MEFC Connecting the Globe

Middle East Fiber Cable Manufacturing Co.

Connecting the Globe

Second Edition
Middle East Fiber Cable Manufacturing Co.

Connecting the Globe
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Since its inception in 1995, Middle East Fiber Cable Manufacturing Co. (MEFC) has established itself as the leader in manufacturing optical fiber cables for telecommunications and industrial sectors. Headquartered in Riyadh - Saudi Arabia, MEFC is a Saudi-Japanese partnership (year 2007) with Fujikura, a well-known global company in the fiber and telecom systems products. MEFC factory was built with a world class technical infrastructure and vast experience of professionals. MEFC is well positioned to deliver high quality products to its valued clients in short delivery periods. MEFC has a production capacity that exceeds 3000 KM/month, and is ISO 9001:2008 Certified. MEFC maintains production of very superior-quality fiber cables. Focusing on fiber optics and related technologies, MEFC has accumulated great experience and innovative technical knowledge. Our quality control procedures are strictly followed throughout the manufacturing processes in accordance with the International Telecommunication Union (ITU) and IEC standards. MEFC has been also certified by international certification bodies such as Telecordia, BSI, Intertek, and ITU. In addition, MEFC employs a very competent, well-experienced management team and dedicated employees, most of which have been with the company for very long term. Sales and marketing staff have established long-term business relationships with government entities as well as service providers, industrial and integration and OSP contractors. MEFC top priority is to provide superior quality products, along with continual improvement in order to achieve ultimate customer satisfaction.

ISO 9001-2008 Certified
- Certified by RWTUV Germany

Company’s Top Priorities
- Superior quality products
- Continuous Improvement
- Customer Satisfaction

MEFC Vendor Approvals
1. Saudi Aramco
2. Saudi Telecom Company
3. Saudi Railways
4. Kuwait Oil Company
5. Kuwait National Petroleum Corporation
6. Zain Kuwait
7. Qatari Petroleum
8. Sudan Telecom
9. Dubai Electricity Water Authority
10. Federal Electricity Water Authority
11. SEC
12. SWCC
13. Iran Telecom
14. MODA, Saudi Arabia
15. Mobily (Bayanat) / ITC
16. MOI, Saudi Arabia
17. Princess Nourah University
18. King Abdullah Petroleum Science & Research Centre
19. King Abdullah Financial District

Approvals For Fiber & Cables
- Telecordia Technologies - USA
- British Standards Institute
- Underwriters Laboratories. (Simplex & Duplex)
- Intertek Testing Services
- Canadian Standards Association USA
MEFC Product Overview

1.2 - OPTICAL FIBER CABLES

MEFC manufactures various types of optical fiber cables by taking into account the customers’ requirements, the latest technologies and the highest quality.

MEFC manufactured fiber optic cables by adopting loose tube construction for the most outside plant optical fiber cables.

MEFC F.O.C PRODUCT RANGE

- A. OUTDOOR CABLES
- B. INDOOR CABLES
- C. INDOOR / OUTDOOR CABLES
- D. CUSTOMER SPECIFIC F.O. CABLES

A. OUTDOOR CABLES

A.1: UNDERGROUND CABLES

The construction of MEFC outdoor cables are mostly of Loose tube structure in which the gel filled buffer tubes are stranded over bySZ type around a central strength member. The central strength member is responsible for providing support to the tubes as well providing tensile strength. These cables may also have KEVLAR or Glass Yarns for additional strength.

Main Types of Construction of outdoor cables are DUCT and DIRECT BURIED along with MEFC manufactures cables for specific customer requirements and applications in oil and gas and high voltage lines etc.

A.1.1 - DIRECT BURIED CABLES

The cable is directly buried in trenches, providing a jacket with resists damages caused by moisture (rodents and insects), abrasion, compression etc. These cables are available in both Metallic and Non-Metallic type.

A.1.2 DUCT CABLES

The cable is directly deployed inside a conduit, and are subject to fewer stress than Direct buried cables, these cables are available in both Metallic and Non-metallic type.

A.2 - AERIAL CABLES

MEFC manufactures both type of aerial cables self support and FIG.8 Cables. These cables support environmental loads generated by wind, snow and extreme temperatures.

B. INDOOR CABLES

MEFC manufactures both plenum and riser rated Indoor cables, these cables are designed to reduce smoke emission and flame spreading. The structure of these cables is of Tight buffer, which facilitates handling and termination. All types of Indoor type like Simplex, Duplex (both flat and zip) Break out, distribution and back bone cables is being manufactured as per international standards.

C. INDOOR / OUTDOOR CABLES

Many times customer lacks premises space needed for the transition between outside plant cable and Indoor cable. MEFC offers special type of Indoor/Outdoor cables which can withstand harsh environments while complying with RISER AND PLENUM Grades.

D. CUSTOMER SPECIFIC OPTICAL FIBER CABLES

Complying to the standards of its special customers like ARAMCO, STC, SCECO, MODA, SRO, MOBILY, and KOC, MEFC manufactures special type of cables for the specific requirements of these customers.

Quality Assurance And Quality Control

As an ISO 9001: 2008 certified company, MEFC has been successfully implementing the quality management system requirements with a complete commitment to satisfy the Customer needs. Our experienced and highly skilled engineers/inspectors test the incoming raw materials, conduct in process inspection at every cable manufacturing stage, verify the compliance to the requirements after every process. Finished cables are tested as per national /international standards & customer specifications.

Our cables meet the performance requirements of local utility Companies & national and international standards namely SEC, ARAMCO, Saudi Telecom Company, MOBILY, IEC, ITU-T, EIA/ TIA, BS, BELL CORE, RUS-PE 90.

Our Quality staff conducts tests to verify the performance and reliability of Optical Fiber. These tests include Fiber strength, Attenuation Co-efficient, Attenuation uniformity, Mode field diameter, Cutoff Wavelength, Chromatic Dispersion, Polarization mode dispersion, Bandwidth, Numerical aperture, Cladding diameter, Concentricity error, Non-circularity and Coating diameter. The measurement in respect of above referred fiber parameters is carried out before the cabling process using advanced computer controlled test equipment, which are calibrated using international standard artifacts at regular intervals. These optical fibers are manufactured and tested in a dust free clean room environment. Type tests such as Macro bending, Temperature cycling are conducted periodically an optical fibers to the latest standards.

Colored fibers are tested for MEK and compatibility with material, which they come in contact with when they are cabled. In order to verify the ability to withstand the extreme climate conditions, all the plastics components of the cable are tested for shrink back and cold bend test before being approved for processing.
After the stage wise inspection, routine tests—attenuation co-efficient, Attenuation uniformity, water ingress test on filled cables, physical dimensions and surface quality, are carried out on the finished cables. In order to ensure the finished cables function satisfactorily for at least 30 to 40 years without degradation to the Optical transmission, type tests are conducted for every design periodically. Tensile loading, Fiber strain, Flexing, Repeated Bend, Impact, Crush, Torsion, Temperature cycling, Compound Flow tests are conducted using automated equipments to precisely apply the conditions laid down in international standards as well as customers specifications. The process and product quality characteristics are analyzed using statistical quality control techniques. X-bar and R charts, Normal Distribution analysis, Pareto Analysis, Percentile charts, P-charts are widely used statistical techniques for monitoring of test equipment and product quality characteristics in MEFC. Our commitment towards delivering highest quality optical fiber cables is quality assurance to our customers that they can reap the benefits of peak performance from their fiber optic network.
**DUCT NON METALLIC F.O. CABLE**

**CABLE CONSTRUCTION**
Loose Tubes filled with Gel • Stranded around Central Strength Member • Interstices filled with Gel • Core Wrap • Peripheral Strength Members • Polyethylene Outer Jacket.

**DESCRIPTION**
The construction of the non-metallic cables begins with our proven loose tube design. The loose tube provides protection against environmental and mechanical forces. This smaller diameter cable is light weight and suitable enough for duct and conduit use.

**APPLICATIONS**
Inter Office Trunking, Data, Video Transmission, Control /Alarm system - Light Weight and Flexible - Laying in Ducts and Concrete.

**FEATURES AND BENEFITS**
- Suitable for conduits and pipelines for long haul applications.
- Supports all grades of single mode and multimode fibers.
- It can be laid in vicinity of power cables.
- No additional grounding is required, at vicinity of power lines and lighting risks.
- Telemetry and SCADA links for oil & gas, electricity.

**PERFORMANCE CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Standards</th>
<th>Performance Characteristics</th>
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<tr>
<td>Reference standards: Industry standard</td>
<td>Storage temperature: -40°C to +70°C</td>
</tr>
<tr>
<td>Operating temperature: -40°C to +70°C</td>
<td></td>
</tr>
<tr>
<td>FIBER /Tube Colours: as per IEC 60304</td>
<td>Installation temperature: -40°C to +70°C</td>
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<tr>
<td>Testing Procedures: IEC-60794-1</td>
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</table>

**FIBER / Tube Colours:**
- SM DISP.
- SMNZDS
- UNI 

**CABLE CODES**

<table>
<thead>
<tr>
<th>Cable code</th>
<th>Fiber Count</th>
<th>Fiber Per Loose Tube</th>
<th>No. of Active Loose Tubes</th>
<th>Outer Diameter</th>
<th>Min. bending Radius (mm)</th>
<th>Net Weight (kg/km)</th>
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</table>

**NOTES:**
1. Other fiber counts are available as per customer requirements.
2. Customized cables can be manufactured as per customer requirements in cable constructions and performance and optical characteristics.
3. Jacket metered can be customized on customer requirements.

**DUCT METALLIC F.O. CABLE**

**CABLE CONSTRUCTION**
Loose Tubes filled with Gel • Stranded around Central Strength Member • Interstices filled with Gel • Core Wrap • Peripheral Strength Members • Identification Tape • Aluminum Moisture Barrier Tape • Polyethylene Outer Jacket.

**DESCRIPTION**
The construction of the metallic cables begins with our proven loose tube design. The loose tube provides protection against environmental and mechanical forces. This smaller diameter cable is light weight and suitable enough for duct and conduit use.

**APPLICATIONS**
Inter Office Trunking, Data, Video Transmission, Control /Alarm system - Light weight and flexible - Laying in Ducts and Concrete.

**FEATURES AND BENEFITS**
- Suitable for conduits and pipelines for long haul applications.
- Supports all grades of single mode and multimode fibers.
- It can be laid in vicinity of power cables.
- Telemetry and SCADA links for oil & gas, electricity.

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UNDERGROUND CABLES

DIRECT BURIED NON METALLIC F.O. CABLE

CABLE CONSTRUCTION
Loose Tubes filled with Gel - Stranded around Central Strength Member - Interstices filled with Gel - Core Wrap - Polyethylene Inner sheath - Peripheral Strength Members - Water Blocking Material - Polyethylene Outer Jacket.

DESCRIPTION
Double Jacket is an excellent choice for installation requiring the added mechanical and environmental protection of two durable polyethylene jackets. This Double Jacketed cable is directly buried in trenches.

APPLICATIONS
Junction communication system, subscriber network system - Data, Video transmission - Direct Buried Installation.

FEATURES AND BENEFITS
- Supports all grades of single mode and multimode fibers.
- No additional grounding is required, at vicinity of power lines and lighting risks.
- Long haul telecommunication.
- Suitable for lying in the trenches.
- Telemetry and SCADA links for oil & gas, electricity.

![Diagram of cable construction]

Notes:
1. Other fiber counts are available as per customer requirements.
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3. Jacket metered can be customized on customer requirements.

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DIRECT BURIED METALLIC F.O. CABLE

CABLE CONSTRUCTION
Loose Tubes filled with Gel - Stranded around Central Strength Member - Interstices filled with Gel - Core Wrap - Peripheral Strength Members - Identification Tape - Aluminum Moisture Barrier Tape - Polyethylene Inner Sheath - Water Blocking Material - Polyethylene Outer Jacket.

DESCRIPTION
Double Jacket is an excellent choice for installation requiring the added mechanical and environmental protection of two durable polyethylene jackets. This Double Jacketed cable is directly buried in trenches.

APPLICATIONS
Junction communication system, Subscriber network system - Data, Video transmission - Direct Buried Installation.

FEATURES AND BENEFITS
- Supports all grades of single mode and multimode fibers.
- Long haul telecommunication.
- Suitable for lying in the trenches.
- Telemetry and SCADA links for oil & gas, electricity.

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Notes:
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3. Jacket metered can be customized on customer requirements.
STEEL TAPE ARMoured (SINGLE SHEATH) F.O. CABLE

CABLE CONSTRUCTION
Loose Tubes filled with Gel - Stranded around Central Strength Member - Interstices filled with Gel - Core Wrap - Peripheral Strength Members - Water Blocking Material - Corrugated Steel Tape Armour - Polyethylene Outer Jacket.

DESCRIPTION
MEFC offers steel tape armored optical cable, which has been popular cabling solution for outside plant applications. Corrugated Steel Tape and robust Polyethylene Outer Jacket combine to deliver rugged durability and added rodent resistance.

APPLICATIONS
- Rodent resistance - Direct buried installation - Data, Video, voice, Transmission.

FEATURES AND BENEFITS
- Supports all grades of single mode and multimode fibers.
- Offers excellent crush resistance.
- Telemetry and SCADA links for oil & gas, electricity.

### Cable Construction

<table>
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<tr>
<th>Cable Code</th>
<th>F.O. Count</th>
<th>Fiber Per Loose Tube</th>
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Notes:
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STEEL TAPE ARMoured (DOUBLE SHEATH) F.O. CABLE

CABLE CONSTRUCTION
Loose Tubes filled with Gel - Stranded around Central Strength Member - Interstices filled with Gel - Core Wrap - Peripheral Strength Members - Water Blocking Material - Polyethylene Inner Jacket Corrugated Steel Tape Armour - Polyethylene Outer Jacket.

DESCRIPTION
MEFC offers steel tape armored optical cable, which has been popular cabling solution for outside plant applications. Corrugated Steel Tape and robust Polyethylene Outer Jacket combine to deliver rugged durability and added rodent resistance.

APPLICATIONS
- Rodent resistance - Direct buried installation - Data, Video, voice, Transmission.

FEATURES AND BENEFITS
- Supports all grades of single mode and multimode fibers.
- Offers excellent crush resistance and projects from Rodent attacks.
- Telemetry and SCADA links for oil & gas, electricity.

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3. Jacket metered can be customized on customer requirements.
STEEL TAPE DOUBLE ARMoured F.O. CABLE

CABLE CONSTRUCTION
Loose Tubes filled with Gel - Stranded around Central Strength Member - Interstices filled with Gel - Core Wrap - Peripheral Strength Members - Polyethylene inner sheath - Corrugated Steel Tape Armour - Polyethylene intermediate sheath - Corrugated Steel Tape Armour - Polyethylene Outer Jacket.

DESCRIPTION
MEFC offers steel tape armored optical cable, rugged and heavy-duty fiber which has been popular cabling solution for harsh environment. Corrugated Steel Tape and robust double Polyethylene Outer Jacket combine to deliver rugged durability and added rodent resistance.

APPLICATIONS
Rodent resistance - Heavy Duty - Data, Video, voice, Transmission.

FEATURES AND BENEFITS
• Supports all grades of single mode and multimode fibers.
• Offers excellent crush resistance.
• For lying in harsh environment.
• Telemetry and SCADA links for oil & gas, electricity.

<table>
<thead>
<tr>
<th>Standards</th>
<th>Performance Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference standards: Industry standard.</td>
<td>Storage temperature: -40°C to 70°C</td>
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<td>Operating temperature: -40°C to 70°C</td>
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| Testing Procedures | IEC-60794-1 (or) EN/IEA-465 |

<table>
<thead>
<tr>
<th>Cable code</th>
<th>Fiber Count</th>
<th>Fiber Per Loose Tube</th>
<th>No. of Active Loose Tubes</th>
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<th>Test Weight (kg/km)</th>
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Notes:
1. Other fiber counts are available as per customer requirements.
2. Customized cables can be manufactured as per customer requirements in cable constructions and performance and optical characteristics.
3. Jacket metered can be customized on customer requirements.

STEEL TAPE ARMoured MONO TUBE F.O. CABLE

CABLE CONSTRUCTION
Fiber in Loose Tubes filled with Gel - Peripheral Strength Members - Corrugated Steel Tape Armour - Steel Wires Embedded in Polyethylene Outer Jacket.

DESCRIPTION
MEFC offers flexible and cost effective mono tube design for outdoor applications. Optical Fibers are bundled in a single tube, and a required tensile strength is obtained without strength members using two supporting steel wires. For specific applications MEFC offer all dielectric mono tube design.

APPLICATIONS
Rodent resistance - Data, Video, voice, Transmission.

FEATURES AND BENEFITS
• Flexible and light weight, installation friendly.
• Coast effective.
• Rodent resistant.

<table>
<thead>
<tr>
<th>Standards</th>
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</tr>
</thead>
<tbody>
<tr>
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| Testing Procedures | IEC-60794-1 (or) EN/IEA-465 |

<table>
<thead>
<tr>
<th>Cable code</th>
<th>Fiber Count</th>
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Notes:
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3. Jacket metered can be customized on customer requirements.
SEMI CONDUCTIVE SHEATH ARMOURED F.O. CABLE

CABLE CONSTRUCTION
Loose Tubes filled with Gel - Stranded around Central Strength Member - Interstices filled with Gel - Core Wrap - Peripheral Strength Members - Polyethylene inner sheath - Corrugated Steel Tape - Polyethylene sheath - Semi conductive PVC Outer Jacket.

DESCRIPTION
MEFC Semi conductive sheath Armoured F.O. Cable offers a good protection of high voltage effects, usually layered near high voltage lines. These cables contains loose tube structured cables, over lapped with corrugated steel tape. Double sheathed by polyethylene and special type of Semi conductive material.

APPLICATIONS
Petro Chemical plant - Junction communication system, LANs - Direct Buried installation.

FEATURES AND BENEFITS
• Semi conductive sheath protection from high voltage to the metal part of the cables.
• High tensile and compressive strength.
• Anti rodent protection.

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<tbody>
<tr>
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<td>372</td>
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</table>

HYBRID F.O. CABLE

CABLE CONSTRUCTION
Loose Tubes filled with Gel - Copper pair along with loose tubes stranded around steel Central Strength Member - Interstices filled with Gel - Core Wrap - Peripheral Strength Members - Aluminum Moisture Barrier Tape - Polyethylene Outer Jacket.

DESCRIPTION
MEFC offers a robust, highly reliable cable solution for a wide range of demanding outside plant applications including direct buried and Rocky terrain. The cable consists of fibers with Insulated copper pair, Insulated with Polyethylene Jacket.

APPLICATIONS
Enables alternate communication - Moisture Resistant - Junction Communication System, Subscriber Network System.

FEATURES AND BENEFITS
• Applicable for remote stations - where distribution of power cables are difficult...
• Excellent Chemical resistant outer cable jacket for inside/outside plant environment.
• Composite cable can be utilized for both applications in power and data applications.
• Supports all grade of single mode and multi mode fibers.

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<td>4</td>
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CABLE CONSTRUCTION
Loose Tubes filled with Gel - Stranded around Steel Central Strength Member - Core Wrap with Water Blocking Mica Tape - Low Smoke Zero Halogen Inner Sheath - Mica Tape - Low Smoke Zero Halogen Outer Sheath.

DESCRIPTION
MEFC offers special type of Fire resistant cables for application in Oil and Gas Industries and other Petrochemical Industries for higher resistance. This Core is wrapped with mica tape, which is having excellent characteristics of fire resistance. All

APPLICATIONS

FEATURES AND BENEFITS
- High temperature and Explosive Environments.
- Extra heavy duty compressive strength.
- Halogen free, less toxic and hazardous when exposed fire.

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<tr>
<td>Operating temperature: -40°C to +70°C</td>
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<td>Testing Procedures: IEC-60794</td>
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<tr>
<td>FIBER / Tube Colours: as per EIA-TIA-455</td>
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</tbody>
</table>

CABLE CONSTRUCTION
Loose Tubes filled with Gel - Stranded around Central Strength Member - Interstices filled with Gel - Core Wrap - Polyethylene Inner Sheath - Peripheral Strength Members - Polyethylene Outer Jacket.

DESCRIPTION
MEFC ADSS F.O. Cables are solution for high performance aerial environments including power transmission and distribution networks. All — Dielectric construction reduces installation costs, by avoiding the need for expensive cable shielding and grounding.

APPLICATIONS

FEATURES AND BENEFITS
- Supports all grades of single and multimode fibers
- Cable round Profile minimizes wind loading and tensile and ice loading. (Reducing cable sag and tensile force
- All Dielectric loose tube design in immune to Electro Magnetic Interference.

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Notes:
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CABLE CONSTRUCTION
Loose Tubes filled with Gel - Stranded around Central Strength Member - Core Wrap - Polyethylene Inner Sheath - Aluminium Moisture Barrier Tape - Messenger Wire embedded Polyethylene Outer Jacket.

DESCRIPTION MEFC Fig — 8 Cables are self-supporting cables designed for aerial installation. The Cable design provides easy and economical one- step Installation and Stable performance over a wide temperature range. The Whole tensile load is borne by steel messenger wire.

APPLICATIONS
- Aerial Installation - High Mechanical Strength - Data, Voice, Video Transmission

FEATURES AND BENEFITS
- Small Diameter and Light Weight
- Double Jacket single armor construction provides additional crush and mechanical Protection
- Compatible for any telecommunication grade optical fiber.

INDOOR SIMPLEX F.O. CABLE

900 um Tight Buffer - Peripheral Strength Members - Riser / Plenum Orange Color Jacket.

DESCRIPTION MEFC
Simplex cables for indoor applications are flexible enough to handle easily in any interconnect vs cross connect applications in the central office, equipment room. The main construction of these cables consists of flexible tight-buffered material, extended over the fibers surrounded with aramid yams for additional protection and strength.

APPLICATIONS
- Pigtail and Patch cords - Factory Automation, Inter office - Aircraft and marine systems.

FEATURES AND BENEFITS
- Used for Pigtail/ Patch Cords in central offices, data centers etc.
- Cab be directly terminated to any type of connectors.
- Easier to strip and allows longer lengths of buffer to be removed in single press.
- Both raiser and plenum grades are available.

CABLE CONSTRUCTION
Tight Buffered Optical Fiber - Peripheral Strength Members - Riser / Plenum Orange Color Jacket.

PERFORMANCE CHARACTERISTICS
- Storage temperature: -40°C to +70°C
- Operating temperature: -40°C to +70°C

APPLICATIONS
- Pigtail and Patch cords - Factory Automation, Inter office - Aircraft and marine systems.

FEATURES AND BENEFITS
- Used for Pigtail/ Patch Cords in central offices, data centers etc.
- Cab be directly terminated to any type of connectors.
- Easier to strip and allows longer lengths of buffer to be removed in single press.
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CABLE CONSTRUCTION
Loose Tubes filled with Gel - Stranded around Central Strength Member - Core Wrap - Polyethylene Inner Sheath - Aluminium Moisture Barrier Tape - Messenger Wire embedded Polyethylene Outer Jacket.

DESCRIPTION MEFC Fig — 8 Cables are self-supporting cables designed for aerial installation. The Cable design provides easy and economical one- step Installation and Stable performance over a wide temperature range. The Whole tensile load is borne by steel messenger wire.

APPLICATIONS
- Aerial Installation - High Mechanical Strength - Data, Voice, Video Transmission

FEATURES AND BENEFITS
- Small Diameter and Light Weight
- Double Jacket single armor construction provides additional crush and mechanical Protection
- Compatible for any telecommunication grade optical fiber.
### Cable Construction

**INDOOR ZIP CORD F.O. CABLE**

900 um Tight Buffer - Peripheral Strength Members - Riser / Plenum Orange Color Jacket.

**DESCRIPTION**

MEFC zip cord indoor type cables are designed for two-way communication, providing excellent transmission performance, flexibility, and connectivity for optical network systems in a variety of installation environments. The tight buffers are color coded for easy identification during termination.

**APPLICATIONS**

- Pigtail and Patch cords
- Factory Automation, Inter office
- Aircraft and marine systems

**FEATURES AND BENEFITS**

- Eases installation and space-constrained areas
- Ensures lower total installation costs
- Used in LAN, SAN equipment rooms
- Small size lightweight and versatile installation capability.

### Cable Code

<table>
<thead>
<tr>
<th>Fiber Code</th>
<th>Fiber Count</th>
<th>Tight Buffer Per Cord</th>
<th>No. of Cords</th>
<th>Outer Diameter (mm)</th>
<th>Min. Bending Radius (mm)</th>
<th>Net Weight (kg/km)</th>
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### Notes:

1. Other fiber counts are available as per customer requirements.
2. Customized cables can be manufactured as per customer requirements in cable constructions and performance and optical characteristics.
3. Jacket metered can be customized on customer requirements.

### Standards and Performance Characteristics

| Reference Standards: Industry standard. | Storage Temperature: -40°C to +70°C |
| Operating Temperature: -40°C to +70°C |
| FIBER/Tube Colors: as per IEC 60304 |
| Testing Procedures: IEC-60794-1 (or) EIA/TIA-455 |

### Flat Drop Cable

**CABLE CONSTRUCTION**

Optical Fiber ARP strength member are placed at two sides.

**DESCRIPTION**

MEFC flat drop cable for FTTH applications are flexible enough to handle easily in any interconnection or cross connect applications in the central office, equipment room.

**APPLICATIONS**

- Internal FTTH applications horizontal and riser clipping to surfaces including skirting boards.

**FEATURES AND BENEFITS**

- To bend sensitivity fiber provides high bandwidth and good communication.
- Easier to strip and splice, simplify the installation and maintenance.
- Small size lightweight and versatile installation capability.

### Cable Code

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<td>6.0 x 5.0</td>
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<tr>
<td>BFDR5002</td>
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### Notes:

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2. Customized cables can be manufactured as per customer requirements in cable constructions and performance and optical characteristics.
3. Jacket metered can be customized on customer requirements.
MEFC Indoor Breakout Cable provides excellent transmission performance, flexibility and connectivity for optical network systems in a variety of installation environments.

APPLICATIONS
- LAN, CCTV — Direct Termination of Fibers — Plenum and Riser

FEATURES AND BENEFITS
- Small size lightweight and versatile installation capability.
- Eases installation and space constrained areas.
- Lower Installation costs.
- LSZH — Low smoke zero halogen outer jacket protects fibers from flame.
- Reduce smoke emissions and flame spreading.
- Available in both riser and plenum grades.

<table>
<thead>
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3. Jacket metered can be customized on customer requirements.

INDOOR BACKBONE F.O. CABLE

MEFC Indoor distribution cables dry core, which is available both plenum and rise grade. The peripheral strength members mostly aramid yarns provide excellent tensile load for cable.

APPLICATIONS
- LAN, CCTV — Direct termination of fibers — Plenum and Riser

FEATURES AND BENEFITS
- Flexible light weight.
- Eases installation and space constrained areas.
- Ensures lower total installation costs.
- Used in LAN, SAN equipment rooms.
- Offers all grades of multi mode and single mode fibers.

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**IN indoor / OUTDOOR DISTRIBUTION F.O. CABLE**

(Tight Buffer Type)

**CABLE CONSTRUCTION**
Sub Units with Tight Buffers and Peripheral Strength Member (Aramid Yarns) Stranded around Central Strength Member - Core Wrap - UV Resistant LSZH Outer Jacket.

**DESCRIPTION**
MEFC Indoor Breakout Cable provides excellent transmission performance, flexibility and connectivity for optical network systems in a variety of installation environments.

**APPLICATIONS**
- LAN, CCTV -Direct Termination of Fibers - Plenum and Riser.

**FEATURES AND BENEFITS**
- Small size lightweight and versatile installation capability.
- Eases installation and space constrained areas.
- Lower Installation costs.
- LSZH — Low smoke zero halogen out jacket protects fibers from flame.
- Reduce smoke emissions and flame spreading.
- Available in both riser and plenum grades.

---

**INDOOR / OUTDOOR ARMOURED F.O. CABLE**

**CABLE CONSTRUCTION**
Tight Buffered Simplex Cords Sub Unit - Stranded around Central Strength Member - Core Wrap - Corrugated Steel Tape - Flame Retardant Outer Jacket.

**DESCRIPTION**
MEFC Indoor Outdoor armored cable offers excellent tensile strength for both Indoor and Outdoor applications. Suitable for building-to-building short distance inter connected applications. MEFC Indoor /Outdoor armored cable offers excellent resistance for rodent attacks.

**APPLICATIONS**
- Rodent Resistant — Indoor and Outdoor Installation — Direct Buried Installation
- Rodent resistant.

---

**FIBER / Tube Colours**: as per IEC 60304

**Standards**: Reference standards: Industry standard.

**Performance Characteristics**
- Installation temperature: -40°C to +70°C
- Operating temperature: -40°C to +70°C
- Installation temperature: -40°C to +70°C
- Operating temperature: -40°C to +70°C

---

**Notes**: 1. Other fiber counts are available as per customer requirements.
2. Customized cables can be manufactured as per customer requirements in cable constructions and performance and optical characteristics.
3. Jacket metered can be customized on customer requirements.
CABLE CONSTRUCTION
Loose Tubes filled with Gel - Stranded around Central Strength Member - Interstices filled with Gel / water blocking yarns - Polyethylene Outer Jacket

DESCRIPTION
The construction of the non-metallic cables begins with our proven loose tube design. The loose tube provides protection against environmental and mechanical forces. This smaller diameter cable is light weight and suitable enough for microwave duct and conduit use.

APPLICATIONS
Inter Office Trunking, Data, Video Transmission, Control /Alarm System - Light Weight and Flexible - Blowing in Micro Ducts and Concrete

FEATURES AND BENEFITS
• Suitable for conduits and pipelines for long haul applications.
• It supports all grades of single mode and multimode fibers.
• It can be laid in vicinity of power cables.
• No additional grounding is required, at vicinity of power lines and lighting risks.
• Telemetry and SCADA links for oil & gas, electricity.

CABLE CONSTRUCTION
Dry Loose Tubes - Stranded around Central Strength Member - Water blocking yarns - Water swellable tape - Anti Rodent Glass Yarns, Perforated Strength Members - Flame retardant jacket

DESCRIPTION
The construction of the non-metallic cables begins with our proven dry loose tube & dry core design. Suitable enough for duct and indoor/ outdoor application.

APPLICATIONS
Inter Office Trunking, Data, Video Transmission, Control /Alarm System - Light Weight and Flexible - Blowing in Micro Ducts and Concrete

FEATURES AND BENEFITS
• Suitable for ducts / indoor / outdoor.
• Supports all grades of single mode and multimode fibers.
• It can be laid in vicinity of power cables.
• No additional grounding is required, at vicinity of power lines and lighting risks.
• Telemetry and SCADA links for oil & gas, electricity.

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<tr>
<th>Table Entries</th>
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<td><strong>12 62.5µm</strong></td>
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<tr>
<td><strong>MM 50/125µm (G657)</strong></td>
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<td><strong>Max. bending Radius (mm)</strong></td>
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CABLE CONSTRUCTION
Loose Tubes filled with Gel - Stranded around Central Strength Members - Interstices filled with Gel - Core Wrap - Flame Retardant PVC Inner Sheath - Lead Sheath - Second Inner Sheath - Helically stranded Steel Wire Armour - Flame Retardant Outer Jacket

DESCRIPTION
MEFC offers Lead Sheathed Optical Fiber Cables which have an secondary sheath covered over an inner sheath material to protect the cable within from aromatic hydrides. These cables are covered by high tensile strength.

APPLICATIONS
- Petrochemical Plants - Junction Communication System, LANs - Direct Buried Installation.

FEATURES AND BENEFITS
- Installation in location where aromatic carbon hydrides are present. Like near petrol stations
- In the vicinity of pipe lines
- In oil refineries and similar locations.
- Telemetry and SCADA links for oil & gas, electricity.

<table>
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<tr>
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<th>Performance Characteristics</th>
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</table>

LEAD SHEATH STEEL WIRE ARMOURED F.O. CABLE

BRAIDED STEEL WIRE ARMOURED F.O. CABLE

CABLE CONSTRUCTION
Loose Tubes filled with Gel — Peripheral Strength Member - Polyethylene Inner Sheath - Steel Wire Braiding - Polyethylene Outer Jacket

DESCRIPTION
MEFC Steel wire armored fiber optic cable offers excellent resistance and flexibility with high tensile strength. These Cables covered with low rugged polyethylene jackets as well, to resist the rodent attacks.

APPLICATIONS

FEATURES AND BENEFITS
- Greater Flexibility,
- Enhanced compressive strength and rodent resistance.
- Supports all graded of single mode and multi mode fibers.
- Telemetry and SCADA links for oil & gas, electricity.

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STEEL WIRE ARMoured F.O. Cable

Cable Construction
Loose Tubes filled with Gel • Stranded around Central Strength Member • Interstices filled with Gel • Core Wrap • Polyethylene Inner Sheath • Helically Stranded Steel Wires • Polyethylene Outer Jacket

Description
MEFC Steel wire armored cable offers applications for higher tensile requirements. The cable consists of two rugged polyethylene jackets to deliver the strength and rodent resistance, need for tough outside plant use.

Applications
- Rodent Resistant - Direct Buried Installation Data, Video, Voice, Transmission

Features and Benefits
- Supports all grades of single mode and multimode fibers.
- Enhanced compressive strength and rodent resistance.
- Telemetry and SCADA links for oil & gas, electricity.

Standards
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Cable Code Table

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MEFC Connectors

MEFC-OFc Connectors

- Multi-mode Fiber (Beige)
- Single-mode Fiber (Blue)
- Angled Fiber Connectors (Green)

Applications
- FTTX, Gpon, Epon Technology
- Telecommunication Networks
- CATV Networks
- Active Device Termination
- Local Area Networks
- Fiber to the home

Features
- Low insertion loss
- Low back reflection loss
- Easy installation
- Environmentally stable
CUSTOMER APPROVALS

CERTIFICATIONS AND APPROVALS

TYPE Approval Certificate

Certificate No: WA6775FSC/008
This certificate is valid from: 01/01/2014 To: 01/01/2018

Name of the Manufacturer/Supplier: MEFC/MEFC
Address of Manufacturer/Supplier: Second Industrial City Phase 1, Jeddah, KSA
Type of Approval: Provisional Certificate - Periodic (Renewal)
Product Details:

Product Name/Code Description

This certificate is valid with the terms and conditions applied by MEFC regarding this type approval.

Approval By: Mohamed Al Juhany General Manager

Notes: Terms & Conditions (Stay) for All CSR Certificates

CUSTOMER APPROVALS

CERTIFICATIONS AND APPROVALS

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CERTIFICATIONS AND APPROVALS

CERTIFICATIONS AND APPROVALS

CERTIFICATIONS AND APPROVALS
Approval Letter:

Date: 23 Feb '10
Ref: 230210_4
No of Pages: 01

To: Mr. Owais Ahmed
Sales Manager
Middle East Fiber Cable Manufacturing Co.
PO Box 733, Riyadh 11383, Saudi Arabia

Subject: SABIC Approved Vendor Product

Dear Sirs,

We would like to inform you that your company has been included in SABIC Engineering & Project Management Approved Vendors List.

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Manufacturer</th>
</tr>
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<tbody>
<tr>
<td>Single Mode (SM) &amp; Multi Mode (MM) fiber optic cables for indoor and outdoor</td>
<td>Middle East Fiber Cable Manufacturing Company - KSA</td>
</tr>
</tbody>
</table>

In order to update our vendor data base, please fill in the attached Form (Annexure II) and send it back to the undersigned. This is for the confirmation of your address and contact details.

Best regards,

Mr. Sami Al-Aboos
Vendor Committee Leader

CC: AALAVL

P.O. Box 1425 Al jubail Industrial City - 31061 - Saudi Arabia
Tel: 966 (3) 540 1880 Fax: 966 (3) 541 2816
MEFC FIBER OPTIC SERVICES

- Customized, Fiber to home, Office, Desk, (FTTX)
- FOC Network Consultant, Technical Assistance Network Design and Site Survey
- Fiber Optic Training & Certification
- Troubleshooting, Fault Location and Restoration
- OSP Project Engineering Services, Cable Installation, Splicing Termination and Testing

MEFC Offers Right Fiber Selection for your network

LOW WATER PEAK DISPERSION UNSHIFTED SM FIBER (ITU.G.652.C&D)

MEFC FIBER OPTIC GLOSSARY

Absorption
That portion of optical attenuation in optical fiber resulting from the conversion of optical power to heat. Caused by impurities in the fiber such as hydroxyl ions.

Acceptance Angle
The half-angle of the cone within which incident light is totally internally reflected by the fiber core. It is equal to sin^-1(NA).

APC
Abbreviation for angle polished connector. A5°-15° angle on the connector tip for the minimum possible back reflection.

Armor
A protective layer, usually metal, wrapped around a cable.

Asynchronous Transfer Mode (ATM)
A transmission standard widely used by the telecom industry. A digital transmission-switching format with cells containing 5 bytes of header information followed by 48 data bytes. Part of the B-ISDN standard.

Attenuation
Loss of signal power between points, in optical cables, attenuation is a ratio of input power vs. output power, measured in decibels per unit length, usually dB/km.

Attenuation Coefficient
A factor expressing optical power loss per unit of length, expressed in dB/Km.

Avalanche Photodiode (APD)
A photodiode that exhibits internal amplification of photocurrent through avalanche multiplication of carriers in the junction region.

Average Power
The average level of power in a signal that varies with time.

Backreflection (BR)
In cases where light is launched into an optical fiber, back reflection refers to the light that is returned to the launch point.

Backscattering
The return of a portion of scattered light to the input end of a fiber, the scattering of light in the direction opposite to its original propagation.

Backbone
A high-speed transmission system used to connect relatively distant points. Backbone networks can be used to join autonomous networks within buildings or between different buildings.

Bel (B)
The logarithm to the base 10 of a power ratio, expressed as B =log10(P1/P2), where P1 and P2 are distinct powers. The decibel, equal to one-tenth bel, is a more commonly used unit.

Bending Loss
Attenuation caused by high-order modes radiating from the outside of a fiber optic wave-guide, which occur when the fiber is bent around a small radius. See also macro bending, micro bending.

Bandwidth
The information carrying capacity of a fiber. The bandwidth for a given wavelength is the lowest frequency at which optical power has decreased by 3 dB and is expressed in MHz.km.

Bend Radius
The radius of curvature that an optical fiber cable can bend without causing harmful effects on the optical or mechanical performance of the cable.

BER (Bit Error Rate)
The fraction of bits transmitted that are received incorrectly.

Bidirectional
Operating in both directions. Bidirectional couplers operate the same way regardless of the direction light passes through them. Bidirectional transmission sends signals in both directions, sometimes through the same fiber.

Birefringent
Having a refractive index that differs for light of different polarizations.

Broadband
A method of communication where the signal is transmitted by being impressed on a high-frequency carrier.

Buffer
In optical fiber, a protective coating applied directly to the fiber. 2) A routine or storage used to compensate for a difference in rate of flow of data, or time of occurrence of events, when transferring data from one device to another.

Cable
One or more optical fibers enclosed, with strength members, in a protective covering.

www.mefc.com
FIBER OPTIC GLOSSARY

Cable assembly
A cable that is connector terminated and ready for installation. The wavelength range between 1530 nm and 1562 nm used in some CWDM and DWDM applications.

C-Band
Maximum number of channels that a cable system can carry simultaneously.

Channel Capacity
Different wavelengths travel along an optical medium at different speeds. Wavelengths reach the end of the medium at different times, causing the light pulse to spread. This chromatic dispersion is expressed in picoseconds (of dispersion) per kilometer (of length) per nanometer (of source band width). It is the sum of material and waveguide dispersion.

Chromatic Dispersion
The process of cutting an optical fiber by a controlled fracture of the glass, for the purpose of obtaining a fiber end, which is flat, smooth, and perpendicular to the fiber axis. Coating a material applied to the cladding for protective purposes.

Cleave
CWDM allows eight or fewer channels to be stacked in the 1550 nm region.

Coarse Wavelength-division Multiplexing (CWDM)
A mechanical or optical device that provides a demountable connection between two fibers or a fiber and a source or detector.

Concentricity
The fixed or stationary half of a connection that is mounted on a panel/bulkhead. Receptacles mate with plugs.

Connector
The wavelength at which a singlemode fiber transmits a single mode of light.

Core
The standard unit used to express gain or loss of optical power. A standard logarithmic unit for the ratio of two powers, voltages or currents. In fiber optics, the ratio of power. DB = 10 log(P2/P1).

Cut-off Wavelength
This refers to the transmission of a multiplicity of closely spaced wavelengths in the 1550 nm region. Wavelength spacings are usually 100GHz or 200 GHz, which corresponds to 0.8 nm or 1.6 nm. DWDM bands include the C-Band, the S-Band, and the L-Band.

Decibel (dB)
Nonmetallic. All-dielectric designs are inherently nonconductive; all-dielectric cables contain no metal and are lightning resistant.

Dense Wavelength-division Multiplexing (DWDM)
Dielectric
The cause of bandwidth limitations in a fiber. Dispersion causes a broadening of input pulses along the length of the fiber. Two major types are mode dispersion caused by differential optical path lengths in a multimode fiber and material dispersion caused by a differential delay of various wavelengths of light in a waveguide material.

Dispersion Dispersion-compensating Fiber (DCF)
A fiber that has the opposite dispersion of the fiber being used in a transmission system. It is used to nullify the dispersion caused by that.

Dispersion-compensating Module (DCM)
This module has the opposite dispersion of the fiber being used in a transmission system. It is used to nullify the dispersion caused by that fiber. It can be either a spool of a special fiber or a grating based module.

Dispersion-shifted Fiber (DSF)
A type of single-mode fiber designed to have zero dispersion near 1550 nm. This fiber type works very poorly for DWDM applications because of high fiber non-linearity at the zero dispersion point.

Double-window Fiber
This term is used two ways. For multimode fibers, the term means that the fiber is optimized for 850 nm and 1310 nm operation. For single-mode fibers the term means that the fiber is optimized for 1310 nm and 1550 nm operation.

Duplex Cable
A two-fiber cable suitable for duplex transmission.

Effective Area
The area of a single-mode fiber that carries the light.

EIA
Abbreviation for Electronic Industries Association. An organization that sets video and audio standards.

Erbium-doped Fiber Amplifier (EDFA)
Optical fibers doped with the rare earth element, erbium, which can amplify light in the 1550 nm region when pumped by an external light source.

Extrinsic Loss
In a fiber interconnection, that portion of loss not intrinsic to the fiber but related to imperfect joining of a connector or splice.

Eye Pattern
Also called eye diagram. The proper function of a digital system can be quantitatively described by its BER, or qualitatively by its eye pattern. The “openness” of the eye relates to the BER that can be achieved.

Concentricity
Also called eye diagram. The proper function of a digital system can be quantitatively described by its BER, or qualitatively by its eye pattern. The “openness” of the eye relates to the BER that can be achieved.

Ferrule
A rigid tube that confines or holds a fiber as part of a connector assembly.

Fiber Distributed Data Interface (FDDI)
An ANSI standard to ensure compatibility of components from different manufacturers.

Fiber Optic Attenuator
A component installed in a fiber optic transmission system that reduces the power in the optical signal. It is often used to limit the optical power received by the photodetector to within the limits of the optical receiver.

Fiber Optic Cable
A cable containing one or more optical fibers.

Fiber Optic Link
A transmitter, receiver, and cable assembly that can transmit information between two points.

Fiber-in-the-Loop (FTTL)
Fiber optic service to a node that is located in a neighborhood.

Fiber-to-the-Curb (FTTC)
Fiber optic service to a node connected by wires to several nearby homes, typically on a block.

Fiber-to-the-Home (FTTH)
Fiber optic service to a node located inside an individual home.

FOTP (Fiber Optic Test Procedure)
Standards developed and published by the Electronic Industries Association (EIA) under the EIA-RS-455 series of standards.

Four Wave Mixing (FWM)
Nonlinearity common in DWDM systems where multiple wavelengths mix together to form new wavelengths. Most prevalent near the zero-dispersion wavelength and at close wavelength spacings.

Frequency-division Multiplexing (FDM)
A method of deriving two or more simultaneous, continuous channels from a transmission medium by assigning separate portions of the available frequency spectrum to each of the individual channels.

Fresnel Reflection Loss
Reflection losses at the ends of fibers caused by differences in the refractive index between glass and air. The maximum reflection caused by a perpendicular air-glass interface is about 4% or about -14 dB.

FUT
Abbreviation for fiber under test. Refers to the fiber being measured by some type of test equipment.

Graded Index
A core refractive index profile that varies with the radius of the core.

Hard-clad Silica Fiber
An optical fiber having a silica core and a hard polymeric plastic cladding intimately bounded to the core.

Index-matching Fluid
Attenuates or gel whose index of refraction nearly equals that of the fiber’s core. Used to reduce Fresnel reflection loss at fiber ends. Also called index matching gel.
FIBER OPTIC GLOSSARY

Index of Refraction
Also refractive index. The ratio of the velocity of light in free space to the velocity of light in a fiber material. Always greater than or equal to one.

Insertion Loss
The loss of power that results from inserting a component, such as a connector or.

Halogens
Chemicals from the halogen family (chlorine, fluorine, bromine) are typically compounded into plastic materials to improve the flame retardance. When the materials are exposed to a high heat source, halogen gases are released, limiting the spread of flames but potentially causing a health hazard.

Insertion Loss
Total optical power loss caused by insertion of an optical component such as a connector, splice, or coupler into a previously continuous path.

Intrinsic Losses
Splice losses arising from differences in the fibers being spliced.

ISDN (Integrated Services Digital Network)
ISDN is an international standard for transmitting digital information (text, sound, voice, data, video, etc.)

Jacket
The outer, protective covering of the cable.

Jitter
Small and rapid variations in the timing of a waveform due to noise, changes in component characteristics, supply voltages, imperfect synchronizing circuits, etc.

Jumper
A short fiber optic cable with connectors on both ends.

Large Core Fiber
Usually, a fiber with a core of 200 pm or more.

Large Effective Area Fiber (LEAF)
An optical fiber, developed by Corning, designed to have a large area in the core, which carries the light.

Launch Fiber
An optical fiber used to couple and condition light from an optical source into an optical fiber. Often the launch fiber is used to create an equilibrium mode distribution in multimode fiber. Also called launching fiber.

L-Band
The wavelength range between 1570 nm and 1610 nm used in some CWDM and DWDM applications.

Light
In a strict sense, the region of the electromagnetic spectrum that can be perceived by human vision, designated the visible spectrum and nominally covering the wavelength range of 0.4 um to 0.7 um. In the laser and optical communication fields, custom and practice have extended usage of the term to include the much broader portion of the electromagnetic spectrum that can be handled by the basic optical techniques used for the visible spectrum. This region has not been clearly defined, but, as employed by most workers in the field, may be considered to extend from the nearultraviolet region of approximately 0.3 um, through the visible region, and into the midinfrared region to 30 um.

Lightguide
Synonym for optical fiber.

Loose Tube Buffering
A cable construction in which the optical fiber is placed in a plastic tube having an inner diameter much larger than the fiber itself. The loose tube isolates the fiber from the external mechanical forces acting on the cushion. The space between the tube and the fiber is often filled with a gel to cushion the fiber.

Loss
The amount of a signal's power, expressed in dB, that is lost in connectors, splices, or fiber defects.

Loss Budget
The total acceptable loss for a given system from transmitter to receiver. Includes cables, splices and connectors.

Low Smoke, Zero Halogen (LSZH)
Thermoplastic or thermoset jacketing compounds that emit limited smoke and no halogen gases when exposed to high sources of heat.

Material Dispersion
Pulse dispersion due to variations in a material's refractive index as a function of wavelength.

Macrobending
In an optical fiber, all macroscopic deviations of the fiber's axis from a straight line; distinguished from microbending.

MAN (Metropolitan Area Network)
A network covering an area greater than a local area network. A wide area network that covers a metropolitan area. Usually, an interconnection of two or more local area networks.

Material Dispersion
Dispersion resulting from different velocities of each wavelength in material.

Mechanical Splice
An optical fiber splice accomplished by fixtures or materials, rather than by thermal fusion.

Microbending
Minute but severe bends in fiber that result in light displacement and increased loss. Most microbending can be avoided by the correct selection of materials and proper bending, handling, and installation techniques.

Mode
A single electromagnetic wave traveling in a fiber.

Mode Field Diameter (MFD)
In singlemode fiber, the region in which the light transmitted is larger than the glass core diameter. This mode field diameter is a measured value and often listed as a requirement with core diameter in fiber specifications.

Mode Filter
A device that removes higher-order modes to simulate equilibrium mode distribution.

Multimode Dispersion
Dispersion resulting from the different transit lengths of different propagating modes in a multimode optical fiber. Also called modal dispersion.

Multimode (MM) Fiber
An optical fiber that has a core large enough to propagate more than one mode of light. The typical diameter is 62.5 micrometers.

Numerical aperture (NA)
A measure of the light acceptance angle of the fiber.

Optical amplifier
A device that amplifies light without converting it to an electrical signal. Optical fiber amplifiers are typically used to increase light for long haul transmission or to extend the distance over which information can be transmitted.

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A device that amplifies light without converting it to an electrical signal. Optical fiber amplifiers are typically used to increase light for long haul transmission or to extend the distance over which information can be transmitted.

Overfilled launch
A condition for launching light into the fiber where the incoming light has a spot size and NA larger than accepted by the fiber, filling all modes in the fiber.

Pigtail
A fiber optic cable that has a connector on only one end.

Plastic optical fiber (POF)
An optical fiber made of plastic.

Plastic-clad silica (PCS) fiber
A fiber made with a glass core and plastic cladding.

Preform
The large diameter glass rod from which fiber is drawn.

Plenum Cable
A cable whose flammability and smoke characteristics allow it to be routed in a plenum area without being enclosed in a conduit.

Refraction
The bending of a beam of light at an interface between two dissimilar media or in a medium whose refractive index is a continuous function of position (graded-index medium).

Riser Cable
Indoor cables made especially for vertical floor applications.

Repeater, regenerator
A device that receives a fiber optic signal and regenerates it for retransmission used in very long fiber optic links.

Scattering
The change of direction of light after striking small particles that causes loss in optical fibers.

Single mode fiber
A fiber with a small core, only a few times the wavelength of light transmitted, that only allows one mode of light to propagate. Commonly used with laser sources for high speed, long distance links.
**FIBER OPTIC GLOSSARY**

**Step Index**
A refractive index profile characterized by a uniform refractive index within the core and a sharp decrease at the core-cladding interface.

**Strength Member**
That part of a fiber optic cable composed of aramid yarn, steel strands, or fiberglass filaments that increase the tensile strength of the cable.

**Splice (fusion or mechanical)**
A device that provides for a connection between two fibers, typically intended to be permanent.

**Tight Buffer**
In tight buffer constructions the thermoplastic is extruded directly over the coated fiber, increasing the outside diameter to 900 micron (0.9 mm), an industry standard.

**VCSEL**
Vertical cavity surface emitting laser, a type of laser that emits light vertically out of the chip, not out the edge.

**Visual fault locator**
A device that couples visible light into the fiber to allow visual tracing and testing of continuity. Some are bright enough to allow finding breaks in fiber through the cable jacket.

**Wave guide Dispersion**
Dispersion caused by the fact that light travels at different speeds in the core and cladding of single mode fibers.

**Wavelength division multiplexing (WDM)**
A technique of sending signals of several different wavelengths of light into the fiber simultaneously.

**Working margin**
The difference (in dB) between the power budget and the loss budget (i.e. the excess power margin).

**Wavelength Zero Dispersion**
In singlemode fibers, the wavelength at which the effects of chromatic dispersion and waveguide dispersion are lowest; thus providing the greatest information carrying capacity.
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