MULTIFIBERS ENGINEERING EXCELLENCE

OPTEC TECHNOLOGY LIMITED

Optec

MULTIFIBERS ENGINEERING EXCELLENCE

CONTENT

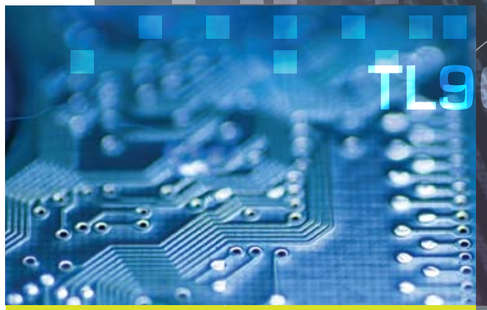
About Optec

OPTEC – MULTIFIBERS ENGINEERING EXCELLENCE

Optec has long-standing commitment in delivering superior professional services to our customers. As a valuable partner in connectivity business with decades of experience, our **MULTIFIBERS ENGINEERING EXCELLENCE** helps customers fulfill the cabling need for high density, high bandwidth, high scalability in this bandwidth-hungry era.

We invest in production facility, engineering process control and people talent development to grow as a leading fiber termination solution house. Our leading edge multifibers interconnect solutions extended from network structured cabling to disparate fields for ***delivering latest multifibers technologies to different users around the globe***. Applications include:

- Outside plant (OSP) multifibers interconnect solution for harsh environment
- Printed circuit board (PCB) level multifibers mating for high performance computer
- Sub-component level MT technology for active optical cable (AOC) sub-assemblies



We Always Stick Close to Your Technological Need on Connectivity

Our Multifibers Product Solutions include:

- Miniature PRIZM® Assembly for high speed board-mounted Parallel Optic Device (POD)
  - *PRIZM® LightTurn® Fiber Cable Assemblies*
- Multifibers Sub-assembly Solutions for Active Optical Cable (AOC)
  - *Customized AOC Jumpers*
- Parallel Optic 40G/100G Multifibers Cabling Solutions
  - *Provides both off-the-shelf and customized MT based 40G Jumpers (for QSFP) and 100G Jumpers (for CXP)*
- Very High Density Multifibers Structured Cabling Solutions
  - *High fiber count MTP/MPO connector terminations for 1x72-fiber or 1x48-fiber to 1x24-fiber*
- Harsh Environment MT based Interconnect Solutions
  - *IP-68 MT based Harsh Environment Connectors and Fiber Assemblies*

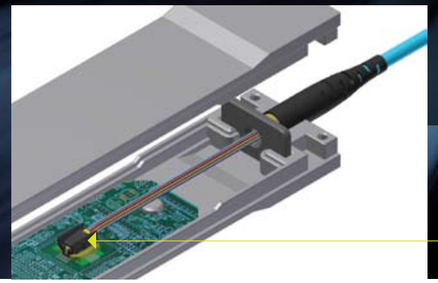
Our Commitment in **DELIVERING SUPERIOR PROFESSIONAL SERVICE** to our customers distinguishes us a leader of the fiber termination solutions provider

PRIZM®

LightTurn® Fiber Assemblies

Optec manufactures customized fiber assemblies for mating to Parallel Optical Devices (POD) by using PRIZM® LightTurn® connector. This fiber assembly supports simple mating to board-mounted Avago's MiniPOD™, MicroPOD™ modules and other high density transceivers that deploying parallel optic technology. The alignment of the PRIZM® fiber assembly and the POD supports a significant increase in optical T/R module density on circuit boards, it improves fiber routing by direct connection to the card edge, optimizing airflow and port density for migrating to the next-generation high speed, high density networks.

The PRIZM® LightTurn® connector, offered by US Conec, is a miniature detachable connector to provide passive alignment allowing multiple re-mating perpendicular to the printed circuit board (PCB). It was developed specifically for Avago's MicroPOD™ receiver and transmitter modules, provides the passive optical connection and enables the dense tiling of the modules on the host printed circuit board.



PRIZM® LightTurn® Fiber Assemblies with MOI in AOC Application

FEATURES & BENEFITS

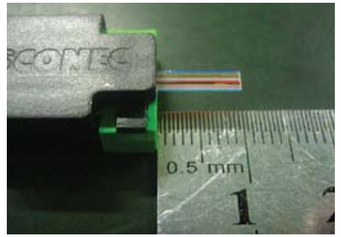
- Increase optical T/R module port density on PCBs
- Optimize airflow and fiber routing
- Allows multiple re-matings to the POD modules
- Customized assembly configurations provide application flexibility
- 100% factory-tested for highest optical performance

APPLICATIONS

- Data Centers
- High Speed Computing Applications
- Datacom Markets
- Telecom Markets

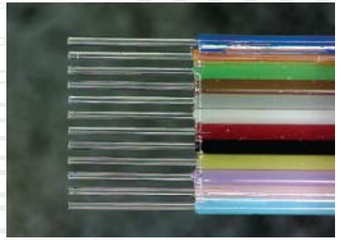
Optec's Engineering Excellence

Optec strikes to deliver the highest quality PRIZM® fiber assembly solutions to our customers through proprietary production knowhow, unique engineering process and advance process control.



■ *Stringent control on fiber cutting length*

■ *State-of-the-art clean-room facility for dust-free termination*

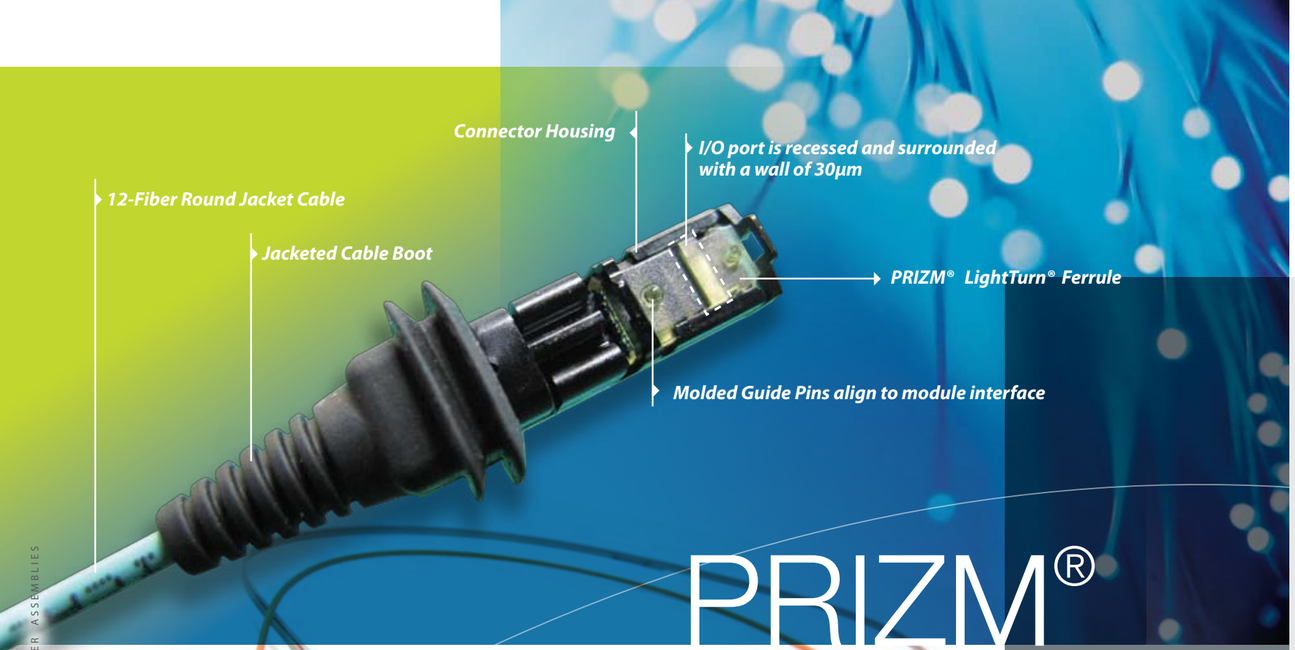


■ *Advanced set-up for precision fiber cleaving*

■ *Efficient epoxy injection procedure for holding fibers in position*

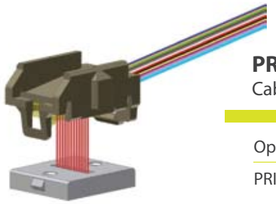
■ *Superior process control on epoxy curing*

■ *Proprietary design of Jigs & Fixtures for efficiency enhancement*



PRIZM®

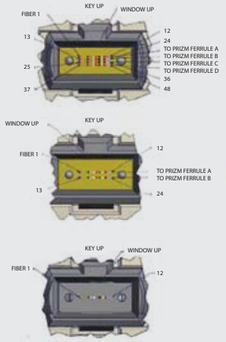
Optec's PRIZM® LightTurn® Fiber Assembly is available in 1.6mm round jacketed and bare ribbon cables, with the choices of OM2, OM3 or OM4 for using across multiple applications.

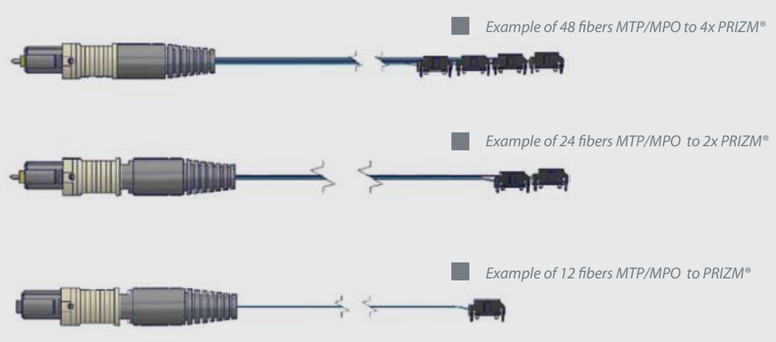


PRIZM® LightTurn® Fiber Assembly

Cable assemblies are made to fulfill GR-1435-CORE requirements

Optical Parameters	IL @850nm	RL @850nm
PRIZM® LightTurn®	≤ 2.0dB	≥ 20dB



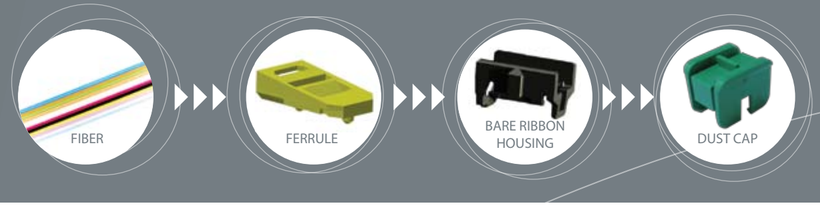


Example of 48 fibers MTP/MPO to 4x PRIZM®

Example of 24 fibers MTP/MPO to 2x PRIZM®

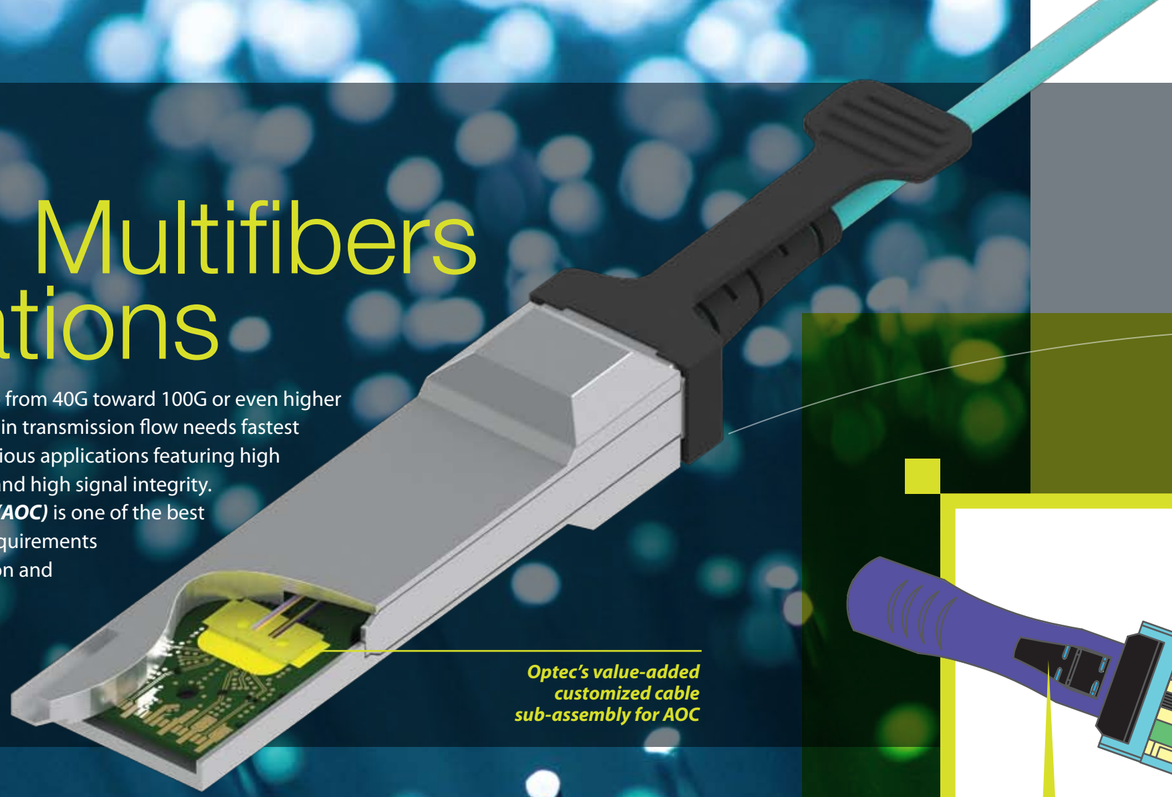
Example of 12 fibers MTP/MPO to PRIZM®

Multiple 12-fiber PRIZM® LightTurn® interface can be terminated with either 12-, 24-, 48-fiber MTP/MPO connectors to form a single I/O assembly for achieving the highest port density of this kind.



AOC Related Multifibers Terminations

Inter-city backbone networks develop from 40G toward 100G or even higher transmission capacity. Rapid increase in transmission flow needs fastest technical development to support various applications featuring high speed, high scalability, cost-effective and high signal integrity. ***The fiber based Active Optical Cable (AOC)*** is one of the best solutions to fulfill all these rigorous requirements intended for multi-lane communication and interconnect applications.



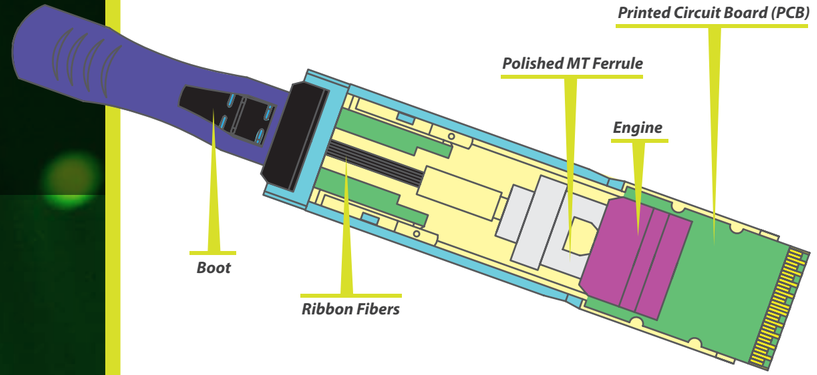
Optec's value-added customized cable sub-assembly for AOC

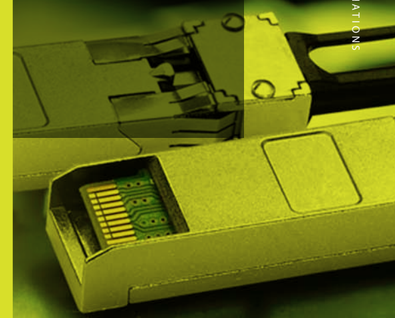
Working in close collaboration with customers, **Optec provides advanced customized cable sub-assembly for fiber based AOC**. Our advanced facilities set-up and unique manufacturing know-how provide our customers with a cost effective, leading edge and time-to-market OEMs integrated solution.

The fiber based Active Optical Cable (AOC) assembly includes a substrate sub-assembly and a cable sub-assembly.

- The substrate assembly includes a substrate, a holder disposed on the substrate, an optoelectronic interface IC, and a plurality of optoelectronic components.
- The cable sub-assembly includes a lens cover and a plurality of fiber cables bonded to the lens cover.

Optec provides value-added precision cable sub-assembly on the MT based ferrule, from fiber insertion, fiber cleaving, polishing, to testing. All cable sub-assemblies are made in accordance with customers' unique structural design under stringent control procedures.





Optec's state-of-the-art manufacturing facility and stringent process control ensure unsurpassed AOC mating performance that meet or exceed customer required standards for reflection and insertion loss.

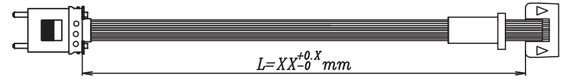
GREATEST PERFORMANCE BUILD ON TINIEST TERMINATION

STRINGENT PROCESS CONTROL

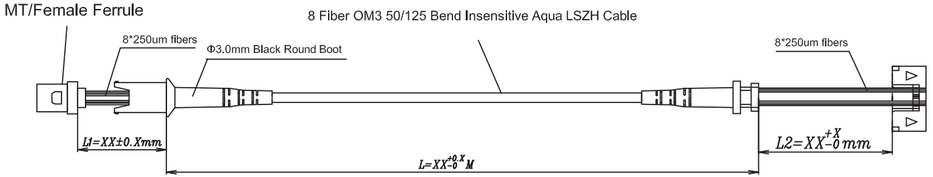
- Highly trained and qualified associates for stringent assembly procedures
- Proprietary jig and fixture design for optimizing assembly efficiency
- Accurate length tolerance controlled up to micron meter (μm) level
- Proprietary polishing process in a carefully monitored and controlled process
- State-of-the-art controlled environment for dust-free production (Clean Room Class-10,000, ISO 14644-1, ISO7)
- Stringent quality control & traceable data before shipment

Optec provides value-added AOC sub-assemblies to fit for every unique inner structure design of AOC. Each customized AOC fiber sub-assemblies are made to order with customer specified structure and fiber length.

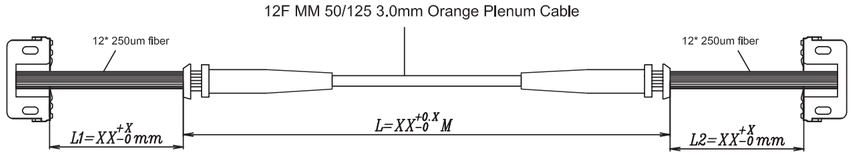
Example-1: MT-AOC connector, 12-Fiber, OM4, Bare Ribbon



Example-2: MT-AOC connector, 8-Fiber, OM3 Bend-insensitive Minicore LSZH Cable



Example-3: AOC-AOC connector, 12-Fiber, OM2, Minicore Plenum Cable



MT-series
Structured Cabling Solutions

PART 1 | 40G/100G MTP/MPO SOLUTION

100G READY
MIGRATE TO THE FUTURE

Optec's 40Gig, 100Gig MTP/MPO Solution provides you with a simple, cost-effective structured cabling system for migrating from legacy 10G to high speed 40G/100G Ethernet. Combining with Optec's advanced MTP/MPO assembly technology and high quality OM3 and OM4 fiber cables, our solution delivers the truly reliable high speed 40G/100G applications.

MTP/MPO Patchcords for 40G/100G

FEATURES

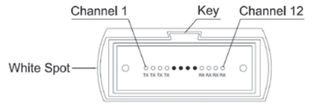
- Meets IEEE802.3ba 40G/100G standard
- Interfaces for 40G QSFP and 100G CXP transceivers
- Portfolio products of fiber trunks, harnesses, and cassette modules
- Built-in polarity management options, including TIA methods A, B or C
- Choices of laser optimized multimode (OM3 and OM4) fibers

BENEFITS

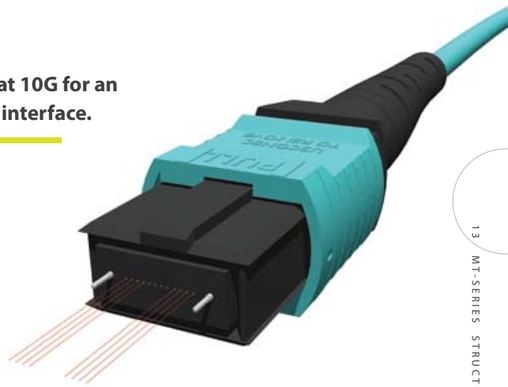
- High-quality low-loss factory terminated MTP/MPO connectors
- Customizable for fiber types, fiber counts, cable and staggered lengths for excellent materials planning
- Well-defined labeling and documented test report for excellent traceability and ease of management
- 100% factory tested for highest optical performance

For 40G transmission, 4 Tx and 4 Rx fibers are transmitted at 10G for an aggregate of 40G, utilizing a 12-fiber MTP/MPO connector interface.

- 40Gig 12-fiber MTP/MPO termination
- Channel 1~4: Transmit (Tx)
- Channel 9~12: Receive (Rx)
- Channel 5~8: Not used

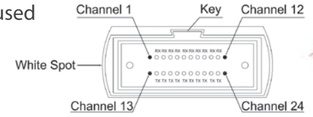


MTP/MPO Channel Definition (Front View)

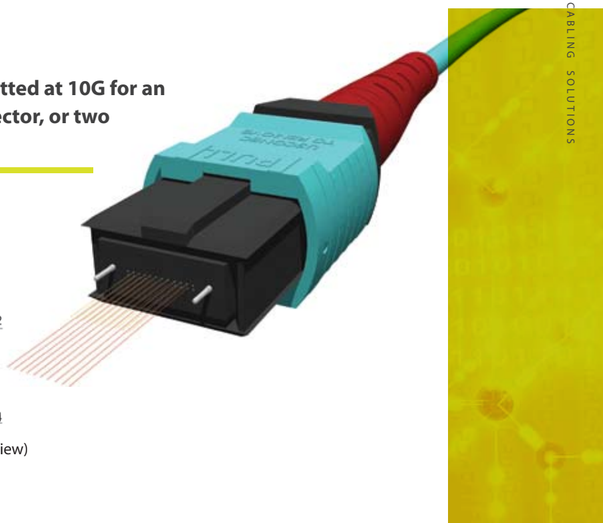


In the 100G scenario, 10 Tx and 10 Rx fibers are transmitted at 10G for an aggregate of 100G, utilizing a 24-fiber MTP/MPO connector, or two 12-fiber MTP/MPO connectors.

- 100Gig 24-fiber MTP/MPO termination
- Channel 2~11: Receive (Rx)
- Channel 14~23: Transmit (Tx)
- Channel 1 & 12: Not used
- Channel 13 & 24: Not used



MTP/MPO Channel Definition (Front View)



PART 2 | High Fiber Count MTP/MPO Solution (1x48F, 1x72F)

A very High Density & Space-Saving Solution for the Next Generation Interconnect System

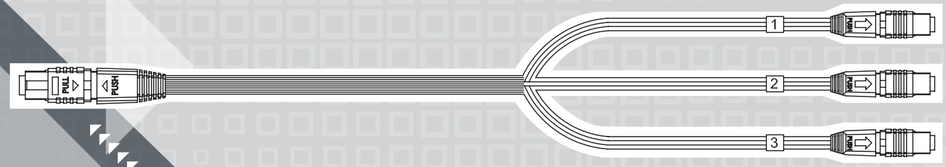
The ever-increasing demand on transmission speed and bandwidth of data centers and other telecommunication applications drive the evolution of network technology. Storage network administrators and data centers managers are eager to adopt the high density, high performance and space-saving solutions in their network deployment. ***The High Density MT (HDMT) structured cabling solution*** is definitely the best choice to support all these latest requirements.

6X HD High Density

HIGH SPEED Transmission with **OM3/OM4 Fibers**

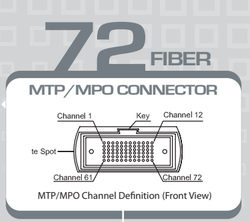
Superior LOW Reflection / Insertion **LOSS**

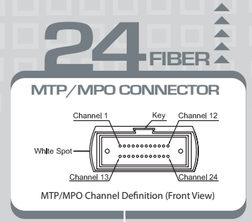
Optec's multifibers engineering excellence in combination of our state-of-the-art production facility delivers the best HDMT cabling solutions to our customers. Our very high fiber count MTP/MPO Solution offers up to 72-fiber in a single connector, which fulfills the challenge of today's high density and space saving requirements.

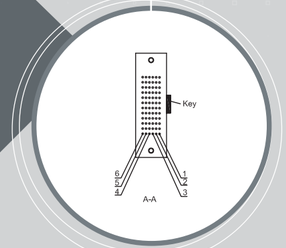


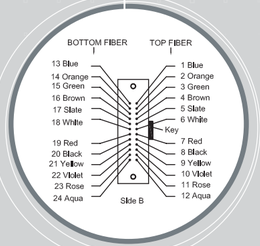
FEATURES

- Available in 48- or 72-fiber over a single ferrule for high density applications
- High density interface with traditional MT ferrule footprint
- Portfolio products of fiber trunks, harnesses, and cassette modules
- Options of Singlemode and Laser Optimized OM3/OM4 fibers
- Meets IEC 61754-7 and TIA/EIA 604-5 standards
- Structured cabling made to TIA-568-C









IP-68

Harsh Environment MTP/MPO Solution

Sealed to IP-68 rating, the highest ingress protection level for all of its kinds, our ruggedized IP-68 MTP/MPO connector delivers distinguished performance in robustness and reliability to deal with those typical challenges like extreme temperature, humidity, vibration, as well as chemicals corrosive gasses.

This IP-68 multifiber MTP/MPO solution offered in forms of pre-terminated assemblies and connector kit. The Pre-terminated solution are custom built to your specific requirements with choices of Standard or Low loss MTP/MPO connector, options of fiber type (OS1/2, OM1~OM4) and different cable length.

FEATURES & BENEFITS

- Sealed to IP-68 for utmost protection
- Bayonet locking design makes ease of mating
- Different receptacle styles for convenient installation
- Compliant to Telcordia GR-326-CORE and TIA/EIA standard
- Pre-terminated solution reduce on-site termination cost
- Excellent reliability and optical performance

APPLICATIONS

- Base station / FTTA
- Transportation and railway system
- Industrial networks
- Broadcasting networks
- Any extreme environments

Ruggedized IP-68 Multifibers Solution
Reliable, Robustness, Ultimate Protection

Specifications of Connector

Mating Mechanism	Bayonet
Ingress Protection	IP-68
Operating Temperature	-40°C ~ +70°C
Mechanical Performance	Straight pulling force 25Kgs*
Mating Durability	500 mating cycles

Specification of Assemblies

	Insertion Loss (IL) **	Return Loss (RL) **
Standard MTP/MPO	SM ≦ 0.75dB (Typical 0.25dB) MM ≦ 0.60dB (Typical 0.20dB)	SM ≧ 60dB MM ≧ 20dB
Low Loss MTP/MPO	≦ 0.35 dB (Typical 0.1dB)	SM ≧ 60dB MM ≧ 20dB

* *Pulling strength may varies depending on choice of cable, guarantee straight pulling force of 25kgs if using Optec's pre-terminated solution*

** *Optec's assemblies are provided in multi-tier performance to cater for different needs, please contact our sales team for more details*

Assembly

SQUARE FLANGE

HEXAGON FLANGE

Receptacle

FEATURES OF RECEPTACLE

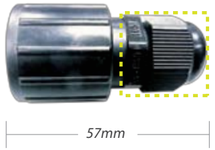
- Options of Hexagon Flange and Square Flange to fit for different installation needs
- Receptacle housing are sealed to fulfill IP-68 ingression protection rating
- Delivering the best mating performance with Optec's IP-68 harsh environment compliant connectors
- Offered in standard MTP/MPO and low loss MTP/MPO for options

Short boot Vs Long boot version

REGULAR BOOT

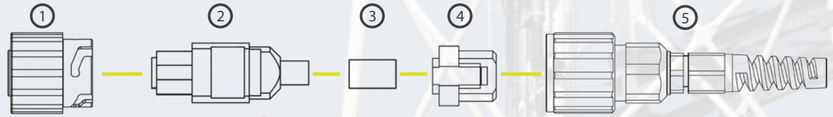
- Overall length after assembled of connector plug is 108mm
- Strain-relief boot design provides extra protection on cable bending
- Suitable for installation where no space constrains

SHORT BOOT



- Overall length after assembled of connector plug is 57mm
- Suitable for installation where limited space applied

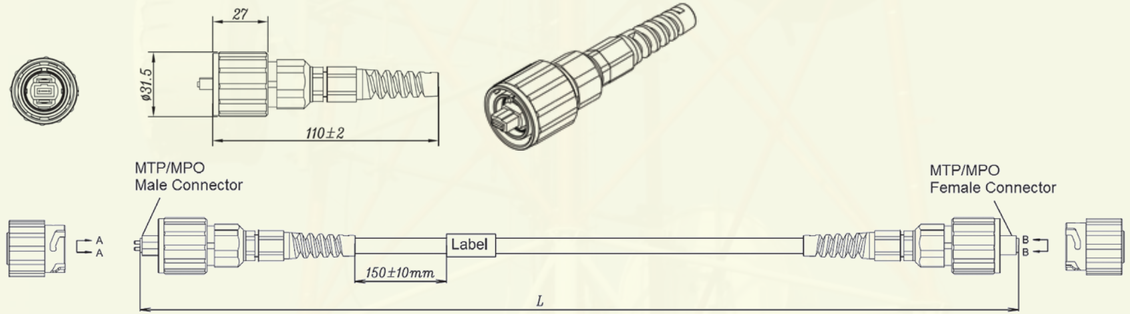
Connector parts



IP connector for MTP

1. IP Dust Cap
2. MTP/MPO Connector Body
3. MTP/MPO Crimp Ring
4. MTP/MPO Holder
5. IP Plug Body and Boot (options of Regular Boot or Short Boot)

Assembly

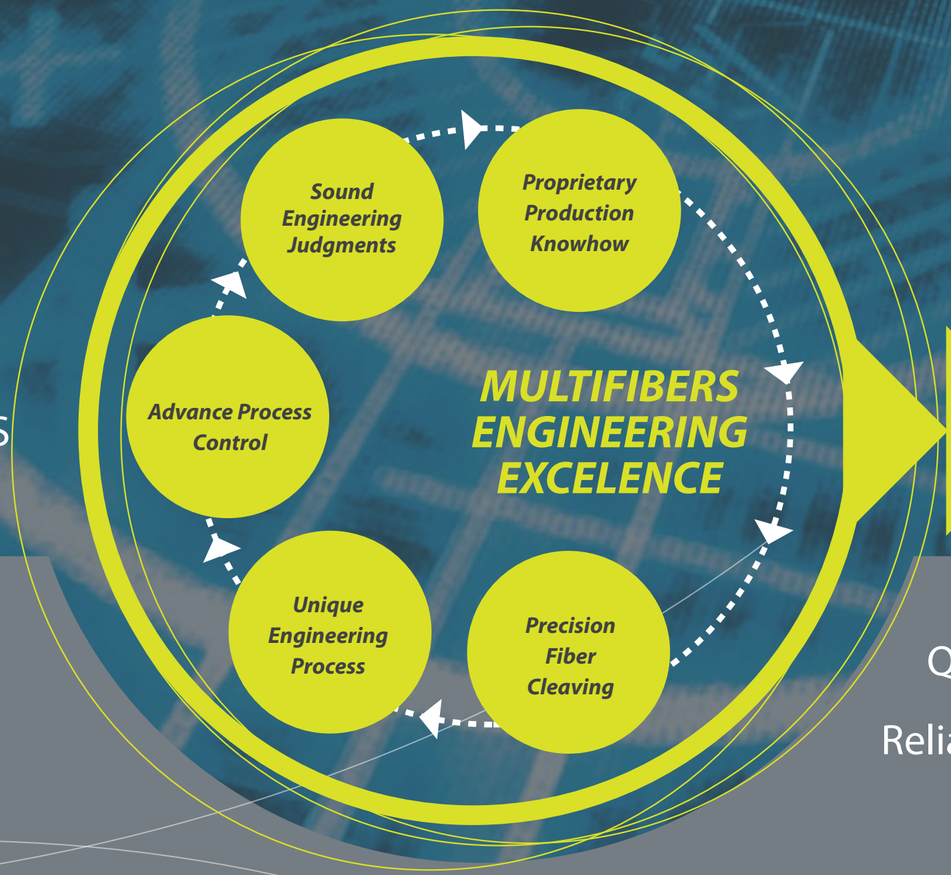


OPTEC'S MULTIFIBERS ENGINEERING EXCELLENCE

TRUST IN OPTEC WHEN YOUR REPUTATION COUNTS

you can count on the unbeatable quality and performance of Optec's cable assemblies

We are dedicated to provide engineering excellence in fiber optic multifibers application by integrating experience, integrity and quality into every project. We create value for our customers through proprietary production knowhow, unique engineering process and advance process control. Our commitment on delivering unbeatable quality and performance distinguishes us as a leader of the multifibers termination solutions provider.



Define Unbeatable Quality and Performance

OUR COMMITMENTS TO CLIENTS

Quality — We strike to deliver the highest quality fiber termination solutions to our customers to protect their reputation.

Reliability — We leverage our state-of-the-art facility with the proprietary production knowhow to develop termination solutions that address the stringent performance and reliability requirements.

Trust — We committed to deliver what we promise and always working with integrity in the best interest of our customers.

Optec Technology Limited

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