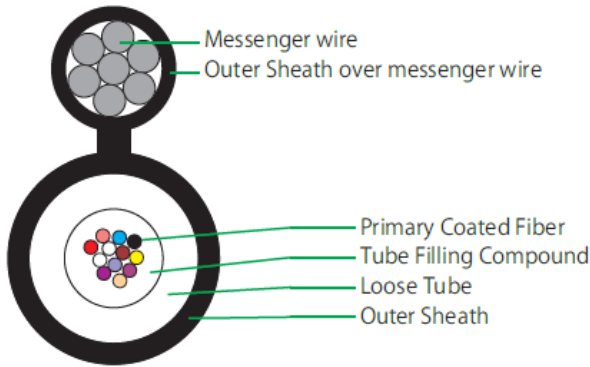
### Applications:

- Lashed aerial installation with rigorous load conditions, including heavy wind and ice
- Suitable for span length of 100 m

Part Number		
XXX	OOO	S8A
XXX	Fiber Count	
OOO	Fiber Type	



### Typical Cross Section of 12 Fiber



### Cable Construction Details

- Up to 48F enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- Loose buffer tubes fully filled
- High tensile, galvanized, stranded steel wire used as integrated messenger wire
- UV Stabilized PE outer sheath, black

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 12F	6.5x6.0	100	2000	1000	15D	20D	-10° to +50°C	-40° to +70°C
16/24F	7.5x6.0	110	2000	1000	15D	20D	-10° to +50°C	-40° to +70°C
48 F	10.0x6.0	150	2000	1000	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



\*For Fiber count more than 12F, bundles in multiple of 12F will be formed with color identification binder (Blue, Orange, Green & Brown)

### Special Features

- Central Loose-Tube construction
- Offers exceptional strength and corrosion resistance for aerial application
- Integrated High tensile messenger for superior strength and corrosion resistance.

### Drum Length

2000/3000/4000 meters ± 5%

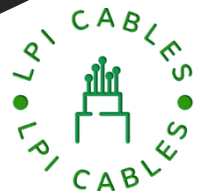
### Mechanical Characteristics

Repeated Bending (IEC 60794-1-2-E6)	30 Cycle, 20 X D, 10 Kg Load, D = Cable D
Torsion Resistance (IEC 60794-1-2-E7)	10 Cycle (± 180°) 5 Kg Weight, L= 2 Mtr
Crush Resistance (IEC 60794-1-2-E3)	1000 N (100 X 100 mm) for 600 sec
Impact Resistance (IEC 60794-1-2-E4)	Height 500 mm, Weight = 5 Kg, 3 Nos
Kink Resistance (IEC 60794-1-2-E10)	20 x D, D = Cable D
Water Penetration (IEC 60794-1-2-F5B)	1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours



# OUTDOOR CABLES

## MULTI-TUBE FIGURE-8 TYPE AERIAL CABLE (2-144 F)



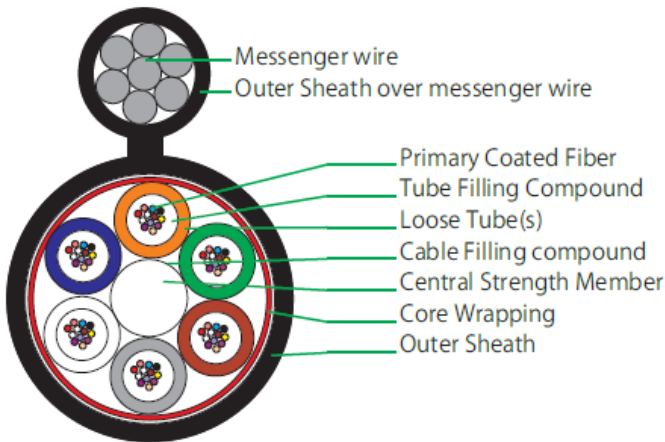
Part Number		
XXX	OOO	M8A
XXX	Fiber Count	
OOO	Fiber Type	

### Applications:

- Lashed aerial installation with rigorous load conditions, including heavy wind and ice
- Suitable for span length of 100 m



### Typical Cross Section of 72 Fiber



### Cable Construction Details

- Up to 144 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- (also available with G655 / G656 / G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- Non-metallic anti-buckling FRP rod as Central Strength Member.
- Loose buffer tubes fully filled, S-Z Stranded
- —Cable core fully filled (also available in dry core)
- —S-Z core wrapped with polyester tape / water swelleble tape
- UV Stabilized PE outer sheath, black
- High tensile, galvanized, stranded steel wire used as integrated messenger wire

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 12F	10.6/6.5	170	6000	2500	15D	20D	-10° to +50°C	-40° to +70°C
24F	12.3/6.5	200	8000	4000	15D	20D	-10° to +50°C	-40° to +70°C
48 F	14.7/6.5	250	9000	5000	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



### Special Features

- Single layer S-Z stranded construction
- Offers exceptional strength and corrosion resistance for aerial application
- Integrated High tensile messenger for superior strength and corrosion resistance.
- Flexible buffer tubes provide easy fiber routing inside closure

### Drum Length

2000/3000/4000 meters ± 5%

### Mechanical Characteristics

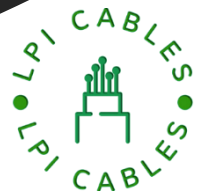
Repeated Bending (IEC 60794-1-2-E6)	30 Cycle, 20 X D, 5 Kg Load, D = Cable D
Torsion Resistance (IEC 60794-1-2-E7)	10 Cycle (± 180°) 5 Kg Weight, L= 2 Mtr
Crush Resistance (IEC 60794-1-2-E3)	2000 N (100 X 100 mm) for 600 sec
Impact Resistance (IEC 60794-1-2-E4)	Height 500 mm, Weight = 5 Kg, 3 Nos
Kink Resistance (IEC 60794-1-2-E10)	20 x D, D = Cable D
Water Penetration (IEC 60794-1-2-F5B)	1 Mtr Water Head, 3 Meter Cable Sample, 24 Hours





# OUTDOOR CABLES

## HYBRID (OPTICAL & COPPER)



### Applications:

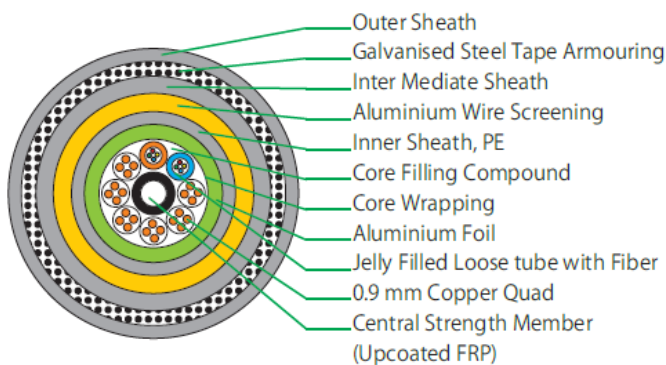
- Suitable for Under Ground Armored Cable Up to 24F
- Signaling

### Part Number

XXX	OOO	HUA
XXX	Fiber Count	
OOO	Fiber Type	



### Typical Cross Section of Hybrid Cable



### Cable Construction Details

Central Strength Member	Up-coated Fiber Reinforced Plastic-FRP (Non-metallic)
Loose tube	2 No. PBT Loose tube filled with Thixotropic gel
No. of Quads	6 Quads with Identification binders
Core wrapping	Polyester Tape applied helically
Moisture Barrier	Aluminum Foil
Inner Sheath	PE Inner Sheath
Screening	Aluminum wire screening
Tape	Barium Chromate Tape PE
Intermediate Sheath	Intermediate Sheath
Armoring	Double Steel tape armoring PE
Outer Sheath	Outer Sheath

### Color Coding-Fiber



### Special Features

- Suitable for underground installation on pathways or roads
- Rodent & Termite proof.
- Robust under all conditions of operation, adjustment, replacement, storage and transport.
- Suitable for lightning prone areas
- Better tensile strength

### Physical Characteristics

Cable Outer Diameter: 30.0 + 4.0 mm

Nominal Cable Weight: 1500 Kg/km

### Drum Length

1000 meters ± 5%

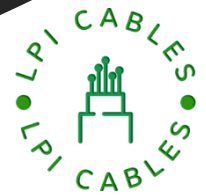
### Mechanical Characteristics

Tensile strength	:	5000 N
Cable Bend Test	:	20D
Repeated Bending test	:	5 kg, 30 Cycles
Torsion Test	:	400 N
Crush Resistance	:	4000 N, 600 Sec
Impact Test	:	50 N, 10 Impact
Kink Test	:	20 D
Operating Temp.	:	200C to +700C
Water Penetration Test	:	3mtrs sample, 1mtr Height

### Color Coding for Quad

- No1 - White, Orange, Red, Green
- No2 - White, Blue, Red, Green
- No3 - White, Brown, Red, Green
- No4 - White, Green, Red, Green
- No5 - White, Yellow, Red, Green
- No6 - White, Black, Red, Green





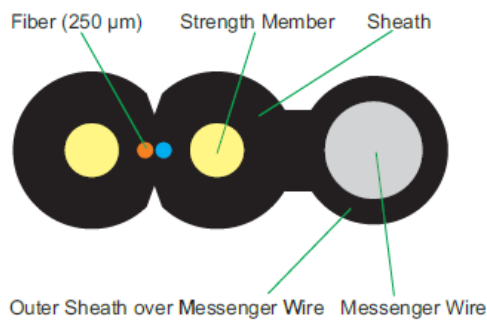
Part Number		
XXX	OOO	ODC
XXX Fiber Count		
OOO Fiber Type		

### Applications:

- Drop Cable suitable for aerial application.



### Typical Cross Section of 2 Fiber



### Cable Construction Details

- Up to 2 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- FRP / ARP rod as strength member
- Steel wire as integrated messenger wire
- LSZH sheath

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
2F	2.0x5.0	20	130	50	30	50	-20° to +50°C	-40° to +70°C

### Color Coding-Fiber

Blue Orange

### Special Features

- Easy access to the fibers
- Quick Cable Entry & Easy-Peel
- Easy Seal in Closures
- Low insertion and back reflection loss
- Good durability
- High Return Loss—
- High temperature stability
- Clean, Gel-Free, Dry Design

### Mechanical Characteristics

Torsion Resistance (IEC 60794-1-2-E11)	50 N (± 180°) 10 Cycles
Impact Resistance (IEC 60794-1-E4)	Height 1 m, Weight = 0.3 Kg, 3 Nos at different location

### Drum Length

500 meters ± 5%



Indoor



Aerial



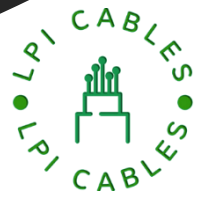
Metro



RoHS

# FTTH / INDOOR CABLES

## INDOOR DROP CABLE (1/2 F)



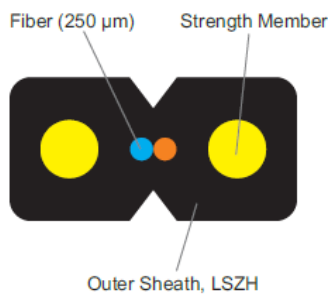
Part Number		
XXX	OOO	IDC
XXX Fiber Count		
OOO Fiber Type		

### Applications:

- Low bending Cable suitable for Indoor Application.



### Typical Cross Section of 2 Fiber



### Cable Construction Details

- Up to 2 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- FRP / ARP rod as strength member
- LSZH sheath

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
2F	2.0x5.0	20	130	50	30	50	-20° to +50°C	-40° to +70°C

### Color Coding-Fiber



### Special Features

- Easy access to the fibers
- Fast Installation
- Quick Cable Entry & Easy-Peel
- Easy Seal in Closures
- Maximization of Duct Space
- Flame Retardant Sheath
- Good durability
- Clean, Gel-Free, Dry Design

### Mechanical Characteristics

Torsion Resistance (IEC 60794-1-2-E11)  
Impact Resistance (IEC 60794-1-E4)

40 N (± 180°) 10 Cycles

Height 1 mtr., Weight = 0.3 Kg, 3 Nos at different location

### Drum Length

500 meters ± 5%



Indoor



Flame resistant



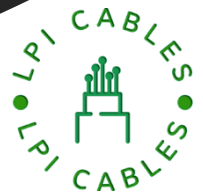
Metro



RoHS

# FTTH CABLES

## CENTRAL-TUBE AIRBLOWN MICRO CABLE (2-12F)



### Applications:

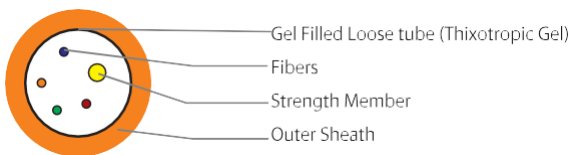
- Inside building, suitable for Indoor use

### Part Number

XXX	OOO	CMC
XXX	Fiber Count	
OOO	Fiber Type	



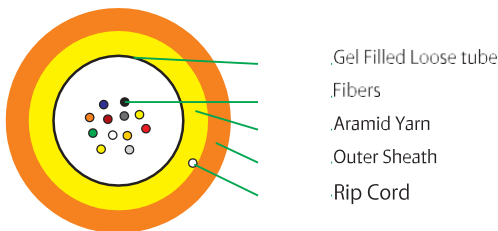
### Typical Cross Section Of 4 F Air Blown Cable



### Cable Construction Details

- Up to 4 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber)
- Loose buffer tube fully filled
- ARP/KRP/FRP rod as a strength member inside the loose tube
- Insect & Termite resistance PA-12 outer sheath, Orange

### Typical Cross Section Of 12f Unitube MicroCable



### Cable Construction Details (Available in 2.5mm)

- Up to 12 enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G655 / G656 / G657 SM Fiber)
- Loose buffer tubes fully filled
- Aramid yarns as flexible peripheral strength member
- Rip cords for ripping outer jacket
- Insect & Termite resistance PA-12 outer sheath, Orange

### Technical Characteristics-Air Blown & Unitube Micro Cable

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (Kg/km) Nominal	TENSILE STRENGTH(N)		BENDING RADIUS(mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 12F	10.6/6.5	170	6000	2500	15D	20D	-10° to +50°C	-40° to +70°C
24F	12.3/6.5	200	8000	4000	15D	20D	-10° to +50°C	-40° to +70°C
48 F	14.7/6.5	250	9000	5000	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



### Special Features

- Completely dielectric cable / non-metallic cable immune to electromagnetic interferences
- Suitable for Micro duct Installation

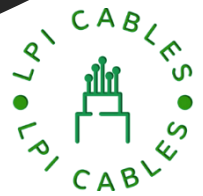
### Drum Length

2000/3000/4000 meters ± 5%

### Mechanical Characteristics

- Repeated Bending (IEC 60794-1-2-E6) 30 Cycle, 20 X D, 1 Kg Load, D = Cable Diameter
- Torsion Resistance (IEC 60794-1-2-E7) 2 Cycle (± 180°) 1 Kg Weight, L= 2 Mtr
- Kink Resistance (IEC 60794-1-2-E10) 15 x D, D = Cable D





### Part Number

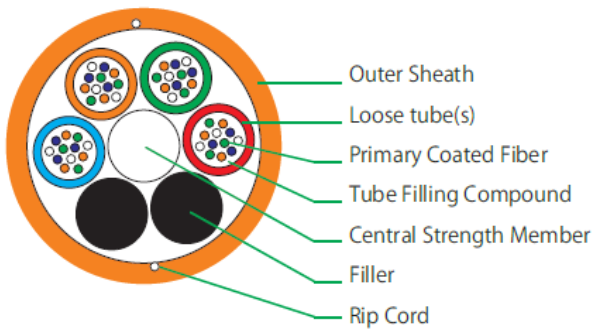
XXX	OOO	MTM
XXX	Fiber Count	
OOO	Fiber Type	

### Applications:

- Suitable for installation in Micro Duct



### Typical Cross section of 48 Fiber



### Cable Construction Details

- Up to 144 fibers in full compliance with ITU-T-G 652 D (also available with G655 / G656 / G657 SM Fiber and OM1 OM2 / OM3 & OM4 MM Fiber)
- Non-metallic, anti-buckling FRP rod as Central Strength Member (PE upcoated for 144 F)
- Loose buffer tubes fully filled, S-Z Stranded
- Rip cords for easy stripping
- Insect and Termite resistant PA-12 outer sheath, Orange (also available with PE outer sheath)

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 72F	5.7	27	650	400	15D	20D	-20° to +50°C	-40° to +70°C
96F	6.8	45	1500	1000	15D	20D	-20° to +50°C	-40° to +70°C
144F	9.5	70	1500	1000	15D	20D	-20° to +50°C	-40° to +70°C

### Color Coding-Fiber



### Special Features

- Completely dielectric cable / non-metallic cable immune to electromagnetic interferences
- High level bend capacity
- Low friction jacket design
- Easy access and breakout of Fibers

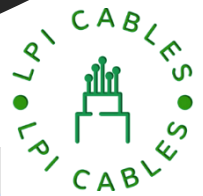
### Mechanical Characteristics

Repeated Bending (IEC 60794-1-2-E6)	30 Cycle, 20 X D, 1 Kg Load, D = Cable Diameter
Torsion Resistance (IEC 60794-1-2-E7)	2 Cycle (± 360°) 5 Kg Weight, L= 2 Mtr
Crush Resistance (IEC 60794-1-2-E3)	1000 N (100 X 100 mm) for 600 sec
Kink Resistance (IEC 60794-1-2-E10)	15 x D, D = Cable D

### Drum Length

2000/3000/4000 meters ± 5%



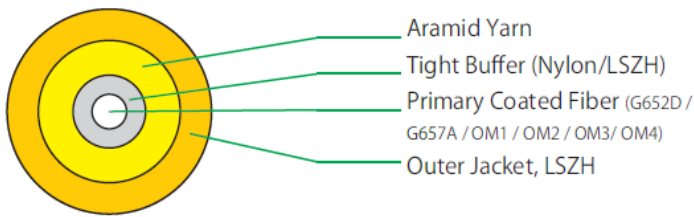


### Applications:

- Communication racks and wiring closets, walls, ceilings, floor ducts,
- —In the final connection to terminal devices such as workstation and computer terminals for high speed voice, video, data, and FTTx applications
- Short run office & computer room cabling
- Patch cords, Pigtails & Jumpers

Part Number		
XXX	000	OIC
XXX	Fiber Count	
000	Fiber Type	

### Typical Cross Section of Simplex

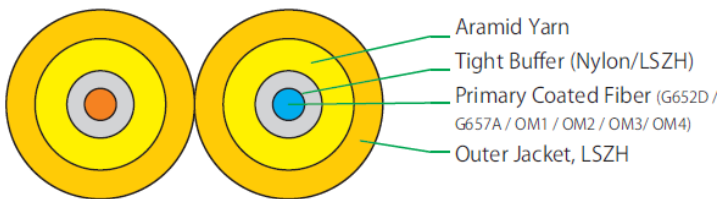


### Cable Construction Details - Simplex

- A single optical fiber is tight buffered and surrounded by aramid yarn strength member and jacketed with riser or plenum or LSZH grade jacketing to 2.0/3.0 mm diameter.



### Typical Cross Section of Duplex

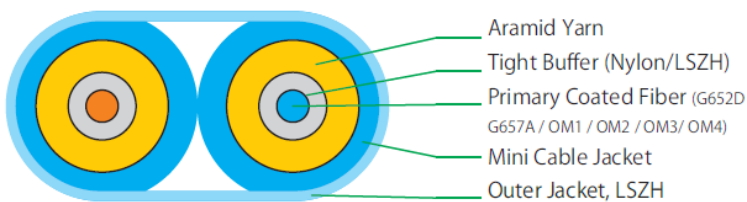


### Cable Construction Details - Duplex

- Two Simplex cables 2.0/3.0 mm are joined as a figure-8



### Typical Cross Section of Flat Twin



### Cable Construction Details - Flat Twin

- Duplex Zip cable (2.0/3.0 mm) is jacketed with riser, plenum or LSZH grade jacketing.



### Drum Length

1000/2000 meters ± 5%



Indoor



Flame resistant



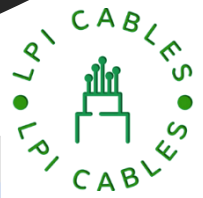
Metro



RoHS

# FTTH / Indoor Cables

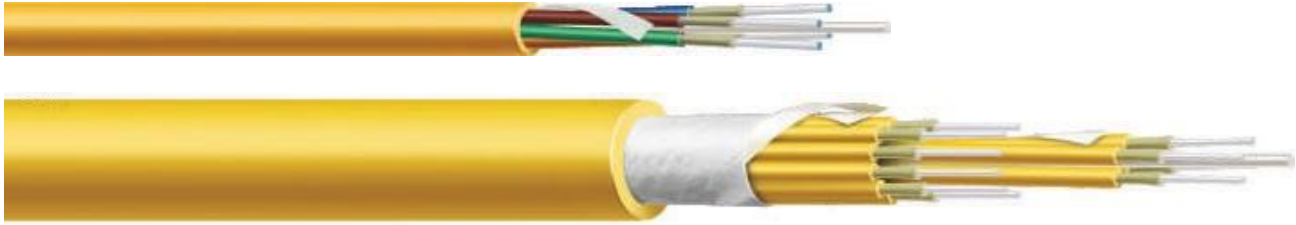
## BREAKOUT TIGHT BUFFER UNARMORED OPTICAL FIBER CABLE (2-16F)



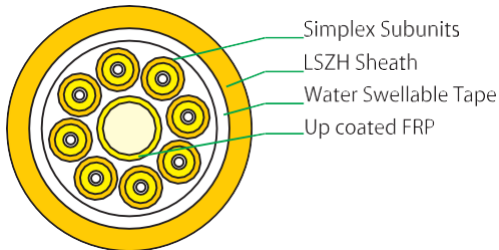
Part Number		
XXX	OOO	BBU
XXX	Fiber Count	
OOO	Fiber Type	

### Applications:

- Rugged multi fiber cross connect-
- Intra building backbone
- Fiber backbone to communication closets



### Typical Cross Section of 8F



### Cable Construction Details

- 4/6/8/12/16 Fiber of Single mode fiber in full compliance with ITU-T G652D (also available with G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- FRP and Aramid Yarns as Strength Member
- PA-12 tight coating on Fiber
- LSZH Compound for sheathing for simplex subunits & outer sheath of cable

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
4F	8.0	60	800	400	15D	20D	-20° to +50°C	-40° to +70°C
6F	9.0	79	800	400	15D	20D	-20° to +50°C	-40° to +70°C
8F	10.2	95	800	400	15D	20D	-20° to +50°C	-40° to +70°C
12F	12.0	120	800	400	15D	20D	-20° to +50°C	-40° to +70°C
16F	13.5	150	800	400	15D	20D	-20° to +50°C	-40° to +70°C

### Special Features

- Individual cores are printed at every 200 mm for identification
- Tight buffer & simplex jacket are available in variety of colors.
- Easy access to the fibers
- Quick Cable Entry

### Mechanical Characteristics

- Torsion Resistance (IEC 60794-1-2-E7) 2 Cycle ( $\pm 360^\circ$ ) 1 Kg Weight, L= 2 Mtr
- Crush Resistance (IEC 60794-1-2-E3) 1000 N (100 X 100 mm) for 60 sec
- Kink Resistance (IEC 60794-1-2-E10) 15 x D, D = Cable D

### Drum Length

1000 meters  $\pm$  10%



Indoor



Flame resistant



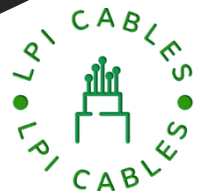
Metro



RoHS

# FTTH / Indoor Cables

## FANOUT TIGHT BUFFER UNARMORED OPTICAL FIBER CABLE (2-48F)



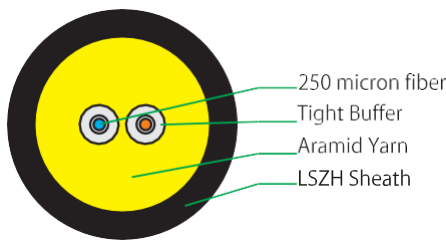
Part Number		
XXX	OOO	FBU
XXX	Fiber Count	
OOO	Fiber Type	

### Applications:

- Rugged multi fiber cross connect
- Intra building backbone
- Fiber backbone to communication closets



### Typical Cross section of 2F



### Cable Construction Details

- Up to 48 Fiber of Single mode fiber in full compliance with ITU-T G652D (also available with G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- Aramid Yarns as Strength Member
- PA-12 / LSZH tight coating on Fiber
- LSZH Compound for outer sheathing

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
Up to 6F	5.0	25	500	300	15D	20D	-10° to +50°C	-40° to +70°C
12/24F	6.8	32	500	300	15D	20D	-10° to +50°C	-40° to +70°C
36/48F	16.5	215	2000	1000	15D	20D	-10° to +50°C	-40° to +70°C

### Color Coding-Fiber



\* For Fiber count more than 12F, bundles in multiple of 9/12F will be formed with color identification binder (Blue, Orange, Green & Brown)

### Special Features

- Tight buffer & jacket are available in variety of colors.
- Easy access to the fibers
- Quick Cable Entry---

### Mechanical Characteristics

Torsion Resistance (IEC 60794-1-2-E7) 2 Cycle ( $\pm 360^\circ$ ) 1 Kg Weight, L= 2 Mtr  
 Crush Resistance (IEC 60794-1-2-E3) 1000 N (100 X 100 mm) for 600 sec

### Drum Length

1000 meters + 10%



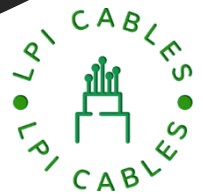


# OUTDOOR CABLES

## STAINLESS STEEL WIRE ARMORED TACTICAL CABLE

### FOR MILITARY APPLICATION

#### Tactical Optical Fiber Cables



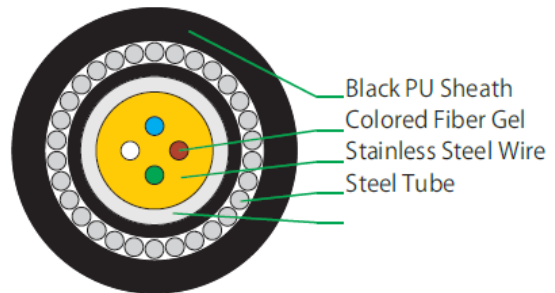
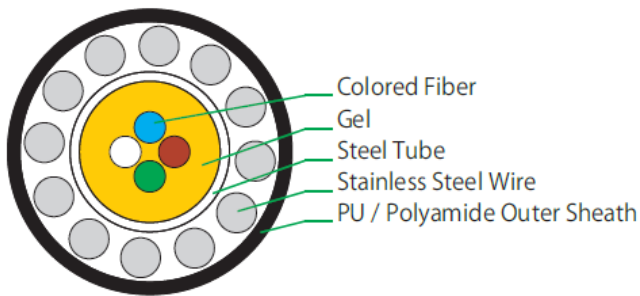
Part Number		
XXX	OOO	SST
XXX	Fiber Count	
OOO	Fiber Type	

#### Applications:

- Indoor/Outdoor
- Suitable for rapid deployment in extreme environmental conditions
- For military application
- Temporary robust communication lines and mobile applications with rodent protection



#### Typical Cross Section of 48 Fiber



#### Technical Characteristics

Fiber Count	SHEATH	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
				Temporary	Permanent	Installation	Operating
Up to 6F	Double Sheath	6.0	70	15D	20D	-10° to +50°C	-40° to +70°C
12F	Double Sheath	8.0	95	15D	20D	-10° to +50°C	-40° to +70°C
Up to 6F	Single Sheath	9.5	45	15D	20D	-10° to +50°C	-40° to +70°C

#### Color Coding-Fiber



#### Special Features

- Cut resistant, Polyurethane outer jacket
- Flexible construction for multiple deployment
- Performance in wide temp range
- High permissible tensile strength
- Excellent protection against rodents and termite
- Durable in high traffic areas
- Ruggedized cable and easy to use in the field
- High impact and crush resistance

#### Mechanical Characteristics

Tensile Strength	900 N max.
Crush Strength	1000 N/cm
Impact Resistance	200 (Min.)
Flex Resistance	2000 Cycle (Min.)
Storage Temperature	-30° C to +65°C
Breaking Load	>3500 N
Water Pressure	>500 Bar

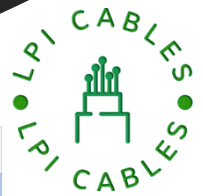
#### Drum Length

500/ 100/ 2000 meters ± 5%



# OUTDOOR CABLES

## FIBER TO ANTENNA, FTTA SOLUTIONS FOR RADIO BASED STATIONS



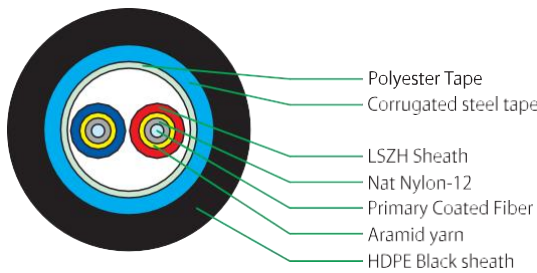
Part Number		
XXX	OOO	FTA
XXX Fiber Count		
OOO Fiber Type		

### Applications:

- For connection of radio-based stations



### Typical Cross section of 48 Fiber



### Cable Construction Details

- Enhance low water peak single mode fibers in full compliance with ITU-T-G.652.D (also available with G657 SM Fiber and OM1 / OM2 / OM3 & OM4 MM Fiber)
- Tight coated fiber with Ny-12/LSZH—
- Aramid Yarn over tight coated fiber
- LSZH Sheath over Aramid yarn
- Polyester tape wrapping
- Corrugated Steel tape armoring
- Outer Sheath of UV resistant PE, Black

### Technical Characteristics

Fiber Count	DIAMETER (mm) Nominal	WEIGHT (kg/km) Nominal	TENSILE STRENGTH (N)		BENDING RADIUS (mm)		TEMPERATURE RANGE (IEC 60794-1-2-F1)	
			Installation	Operating	Temporary	Permanent	Installation	Operating
2F	8.5	70	350	300	15D	20D	-20° to +50°C	-40° to +70°C

### Special Features

- Fiber-fed remote radios (RRs) offer significant power savings
- Reduces wind and weight load on towers; avoid costly tower upgrades.
- —Reduces installation cost through fewer cables sheaths (70% less) compared to coax.
- Reduces installation time through fewer cable sheaths.
- Fast and easy connection and upgrade via tower-top terminal.
- Pre-provision for future equipment additions (spare ports).
- Ruggedized cable with corrugated steel tape armored providing termite resistance, protection against rodents, birds & squirrels.

### Mechanical Characteristics

Repeated Bending (IEC 60794-1-2-E6)	30 Cycle, 20 X D, 5 Kg Load, D = Cable D
Torsion Resistance (IEC 60794-1-2-E7)	10 Cycle (± 180°) 5 Kg Weight, L= 2 Mtr
Crush Resistance (IEC 60794-1-2-E3)	2000 N (100 X 100 mm) for 600 sec
Impact Resistance (IEC 60794-1-2-E4)	Height 500 mm, Weight = 5 Kg, 3 Nos at different points
Kink Resistance (IEC 60794-1-2-E10)	20 x D, D = Cable D

### Drum Length

1000/2000 meters ± 5%



Indoor



Flame resistant



Metro



RoHS compliant

## Specifications of Multimode Optical Fiber

Transmission Properties	Unit	OM1 Values	OM2 Values	OM3 Values	OM4 Values
Attenuation at 850 nm	dB/km	$\leq 3.0$	$\leq 2.9$	$\leq 2.9$	$\leq 2.9$
Attenuation at 1300 nm	dB/km	$\leq 0.7$	$\leq 0.9$	$\leq 0.9$	$\leq 0.9$
Bandwidth at 850 nm	MHzKm	$\geq 200$	$\geq 500$	$\geq 1500$	$\geq 3500$
Bandwidth at 1300 nm	MHzKm	$\geq 500$	$\geq 500$	$\geq 500$	$\geq 500$
Numerical Aperture		$0.275 \pm 0.015$	$0.200 \pm 0.015$	$0.200 \pm 0.015$	$0.200 \pm 0.015$

Geometrical Properties	Unit	OM1(62.5/125um) Values	OM2(50/125um) Values	(OM3) Values	(OM4) Values
Core diameter	$\mu\text{m}$	$62.5 \pm 2.5$	$50.0 \pm 3.0$	$50.0 \pm 3.0$	$50.0 \pm 3.0$
Cladding diameter	$\mu\text{m}$	$125 \pm 1$	$125 \pm 2$	$125 \pm 2$	$125 \pm 2$
Core noncircularity	%	$\leq 5$	$\leq 5$	$\leq 5$	$\leq 5$
Cladding noncircularity	%	$\leq 1$	$\leq 2$	$\leq 2$	$\leq 2$
Core concentricity error	$\mu\text{m}$	$\leq 1.5$	$\leq 2.0$	$\leq 2.0$	$\leq 2.0$
Primary coating diameter	$\mu\text{m}$	$245 \pm 10$	$245 \pm 10$	$245 \pm 10$	$245 \pm 10$

Mechanical Properties	Unit	OM1(62.5/125um) Values	OM2(50/125um) Values	(OM3) Values	(OM4) Values
Proof test for minimum strain level and Duration of proof test	Kpsi, Sec	$\geq 100$	$\geq 100$	$\geq 100$	$\geq 100$
Change in Attenuation with Bending 100 Turns of 75mm Dia. Mandrel at 850	dB	$\geq 0.50$	$\geq 0.50$	$\geq 0.50$	$\geq 0.50$
100 Turns on 75mm Dia. Mandrel at 1300	dB	$\geq 0.50$	$\geq 0.50$	$\geq 0.50$	$\geq 0.50$
Strippability force to remove primary coating of fiber	Newton	1.3 to 8.9	1.3 to 8.9	1.3 to 8.9	1.3 to 8.9
Fiber Curl	Radius of Curve	$\geq 4$ Mtr	$\geq 4$ Mtr	$\geq 4$ Mtr	$\geq 4$ Mtr
Dynamic tensile strength (unaged)	kpsi	$\geq 550$	$\geq 550$	$\geq 550$	$\geq 550$
Dynamic tensile strength (Aged)	kpsi	$\geq 440$	$\geq 440$	$\geq 440$	$\geq 440$
Dynamic Fatigue		$\geq 18$	$\geq 18$	$\geq 18$	$\geq 18$

Environmental Properties	Unit	OM1(62.5/125um) Values	OM2(50/125um) Values	(OM3) Values	(OM4) Values
Induced attenuation at 850 nm & 1300 nm for Temp. & Humidity cycle from - 10°C to + 85°C at 98 % humidity (min), ref temp 23°C	dB/Km	$\leq 0.15$	$\leq 0.15$	$\leq 0.15$	$\leq 0.15$
Induced attenuation at 850 nm & 1300 nm for Temperature cycle from -60°C to $\pm 85^\circ\text{C}$ , ref temp 23°C	dB/Km	$\leq 0.15$	$\leq 0.15$	$\leq 0.15$	$\leq 0.15$
Induced attenuation at 850 nm & 1300 nm for Water Immersion at $23 \pm 2^\circ\text{C}$	dB/Km	$\leq 0.15$	$\leq 0.15$	$\leq 0.15$	$\leq 0.15$
Induced attenuation at 850 nm & 1300 nm for Accelerated Ageing (Temperature) at $85 \pm 2^\circ\text{C}$ ref temp 23°C	dB/Km	$\leq 0.15$	$\leq 0.15$	$\leq 0.15$	$\leq 0.15$

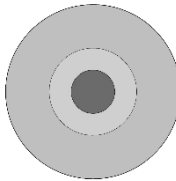
## Specifications of Singlemode Matched Clad Type & Non Zero Dispersion Optical Fiber

Transmission Properties	Unit	G-652.D Values	G-655 Values	G-657.A/IEC B6 Values
Attenuation at 1310 nm	dB/Km	< / = 0.35	-	< / = 0.35
Attenuation at 1550 nm	dB/Km	< / = 0.22	< / = 0.24	< / = 0.22
Attenuation at 1625 nm	dB/Km	< / = 0.25	< / = 0.26	< / = 0.25
Point discontinuity	dB/Km	< / = 0.05	< / = 0.05	< / = 0.05
Difference in max att from 1285 to 1330 nm w.r.t att at 1310 nm	dB/Km	< / = 0.03	-	< / = 0.03
Difference in max att from 1530 to 1570 nm w.r.t att at 1550 nm	ps/nm.km	< / = 0.02	< / = 0.03	< / = 0.02
Max. chromatic dispersion at 1285-1330 nm wavelength range	ps/nm.km	< / = 3.5	-	< / = 3.5
Max. chromatic dispersion at 1270-1340 nm wavelength range	ps/nm.km	< / = 5.3	-	< / = 5.3
Max. chromatic dispersion at 1530-1565 nm wavelength range	ps/nm.km	-	2.0 to 6.0	-
Max. chromatic dispersion at 12650-1625 nm wavelength range	ps/nm.km	-	4.5 to 11.2	-
Chromatic dispersion at 1550 nm	ps/nm.km	< / = 18.0	-	< / = 18.0
Zero dispersion wavelength	nm	1320 to 1322	-	1320 to 1322
Zero dispersion slope	nm <sup>2</sup> .km	< / = 0.092	-	< / = 0.092
PMD at 1310 & 1550 nm (individual)	ps/sqrt.km	< / = 0.20	< / = 0.20	< / = 0.20
Link PMD	ps/sqrt.km	< / = 0.06	< / = 0.04	< / = 0.06
Fiber cut-off wavelength	nm	< / = 1320	-	< / = 1320
Mode field diameter range at 1310 nm	μm	9.2 ± 0.4	-	9.2 ± 0.4
Mode field diameter range at 1550 nm	μm	10.5 ± 0.5	9.6 ± 0.4	10.5 ± 0.5
Geometrical Properties	Unit	Values	Values	Values
Cladding diameter	μm	125 ± 0.7	125 ± 0.7	125 ± 0.7
Core noncircularity	%	< / = 0.07	< / = 0.07	< / = 0.07
Primary coating diameter (uncolored)	μm	245 ± 5	245 ± 5	245 ± 5
Core/Clad concentricity error	μm	< / = 0.05	< / = 0.05	< / = 0.05
Coating / Cladding Concentricity error	μm	< / = 0.10	< / = 0.12	< / = 0.10
Mechanical Properties	Unit	Values	Values	Values
Proof test for minimum strain level and Duration of proof test	Kpsi, Sec	> 100	> 100	> 100
Change in att with Bending 100 turns on 60 mm mandrel at 1310	dB	< / = 0.05	-	-
100 Turns on 60mm Dia. Mandrel at 1550	dB	< / = 0.05	< / = 0.05	< / = 0.01
100 Turns on 60mm Dia. Mandrel at 1625	dB	-	< / = 0.01	< / = 0.05
1 Turn on 32 mm Dia. Mandrel at 1310	dB	< / = 0.05	-	-
1 Turn on 32 mm Dia. Mandrel at 1550	dB	< / = 0.05	< / = 0.05	-
1 Turn on 32 mm Dia. Mandrel at 1625	dB	-	< / = 0.05	-
1 Turn on 10 mm Dia. Mandrel at 1550	dB	-	-	< / = 0.02
1 Turn on 10 mm Dia. Mandrel at 1625	dB	-	-	< / = 0.05
Strippability force to remove primary coating of fiber	Newton	1.3 < F < 8.9	10 < F < 8.9	1.3 < F < 8.9
Fiber Curl	Radius	> / = 4 Mtr	> / = 4 Mtr	> / = 4 Mtr
Dynamic tensile strength (unaged)	kpsi	> / = 550	> / = 550	> / = 550
Dynamic tensile strength (Aged)	kpsi	> / = 440	> / = 440	> / = 440
Dynamic Fatigue		> / = 20	> / = 20	> / = 20
Environmental Properties	Unit	Values	Values	Values
Induced attenuation at 1310 nm & 1550 nm Temp. & Humidity cycle from - 10°C to +85°C at 98 % humidity (min), ref temp 23°C	dB/Km	< / = 0.05	< / = 0.05	< / = 0.05
Induced attenuation at 1310 nm & 1550 nm Temp. cycle from - 60°C to +85°C, ref temp 23°C	dB/Km	< / = 0.05	< / = 0.05	< / = 0.05
Induced attenuation at 1310 nm & 1550 nm for Water Immersion at 23 ± 2°C	dB/Km	< / = 0.05	< / = 0.05	< / = 0.05
Induced attenuation at 1310 nm & 1550 nm for Accelerated Ageing (Temperature) at 85 ± 2°C, ref temp 23°	dB/Km	< / = 0.05	< / = 0.05	< / = 0.05

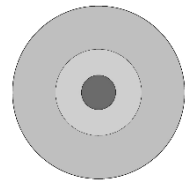
# Fiber Basics 101

## Common Fiber Types:

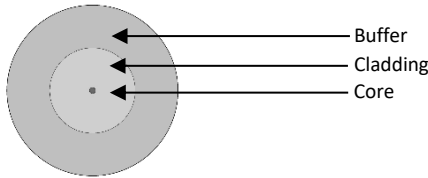
Multimode 62.5/125/250  
Larger core = larger power budget  
Typical maximum length <300 m



Multimode 50/125/250  
Higher Bandwidth than 62.5  
Typical maximum length <1km

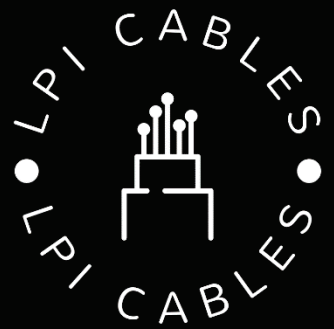


Singlemode  
Small core = Very high bandwidth  
Typical maximum length 50,000m



**dB Loss to Power Ratio Conversion**

dB (loss)	Power ratio
0	1.000
0.1	0.977
0.2	0.955
0.3	0.933
0.4	0.912
0.5	0.891
0.6	0.871
0.7	0.851
0.8	0.832
0.9	0.813
1	0.794
2	0.631
3	0.501
4	0.398
5	0.316
6	0.251
7	0.200
8	0.158
9	0.126
10	0.1
20	0.01
30	0.001
40	0.0001
50	0.00001
60	0.000



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