



We don't just connect,
We bring people together



HIGH-SPEED DATA TRANSFERRING

FIBRE OPTIC SOLUTIONS

CHAIRMAN'S MESSAGE



We are constantly overcoming our yesterday to ensure we gear up for tomorrow. But while business is a priority, there is one thing which supersedes everything else... Transparency in business. The first thing, we learnt from our Founders Mr. K.P. Chhabria and Mr. P.P. Chhabria. A culture, that is truly the stepping stone to where we are today and will remain in our journey to be an Electrical Products Conglomerate.

With this ideology, we strongly focus on: Clear and uniform policies for trade across the country, we call them the backbone of our business. We want to create value for our Customers, Investors, Partners and Employees. We have a common ethos of LONG LIFE that binds every product, we conceptualise and manufacture – this becomes our brand promise to our customers. From using the perfect raw material, right up to the end users needs, we live this ethos each day. Quality is our core mantra. We believe our investment in Excellence – from machines to people to processes to partners, has brought growth to the company.

With best wishes

Deepak Chhabria
Executive Chairman

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Finolex

Finolex

1056

ABOUT US



Finolex Cables Ltd is India's largest and leading manufacturer of electrical and telecommunication cables with a turnover in excess of ₹30 Billion (about US\$ 500 million)

The company started its operation with the manufacture of PVC insulated electrical cables for the automobile industry. Since then, the Company has constantly endeavored to augment its product range to include PVC Insulated Industrial Cables, FR-LSH PVC Insulated Industrial Cables, PVC Insulated Single Core and Multicore Flexible Industrial Cables, Rodent Repellent Multicore Flexible Industrial Cables, PVC Insulated Winding Wires and 3 Core Flat Cables, XLPE 3 Core Flat Cables, Power and Control Cables, High Voltage Power Cables (Up to 33 kV), Polyethylene Insulated Jelly Filled Telephone Cables, Auto & Battery Cables, Co-axial and CCTV cables, LAN Cables, Switchboard Cables, Fibre Optic Cables, Solar Cables and others.

Besides a wide variety of Wires & Cables, the Company is also manufacturing lighting products, electrical accessories, switchgear, fans and water heaters. The company has manufacturing facilities at Pimpri and Urse in Pune as well as at Goa & Uttarakhand. The company has, over the years, established its reputation as an innovative leader and quality manufacturer by continuously upgrading technology, modernising manufacturing facilities and maintaining highest standards of quality and services. Today, the name Finolex has become synonymous with Quality and enjoys overwhelming confidence of the customers. Investors have also fancied its stock in view of its phenomenal progress leading to a manifold increase on investment in stock through the years.

The company has received the IS/ISO 9001 Quality Management Systems Certification across all product lines and plants. Also IS/ISO 14001 -Environmental Management Systems Certification has been accorded to its plants in Urse and Goa. Also, the Optical Fibre plant, Pune and Optical Fibre cable plants at Pune and Goa has received the TL-9000 certification.

Every cable is manufactured using bright annealed electrolytic grade copper – 99.97% pure manufactured in-house and is insulated with virgin grade PVC. That is formulated in-house.

The company has received several honours such as Harvard Business School Association of India - Economic Times award for "corporate excellence"; IIM - LIC award for 'marketing' and the Engineering Export Promotion Council's 'export performance certificate'. The company was awarded the Export House status by the Directorate General of Foreign Trade.

Manufacturing Plants: Finolex Cables has always been striving for offering better products to market on time. For achieving this, Finolex Cables has set up four modern state-of-the-art plants. These manufacturing plants are located in Pimpri (Pune), Urse (Pune), Goa & Roorkee (Uttarakhand).

All these manufacturing plants are well equipped with latest state-of-the-art modern machinery for producing quality product. All the plants are ISO 9001 certified. In addition to this, all plants are ISO 14000 certified. All the plants are equipped with the testing facilities for assuring the best quality products. All these plants are continuously upgraded to latest & modern technology for offering quality product at competitive prices. The safety records of all these plants are excellent.

These plants produces Optical Fibre, Optical Fibre Cables, Electrical & Telecommunication cables, LT & HT Power & Control Cables, Electrical Switches, LED's, Fan's, MCB's and switchgear products & Copper Rods.

OPTIC FIBRE CABLE DIVISION INTRODUCTION

Finolex Cables Limited is the pioneer in manufacturing cables in India. An IS/ISO 9001:2015 certified company, it has 2 plants specializing in optical Fibre cables and one in Optic Fibre.

The first plant was established near Pune (150 kms south of Mumbai) in the year 1994 in joint venture with At&T (Lucent) Technology for the manufacturing for their patented LXE designed (central tube) cables. Today this plant is a division of Finolex Cables Limited, with continued technology support from Lucent. The plant has been designed, built, equipped and staffed to meet with worldwide standards. The plant at Pune has capability to produce cables meeting various national and international standards.

Second plant setup at Goa in year 2001 specializes in manufacturing of various designs of cables up to 576 Fibre count with international standards of manufacturing, distribution and qualified and committed manpower. This plant is ISO 9001:2015 certified. Both these plants have been awarded IS/ISO 14001 certification. All the above plants consist of latest equipment from Europe and USA.

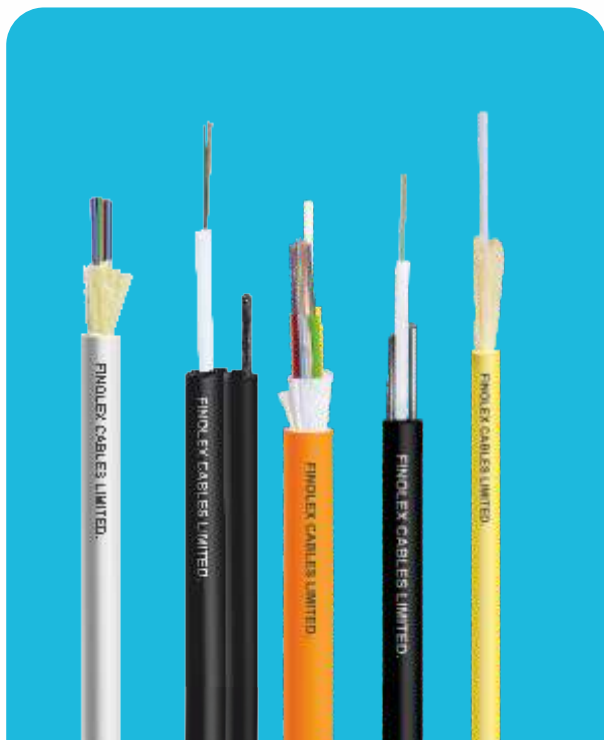
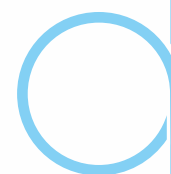
Finolex Cables Limited has also set up a state-of-the-art manufacturing facility to produce various types of Optic Fibres in India with an annual capacity of 2.5 million fibre kms. Finolex has entered into a Joint Venture with Corning Optic Fibre, USA in the year 2011, to promote, market, and sell Corning® single-mode (ITU-T G.652.D) optical fibre.

All the three plants have been awarded the TL-9000 and ISO 9001:2015 certification. With these three plants, FINOLEX is committed to provide its customer world's best and most innovative communication system products, technologies and customer support.

Optical Fibre Cables Division is a major supplier to a variety of highly reputed organisations in various industries - like the Private and Government Telecom Companies like BSNL, BBNL, MTNL, AirTel, Vodafone, Idea, Tata, Reliance Jio, Railways, Defence sector, Metro Projects, Data Centres, Pipeline projects and Atomic power plants in India and abroad.



STANDARD PRODUCT FEATURES



Product Options

Our Cables are available with all kind of Fibres i.e. Single Mode & Multimode Type.

Various Applications

- Aerial Cables
- Direct Burial Cable
- Speciality Cables
- Duct Cables
- Premises Cables for indoor applications

Manufacturing Process

Finolex Cables Limited successfully implemented the quality management system in line with TL-9000 and ISO-9001 requirements with a complete commitment to satisfy the customer needs. Our experienced and highly skilled engineers and technicians carry out quality checks at every stage of manufacturing, right from raw material inspection, in process quality to the final product to verify compliance of specifications and uses following tests methods accordingly in line with various international standards like EIA/TIA, IEC and ITU Standards.

International Standards

Test	Test Standard	Test	Test Standard
Temperature Cycling Test	IEC-60794-1-2-F1	Refractive index profile	IEC 60793-1-20
Tensile Strength	IEC-60794-1-2-E1	Fibre Geometry.	IEC 60793-1-20
Compression Test	IEC-60794-1-2-E3	Fibre Coating	IEC 60793-1-21
Impact Test	IEC-60794-1-2-E4	Length measurement	IEC 60793-1-22
Torsion Test	IEC-60794-1-2-E7	Fibre Proof test	IEC 60793-1-30
Water penetration Test	IEC-60794-1-2-F5B	Dynamic tensile strength	IEC 60793-1-31
Cable Bend Test	IEC-60794-1-2-E11	Stripability force	IEC 60793-1-32
Repeated Bending Test	IEC-60794-1-2-E6	Dynamic Fatigue	IEC 60793-1-33
Kink Resistance Test	IEC-60794-1-2-E10	Static Fatigue	IEC 60793-1-33
Polarization Mode Dispersion	IEC 60793-1-48	Fibre Curl	IEC 60793-1-34
Damp heat	IEC 60793-1-50	Attenuation coefficient	IEC 60793-1-40
Accelerated Aging	IEC 60793-1-51	Chromatic Dispersion	IEC 60793-1-42
Operating Temperature	IEC 60793-1-52	Cut- off Wavelength	IEC 60793-1-44
Water Immersion	IEC 60793-1-53	Mode Field Diameter	IEC 60793-1-45
Temperature-Humidity Cycling	ANSI/TIA/EIA-455-73	Fibre Macro bend	IEC 60793-1-47
Fusion splice loss	ANSI/TIA/EIA-455-8	Hydrogen aging	IEC 60793-2-50

Technical Specifications

The Designs in the catalogue are only the samples of options available from Finolex. You can contact our Sales team for a cable designed to your required specifications.

Fibre and Fibre Optic Cable with enhanced properties/customized specification can be provided on request. Test report (Attenuation) is supplied with each consignment.

Colour coding as per the EIA/TIA 598



BLUE



ORANGE



GREEN



BROWN



SLATE



WHITE



RED



BLACK



YELLOW



VIOLET



PINK



AQUA

Length Details

Cables are available in standard length of 2/4 kms per drum. Drum length as per customer request is also available.

Finolex USP

- More than 60 years of trust • Virgin raw materials hence longer life & premium quality products
- In-house production of genuine & world-class Optical Fibre • Wide range of cables
- India's only company with patented technology from OFS, USA for Unitube Cables

DISCLAIMER

All information given herein is in good faith. Finolex shall not be liable for any damages arising out of incorrect use of interpretation.

The company reserves the right to change any of the given specification without any prior notice.

Any Warranty of any nature relating to any Finolex Product is only contained in the written agreement between Finolex and the direct purchaser of such product(products).

For purpose of determining conformance to any specifications agreed, an observed or calculated value shall be rounded "to the nearest unit" in the last right hand digit used in expressing the specification limit, in accordance with the rounding method of ASTM Practice E29, "Using Significant Digits in Test Data to Determine Conformance with specifications.

BUREAU VERITAS
Certification



FINOLEX CABLES LIMITED

OFC DIVISION, PLOT NO. 344, VILLAGE URSE, TALUKA MAVAL,
PUNE, MAHARASHTRA, 410506, INDIA

Bureau Veritas Certification Holding SAS certifies that the Management System
of the above organization has been audited and found to be in accordance
with the requirements of the management system standards detailed below

Standards

ISO 9001:2015 | TL 9000 R6.0/5.5 H

Scope of Certification

**DESIGN, MANUFACTURE AND SUPPLY OF OPTICAL FIBRE CABLES,
OPTICAL FIBRE AND
OPTICAL FIBRE RIBBONS**

Product Category	Product Category Name
3.1.1.2.1	FIBRE OPTIC CABLE
3.1.1.2.1	OPTICAL FIBRE RIBBONS
3.5.1	OPTICAL FIBRE

Certification cycle start date: **10 October 2017**

Subject to the continued satisfactory operation of the organization's Management
System, this certificate expires on: **9 October 2020**

Certificate No. **272038**
TL ID: 7031

Revision Date: **11 March 2019**

Said Virel
Signed on behalf of BVCS SAS

Local office: Bureau Veritas Certification (India) Private Ltd.
10000, International Park Drive, Suite 300, Hyderabad, Telangana, India
www.bv.com/bvcertification/india



Further qualifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by
consulting the organization. To check this certificate validity please call +33(0) 800 507 807.
Certification body address: 85/113, Boulevard de l'Industrie - 92000 Nanterre - Ile de France - France

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BUREAU VERITAS
Certification



FINOLEX CABLES LIMITED

Standards

ISO 9001:2015/TL9000 R6.0/R5.5 H

Certified Locations

Site	Address	ISO 9001:2015	TL9000:2014 R6.0/5.5 H
HQ	Finolex Cables Ltd, OFC Division, Plot 344, Urse, Taluka Maval, Pune- 410 500, Maharashtra, India	Design, Manufacture and supply of Optical Fibre Cables, Optical Fibre and Optical Fibre Ribbons	Design, Manufacture and supply of Optical Fibre Cables, Optical Fibre and Optical Fibre Ribbons
Goa	Finolex Cables Ltd, OFC Division, Plot No. 1, 123456789, Verna Industrial Estate, Suburban, Goa- 403 722, Goa, India	Design, Manufacture, and supply of Optical Fibre Cables, FPO Rods, Impregnated Glass Rovings	Design, Manufacture and supply of Optical Fibre Cables

Subject to the continued satisfactory operation of the organization's
Management System, this certificate expires on: **9 October 2020**

Certificate No. **272039**
TL ID: 7031

Revision Date: **11 March 2019**

Said Virel
Signed on behalf of BVCS SAS

Local office: Bureau Veritas Certification (India) Private Ltd.
10000, International Park Drive, Suite 300,
Hyderabad, Telangana, India
www.bv.com/bvcertification/india



Further qualifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by
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Certification body address: 85/113, Boulevard de l'Industrie - 92000 Nanterre - Ile de France - France

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ECO EFFECTIVE CABLES

UNITUBE STEEL WIRE OPTICAL FIBRE CABLES



Description

- Central Loose tube with thixotropic jelly compound.
- Steel Music Wires for high Strength.

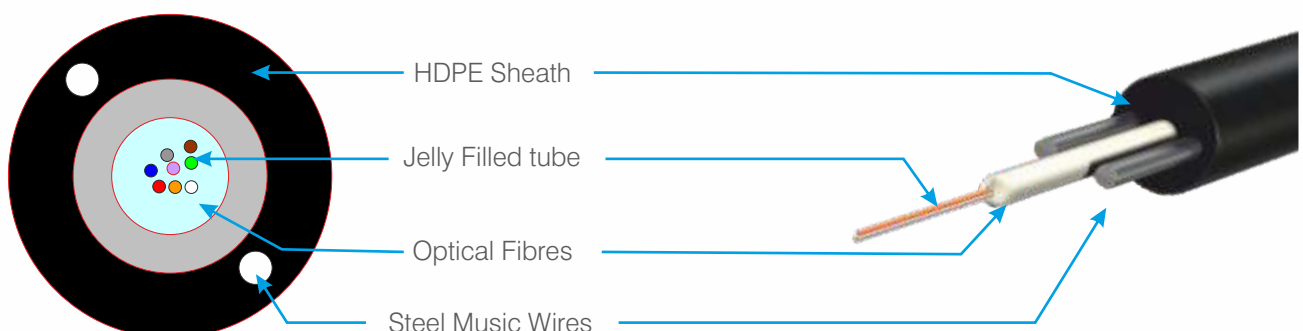
Application

- Suitable for Indoor / Outdoor Local Area network System & CATV application.
- Excellent crush resistant performance, light weight, Compact structure.

Mechanical & Environment Characteristics:

Operating Temperature	-20 deg C to +60 dec C
Storage Temperature	-40 deg C to +60 dec C
Jacket Material	HDPE

Fibre Count	Design	Outer diameter (mm)	Nominal Cable Weight (kg/km)	Pulling Tension IEC 60794-1-2-E1	Crush Load IEC 60794-1-2-E3 (N/100mm)	Bend Radius (mm) IEC 60794-1-2-E11 IEC 60794-1-2-E6
2F to 8F	MDMAXE	5.3 ± 0.3	30	1000	2000	20D
2F to 8F	MDMAXER	6.3 ± 0.3	38	1000	2000	20D



ECO EFFECTIVE CABLES

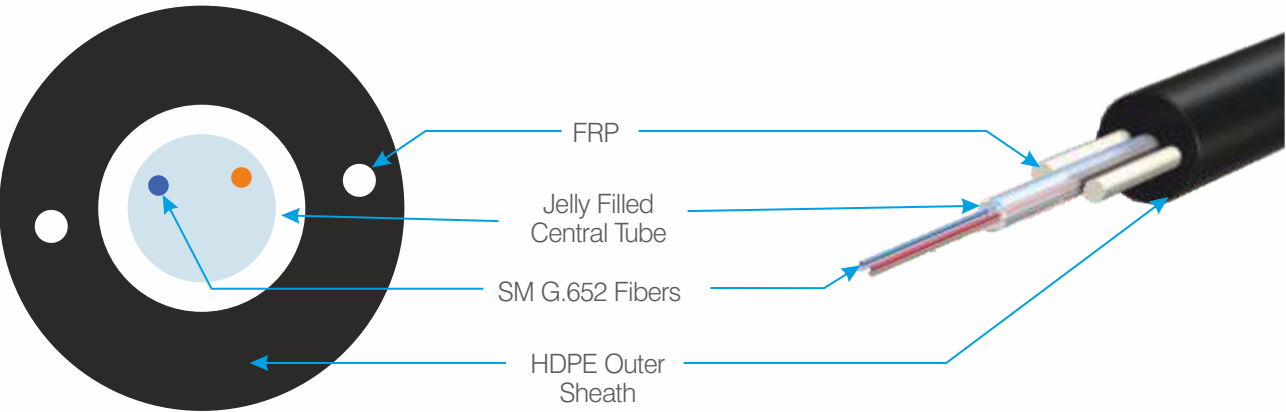
ECO EFFECTIVE OPTICAL FIBRE CABLES



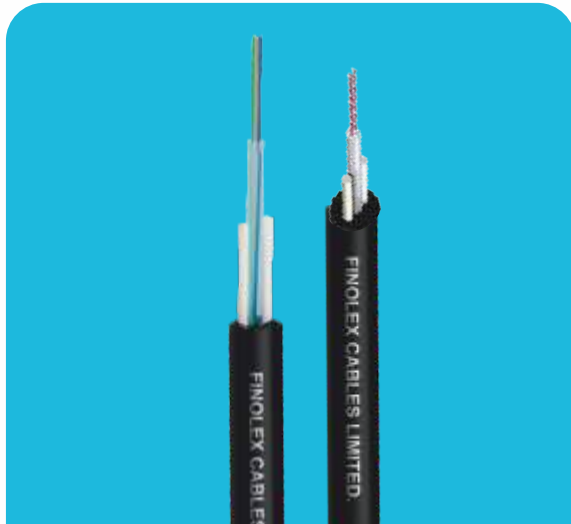
These are the Optic Fibre Cables which consumes less power, petroleum products, and packing material such as wood, thus assisting to maintain a healthy environment.

Cable Construction details

Sr. No	Component	Description
1	Central Tube	Polybutylene Teraphthalato (PBT) filled with Thixotropic Jelly
2	Fibre / Colours	SM G.652 Fibres
3	No. of Fibres	2/4/6F
4	Strength Members	Embedded FRP - 0.8 mm, 2 Nos
5	Outer Sheath	HDPE
6	Overall cable diameter	5.3 ± 0.3 mm
7	Cable Weight	21 kg (Nominal)



UNI-TUBE UNARMoured OPTICAL FIBRE CABLES



Description

Central Loose tube with thixotropic jelly compound

Application

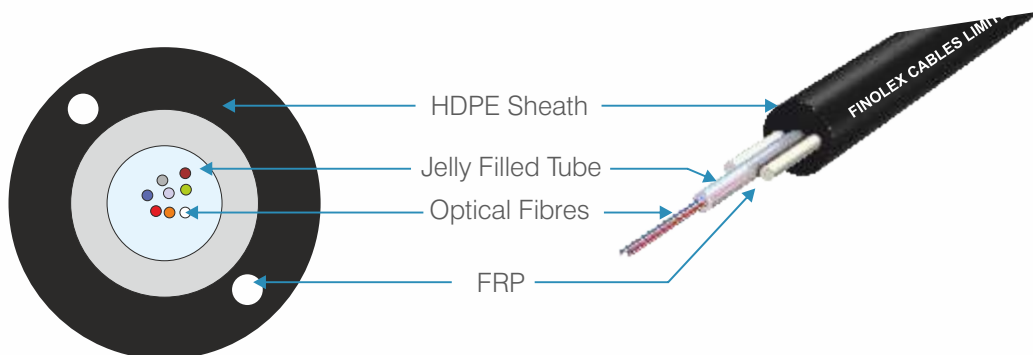
Suitable for Indoor / Outdoor Local Area network System & CATV application

Excellent crush resistant performance, light weight, Compact structure

Mechanical & Environment Characteristics:

Operating Temperature	-20 deg C to +60 deg C
Storage Temperature	-40 deg C to +60 deg C
Jacket Material	HDPE

Fibre Count	Design	Outer diameter (mm)	Nominal Cable Weight (kg/km)	Pulling Tension IEC 60794-1-2-E1	Crush Load IEC 60794-1-2-E3 (N/100mm)	Bend Radius (mm) IEC 60794-1-2-E11 IEC 60794-1-2-E6
2F to 8F	DMAXE	5.3 ± 0.3	22	400	1000	20D
2F to 8F	DMAXER	6.3 ± 0.3	30	400	1000	20D
24F	DMAX	7.3 ± 0.3	40	400	1000	20D
48F	EDMAX	8.5 ± 0.5	52kgs/km	600	1000	20D



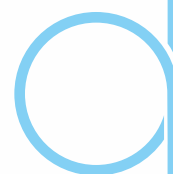
We also offer MFX UA Type design: HDPE / LSZH

PHYSICAL & DIMENSIONS PROPERTIES

Fibre Count	Outer diameter (mm) HDPE / LSZH	Thickness of Jacket (mm) HDPE / LSZH	Nominal Cable Weight (kg/km) HDPE / LSZH	Pulling Tension IEC 60794-1-2-E1		Crush Load IEC 60794-1-2-E3 (N/100mm)		Bend Radius (mm) IEC 60794-1-2-E11 IEC 60794-1-2-E6	
				Short Term	Long Term	Short Term	Long Term	Short Term	Long Term
2	6.8/6.2 + 0.3	1.6/ 1.4 + 0.2	36/45	1000	500	1000	300	10D	20D
4	6.8/6.2 + 0.3	1.6/ 1.4 + 0.2	36/45	1000	500	1000	300	10D	20D
6	6.8/6.2 + 0.3	1.6/ 1.4 + 0.2	36/45	1000	500	1000	300	10D	20D
12	6.8/6.2 + 0.3	1.6/ 1.4 + 0.2	36/45	1000	500	1000	300	10D	20D
24	7.3/6.7 + 0.3	1.6/ 1.3 + 0.2	38/50	1000	500	1000	300	10D	20D

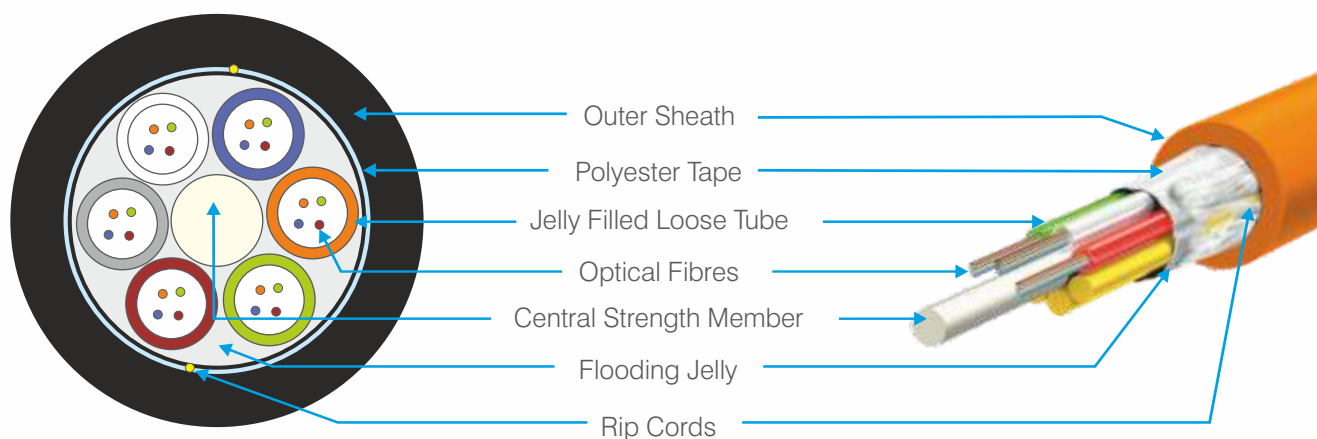
DUCT CABLES

MULTITUBE SINGLE SHEATH UNARMoured WET CORE OPTICAL FIBRE CABLES



Physical & Dimensions Properties

NO. OF FIBRES	4F	6F	12F	24F	48F	72F	96F	144F
STRENGTH MEMBER-FRP	1.8 ± 0.1	1.8 ± 0.1	1.8 ± 0.1	1.8 ± 0.1	2.0 ± 0.1	2.2 ± 0.1	3.5 ± 0.1	Upcoated 6.5 ± 0.1 mm
LOOSE TUBE DIAMETER-mm	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	2.0 ± 0.1	2.1 ± 0.1	2.1 ± 0.1	2.1 ± 0.1
NUMBER OF LOOSE TUBE	2	3	3	6	6	6	8	12
NUMBER OF Fibre IN LOOSE TUBE	2	2	4	4	8	12	12	12
NUMBER OF FILLER	4	3	3	0	0	0	0	0
OUTER HDPE JACKET THICK- Nominal (mm)	2	2	2	2	2	2	2	2
CABLE DIAMETER-Nominal (mm)	9.5	9.5	9.5	9.5	10.3	10.7	12	15
CABLE WEGHT-Nominal (mm)	72	72	72	72	88	96	128	156



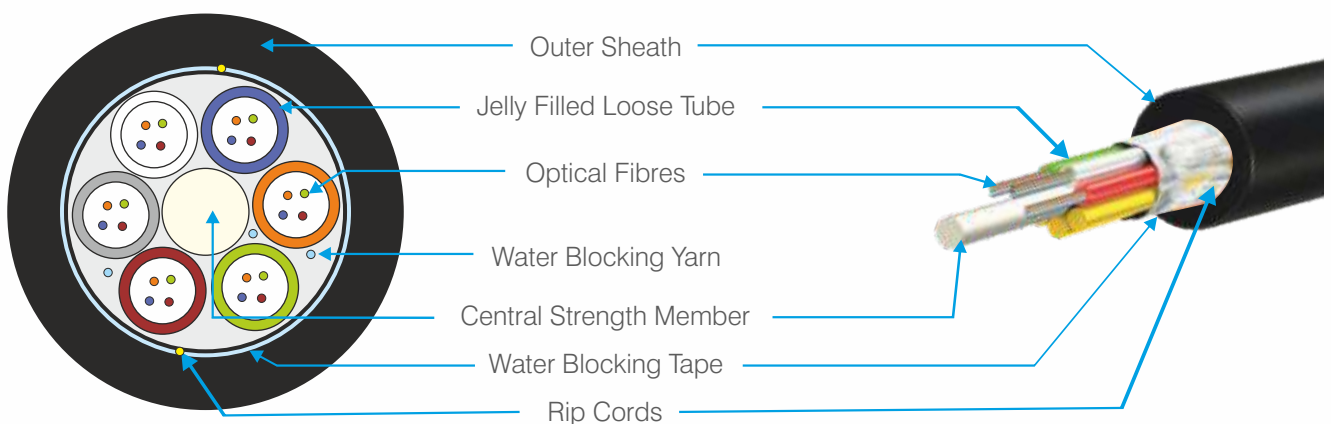
DUCT CABLES

MULTITUBE SINGLE SHEATH UNARMoured DRY CORE OPTICAL FIBRE CABLES



Physical & Dimensions Properties

NO. OF FIBRES	4F	6F	12F	24F	48F	72F	96F	144F
STRENGTH MEMBER-FRP	1.8 ± 0.1	1.8 ± 0.1	1.8 ± 0.1	1.8 ± 0.1	2.0 ± 0.1	2.2 ± 0.1	3.5 ± 0.1	Upcoated 6.5±0.1mm
LOOSE TUBE DIAMETER-mm	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	2.0 ± 0.1	2.1 ± 0.1	2.1 ± 0.1	2.1 ± 0.1
NUMBER OF LOOSE TUBE	2	3	3	6	6	6	8	12
NUMBER OF FIBRE IN LOOSE TUBE	2	2	4	4	8	12	12	12
NUMBER OF FILLER	4	3	3	0	0	0	0	0
OUTER HDPE JACKET THICK- Nominal (mm)	2	2	2	2	2	2	2	2
CABLE DIAMETER-Nominal (mm)	9.5	9.5	9.5	9.5	10.3	10.7	12	15
CABLE WEIGHT-Nominal (mm)	70	70	70	70	85	93	123	150



DIRECT BURIAL CABLES

UNITUBE ARMoured OPTICAL FIBRE CABLES



Description:

- Central Loose Tube with jelly compound
- High quality Electro Chromium Coated Corrugated Steel tape (ECCS)
- Armoured design with Music Quality Steel wire
- HDPE / LSZH sheath

Application:

- Suitable for Outdoor network System
- Excellent Crush resistant performance, light weight, Compact Structure
- Export design cable

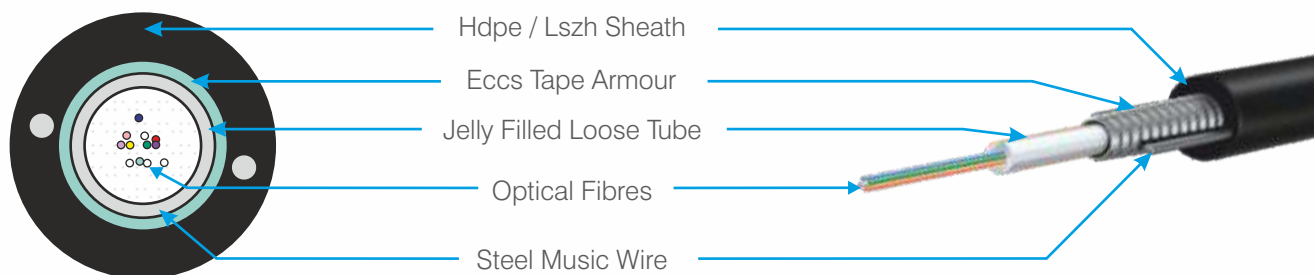
Mechanical & Environment Characteristics:

Operating Temperature	-20 deg C to +60 deg C
Storage Temperature	-40 deg C to +60 deg C
Jacket Material	HDPE / LSZH

LSZH compound meets the following properties as per International Specification/s:

Specification	Properties
IEC 811-1	Water Absorption
IEC 1034	Smoke Emission
IEC 754-1	Acid Gas Emission
IEC 60754-2 (EN 50267-2-2)	Halogen Free (pH $\geq$ 3.5 - μ S/cm $\leq$ 100)
IEC 60332-1-2	Flame Retardancy / Fire Propagation
NES 713	Toxicity

Fibre Count	Design	Outer diameter (mm)	Nominal Cable Weight (kg/km) HDPE/LSZH	Pulling Tension IEC 60794-1-2-E1		Crush Load IEC 60794-1-2-E3 (N/100mm)	Bend Radius (mm) IEC 60794-1-2-E11 IEC 60794-1-2-E6
				Short Term (N)	Long Term (N)		
2F to 12F	MMAx	7.8 $\pm$ 0.3	64 / 84	1000	400	2000	20D
2F to 12F	MLM	8.8 $\pm$ 0.3	78 / 98	1800	800	4000	20D
24F	EMLM	8.8 $\pm$ 0.3	79 / 98	2000	1000	4000	20D
48F	EMLX	9.4 $\pm$ 0.3	96 / 118	2200	1000	4000	20D



We also offer MFX AR Type design: HDPE / LSZH

PHYSICAL & DIMENSIONS PROPERTIES

Fibre Count	Outer Diameter (mm)	Thickness of Jacket (mm)	Nominal Cable Weight (kg/km) HDPE / LSZH	Pulling Tension IEC 60794-1-2-E1		Crush Load IEC 60794-1-2-E3 (N/100mm)	Bend Radius (mm) IEC 60794-1-2-E11 IEC 60794-1-2-E6	
				Short Term	Long Term		Short Term	Long Term
2	9 + 0.3	1.8 + 0.2	72 / 95	1500	1000	3000	10D	20D
6	9 + 0.3	1.8 + 0.2	72 / 95	1500	1000	3000	10D	20D
12	9 + 0.3	1.8 + 0.2	72 / 95	1500	1000	3000	10D	20D
24**	9.5 + 0.3	1.8 + 0.2	82 / 110	1500	1000	3000	10D	20D

DIRECT BURIAL CABLES

UNITUBE ARMoured OPTICAL FIBRE CABLES

FINOLEX CABLES LIMITED.

Description:

- Central Loose Tube with jelly compound
- High quality Electro Chromium Coated Corrugated Steel tape (ECCS)
- Armoured design with Music Quality Steel wire
- HDPE / LSZH sheath
- 24F - Contains two bundle of 12F in Blue & Orange colour thread

Application:

- Suitable for Outdoor network System
- Excellent Water proof layer & moisture resistance
- Excellent Crush resistant performance, light weight, Compact Structure
- Export design cable

Mechanical & Environment Characteristics:

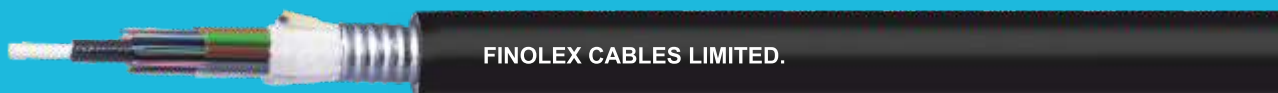
Operating Temperature	-20 deg C to +60 deg C
Storage Temperature	-40 deg C to +60 deg C
Jacket Material	HDPE / LSZH

Fibre Count	Design	Outer diameter (mm)	Thickness of Jacket (mm)	Nominal Cable Weight (kg/km) HDPE/LSZH	Pulling Tension IEC 60794-1-2-E1		Crush Load IEC 60794-1-2-E3 (N/100mm)	Bend Radius (mm) IEC 60794-1-2-E11 IEC 60794-1-2-E6
					Short Term (N)	Long Term (N)		
2F to 12F	MMX	7.3 ± 0.3	1.8 ± 0.2	54 / 68	1000	400	2000	20D
2F to 12F	MMAXP	7.8 ± 0.3	1.8 ± 0.2	64 / 84	1000	400	2000	20D
24F	MLX	10.0 ± 0.3	1.8 ± 0.2	95 / 120	2000	1000	4000	20D
2-12	MLMP	8.8 ± 0.3	1.8 ± 0.2	78 / 98	1800	800	4000	20D
2-12	MLMW	9.0 ± 0.3	1.8 ± 0.2	90 / 110	2670	1000	4000	20D



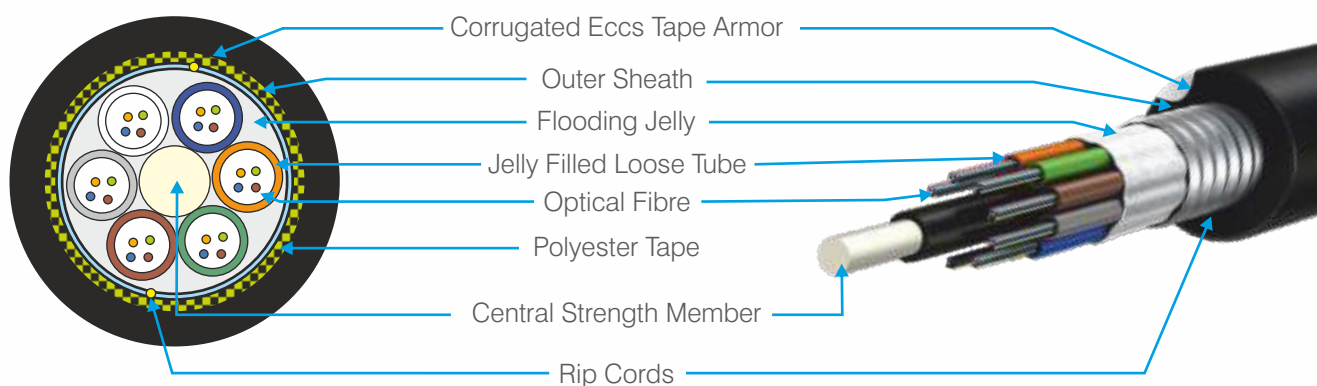
DIRECT BURIAL CABLES

MULTITUBE SINGLE SHEATH ARMoured WET CORE OPTICAL FIBRE CABLES



3. PHYSICAL & DIMENSIONS PROPERTIES

NO. OF FIBRES	4F	6F	12F	24F	48F	72F	96F
STRENGTH MEMBER-FRP	1.8 ± 0.1	1.8 ± 0.1	1.8 ± 0.1	1.8 ± 0.1	2.0 ± 0.1	2.2 ± 0.1	3.5 ± 0.1
LOOSE TUBE DIAMETER-mm	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	2.0 ± 0.1	2.1 ± 0.1	2.1 ± 0.1
NUMBER OF LOOSE TUBE	2	3	3	6	6	6	8
NUMBER OF Fibre IN LOOSE TUBE	2	2	4	4	8	12	12
NUMBER OF FILLER	4	3	3	0	0	0	0
CORRUGATED STEEL TAPE ARMOR	ECCS	ECCS	ECCS	ECCS	ECCS	ECCS	ECCS
OUTER HDPE JACKET THICK- Nominal (mm)	1.5	1.5	1.5	1.5	1.5	1.5	1.5
CABLE DIAMETER-Nominal (mm)	10	10	10	10	10.8	11.2	12.5
CABLE WEIGHT-Nominal (kg/km)	100	100	100	100	120	130	165



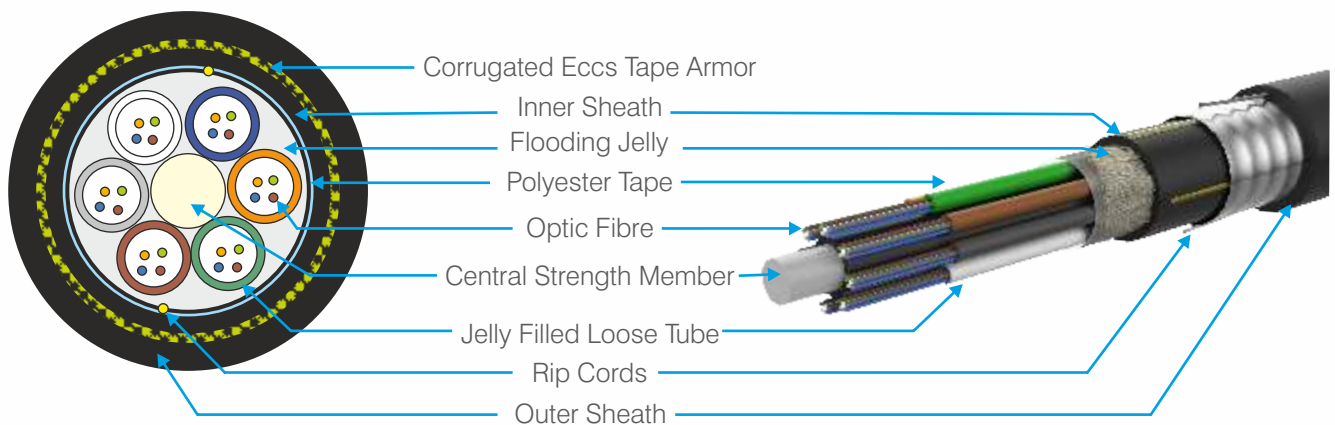
DIRECT BURIAL CABLES

MULTITUBE DOUBLE SHEATH ARMoured WET CORE OPTICAL FIBRE CABLES



3. Physical & Dimensions Properties

NO. OF FIBRES	4F	6F	12F	24F	48F	72F	96F	144F
STRENGTH MEMBER-FRP	1.8 ± 0.1	1.8 ± 0.1	1.8 ± 0.1	1.8 ± 0.1	2.0 ± 0.1	2.2 ± 0.1	3.5 ± 0.1	Upcoated 6.5±0.1mm
LOOSE TUBE DIAMETER-mm		1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	2.0 ± 0.1	2.1 ± 0.1	2.1 ± 0.1	2.1 ± 0.1
NUMBER OF LOOSE TUBE	2	3	3	6	6	6	8	12
NUMBER OF FIBRE IN LOOSE TUBE	2	2	4	4	8	12	12	12
NUMBER OF FILLER	4	3	3	0	0	0	0	0
INNER HDPE JACKET THICK- Nominal (mm)	1	1	1	1	1	1	1	1
CORRUGATED STEEL TAPE ARMOR	ECCS	ECCS	ECCS	ECCS	ECCS	ECCS	ECCS	ECCS
OUTER HDPE JACKET THICK- Nominal (mm)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
CABLE DIAMETER-Nominal (mm)	11.9	11.9	11.9	11.9	12.7	13.1	14.4	17.5
CABLE WEIGHT-Nominal (kg/km)	138	138	138	138	160	170	210	250



AERIAL CABLES

TUBE DROP CABLE



Description:

- 4 fibres are placed in loose tube in between two frp rods and covered with hdpe sheath.
- Fibres can be taken out easily from the loose tube. Optical fibre used is G.652 Fibre.

Application:

- Termination to cabinets
- Easiness at splice closure
- Easy termination to any OFC system

Advantages

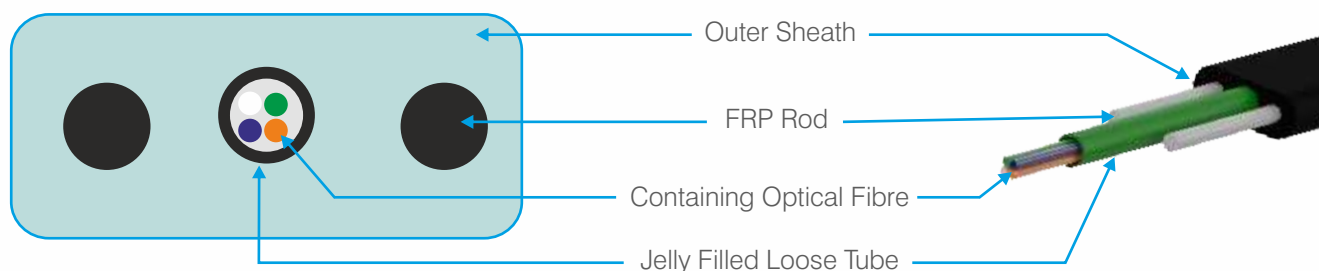
- All dielectric cable
- Light weight
- Simple and fast installation
- Self supporting
- Easy for termination

Cable Construction details

No. of Fibres	2/4/6 F
Fibre Colour	Individually coloured Fibres
Strength Member	Fibre Reinforced Plastic (FRP) Rod - 2 Nos.
Sheath Colour	Black or As per requirement

Cable Mechanical Characteristics	
Tensile Strength	
Installation	900N
Operation	350N
Minimum Bending radius	200 mm
Crush Resistance	500N/ 100x100

Physical Characteristics	
Cable Dimensions	
Width	6 ± 0.1 mm
Height	3 ± 0.4 mm
Nominal Cable Weight	20 Kg/km (Nominal)
Cable length per drum	500 Meter to 2 Km $\pm$ 10%



AERIAL CABLES

UNITUBE AERIAL OPTICAL FIBRE CABLES

FINOLEX CABLES LIMITED.

Description:

- Central loose tube with thixotropic jelly compound
- All dielectric cable with Glass rovings

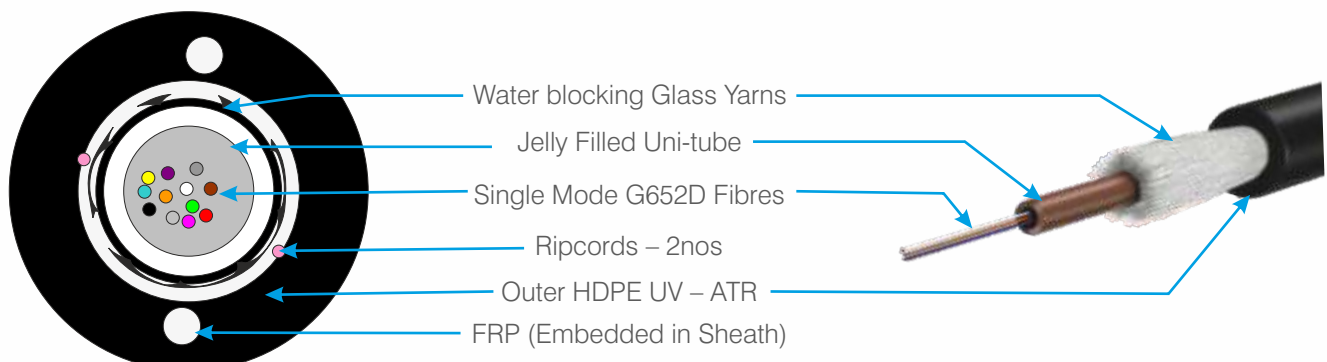
Application:

- Aerial application cable, used over head
- ADSS cables in Uni tube designs

Characteristics:

Span Length	Up to 70 meters
Installation Sag	1 % of span length
Installation Tension	725 N
Wind speed	100 km per hour
Extra Load	0.255 Kgs/m

Fibre Count	Outer Diameter (mm)	Thickness of Jacket (mm)	Nominal Cable Weight (Kg/km) HDEP	Pulling Tension IEC 60794-1-2-E1		Crush Load IEC 60794-1-2-E3 (N/100mm)	Bend Radius (mm) IEC 60794-1-2-E11 IEC 60794-1-2-E6
				Short Term (N)	Long Term(N)		Long Term
2F - 12F	9 ± 0.3	1.8 ± 0.2	68	1700	800	2000	20D
24F	9.5 ± 0.3	1.8 ± 0.2	75	2000	1000	3000	20D



AERIAL CABLES

MULTI-TUBE AERIAL CABLES OPTICAL FIBRE CABLES



Description:

- Central FRP strength member
- Loose tube construction
- All dielectric cable

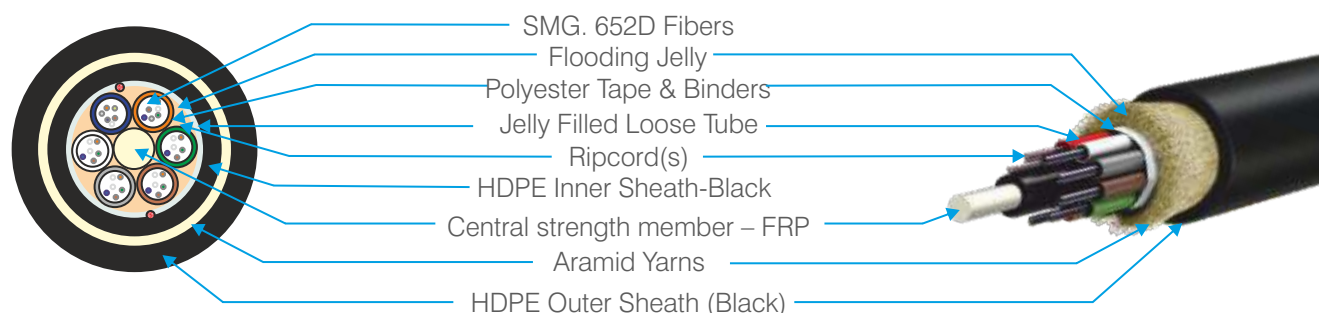
Application:

- Aerial application cable, used over head
- ADSS cables in Multi tube designs

Characteristics:

Span Length	Up to 70 meters
Installation Sag	1 % of span length
Installation Tension	725 N
Wind speed	100 km per hour
Extra Load	0.255 Kgs/m

Fibre Count	Nominal Outer Diameter (mm)	Nominal Thickness of Jacket (mm)	Nominal Cable Weight (Kg/km)	Tensile Load Maximum (N)	Crush Load (N/100 mm)		Bend Radius (mm)	
					Short Term	Long Term	Short Term	Long Term
6	14	1.6	145	8000	4000	2000	20D	10D
8	14	1.6	145	8000	4000	2000	20D	10D
12	14	1.6	145	8000	4000	2000	20D	10D
24	14	1.6	145	8000	4000	2000	20D	10D
48	14	1.6	145	8000	4000	2000	20D	10D
96	16.7	1.6	205	8000	4000	2000	20D	10D
144	20	1.6	250	8000	4000	2000	20D	10D



AERIAL CABLES

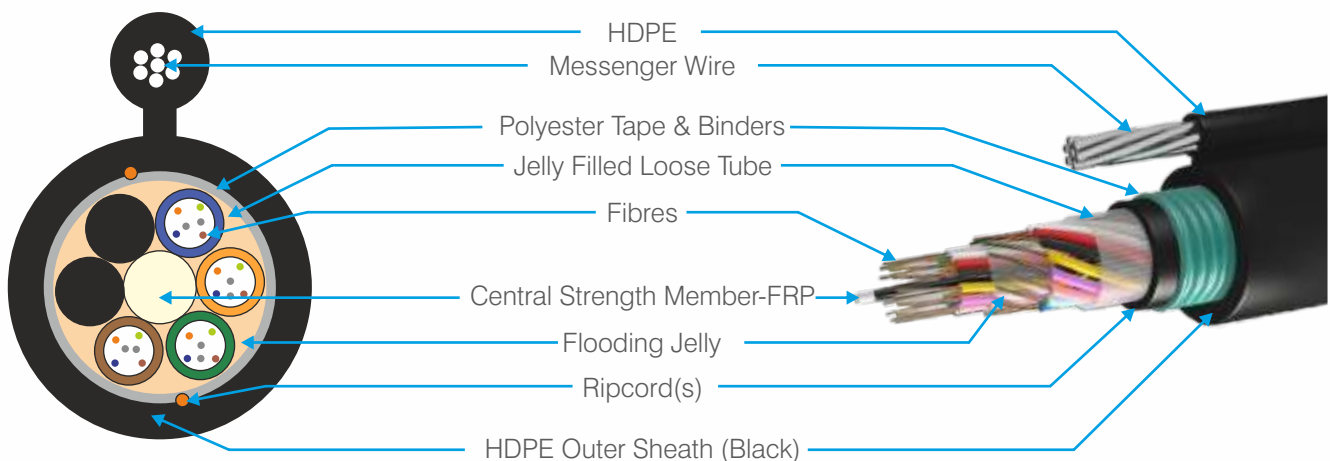
SINGLE SHEATH MULTITUBE FIG-8 FIBRE OPTICAL FIBRE CABLES

FINOLEX CABLES LIMITED.

Mechanical & Environment Characteristics:

Operating Temperature	-10 deg C to +60 deg C
Storage Temperature	-20 deg C to +85 deg C
Jacket Material	HDPE

Fibre Count	Nominal Outer diameter (mm)	Nominal Thickness of Jacket (mm)	Nominal Cable Weight (kg/km)	Tensile Load Maximum (N)	Crush Load (N/ 100mm)		Bend Radius (mm)	
					Short Term	Long Term	Short Term	Long Term
6	10.2x19.2	1.5	200	2000	2000	1000	20D	10D
12	10.2x19.2	1.5	200	2000	2000	1000	20D	10D
24	10.2x19.2	1.5	200	2000	2000	1000	20D	10D
36	10.2x19.2	1.5	200	2000	2000	1000	20D	10D
48	10.2x19.2	1.5	200	6000	2000	1000	20D	10D
72	10.2x19.2	1.5	220	6000	2000	1000	20D	10D
96	12.2x20.2	1.5	235	6000	2000	1000	20D	10D
144	15.6x23.6	1.5	265	6000	2000	1000	20D	10D



AERIAL CABLES

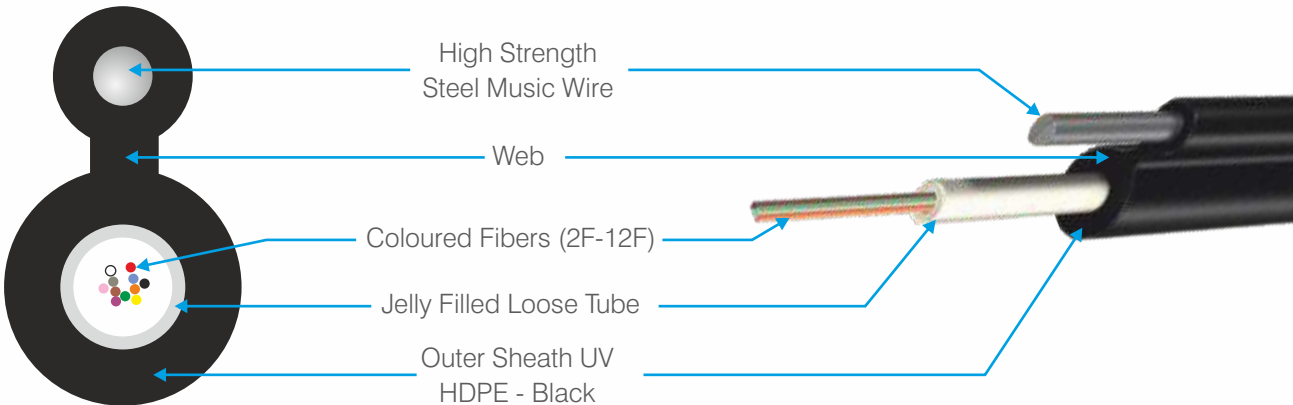
SINGLE SHEATH UNI TUBE FIG-8 FIBRE OPTICAL FIBRE CABLES



Description
 Fig-8 OFC : 2F to 12F Single Mode: Size: 6.5mm x 10.5mm(Nom.)

CABLE CONSTRUCTION DETAILS

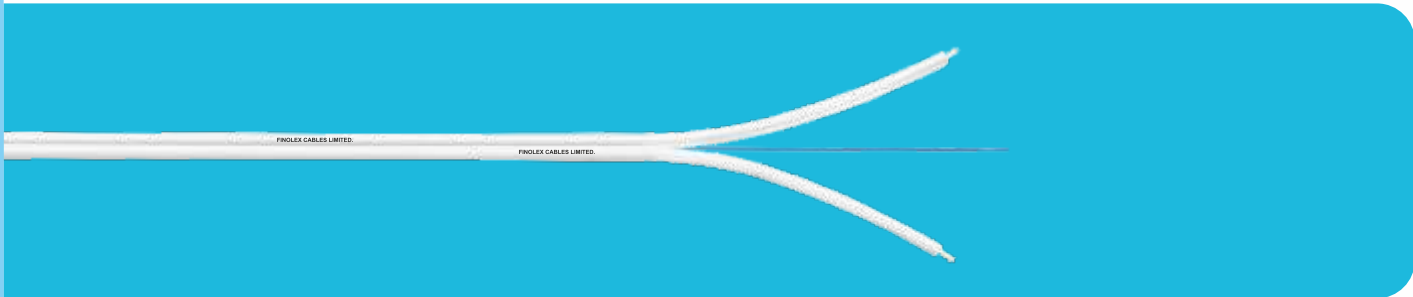
Sr.	Component	Description
1	Fiber Type / Attenuation /Fibre Colours	SM G652: 0.38/0.25dB/km Max at 1310/1550nm respectively. FIBRE COLOURS: 2F: BL, OR/NT 4F: BL, OR, GR & BR/NT 6F: BL, OR, GR, BR, SL, WH/NT 12F: BL, OR, GR, BR, SL, WH, RD, BK, YL, VIO, RS, AQ/NAT
2	Uni-tube	Polybutylene Teraphthalate (PBT) filled with Thixotropic Jelly
3	Web	UV HDPE Black - Solid
4	Messenger/Support	High Strength - Steel Music Wire Dia. 1.6mm Nom.
5	Outer Sheath	UV HDPE Black
6	Cable Size	6.5 + 0.5mm x 10.5mm + 0.5mm
7	Cable weight	58 kg/km Nominal





PREMISES CABLES

FTTH CABLE



Description
1 or 2 fibres are placed in LSZH/ PVC sheath in between two ARP rods which can be taken out easily from the sheath. Optical Fibre used is insensitive to bending which is suitable in FTTH network for indoor application.

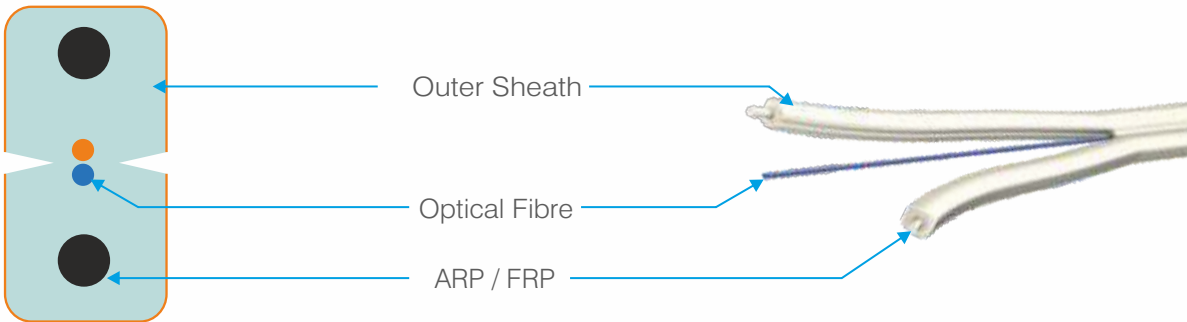
- Advantages**

 - All dielectric cable
 - Light weight
- Simple and fast installation
 - Self supporting
- Easy for termination
 - Low bend radius

Cable Construction details

No. of Fibres	1F or 2F as per requirement
Fibre Colour	Blue, Orange
Strength Member	Aramid Reinforced Plastic (ARP) Rod – 2 Nos.
Sheath	Low Smoke Zero Halogen or PVC
Sheath Colour	Black or As per requirement

Cable Mechanical Characteristics		Physical Characteristics	
Tensile Strength		Cable Dimensions	
Installation	100N	Width	3.1 ± 0.2 mm
Operation	50N	Height	2 ± 0.2 mm
Minimum Bending radius	20 mm	Nominal Cable Weight	9.5 Kg/km (Nominal)
Crush Resistance	500N/ 100x100	Cable length per drum	500 Meter to 2 Km ± 10%



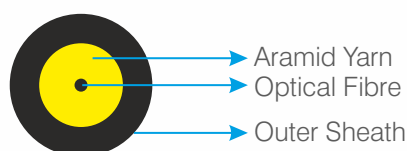
PREMISES CABLES

SIMPLEX CABLE



1 Fibre Tight Coated With PVC Or Lszh Is Placed In Lszh Sheath With Aramid Yarn. Optical Fibre Used Is Bending Loss Insensitive which is Suitable in FTTH Network For Indoor Application.

No. of Fibres	1F Tight Coated
Fibre Colour	Natural
Strength Member	Aramid Yarn
Sheath	Low Smoke Zero Halogen
Sheath Colour	Yellow or as per requirement



Cable Mechanical Characteristics		Physical Characteristics	
Tensile Strength		Cable Dimensions	
Installation	100N	OD	2.0 ± 0.2 mm
Operation	50N	Nominal Cable Weight	4 Kg/km (Nominal)
Minimum Bending radius	50 mm	Cable length per drum	500 Meter to 2 Km $\pm$ 10%
Crush Resistance	200N/ 100x100		

DUPLEX CABLE



Mechanical & Environment Characteristics:

Operating Temperature	-10 deg C to +60 deg C
Storage Temperature	-20 deg C to +85 deg C
Jacket Material	LSZH



Fibre Count	Outer diameter (mm)	Nominal thickness of Jacket (mm)	Nominal Cable Weight (Kg/km)	Tensile Load Maximum (N)	Crush Load (N/100 mm)	Bend Radius (mm)
02	4.2 ± 0.3	0.3		100	500 200	20D 10D

PREMISES CABLES

SPIRAL ARMoured FLEXIBLE OPTICAL FIBRE CABLES

FINOLEX CABLES LIMITED.

1 or 2 fibre tight coated with nylon or LSZH is placed in spiral armour tube with aramid yarn as peripheral strength member and LSZH/HDPE as outer sheath.

Cable Description	1F/ 2F Spiral Armoured Cable
Type of Fibre	G.652D, G.657, OM1, OM2, OM3, OM4

Advantages:

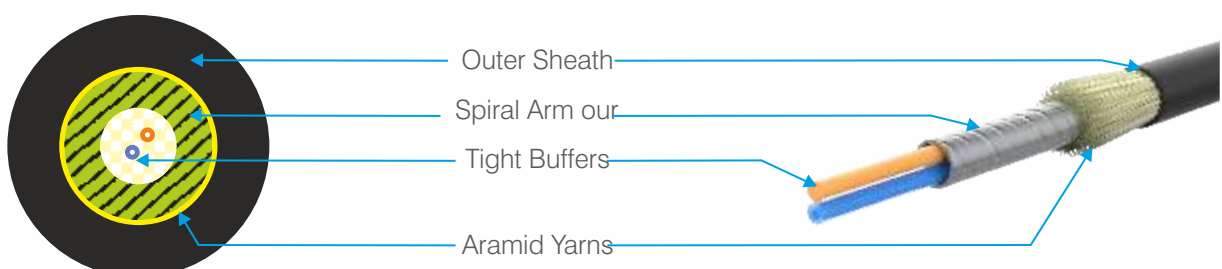
- Anti Rodent
- Highly Flexible
- Light weight
- Simple and fast installation
- Easy for termination
- Low bend radius

Application:

1. Suitable for Indoor & Outdoor application
2. Suitable for Fiber to the Antenna (FTTA)
3. Squirrel & Rodent Proof
4. Defense application

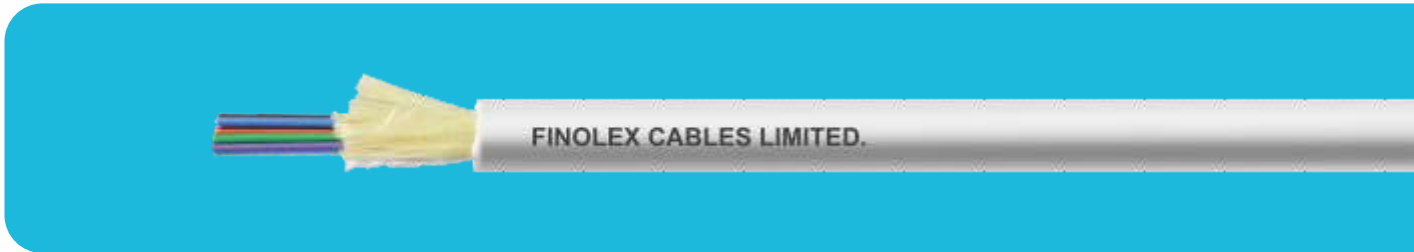
No. of Fibres	1F/ 2F Tight Coated
Fibre Colour	Natural/ or coloured as Blue, Orange
Strength Member	Aramid Yarn
Sheath	Low Smoke Zero Halogen/ HDPE
Sheath Colour	Black or As per requirement

Cable Mechanical Characteristics		Physical Characteristics	
Tensile Strength		Cable Dimensions	
Installation	400N	OD	1F – 3.0 ± 0.2 mm
Operation	300N		2F – 4.8 ± 0.2 mm
Minimum Bending radius	50 mm	Cable length per drum	In multiple of 50 Meter
Crush Resistance	3000N/ 100x100		



PREMISES CABLES

DISTRIBUTION TIGHT BUFFER OPTICAL FIBRE CABLES



Description

- Tight buffered fibre without jelly compound
- Aramid yarn strength members
- LSZH black outer sheath
- Round construction and termination can be made with standard connector

Application

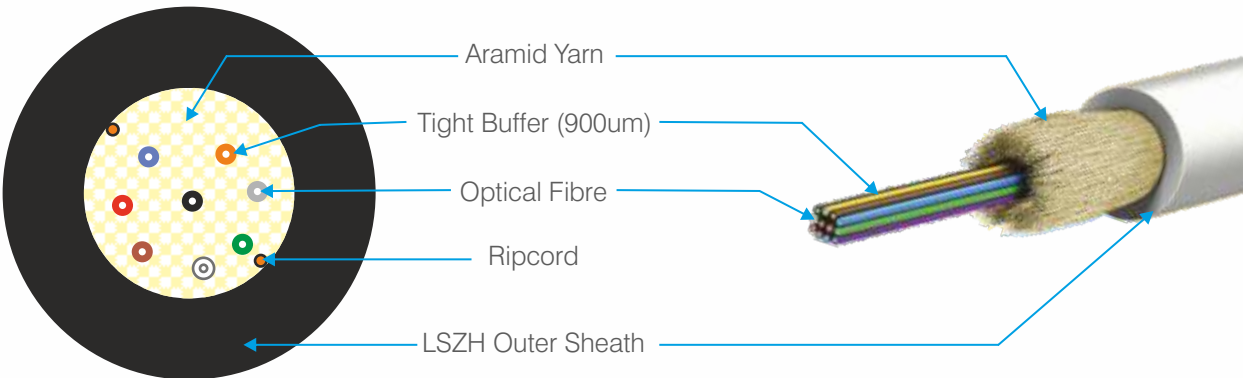
- Suitable for aerial, pipeline, bracket lying
- Suitable for indoor and outdoor cable
- Light weight, all dielectric self supporting (ADSS)
- *Backbone & Computer room cabling

Mechanical, Physical & Environment Characteristics:

Operating Temperature	-10 deg C to +60 deg C
Storage Temperature	-20 deg C to +85 deg C
Tight Buffer Material	PVC / LSZH / Nylon - 12
Jacket Material	LSZH

Fibre Count	Outer diameter (mm)	Nominal Thickness of Jacket (mm)	Nominal Cable Weight (kg/km)	Pulling tension IEC 60794-1-2-E1		Crush Load (N/ 100mm) IEC 60794-1-2-E3		Bend Radius (mm) IEC 60794-1-2-E11 IEC 60794-1-2-E6	
				Short Term (N)	Long Term (N)	Short Term	Long Term	Short Term	Long Term
2	5.0 ± 0.3	1.2	25	640	640	1500	600	20D	10D
4	5.4 ± 0.3	1.2	29	640	640	1500	600	20D	10D
6	6.0 ± 0.3	1.2	35	730	730	1500	600	20D	10D
8	6.5 ± 0.3	1.2	40	730	730	1500	600	20D	10D
12	7.5 ± 0.3	1.3	52	1100	1100	1500	600	20D	10D
16*	8.5 ± 0.3	1.3	63	1500	1500	2000	1000	20D	10D

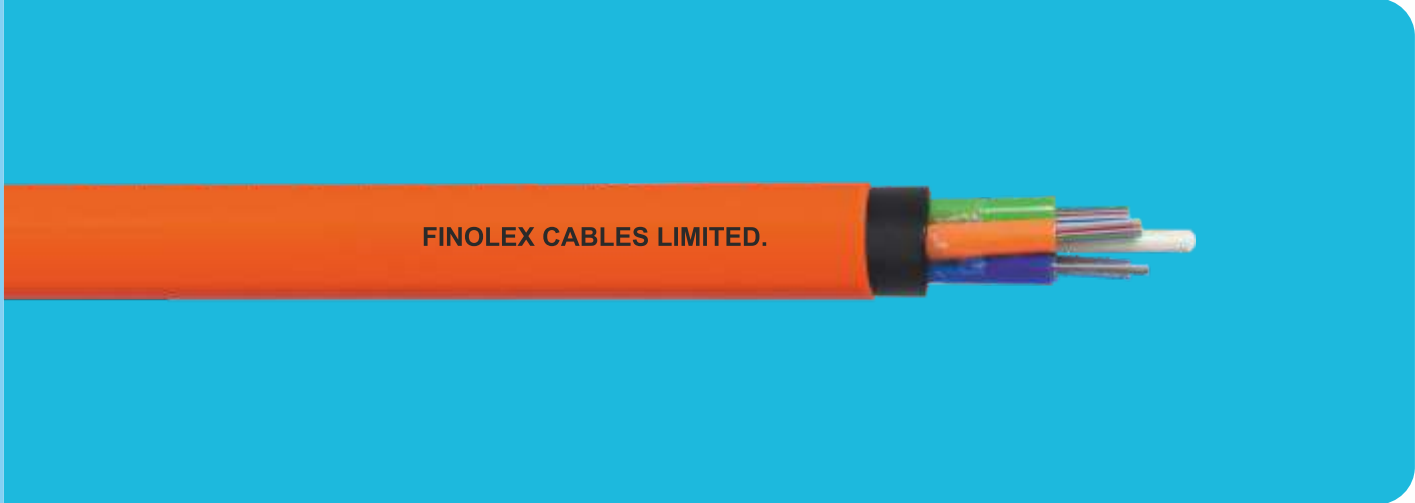
* 16C - Core contains two bundle of 8F





SPECIALITY CABLES

SINGLE SHEATH UNARMoured RIBBON OPTICAL FIBRE CABLES

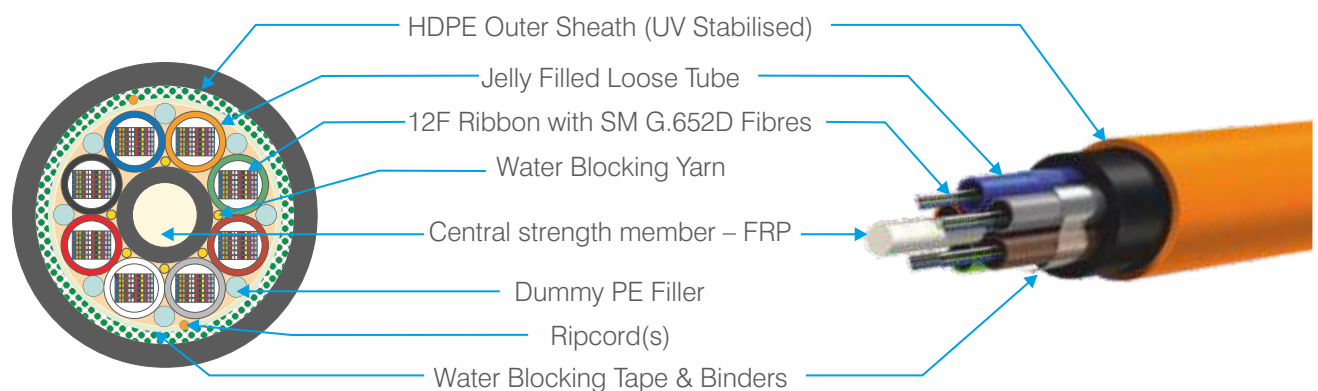


Description

- All dielectric Cable
- Multitube design in Ribbon
- High fibre count ribbon accommodating 576 Fibres

PHYSICAL & DIMENSIONS PROPERTIES

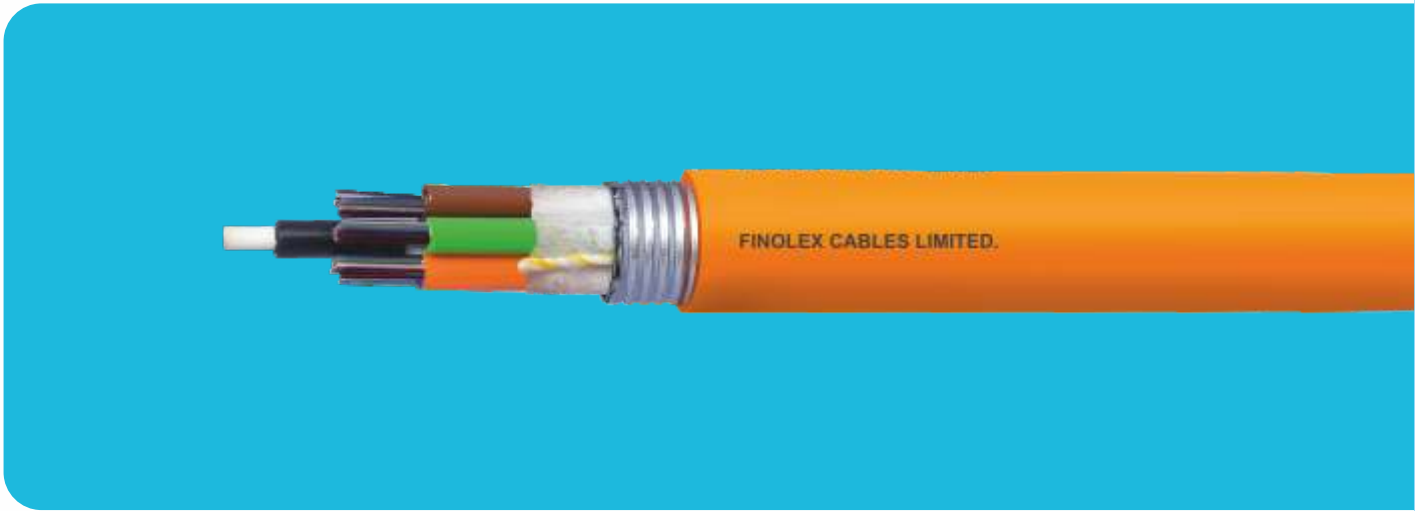
Fibre Count	Nominal Outer Diameter (mm)	Nominal Thickness of Jacket (mm)	Nominal Cable Weight (Kg/km)	Tensile Load Maximum (N)	Crush Load (N/100 mm)		Bend Radius (mm)	
					Short Term	Long Term	Short Term	Long Term
48	17.5	1.8	225	1500	4000	2000	20D	10D
96	17.5	1.8	225	1500	4000	2000	20D	10D
144	19	1.8	270	1500	4000	2000	20D	10D
192	23.2	1.8	410	1500	4000	2000	20D	10D
288	23.2	1.8	410	1500	4000	2000	20D	10D
576	28.5	1.8	600	1500	4000	2000	20D	10D



SPECIALITY CABLES

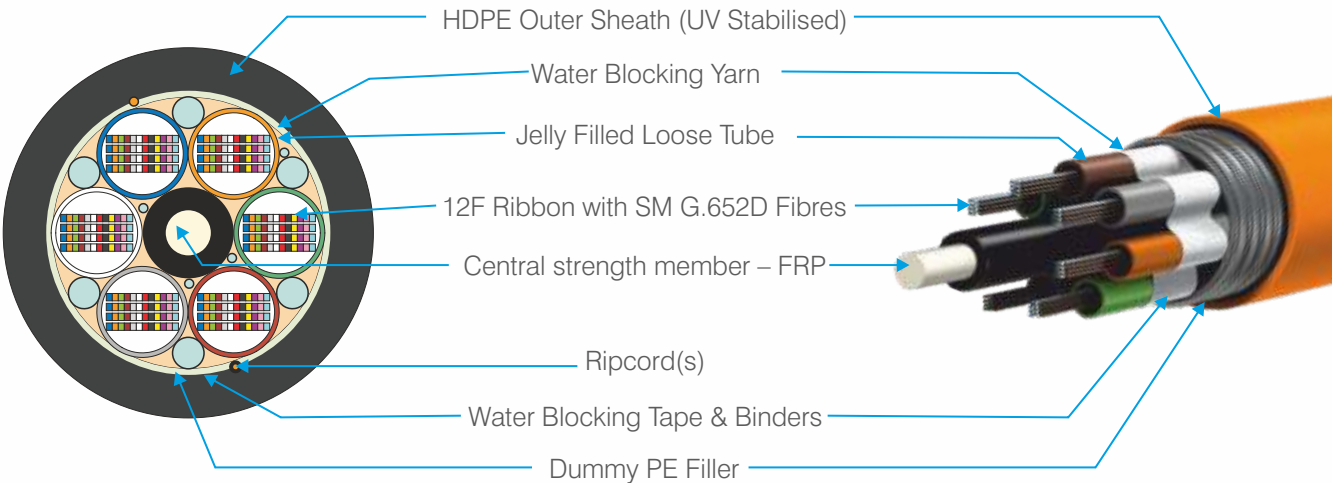
SINGLE SHEATH ARMoured RIBBON

OPTICAL FIBRE CABLES



PHYSICAL & DIMENSIONS PROPERTIES

Fibre Count	Nominal Outer Diameter (mm)	Nominal Thickness of Jacket (mm)	Nominal Cable Weight (Kg/km)	Tensile Load Maximum (N)	Crush Load (N/100 mm)		Bend Radius (mm)	
					Short Term	Long Term	Short Term	Long Term
48	19	1.8	310	3000	4000	2000	20D	10D
96	19	1.8	310	3000	4000	2000	20D	10D
144	20.5	1.8	410	3000	4000	2000	20D	10D
192	24.7	1.8	560	3000	4000	2000	20D	10D
288	24.7	1.8	560	3000	4000	2000	20D	10D
576	30	1.8	740	3000	4000	2000	20D	10D



FinOptic-LBLF(G657A1) is a Low Bend Loss Singlemode fiber designed for transmission systems over the entire range from 1260 to 1625 nm range. FinOptic-LBLF (G657A1) has excellent bending performance and also result in lower attenuation in challenging applications & it is optimised for use in Fibre To The Home (FTTH) operations. FinOptic-LBLF meets or exceeds ITU Recommendations G657(Category A), IEC 60793-2-50(TypeB1.3)

SPECIFICATIONS - FINOPTIC / LBLF(G657A1) / 07 / 13

MAX ATTENUATION (dB/km)		MECHANICAL PROPERTIES	
At 1310 nm	≤ 0.34 dB/Km	Proof Test - The entire fiber length is subjected to tensile stress of 100Kpsi (0.7 Gpa). This is equivalent to 1% strain	
At 1550 nm	≤ 0.21 dB/Km	DYNAMIC TENSILE STRENGTH	
At 1490 nm	≤ 0.24 dB/Km	Un-aged	≥ 550 Kpsi (3.80 Gpa)
At 1625 nm	≤ 0.23 dB/Km	Aged	≥ 440 Kpsi (3.00 Gpa)
POINT DISCONTINUITY		Fiber Curl	≥ 4.0 mts
At 1310 nm	≤ 0.05 dB	MACRO BEND LOSS:	
At 1550 nm	≤ 0.05 dB	(Mandrel Dia/Turn/Wavelength)	
SPECTRAL ATTENUATION		30mm/10 turn/ 1550 nm	≤ 0.25 dB
Bet 1285-1360 nm	≤ 0.37dB/Km	30mm/10 turn/ 1625 nm	≤ 1.0 dB
Bet 1360-1480 nm	≤ Atten at 1310 dB/Km	20mm/1turn/ 1550 nm	≤ 0.75 dB
Bet 1480-1525 nm	≤ 0.34 dB/Km	20mm/1turn/ 1625 nm	≤ 1.5 dB
Bet 1525-1625 nm	≤ 0.23 dB/Km	Coating Strip Force (Average)	1.3 TO 8.9 N
Attenuation at 1380 to 1390*	≤ Atten at 1310 dB/Km	Dynamic Fatigue Typical (nd)	≥ 20
*Attenuation value at this wavelength represents post hydrogen aging performance		Static Fatigue Typical (ns)	≥ 20
CHROMATIC DISPERSION		ENVIRONMENTAL CHARACTERISTICS	
1285-1330 nm	≤ 3.5ps/nm.km	Temperature Dependence(-60 deg C to + 85 deg C) Induced	≤ 0.05 dB/Km
1270-1340 nm	≤ 5.3ps/nm.km	Attenuation At 1550,1625 nm	
At 1550 nm	≤ 18ps/nm.km	Temperature Humidity Cycling (-10 deg C to + 85 degC at 95% RH) Induced Attenuation At 1550,1625 nm	≤ 0.05 dB/Km
At 1625 nm	≤ 22ps/nm.km	Water immersion (23 ± 2 deg C) induced attenuation At 1550,1625	≤ 0.05 dB/Km
Zero Dispersion wavelength	1300 to 1324 nm	Heat Aging (85 ± 2 deg C) induced attenuation At 1550,1625 nm	≤ 0.05 dB/Km
Zero Dispersion Slope	≤ 0.092 ps/nm ^ 2.Km	EFFECTIVE GROUP INDEX OF REFRACTION*	
MAX PMD INDIVIDUAL FIBER		Effective Group Index of Refraction at 1310nm	1.4674
At 1310 nm	≤ 0.1 ps/sqrt Km	Effective Group Index of Refraction at 1550nm	1.4679
At 1550 nm	≤ 0.1 ps/sqrt Km	Effective Group Index of Refraction at 1625nm	1.4679
FIBER PMD Link Design Value*		*Typical Values	
*The cable process can affect the PMD link property strongly		Fiber Length Per Reel	≤ 50.4
CUT-OFF WAVELENGTH		Fiber with enhanced properties/customized specifications can be provided on request	
Cabled Cut-off wavelength.	≤ 1260 nm		
MODE FIELD DIAMETER			
At 1310 nm	8.8 ± 0.6 μm		
GEOMETRICAL PARAMETERS			
Clad Diameter	125 ± 0.7 μm		
Cladding Non Circularity	≤ 0.80 %		
Mode Field Concentricity Error	≤ 0.50 μm		
Coating Diameter	242 ± 7 μm		
Coating/Cladding Concentricity Error	≤ 12 μm		

For purposes of determining conformance to any specifications an observed or calculated value shall be rounded "to the nearest unit" in the last right-hand digit used in expressing the specification limit, in accordance with the rounding method of ASTM Practice E29, "Using Significant Digits in Test Data to Determine Conformance with Specifications."

FinOptic – NZDSF



FinOptic-NZDSF fiber is designed to operate across a window of wavelengths near 1550nm with small amount of dispersion. FinOptic-NZDSF fibre is optimized for use in national long haul backbone networks. Due to its lower dispersion in the 1550nm window it is an ideal and cost effective solution for DWDM operations. FinOptic-NZDSF meets or exceeds ITU Recommendations G655.

FinOptic- NZDSF

MAX ATTENUATION (dB/km)		Fiber Curl ≥ 4.0 mts	
At 1550 nm	≤ 0.22 dB/Km	MACRO BEND LOSS:	
At 1625 nm	≤ 0.24 dB/Km	(Mandrel Dia/Turn/Wavelength)	
Attenuation at 1383 ± 3 nm*	≤ 0.40 dB/Km	60mm/100 turn/ 1550 nm	≤ 0.05 dB
*Attenuation value at this wavelength represents post hydrogen aging performance		60mm/100 turn/ 1625 nm	≤ 0.1 dB
POINT DISCONTINUITY		32mm/1turn/ 1550 nm	≤ 0.50 dB
At 1550 nm	≤ 0.1 dB	Coating Strip Force (Average)	1 to 5 N
At 1625 nm	≤ 0.1 dB	Dynamic Fatigue Typical (nd)	≥ 20
CHROMATIC DISPERSION		Static Fatigue Typical (ns)	≥ 20
1530-1565	2.0 - 6.0 ps/nm.km	ENVIRONMENTAL CHARACTERISTICS	
1565-1625	4.5 - 11.2 ps/nm.km	Temperature Dependence (-60 deg C to + 85 deg C) Induced Attenuation	
POLARIZATION MODE DISPERSION*		At 1550 nm	≤ 0.05 dB/Km
PMD Individual Fiber at 1550 nm	≤ 0.2 ps/sqrt Km	At 1625 nm	≤ 0.05 dB/Km
Cabled Fiber at 1550 nm	≤ 0.3 ps/sqrt Km	Temperature Humidity Cycling (- 10 deg C to + 85 deg C at 98%RH) Induced Attenuation	
*The cable process can affect the PMD link property strongly		At 1550 nm	≤ 0.05 dB/Km
CUT-OFF WAVELENGTH		At 1625 nm	≤ 0.05 dB/Km
Cable Cut-off Wavelength	≤ 1450 nm	Water immersion (23 ± 2 deg C) induced attenuation	
MODE FIELD DIAMETER		At 1550 nm	≤ 0.05 dB/Km
At 1550 nm	$9.6 \pm 0.4 \mu\text{m}$	At 1625 nm	≤ 0.05 dB/Km
GEOMETRICAL PARAMETERS		Heat Aging (85 deg C) Induced Attenuation	
Clad Diameter	$\leq 125 \pm 0.7 \mu\text{m}$	At 1550 nm	≤ 0.05 dB/Km
Cladding Non Circularity	≤ 0.80 %	At 1625 nm	≤ 0.05 dB/Km
Mode Field Concentricity Error	$\leq 0.50 \mu\text{m}$	Damp Heat (30 days, 85 deg C at 85 % RH) Induced Attenuation	
Coating Diameter	$242 \pm 7 \mu\text{m}$	At 1550 nm	≤ 0.05 dB/Km
Coating/Cladding Concentricity Error	$\leq 12.0 \mu\text{m}$	At 1625 nm	≤ 0.05 dB/Km
Coating Non Circularity	≤ 4 %	EFFECTIVE GROUP INDEX OF REFRACTION*	
MECHANICAL PROPERTIES		Effective Group Index of Refraction at 1550nm	1.4690
Fiber Proof Test for minimum strain level	1%	Effective Group Index of Refraction at 1625nm	1.4690
DYNAMIC TENSILE STRENGTH		*Typical Values	
Tensile Strength(Median) for 0.5mts specimen length- Un-aged	≥ 550 Kpsi (3.80 Gpa)	Fiber Length Per Reel	≤ 50.4
Tensile Strength(Median) for 0.5mts specimen length- Aged	≥ 440 Kpsi (3.00 Gpa)	Fiber with enhanced properties/customised specifications can be provided on request	
Tensile Strength(Median) for 10mts specimen length- Un-aged	≥ 500 Kpsi (3.45 Gpa)		

For purposes of determining conformance to any specifications an observed or calculated value shall be rounded "to the nearest unit" in the last right-hand digit used in expressing the specification limit, in accordance with the rounding method of ASTM Practice E29, "Using Significant Digits in Test Data to Determine Conformance with Specifications."

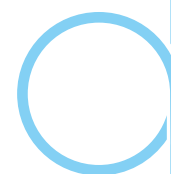
FinOptic - LWPF fibre is designed for transmission systems over the entire wavelength range from 1260 to 1625 nm, and is characterized by attenuation at 1380 - 1386nm band being less than attenuation at 1310 nm. FinOptic - LWPF is optimized for use in metropolitan, local and access networks for long distances due to low attenuation across the entire band and low PMD. It is an ideal & cost effective solution for CWDM operations. It provides outstanding long term reliability due to its immunity to hydrogen aging. FinOptic - LWPF meets or exceeds ITU Recommendations G652 (Categories C & D), IEC60793-1-51, IEC60793-1-52, IEC60793-1-53

SPECIFICATIONS - FINOPTIC / LWPF / A / 05 / 07 / 16

MAX. ATTENUATION AT 1310 nm ≤ 0.34 dB/Km AT 1550 nm ≤ 0.21 dB/Km AT 1490 nm ≤ 0.24 dB/Km AT 1625 nm ≤ 0.23 dB/Km AT 1383 nm* $\leq$ Attenuation at 1310 nm* *Attn value at this wavelength represents post hydrogen aging performance strongly		Coating/Cladding Concentricity Error $\leq 12 \mu\text{m}$	
ATTENUATION Vs WAVELENGTH Between 1285 to 1330 nm (with reference to 1310nm) ≤ 0.03 dB/Km Between 1525 to 1575nm (with reference to 1550nm) ≤ 0.02 dB/Km		MECHANICAL PROPERTIES Proof Test - The entire fiber length is subjected to a tensile stress of 100Kpsi(0.7Gpa). This is equivalent to 1% Strain	
POINT DISCONTINUITY Point Discontinuity at 1310 nm ≤ 0.05 dB Point Discontinuity at 1550 nm ≤ 0.05 dB		DYNAMIC TENSILE STRENGTH Unaged ≥ 550 Kpsi (3.80Gpa) Aged ≥ 440 Kpsi (3.00 Gpa) Fiber Curl ≥ 4.0 Meter	
CHROMATIC DISPERSION Between 1285 to 1330 nm ≤ 3.5 ps/nm.km Between 1270 to 1340 nm ≤ 5.3 ps/nm.km AT 1550 nm ≤ 18 ps/nm.km AT 1625 nm ≤ 22.0 ps/nm.km Zero Dispersion Wavelength 1300 nm to 1324 nm Zero Dispersion Slope ≤ 0.092 ps/nm $^{\circ}$ 2.Km		MACRO BEND LOSS: (Mandrel Dia/Turn/Wavelength) 32mm/1 turn/ 1550 nm ≤ 0.5 dB 50mm/100 turn/ 1310 nm ≤ 0.05 dB 60mm/100 turn/ 1550 nm ≤ 0.05 dB 60mm/100 turn/ 1625 nm ≤ 0.10 dB Coating Strip Force 1.3N to 8.9N Dynamic Fatigue Typical (nd) ≥ 20 Static Fatigue Typical (ns) ≥ 20	
MAX PMD INDIVIDUAL FIBER At 1310 nm ≤ 0.2 ps/sqrt Km At 1550 nm ≤ 0.2 ps/sqrt Km FIBER PMD Link Design Value* *The cable process can affect the PMD link property strongly		ENVIRONMENTAL CHARACTERISTICS Temperature Dependence (-60 deg C to + 85 deg C) Induced Attenuation At 1550,1625 nm ≤ 0.05 dB/Km Temperature Humidity Cycling (- 10 deg C to + 85 degC at 95% RH) Induced Attenuation At 1550,1625 nm ≤ 0.05 dB/Km Water immersion (23 $\pm$ 2 deg C) induced attenuation At 1550,1625 nm ≤ 0.05 dB/Km Heat Aging (85 $\pm$ 2 deg C) induced attenuation At 1550,1625 nm ≤ 0.05 dB/Km	
CUTOFF WAVELENGTH Cable Cut-off Wavelength ≤ 1260 nm		EFFECTIVE GROUP INDEX OF REFRACTION* Effective Group Index of Refraction at 1310nm 1.4674 Effective Group Index of Refraction at 1550nm 1.4679 Effective Group Index of Refraction at 1625nm 1.4679 *Typical values Fiber length per reel ≤ 50.4 Km	
MODE FIELD DIAMETER At 1310 nm $9.2 \pm 0.4 \mu\text{m}$ At 1550 nm $10.4 \pm 0.5 \mu\text{m}$		Fiber with enhanced properties / customized specifications can be provided on request	
GEOMETRICAL PROPERTIES Clad Diameter $125 \pm 1.0 \mu\text{m}$ Cladding Non Circularity $\leq 0.8 \%$ Mode Field Concentricity Error $\leq 0.5 \mu\text{m}$ Coating Diameter $242 \pm 7 \mu\text{m}$			

For purposes of determining conformance to any specifications an observed or calculated value shall be rounded "to the nearest unit" in the last right-hand digit used in expressing the specification limit, in accordance with the rounding method of ASTM Practice E29, "Using Significant Digits in Test Data to Determine Conformance with Specifications."

FinOptic - LWPf PREMIUM



FinOptic - LWPf Premium fibre is designed for transmission systems over the entire wavelength range from 1260 to 1625 nm, and is characterized by attenuation at 1380 to 1386nm band being less than attenuation at 1310 nm. FinOptic - LWPf Premium is optimized for use in metropolitan, local and access networks due to low attenuation across the entire band and low PMD. It is an ideal & cost effective solution for CWDM operations. It provides outstanding long term reliability due to its immunity to hydrogen aging. FinOptic - LWPf Premium fibre meets or exceeds ITU Recommendations G652 (Categories C & D), IEC60793-1-51, IEC60793-1-52, IEC60793-1-53

SPECIFICATIONS - FinOptic - LWPf Premium / B / 05 / 07 / 16

MAX. ATTENUATION

AT 1310 nm	≤ 0.34 dB/Km
AT 1550 nm	≤ 0.21 dB/Km
AT 1490 nm	≤ 0.24 dB/Km
AT 1625 nm	≤ 0.23 dB/Km
AT 1383 nm*	≤ 0.31* dB/Km

*Attn value at this wavelength represents post hydrogen aging performance strongly

ATTENUATION Vs WAVELENGTH

Between 1285 to 1330 nm (with reference to 1310nm)	≤ 0.03 dB/Km
Between 1525 to 1575nm (with reference to 1550nm)	≤ 0.02 dB/Km

POINT DISCONTINUITY

Point Discontinuity at 1310 nm	≤ 0.05 dB
Point Discontinuity at 1550 nm	≤ 0.05 dB

CHROMATIC DISPERSION

Between 1285 to 1330 nm	≤ 3.5 ps/nm.km
Between 1270 to 1340 nm	≤ 5.3 ps/nm.km
AT 1550 nm	≤ 17.5 ps/nm.km
AT 1625 nm	≤ 22.0 ps/nm.km
Zero Dispersion Wavelength	1302 nm to 1322 nm
Zero Dispersion Slope	≤ 0.090 ps/nm ² .Km

MAX PMD INDIVIDUAL FIBER

At 1310 nm	≤ 0.1 ps/sqrt Km
At 1550 nm	≤ 0.1 ps/sqrt Km
FIBER PMD Link Design Value*	≤ 0.06 ps/sqrt Km

*The cable process can affect the PMD link property strongly

CUTOFF WAVELENGTH

Cable Cut-off Wavelength	≤ 1260 nm
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MODE FIELD DIAMETER

At 1310 nm	9.2 ± 0.4 μm
At 1550 nm	10.4 ± 0.5 μm

GEOMETRICAL PROPERTIES

Clad Diameter	125 ± 0.7 μm
Cladding Non Circularity	≤ 0.8 %
Mode Field Concentricity Error	≤ 0.5 μm
Coating Diameter	242 ± 7 μm
Coating/Cladding Concentricity Error	≤ 12 μm

MECHANICAL PROPERTIES

Proof Test - The entire fiber length is subjected to a tensile stress of 100Kpsi (0.7Gpa). This is equivalent to 1% Strain

DYNAMIC TENSILE STRENGTH

Unaged	≥ 550 Kpsi (3.80Gpa)
Aged	≥ 440 Kpsi (3.00 Gpa)
Fiber Curl	≥ 4.0 Meter

MACRO BEND LOSS:

(Mandrel Dia/Turn/Wavelength)	
32mm/1 turn/ 1550 nm	≤ 0.05 dB
50mm/100 turn/ 1310 nm	≤ 0.05 dB
60mm/100 turn/ 1550 nm	≤ 0.05 dB
60mm/100 turn/ 1625 nm	≤ 0.10 dB
Coating Strip Force	1.3N to 8.9N
Dynamic Fatigue Typical (nd)	≥ 20
Static Fatigue Typical (ns)	≥ 20

ENVIRONMENTAL CHARACTERISTICS

Temperature Dependence (-60 deg C to + 85 deg C) Induced	≤ 0.05 dB/Km
Attenuation At 1550, 1625 nm	
Temperature Humidity Cycling (- 10 deg C to + 85 deg C at 95% RH) Induced Attenuation At 1550, 1625 nm	≤ 0.05 dB/Km
Water immersion (23 ± 2 deg C) induced attenuation At 1550, 1625 nm	≤ 0.05 dB/Km
Heat Aging (85 ± 2 deg C) induced attenuation At 1550, 1625 nm	≤ 0.05 dB/Km

EFFECTIVE GROUP INDEX OF REFRACTION*

Effective Group Index of Refraction at 1310nm	1.4674
Effective Group Index of Refraction at 1550nm	1.4679
Effective Group Index of Refraction at 1625nm	1.4679
*Typical values	
Fiber length per reel	≤ 50.4 Km

Fiber with enhanced properties / customized specifications can be provided on request



PRODUCT IDENTIFICATION



Architecture						Property					
024	2D	04	L	W	A	ST	P	D	UV	BK	#
1	2	3	4	5	6	7	8	9	10	11	12

1 - Fibre Count:

002, 004, 006, 008, 012, 024, 048, 096, 144, 288...

2 - Fibre Type

2D – G652D
A1 – G657a1
A2 – G657a2
B3 – G657b3
55 – G655
56 – G556
M1 – Om1
M2 – Om2
M3 – Om3
M4 – Om4

3 - Fibre per Tube:

01, 02, 04, 06, 08, 12, 24, 48

4- Tube Type:

L- Loose Tube
R-Ribbon Tube
T- Tight Buffer

5- Water Protection:

X – Wet Dry
D – Dry Dry
W – Wet Wet
– No Water Protection
Wet Dry – 1st is for within tube and 2nd is for between

6 - Type of Cable:

K- Aerial Self Support Cable
L- Aerial Figure 8 Cable
A- Burial/Armoured Cable
U- Duct/Unarmoured Cable
P- Premises Cable
S- Speciality Cable

7- Strength Member:

GR – Glass Roving Yarns
AR – Aramid Yarns
FR – FRP
AR- ARP
MT – Mica Tape
ST – Steel Tape
AT – Aluminum Tape
SR – Steel Wire
– No Armoring

8- Outer Sheath Material:

P- Polythene
V- PVC
Z- LSZH
U- Polyurethane
N- Nylon
F- FRLS PVC

9- Jacketing:

S – Single Jacket
D – Dual Jacket
T – Triple Jacket

10 - Outer sheath property:

UV- UV Stabilized
AT- Anti-Termite
FR- Fire Retardants
AR – Anti Rodent
RR- Rodent Resistant

11 - Outer Sheath Colour:

BL-Blue OR- Orange
GR- Green BR- Brown
SI- Slate Wh-White
RD- Red BK-Black
YL- Yellow VL-Violet
PR-Purple PK-Pink
AQ- Aqua

12 - Stripe Marking:

SS- Single Stripe
DS – Double Stripe
#- No Strip

24F double sheath Armoured wet-wet cable LP item will be:0242D04LWASTPDUVBK#

STORAGE, TRANSPORTATION, HANDLING & INSTALLATION PROCEDURE

DOs & DON'Ts

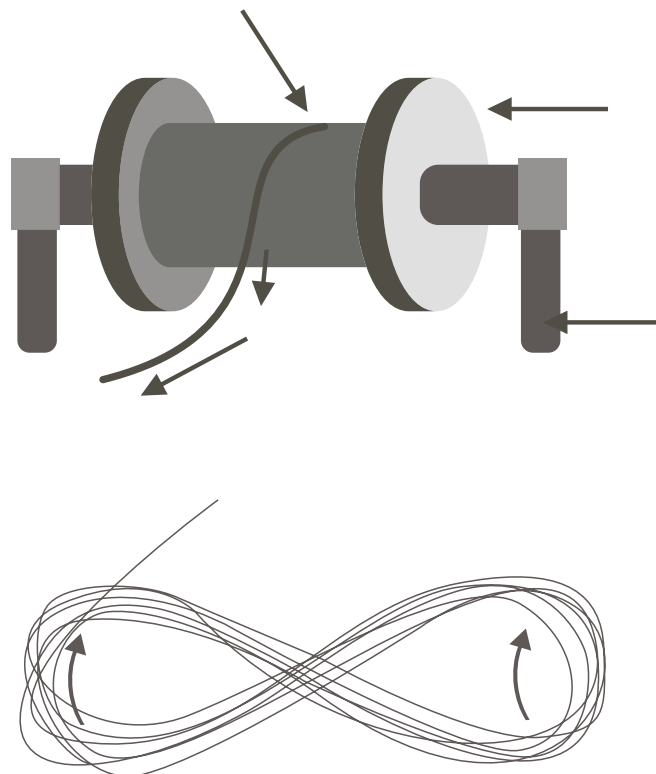
TRANSPORTATION:

1. The cable drum should be tied tightly with chain or belt and wooden blocks are to be kept in between flanges of each drum to avoid any jerks / movement during transportation.
2. During transportation do not place the cable drums in flat position as it will damage the lower cable and may cause fibre break.
3. Do not drop the cable drums while unloading. Use forklift for unloading.

HANDLING:

1. While lifting the drum make sure that the flanges of the drum should sit properly between the forks.
2. Rolling of the drum should be in the direction as indicated on the drum.
3. Use proper tools and method to open the cable drum.
4. Cable Drum should not be lifted in flat position.
5. Don't lift the cable drum by inserting forks in between the flanges. This may cause fibre break in the cable.

Installation:



1. Mounting Drum on Pay-off: Pulling Technique: For proper installation mount the cable properly on the pay off as shown below. This pay off should be properly lubricated. Height of the payoff should be suitably adjusted so the there is no problem is observed while pulling the cable out of the cable drum.
2. If possible, use automated puller with tension control or at at least a breakaway-pulling eye.

STORAGE, TRANSPORTATION, HANDLING & INSTALLATION PROCEDURE



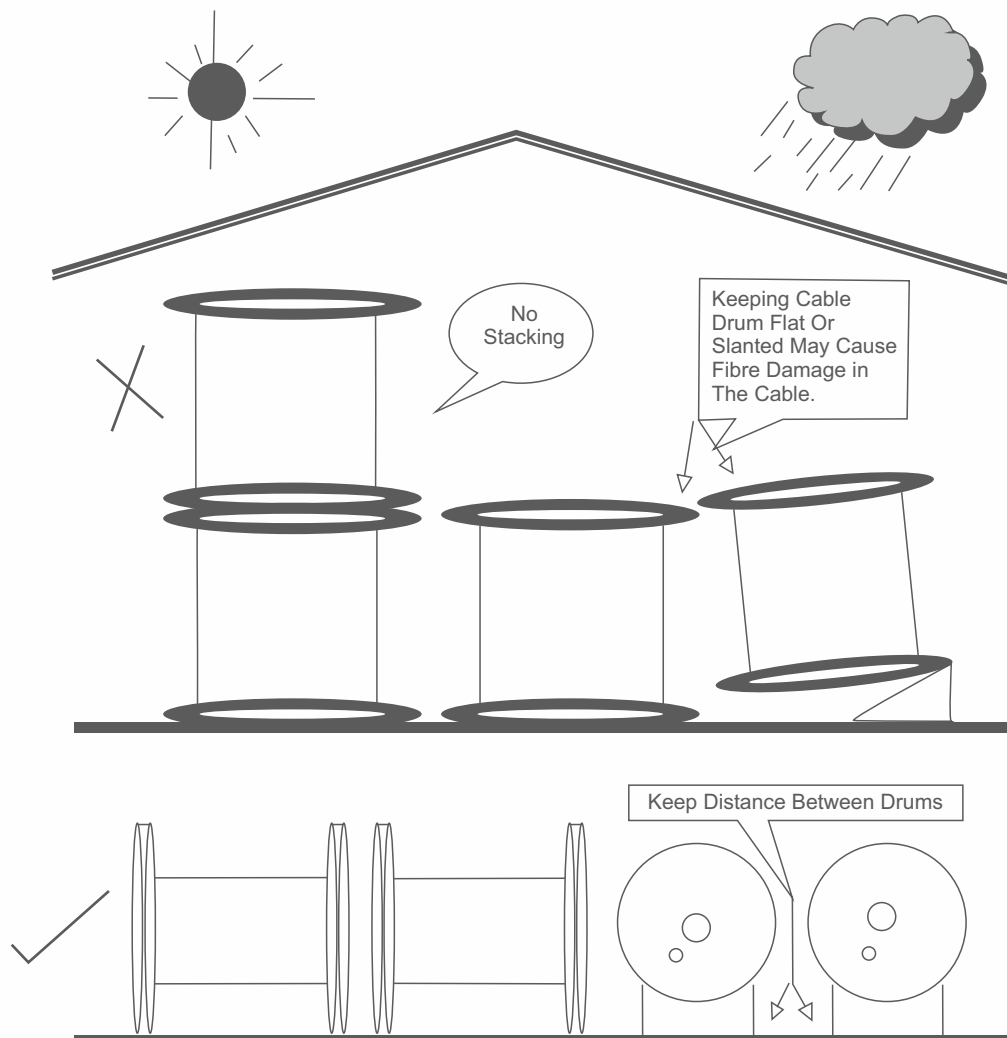
1. Never pull the cable without a pulling eye.
2. Before pulling the cable make sure that the ducts are clean.
3. The Diameter of the PVC duct should be minimum 100 mm.
4. Maintain proper direction as marked on the drum for rolling/unwinding the cable drum.
5. Continuously monitor the pulling tension while pulling the cable.
6. Use Swivel tool in between pulling eye and pulling rope to avoid cable twisting.
7. Don't allow to exceed the pulling tension beyond specified limit given by the manufacturer.
8. Do not bend the cable beyond recommended limits. Exceeding the bend radius harms the fibres. It may not be immediate, it may even take a few years but eventually by exceeding the recommended bend radius of the cable, useful life of the cable reduces.
9. Avoid longer pulls. (Maximum 1 km at a time).
10. Before blowing the cable inside the duct or directly burring inside the ground, lay out the cable in figure 8 pattern.

SAFETY GUIDELINES

1. Electric arc is generated in fusion splicer while splicing of fibre. It should be ensured that there are no flammable gasses in the vicinity.
2. Only work in well ventilated areas
3. Never look into a Fibre having a laser coupled to it. If eye is accidentally exposed to LASER beam, immediately rush for medical assistance.
4. Maintain proper direction as marked on the drum for rolling/unwinding the cable drum.
5. Continuously monitor the pulling tension while pulling the cable.
6. Use Swivel tool in between pulling eye and pulling rope to avoid cable twisting.
7. Don't allow to exceed the pulling tension beyond specified limit given by the manufacturer.
8. Do not bend the cable beyond recommended limits. Exceeding the bend radius harms the fibres. It may not be immediate, it may even take a few years but eventually by exceeding the recommended bend radius of the cable, useful life of the cable reduces.
9. Avoid longer pulls. (Maximum 1 km at a time).
10. Before blowing the cable inside the duct or directly burring inside the ground, lay out the cable in figure 8 pattern
11. Various chemical cleaners and adhesives are used during preparation of Optical Fibre cable for splicing. The safety instructions defined as defined in MSDS (Material Safety Data Sheet) of these materials should be followed.
12. Do not touch your eyes while working with Fibre optic systems until they have been thoroughly washed.
13. Do not drop Fibre pieces on the floor where they will stick in carpets or shoes and be carried elsewhere. These fibre pieces are extremely sharp and can easily penetrate the skin. And any delay in taking the Fibre out of body could lead to infection, which is dangerous. Therefore utmost care must be taken to depose the broken ends of Fibres created during termination and splicing.

STORAGE:

1. The Storage area should be clean and dust free.
2. The warehouse should have temperature and humidity controls.
3. The storage temperature of the cable should conform to the temperature range specified by manufacturer.
4. If stored for longer duration the exposure to the direct sunlight and rainwater to the cable should be avoided.





Flamegard

3 Core Flat Cables



Flame Retardant PVC
Insulated Industrial Cables

Co Axial &
CCTV Cables



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SINCE 1958

Finolex Switches



Lan Cable



Speaker Cable



Water Heater



Power Cable



Finolex Fans



Switchgear



LED Range

TL-9000 CERTIFIED

- Available in single mode and Multi-mode fibre upto 576 fibre count including Ribbon Fibre
- Central tube and multi tube construction
- Long haul Ideal for video / voice and data communication
- Ideal for structured cabling for computer networking & FTTH applications
- Approvals in place for all major Government Departments, ISP's and Private Telecom Operators



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Finolex
Cables Limited

AN IS/ISO 9001:2015 CERTIFIED COMPANY

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:DELIGHT

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