

OZ Optics Limited

Laser & Laser Diode to Fiber Delivery Components
June 2016

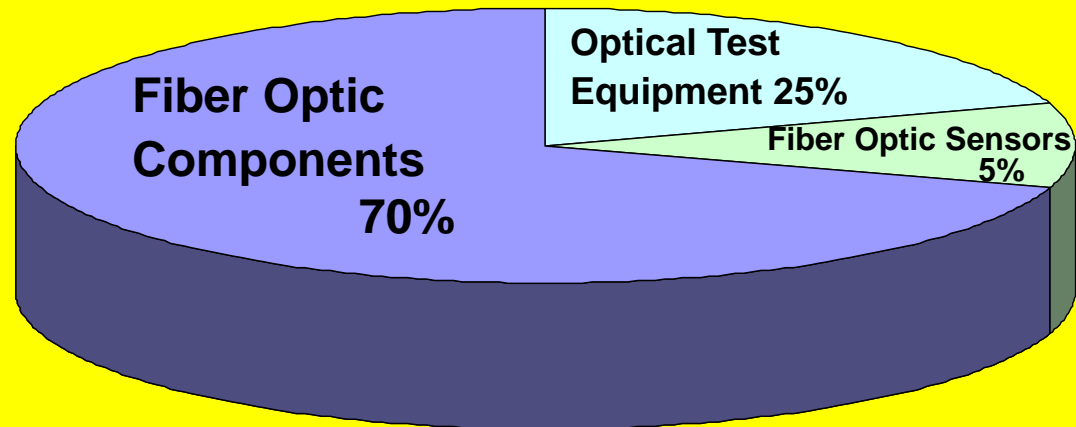
Company Profile

- Company founded in 1985;
- Corporate headquarters located in Ottawa, Canada;
- Manufacturing facility in Ottawa/Canada, Izmir/Turkey, and Jiaxing/China
- Seven Product Groups: **Laser-to-Fiber Delivery Systems, High Power Fiber Optic Components, Polarization Maintaining Products, Attenuators, Opto-Electronic Packaging, Test Equipment, Fiber Optic Sensor Systems**
- Sales offices in Canada, USA, Turkey and China



Company Profile

➤ Three Product Groups:



- Over 1,000 products
- Leading Edge R&D

OZ Optics Products



OZ Optics

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www.ozoptics.com



Global Leader in Fiber Optic Products since 1985

Polarization Maintaining Fiber Optic Components

Patent Numbers: USA 7058275, 7095931, 7295731, China 1672073



Polarization Maintaining
Connectors / Patchcords

Polarization Maintaining and Polarizing Splitters /
Combiners / Fused Couplers / Switches

All Fiber Manual and Electrically Driven
Polarization Controllers / Scramblers

PM Fiber Directional Taps /
Power Monitors

Manual / Electrically Controlled
PM Fiber Pigtailed Variable Attenuators

Fiber Pigtailed Polarizers

PLC Splitters

PM Fiber Pigtailed Circulators



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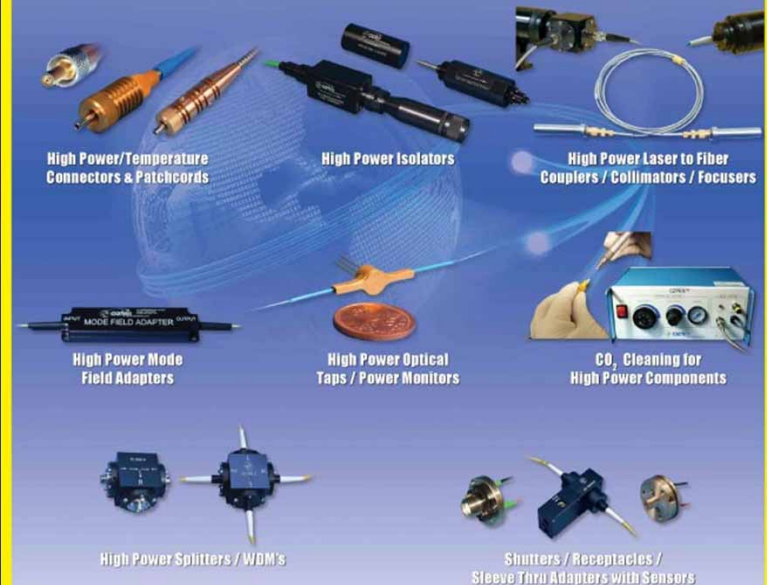
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Global Leader in Fiber Optic Products since 1985

High Power Fiber Optic Components

Patent Numbers: Canada 2494133, USA 7058275, 7095931, 7295731, China 1672073



High Power/Temperature
Connectors & Patchcords

High Power Isolators

High Power Laser to Fiber
Couplers / Collimators / Focusers

High Power Mode
Field Adapters

High Power Optical
Taps / Power Monitors

CO₂ Cleaning for
High Power Components

High Power Splitters / WDM's

Shutters / Receptacles /
Sleeve Thru Adapters with Sensors



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OZ Optics Products



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Fiber Optic Attenuators for SM, PM, and MM Fibers

Digital Variable Attenuators



- 0.01dB Resolution, Fast Response
- 0.001 to 100dB Attenuation Range
- 100mW Max

Electrically Controlled Variable Attenuators



- 0.01dB to 100dB Attenuation Range
- Up to 2 Watts Power Handling
- PC Based, Analog and Digital Control

MEMS Variable Attenuators



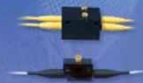
- 0.01dB to 40dB Attenuation Range
- Small Size, Low Cost, Low Power Consumption
- Low Wavelength Resonance, Low Crosstalk

SM / PM / MM Fiber Pigtailed Inline Variable Attenuators



- 0.01dB to 100dB Attenuation Range
- 500mW Power, 200 Wavelength Response
- 0.01dB PC, Novel Trenchless Specifications

Single/Multi Channel Miniature Variable Attenuators



- Compact, Less Than 5mm Spacing Between Fibers
- Optimized for Multiple Fiber Arrays
- PC Based, Monolithic

Reflective Style Variable Attenuators



- 0.01dB to 60dB Attenuation Range
- 0.1dB Resolution
- 40W, 400W, 400W Backreflection

Air Gap Variable Attenuators



- 0.1dB Resolution
- 100W Power Handling
- 1000nm to 1550nm Wavelength

Plug Type Fixed Attenuators



- 100W Power Handling
- 1000nm to 1550nm Wavelength
- Singlemode, Multimode, Polarization

Attenuating Fiber Patchcords



- 0.1dB Resolution
- 100W Power Handling
- 1000nm to 1550nm Wavelength
- All Fiber Patchcords, Jumper, Cordless
- After 30 days and 1000000 cycles



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Laser & Laser Diode to Fiber Delivery Systems



Laser to Fiber Couplers



Bare Fiber Adaptors with Magnetic Clips



Bulkhead Receptacles



Pigtail/Receptacle Style High/Low Power Collimators/Focusers



High/Low Power Patchcords



WDM/RGB Combiners



OCT Modules and 2 micron Components



OEM Laser Diode to Fiber Couplers



Turnkey, Ultra Stable Laser Modules



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OZ Optics Products



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Fiber Optic Components for Optoelectronic Packaging


Hermetically Sealable Patchcords with Glass or Metal Solder



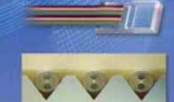
Single Channel



Multi Channel




Metalized Fibers



PM/SM/MM Fiber Pigtailed V-Groove Arrays



Polarization Measurement System for V-Grooves




Tapered / Lensed Fiber Polished / Laser Shaped




Glass Solder Preforms



Fiber Optic Ferrules



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Fiber Optic Test Equipment



Polarization Extinction Ratio Measurement Systems



Power Meters with Smart Detector Heads



Broadband Digital Variable Attenuators



Optical Fiber Length Meters



High Power Visual Fault Locators Fiber Optic Stable Sources



Inline Optical Power Monitors/Meters



Laser Diode Sources Single/Multiwavelength



Fiber Optic Smart Patchcords



Fiber Optic Fault Finders



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Product Innovation



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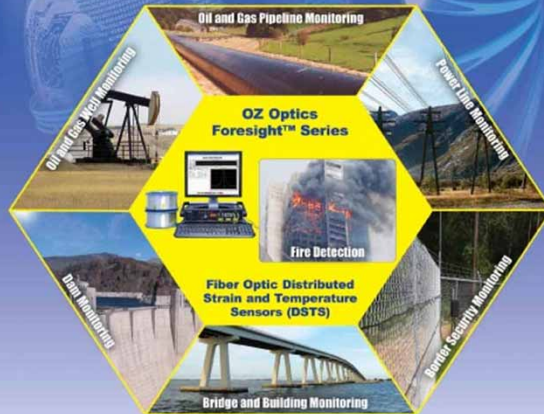


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Fiber Optic Distributed Strain and Temperature Sensors

USA Patent Numbers: 7499151, 7599047

- BOTDA only, BOTDR only, or both BOTDA and BOTDR modules in one unit
- Simultaneous measurement of strain and temperature
- Fast, dynamic measurement of strain and/or temperature up to 100 km sensing range
- Uses standard telecommunication fiber to minimize costs



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Fiber Optic Fault Finder for Optical Network Safeguard™

- Monitors and reports network health status in real time, 24 hours/day, 365 days/year
- Lowers network operating and maintenance expenses
- Reduces revenue loss due to fiber plant outages
- User friendly interface via various wireless interfaces (Wi-Fi, GPRS), USB, or RS-232
- Reports fault location, giving GPS coordinates with time stamp
- Early alert and outage reports via cellular phone, email, IM, SMS, or text messaging



OZ Guard Automated Test Solution



Remote Monitoring a WDM Network



Remotely Accessible/Wireless Fault Finders



GPS Locator



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Product Innovation



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2 micron Fiber Optic Components for PM and SM Fibers



Fiber Optic Patchcords



Fused Couplers / Taps /
Beam Splitters / Combiners



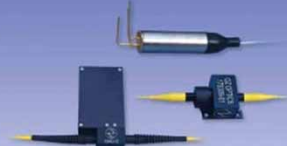
Fiber Pigtailed
Laser Diode Sources



Pigtail / Receptacle Style
Collimators / Focusers



Polarizers



Manual / Electrically Controlled
Variable Attenuators



Isolators



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Fiber Optic Products for OCT Applications



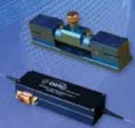
OCT Modules



Manual / Electrically Controlled
Broadband Variable Attenuators



Manual / Electrically Controlled
Fiber Optic Delay Lines



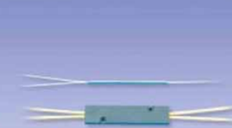
Manual / Electrically Controlled
Polarization Controllers



Fiber Pigtailed
Broadband SLED Sources



Fiber Collimators / Focusers



Broadband Fused Couplers



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Company Profile

Over 470 employees worldwide:

- 260 in Ottawa and US
- 50 in Turkey
- 160 in China

OZ Canada



OZ China



OZ Turkey

Company Profile

OZ Optics is lead by an experienced team:

- **Ömür Sezerman, Chairman, President & CEO**
 - Founder and CEO since inception (31 years)
- **Zahide Sezerman, VP of Human Resources**
 - With OZ Optics since inception (31 years)
- **Garland Best, VP of Components Division**
 - 24 years at OZ Optics
- **Gordon Youle, VP of Test Equipment Division**
 - 17 years at OZ Optics
- **Martin Powell, Operation Manager**
 - 12 years at OZ Optics
- **Sarah Miller, Controller**
 - 3 years at OZ Optics
- **Metin Sezerman, General Manager of OZ Turkey**
 - 15 years at OZ Optics
- **Bing Li, General Manager of OZ Optics China**
 - 12 years at OZ Optics

Company Profile

- ISO9001:2008 certified
- Broad patent portfolio
- Advanced proprietary processing technology



Company Profile

➤ *Using our strong direct sales and distributors, we address the following markets:*



Company Profile

➤ *OZ Optics has resellers and distributors in over 30 Countries & Regions and over 10,000 customers globally:*



In-House Production Capabilities

- Experienced and well-trained staff in following fields:
 - optical, mechanical, electronics & software

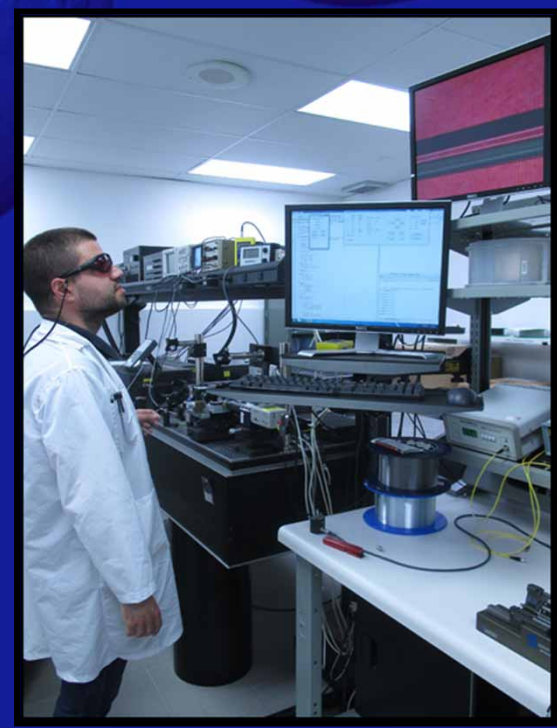
CNC Machine Shop



AR Coating



Femtosecond Laser Lab



Clean Room



Laser Conditioning/Cleaving



Branch Network

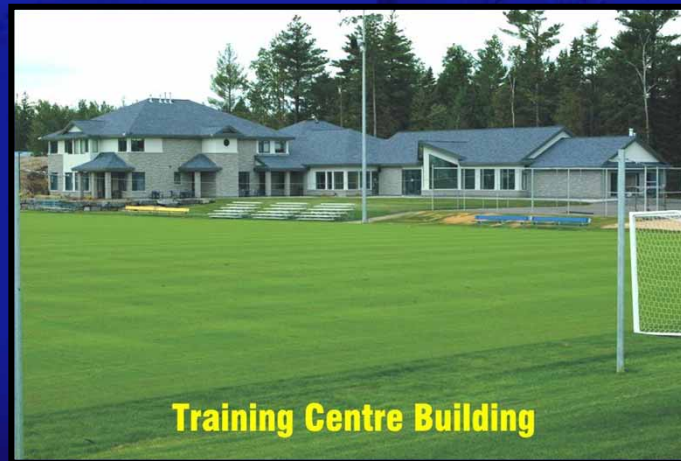


Facility – Ottawa Headquarters

- 60,000 sq ft. – Manufacturing and R&D Facilities
- 15,000 sq ft. – Admin, Sales and Marketing
- 15,000 sq ft. – Training and Fitness Facility
- R&D, Product Design, Engineering, Final Assembly & QA



Facility – Ottawa Headquarters



OZ Optics – Turkey Factory

- Operational since 2000
- 33,000 sq ft. Manufacturing Facility
- Located in Free Trade Zone
- Low Tax Rates
- Sub Component Parts Manufacturing
- Cost Effective Manufacturing
- High Quality Labor



OZ Optics China

- Operational since 2009
- Wholly Foreign Owned Enterprise
- Subcomponent Parts Manufacturing
- Cost Effective Manufacturing
- High Quality Labor
- Extensive Training
(3-6 months in OZ Canada)



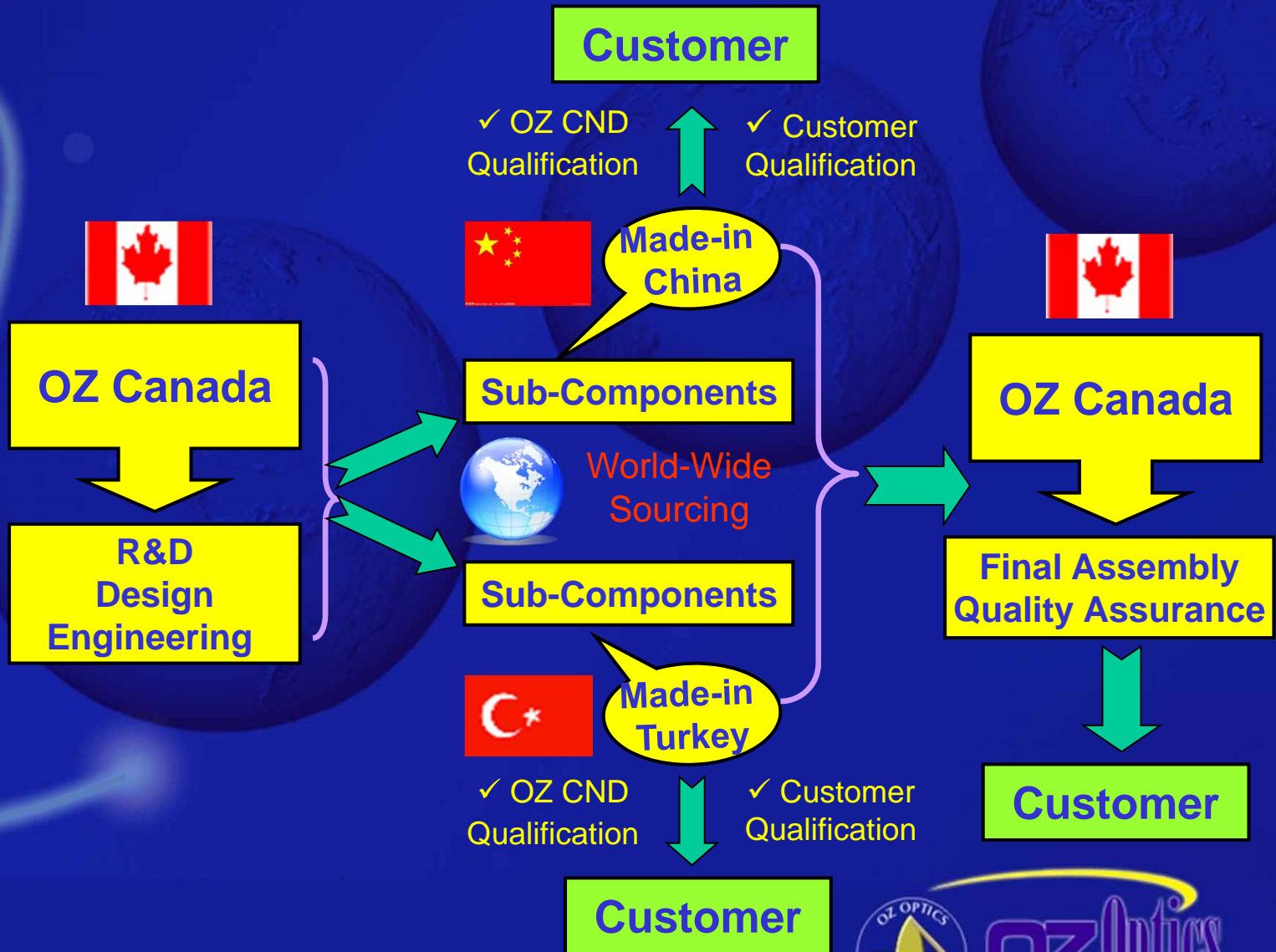
OZ China Facility

Jiaxing, China

- Located in Economic Development Zone
- 500 sq meters – Admin, Sales and Marketing
- 1500 sq meters – Manufacturing Area
 - 100 sq meters – Class 10,000 Clean Room
 - 100 sq meters – ESD Working Area



Manufacturing Strategy



Industry Standards

All products manufactured are in strict accordance with international industry standards:

➤ *Telecordia Compliance*



➤ *CE Compliance*



➤ *RoHS Compliance*



➤ *ISO 9001:2008 Certified (China, Turkey and Canada)*

➤ *Controlled Goods Directorate Registered*

Core Competencies

- Pioneer in Polarization Maintaining (PM) Components
- Leader in Wavelength Flattened, High Power & Low PDL Components
- Leader in High Power Fiber Optic Delivery Systems
- Custom Test Equipment, Including Polarization Test Equipment and FTTH Equipment
- Widest Range in Attenuator Product Offering
- Fiber Optic Distributed Strain and Temperature Sensors
- Complete product line for OCT applications & 2 Micron

Leading Technology

- **High Power Isolators**
 - power handling > 50W
 - low loss, low cost turnkey solution



High Power Free Space and Pigtailed Isolators

- **Pioneer in Polarization Maintaining (PM) Components**
 - wavelength flattened
 - high power & low PDL
 - PM test equipment



Polarization Maintaining Patchcords

Distributed Strain and Temperature Sensors



- **Fiber Optic Sensor**
 - fast and simultaneous measurement of strain & temp
 - large structure health monitoring

High Power Collimators/Focusers



- **Leader in High Power Fiber Optic Delivery Systems**
 - specializes in custom design



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OUR VISION

- Be the preferred Supplier of choice
- Capture and expand market share
- Maximize shareholder value

OUR MISSION

- To become the leading provider of innovative optical products to telecom and non-telecom sectors

OUR CORE VALUES

- Leadership
- Teamwork
- Boldness
- Commitment
- Innovation
- Rewards

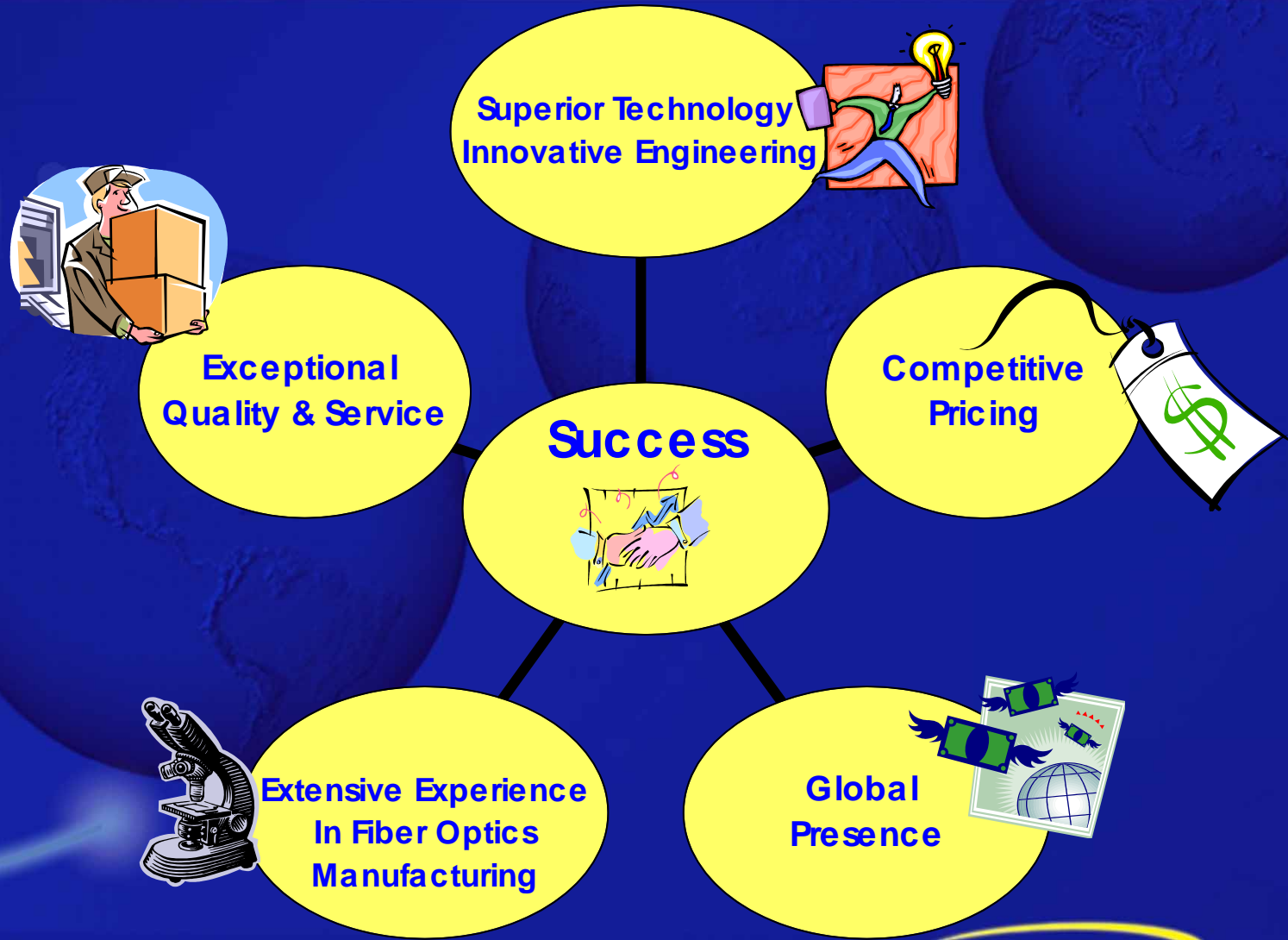
OUR QUALITY POLICY

- Provide our Customers with a competitive advantage, leveraging performance, price and delivery, through a continuous process of Quality advancement in all areas of our Company
- Communicate effectively to our Customers, Suppliers and Shareholders our commitment to Quality and continuous improvement
- Promote opportunities of professional development for all members of our Company through education, training and personal challenge

Ömür Sezerman
President



Competitive Advantage



Laser & Laser Diode to Fiber Delivery Components

- **OZ Optics Provides High Quality, Competitively Priced Fiber Optic Products Based on a Patented Tilt Alignment Technique.**
- **Our Products Include a Laser to Fiber Coupler with Adjustable Focus which Allows >80% Coupling into a Singlemode Fiber.**

Laser & Laser Diode to Fiber Delivery Components

Other Products Include:

- **Turnkey Laser Diode to Fiber Delivery System**
- **High Power Laser to Fiber Couplers with Shutters, Attenuators and/or TE Coolers**
- **Laser to Fiber Delivery Systems for Flow Visualization**
- **Fiber Collimators & Focusers**
- **U-Brackets with Removable Optics**
- **Laser Diode to Fiber Couplers**
- **Laser Diode Collimators**
- **Laser Diode Power Combiners**
- **Fiber Optic Vacuum Feedthroughs**

Laser to Fiber Couplers

DTS0049 and DTS0062: Laser to Fiber Coupler with Receptacle (Non-Contact style) and Laser to Fiber Couplers-Pigtail Style

HPUC-23-400/700-P-10AC-11 AND

LPSC-03-780-5/125-P-11AS-14-40-3AF-3-3

- **> 60% Coupling Efficiency for SMF & PMF**
- **Low / High Power Versions >10 W**
- **240nm to 2200nm Wavelengths**



Laser to Fiber Delivery System Questionnaire

Laser to Fiber Couplers

DTS0049: Laser to Fiber Coupler with Receptacle (Non-Contact style)

HPUC-23-400/700-P-10AC-11

- **> 60% Coupling Efficiency for SMF & PMF**
- **Low / High Power Versions >10W**
- **240nm to 2200 nm Wavelengths**



Laser to Fiber Delivery System Questionnaire



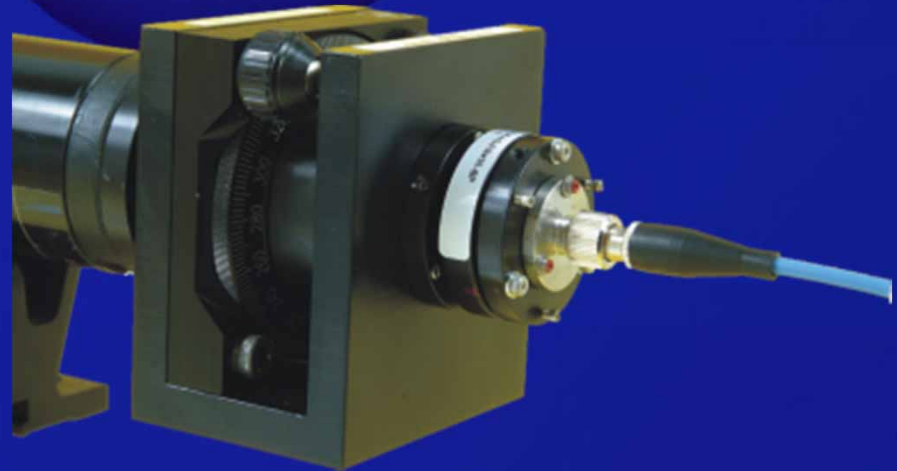
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Laser to Fiber Couplers

DTS0049 and DTS0062: Laser to Fiber Coupler with Receptacle and Polarization Rotators/Analyzers

HPUC-23AF-633-P-3.5AC-15-POL

- **> 60% Coupling Efficiency for SMF & PMF**
- **Low / High Power Versions >10W**
- **240nm to 2200 nm Wavelengths**



Laser to Fiber Delivery System Questionnaire

Laser to Fiber Couplers

DTS0095: Beam Splitters/Combiners

ULBS-12P-4/125-PP-633-90/10-3.9AS-20-40-3AF3AF-3-1

- **> 60% Coupling Efficiency for SMF & PMF**
- **Low / High Power Versions >10W**
- **240nm to 2200 nm Wavelengths**



Laser to Fiber Delivery System Questionnaire

Laser to Fiber Couplers with Adjustable Focus

DTS0047: Laser to fiber Coupler with Adjustable Focus

HPUC-2,A3A-400/700-P-3.5AC-1 and QPMJ-A3A,3S-488-3.5/125-3AS-2-1

- **> 80% Coupling Efficiency for SMF & PMF**
- **SMF, MMF & PMF Versions**
- **0.1 Micron Resolution in Focus Adjustment**



Laser to Fiber Delivery System Questionnaire

Laser to Fiber Couplers with Adjustable Focus

DTS0047: Laser to fiber Coupler with Adjustable Focus

HPUC-2,A3A-400/700-P-3.5AC-1 and QPMJ-A3A,3S-488-3.5/125-3AS-2-1

- **> 80% Coupling Efficiency for SMF & PMF**
- **SMF, MMF & PMF Versions**
- **0.1 Micron Resolution in Focus Adjustment**



Laser to Fiber Delivery System Questionnaire

Adjustable Fiber Connectors

DTS0047: Laser to fiber Coupler with Adjustable Focus

HPUC-2,A3A-400/700-P-3.5AC-1 and QPMJ-A3A,3S-488-3.5/125-3AS-2-1

- **Use For Adjustable Focusers & Couplers**
- **Super & Angled NTT-FC/PC Compatible**
- **SMF, MMF & PMF Versions**



Laser to Fiber Delivery System Questionnaire

Laser to Fiber Couplers - with Electrically Controlled Attenuators

DTS0048: Laser to fiber Coupler with Attenuator or Shutter

HPUC-23AF-P-633-3.9AS-CLH-DD-485:1-6-MC/RS232

- **> 60% Coupling Efficiency for SMF & PMF**
- **60dB Attenuation Range**
- **0.5dB Accuracy, 0.01dB Resolution**



Laser to Fiber Couplers with Shutters

DTS0048: Laser to fiber Coupler with Attenuator or Shutter

HPUC-23AF-633-P-3.9AS-15-SH

- **> 60% Coupling Efficiency for SMF & PMF**
- **Up to 3 Watts Optical Power Handling**
- **Ideal for Safety Interlocks, Remote Control**



Laser to Fiber Delivery System Questionnaire



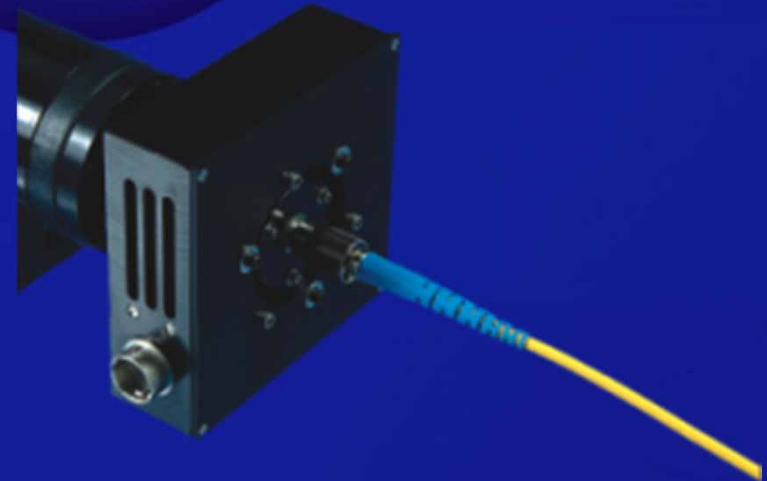
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Laser to Fiber Couplers with TE Cooler

DTS0039: High Power Laser to Fiber Couplers with Temp. Control

HPUC-25-1064-M-50PQ-2-TE-DR-PS

- **>10 Watts CW Power Handling**
- **0.1°C Temperature Control**
- **SMF, MMF & PMF Versions**



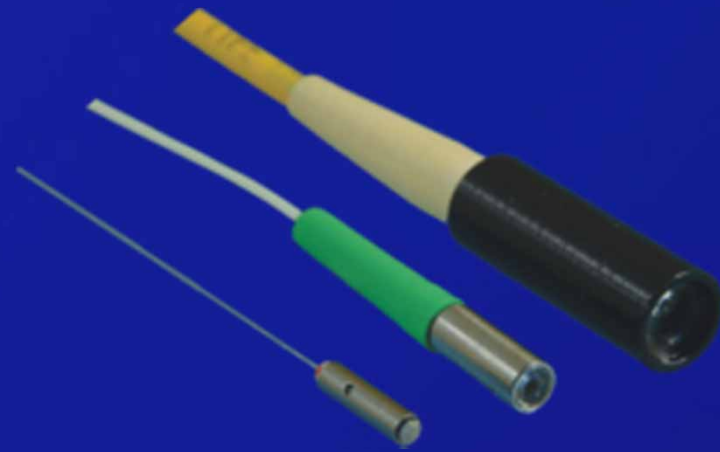
Laser to Fiber Delivery System Questionnaire

Pigtail Style Collimators / Focusers

DTS0060: Collimators/Focusers – Pigtail Style

LPC-03-1550-8/125-P-0.44-2AS-40-3A-3-2 and LPF-01-1550-8/125-P-3-19.4-5AS-60-3A-3-1

- **As Small as 2 μ m Spot Sizes, Up to 5W Power**
- **Up to -60dB Backreflection SMF, PMF & MMF**
- **1.6mm, 2.5mm, 4mm, 8mm & 12mm OD Housing**
- **240 nm – 2200 nm**



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Receptacle Style Collimator / Focusers

DTS0094: Collimators and Focusers – Receptacle Style
HPUCO-23-400/700-P-50AC and HPUFO-23-633-S-7-47-6.2AS

- **0.2mm to > 15mm Beam Diameters**
- **240nm to 2200nm Wavelengths**
- **Achromatic Collimators Available**



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Receptacle Style Collimator / Focusers

DTS0094: Collimators and Focusers – Receptacle Style
HPUCO-T,3-400/700-M-3.5AC and HPUFO-23-633-S-7-47-6.2AS

- **0.2mm to > 15mm Beam Diameters**
- **240nm to 2200nm Wavelengths**
- **Achromatic Collimators Available**

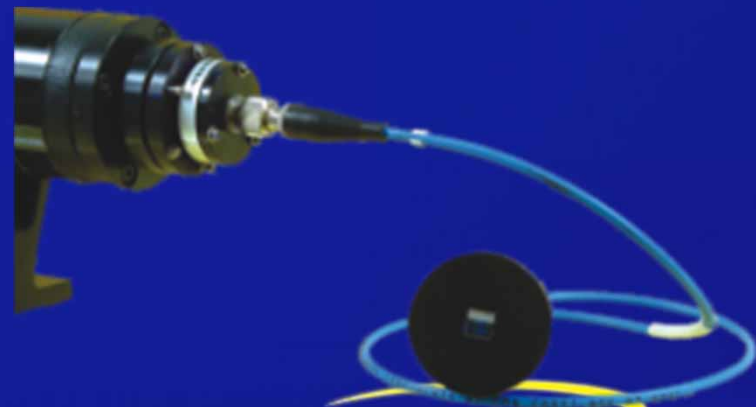


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Delivery Systems for Flow Visualization

*DTS0014: Delivery System for Flow Visualization – Fiber Optic
HPUC...+ FMJ...+ FOLM...*

- **Uniform Intensity along the Line**
- **Up to 1mm Linewidths, 10° to 60° Fan Angles**
- **Cross Targets also available**

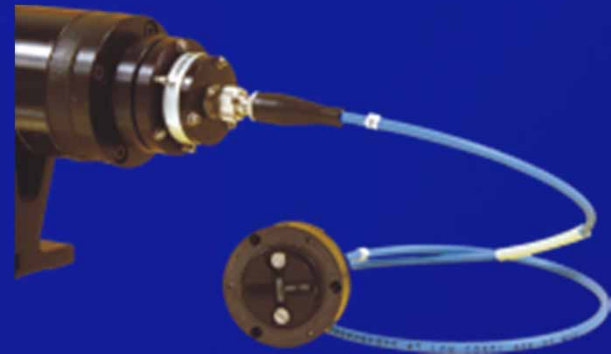


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Cross Target Generators

DTS0014: Delivery System for Flow Visualization – Fiber Optic
FOLM-23-400/700-S-3.5AC-45

- **Up to 1mm Line Widths**
- **Low / High Power Versions**
- **400nm To 700nm Wavelengths**



U-Brackets with Removable Optics

DTS0022: U-Bracket Assembly – Fiber Optic
UB-01-33-1550-S-S-3.03

- **As Good as 0.6dB Insertion Loss (pigtail style)**
- **-40, -50, -60dB Backreflection**
- **Use With A/O Modulators, Bulk Optics**



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OEM Laser Diode to Fiber Couplers

DTS0063: Laser Diode to Fiber Coupler – Pigtail Style
LDPC-01-635-4/125-s-40-3S-3-1-35-5LD

- **375nm to 2050nm Wavelengths**
- **> 20% Coupling into SMF, to > 60%**
- **Low Cost, Rugged & Compact Size**



Laser Diode / LED to Fiber Delivery System Questionnaire



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OEM Laser Diode to Fiber Couplers

DTS0045: Laser Diode to Fiber Couplers
HULD-13-635-S-30-7LD

- **375nm to 2050nm Wavelengths**
- **> 20% Coupling into SMF**
- **Low Cost, Rugged & Compact Size**



Laser Diode / LED to Fiber Delivery System Questionnaire

OEM Laser Diode to Fiber Couplers

DTS0063: Laser Diode to Fiber Coupler – Pigtail Style
LDPC-05-635-4/125-S-40-3S-3-1-20-7LD-DR

- **375nm to 2050nm Wavelengths**
- **> 20% Coupling into SMF**
- **Low Cost, Rugged & Compact Size**



Laser Diode / LED to Fiber Delivery System Questionnaire

Lab Style Laser to Fiber Couplers

DTS0045: Laser Diode to Fiber Couplers
LDPC-05-635-4/125-S-40-3S-3-1-20-7LD-DR

- **375nm to 2050nm Wavelengths**
- **Up to 50% Coupling Efficiency into SMF & PMF**
- **PC Board Mountable, Reusable Optics**



Lab Style Laser to Fiber Couplers

DTS0045: Laser Diode to Fiber Couplers
LDPC-05-635-4/125-S-40-3S-3-1-20-7LD-DR

- **375nm to 2050nm Wavelengths**
- **Up to 50% Coupling Efficiency into SMF & PMF**
- **PC Board Mountable, Reusable Optics**

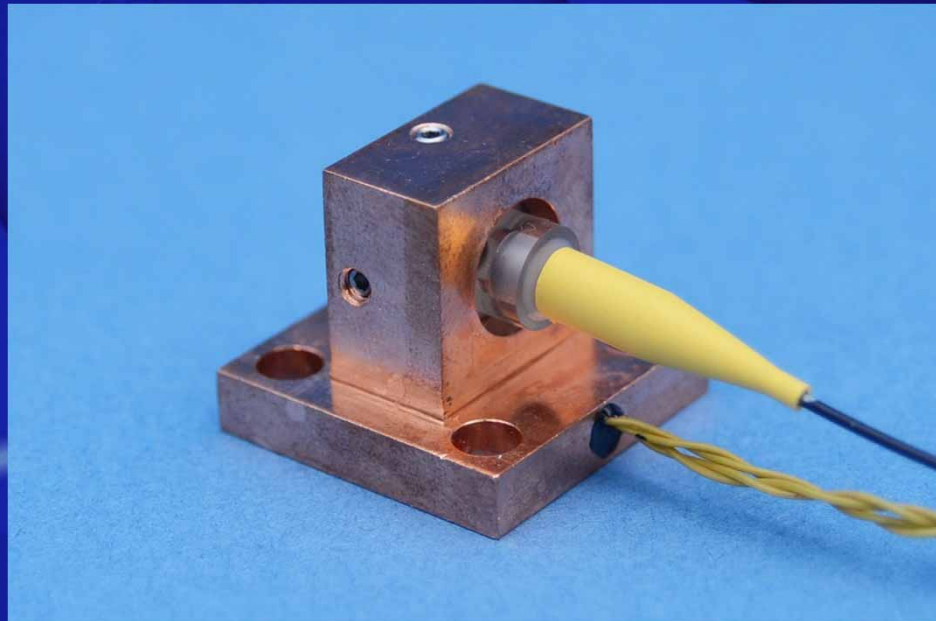


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TE Controlled Laser Diode Housings

*DTS0024: Fiber Pigtailed Temperature Controlled Laser Diode Housing
LDPC-T1-780-5/125-P-40-3A-3-1-40-1-CSP*

- **0.01dB Output Stability. SMF, PMF & MMF**
- **Built-In Temperature Sensor**
- **0.1°C Temperature Control**



Laser Diode Collimators

DTS0043: Laser Diode Collimators
HULDO-41-1310-2AS-PO-SP

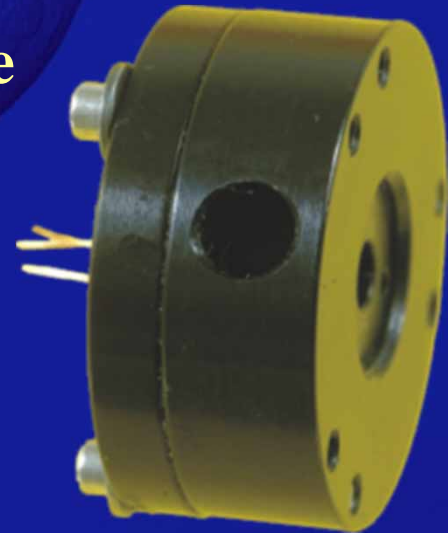
- **0.6mm to 4.9mm Beam Diameters**
- **Adjustable Lens can be Used as Focusers**
- **Low Cost, Rugged & Compact Size**



Laser Diode Collimators

DTS0043: Laser Diode Collimators
HULDO-11-670-2AS-5LD

- **0.6mm to 4.9mm Beam Diameters**
- **Adjustable Lens can be Used as Focusers**
- **Low Cost, Rugged & Compact Size**



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Laser Diode Power Combiners

DTS0044: Laser Diode Power Combiner
ULBS-11P-4/125-P-660/690-PBS-40-3S-3-1-SP

- **Up to 45% Coupling from Each Diode**
- **-40, -50, -60dB Backreflection SMF, PMF & MMF**
- **Can Combine Equal / Different Wavelengths**



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Turnkey Free Space or Fiber Pigtailed Laser Diode Modules

DTS0081: Turnkey, Ultra Stable, OEM LD Source OZ-1000 & OZ-2000 Series

OZ-2000-405-3/125-S-40-3S-3A-1-1

- **Wide Wavelength range 375nm – 2050nm**
- **SM, MM, PM Fiber pigtailed with collimators**
- **Receptacle versions are also available**



Turnkey Free Space or Fiber Pigtailed Laser Diode Modules

DTS0081: Turnkey, Ultra Stable, OEM LD Source OZ-1000 & OZ-2000 Series

OZ-2000-405-3/125-S-40-3S-3A-1-1

- **Wide Wavelength range 375nm – 2050nm**
- **SM, MM, PM Fiber pigtailed with collimators**
- **Receptacle versions are also available**

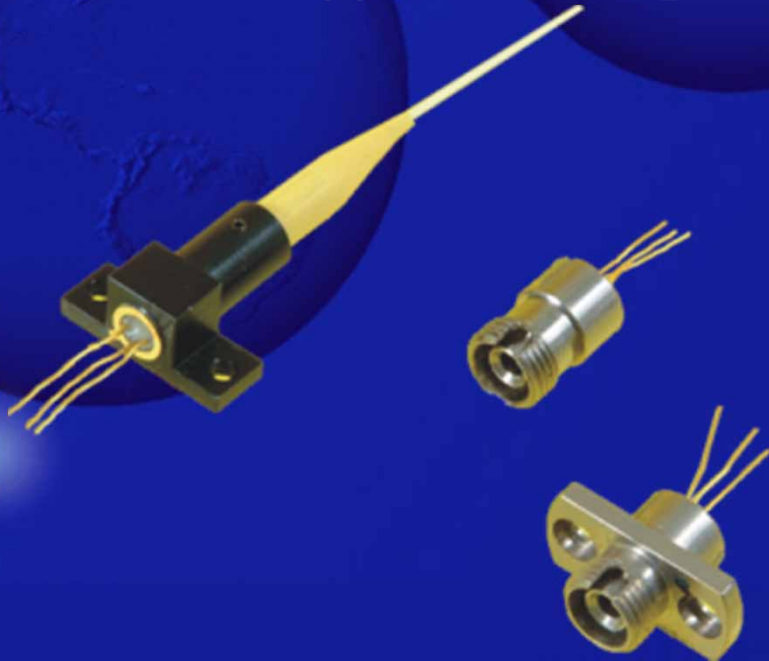


Fiber Pigtailed Photo Diodes

DTS0025: Fiber to Photodiode Couplers

FPD-05-400/1000-M-PD and PFPD-11-635-50/125-M-25-3-1-0.15-CSP-SPI

- **> 70% Coupling Efficiency, SMF, MMF & PMF**
- **-40dB, -50dB, -60dB Backreflection**
- **Low Cost, Rugged & Compact Size**

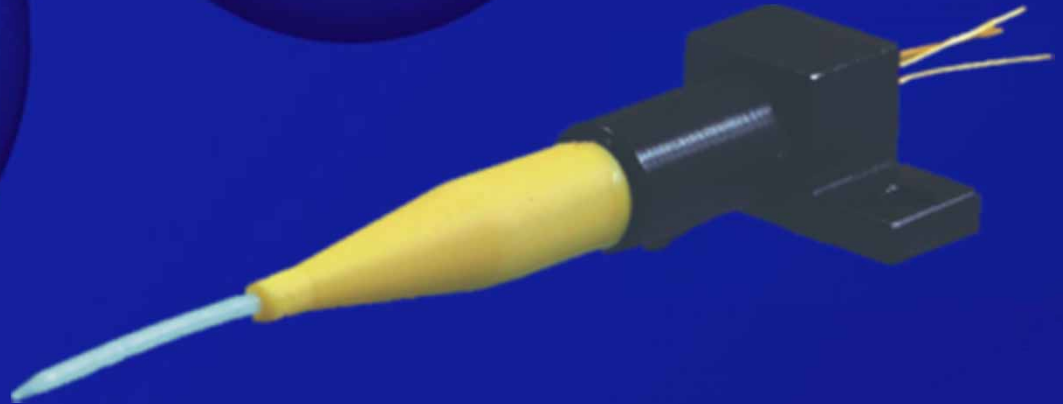


Fiber Pigtailed Photo Diodes

DTS0025: Fiber to Photodiode Couplers

FPD-05-400/1000-M-PD and PFPD-11-635-50/125-M-25-3-1-0.15-CSP-SPI

- **> 70% Coupling Efficiency, SMF, MMF & PMF**
- **-40dB, -50dB, -60dB Backreflection**
- **Low Cost, Rugged & Compact Size**



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Fiber Pigtailed Photo Diodes

DTS0025: Fiber to Photodiode Couplers
FPD-35-635-M-PD

- **> 70% Coupling Efficiency, SMF, MMF & PMF**
- **-40dB, -50dB, -60dB Backreflection**
- **Low Cost, Rugged & Compact Size**



Fiber Pigtailed Photo Diodes

DTS0025: Fiber to Photodiode Couplers
FPD-35-635-M-PD

- **> 70% Coupling Efficiency, SMF, MMF & PMF**
- **-40dB, -50dB, -60dB Backreflection**
- **Low Cost, Rugged & Compact Size**

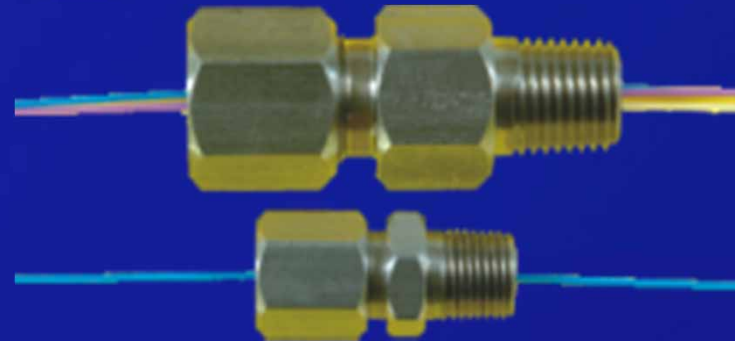


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Penetrating Vacuum Feedthroughs

DTS0023: Vacuum Pressure Feedthrough – Fiber Optic
VAC-01-V-SMJ-3A3A-1300/1550-9/125-1-1.5

- **No Intrinsic Insertion Loss or Backreflection**
- **Low Cost, Rugged & Compact Size**
- **Gas Leak Rate 10^{-6} sec/sec**



Vacuum Feedthroughs – Receptacle Style

*DTS0023: Vacuum Pressure Feedthrough – Fiber Optic
VAC-3S3S-IRVIS-105/125-M*

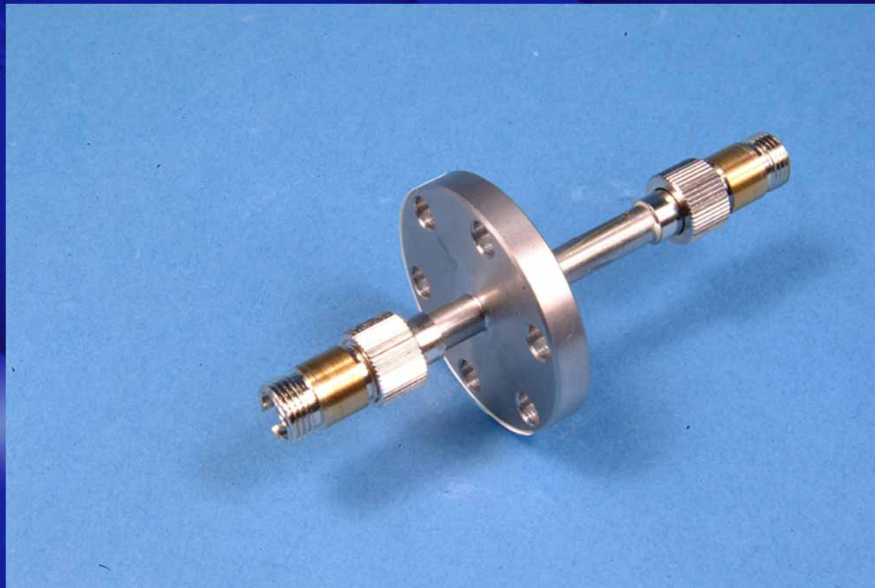
- **Singlemode & Multimode Versions**
- **Easy to Install & Use. Compact & Rugged**
- **Gas Leak Rate 10^{-6} scc/sec**



Vacuum Feedthroughs – Receptacle Style

*DTS0023: Vacuum Pressure Feedthrough – Fiber Optic
VAC-3S3S-IRVIS-105/125-M*

- **Singlemode & Multimode Versions**
- **Easy to Install & Use. Compact & Rugged**
- **Gas Leak Rate 10^{-6} scc/sec**



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High Power Fiber Patchcords

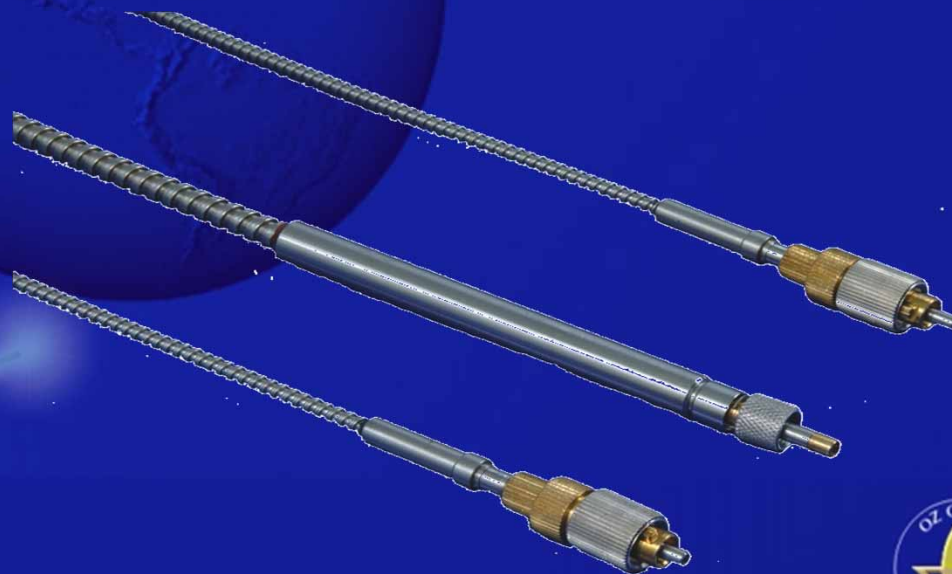
DTS0037: High Power Fiber Optic Patchcords

QMMJ-5HP5HP-UVVIS-200/240-3AS-4

QSMJ-A3HP,3S-320-2/125-3A-2

QPMJ-A3HPM,3S-488-3.5/125-3-5-1

- MMF, SMF & PMF Versions
- Armored Cable Available for Safety
- UV to Far Infrared Wavelengths
- Adjustable connector combination for extra flexibility



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High Power Fiber Patchcords

DTS0037: High Power Fiber Optic Patchcords

QMMJ-A3AHP,2F-UVVIS-100/140-3-10

QMMJ-A3AHPM,3AF-IRVIS-50/125-3-2

QMMJ-A3AHPC,X-IRVIS-20/125-5AS-1-AR-CSP

QMMJ-A5HPL,5HPL-UVVIS-200/240-5AS-5

Versions Offered:

- **HP:- High Power Polish, Air Gap connector**
- **HPM: High Power Mechanical Cleave, Air Gap connector**
- **HPC: High Power Coreless Fiber End Cap, Air Gap connector**
- **HPL: High Power Laser Treated Endface, Air Gap connector**



High Power Fiber Patchcords

DTS0037: High Power Fiber Optic Patchcords

QMMJ-A3AHP,2F-UVVIS-100/140-3-10

QMMJ-A3AHPM,3AF-IRVIS-50/125-3-2

QMMJ-A3AHPC,X-IRVIS-20/125-5AS-1-AR-CSP

QMMJ-A5HPL,5HPL-UVVIS-200/240-5AS-5

Versions Offered:

- **HP:- High Power Polish, Air Gap connector**
- **HPM: High Power Mechanical Cleave, Air Gap connector**
- **HPC: High Power Coreless Fiber End Cap, Air Gap connector**
- **HPL: High Power Laser Treated Endface, Air Gap connector**



High Power Fiber Patchcords

DTS0037: High Power Fiber Optic Patchcords

QMMJ-A3AHP,2F-UVVIS-100/140-3-10

QMMJ-A3AHPM,3AF-IRVIS-50/125-3-2

QMMJ-A3AHPC,X-IRVIS-20/125-5AS-1-AR-CSP

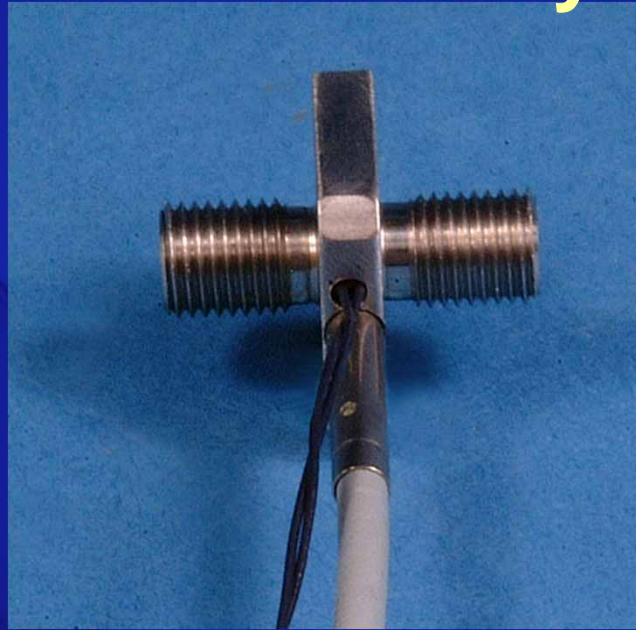
QMMJ-A5HPL,5HPL-UVVIS-200/240-5AS-5

Versions Offered:

- **HP:- High Power Polish, Air Gap connector**
- **HPM: High Power Mechanical Cleave, Air Gap connector**
- **HPC: High Power Coreless Fiber End Cap, Air Gap connector**
- **HPL: High Power Laser Treated Endface, Air Gap connector**

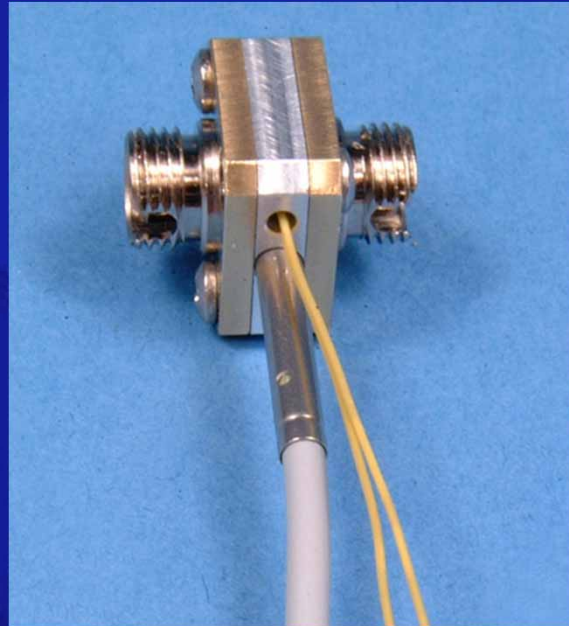


High Power Shutters/Bulkhead Receptacles With Safety Interlocks



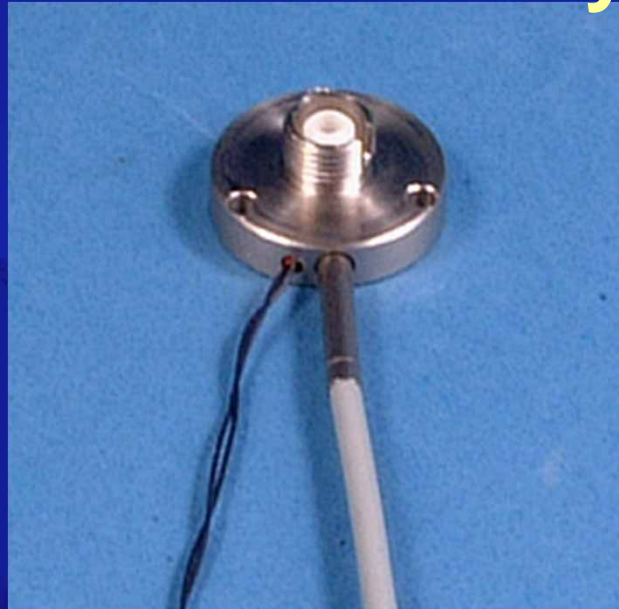
- **Multiple Watts CW Power Handling**
- **Temperature, Contact or Proximity Sensors for Safety Interlock**
- **SMA 905 or FC Receptacles**

High Power Shutters/Bulkhead Receptacles With Safety Interlocks



- **Multiple Watts CW Power Handling**
- **Temperature, Contact or Proximity Sensors for Safety Interlock**
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High Power Shutters/Bulkhead Receptacles With Safety Interlocks



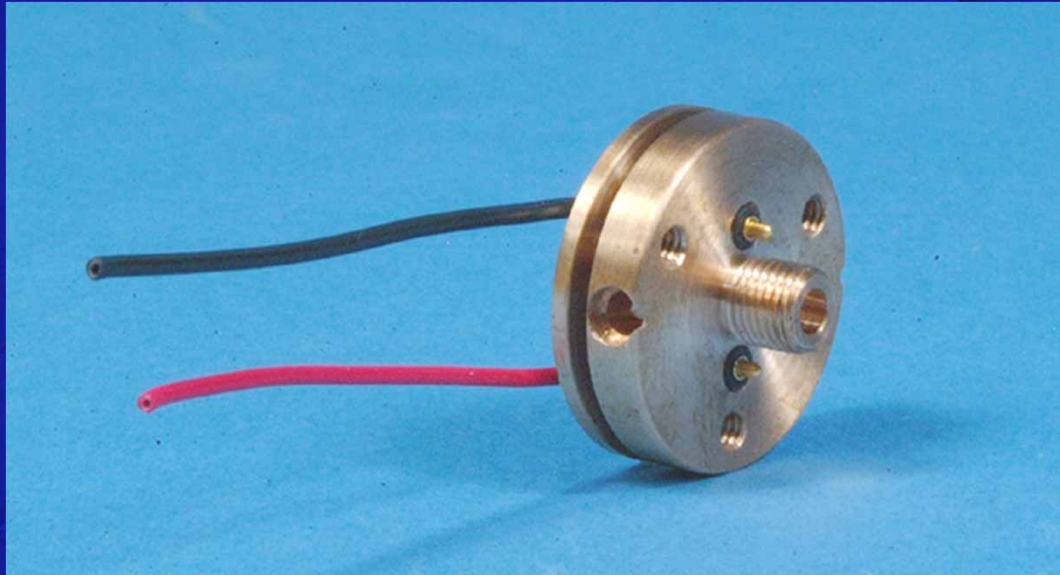
- **Multiple Watts CW Power Handling**
- **Temperature, Contact or Proximity Sensors for Safety Interlock**
- **SMA 905 or FC Receptacles**

High Power Shutters/Bulkhead Receptacles With Safety Interlocks



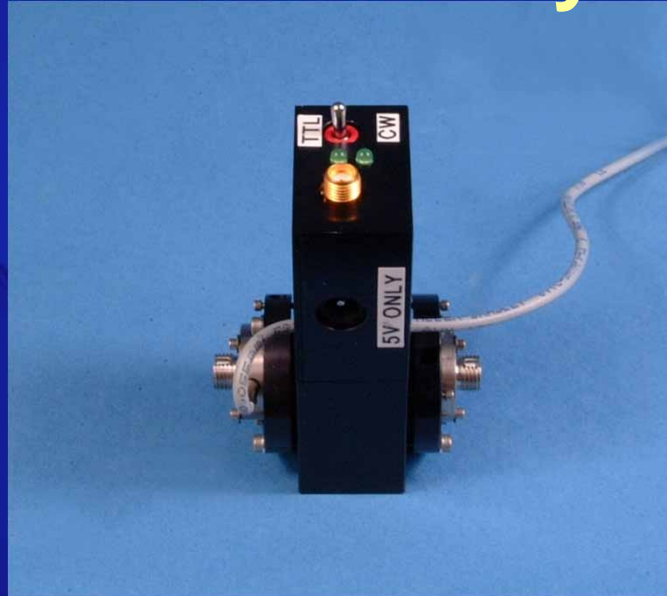
- **Multiple Watts CW Power Handling**
- **Temperature, Contact or Proximity Sensors for Safety Interlock**
- **SMA 905 or FC Receptacles**

High Power Shutters/Bulkhead Receptacles With Safety Interlocks



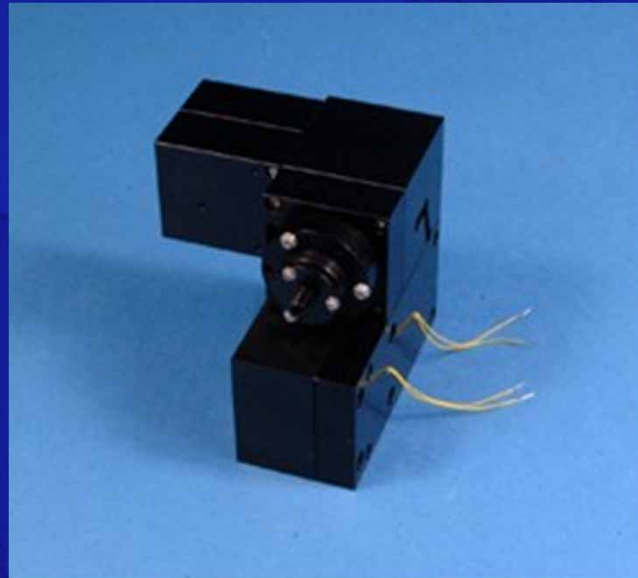
- **Multiple Watts CW Power Handling**
- **Temperature, Contact or Proximity Sensors for Safety Interlock**
- **SMA 905 or FC Receptacles**

High Power Shutters/Bulkhead Receptacles With Safety Interlocks



- Multiple Watts CW Power Handling
- Response Speed of < 30 ms
- Temperature, Contact or Proximity Sensors for Safety Interlock
- SMA 905 or FC Receptacles

High Power Shutters/Bulkhead Receptacles With Safety Interlocks



- **Multiple Watts CW Power Handling**
- **Response Speed of < 30 ms**
- **Temperature, Contact or Proximity Sensors for Safety Interlock**
- **SMA 905 or FC Receptacles**

Hybrid Patchcords

DTS0082: Universal Connectors and Hybrid Patchcords
AA-200-11-9/125-3A3S

- **Angled, Super, Ultra, FC/PC, ST, SC Connectors**
- **Male to Male, Male to Female Versions**
- **Low Cost, Rugged & Compact Size**



Universal Connectors

DTS0082: Universal Connectors and Hybrid Patchcords

AA-200-11-9/125-3S3A

AA-200-3SC

- **Less than 0.5dB Insertion Loss**
- **Ultra, Super, Angled FC/PC, LC, SC, ST & SMA**
- **Low Cost, Rugged & Compact Size**



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Sleeve Thru Adaptors

*DTS0004: Connectors, Patchcords, Bulkhead Receptacles & Sleeve Thru Adaptors
SMC-03 and PMC-03
HLPC-SMA/M*

- Available for FC, ST, SMA, SC & LC
- Less than 0.3dB Insertion Losses
- Patch Panel Mountable, Duplex Styles



Bare Fiber Adaptors

DTS0003: Bare Fiber Adaptors
BARE-03-82

- **Use to Hold Bare Fibers**
- **FC, SC, ST, SMA Connectors Available with Standard and Magnetic Clips versions.**
- **Reusable, Inexpensive**



Bulkhead Receptacles

DTS0004: Connectors, Patchcords, Bulkhead Receptacles & Sleeve Thru Adaptors
HLPC-NTT/FC-PM
HLPC-ATT/ST-SM

- Available for FC, ST, SMA, SC, Angled FC/PC
- Angled AT&T-ST & Angled SC
- Designed for Free Space Use, Compact Size

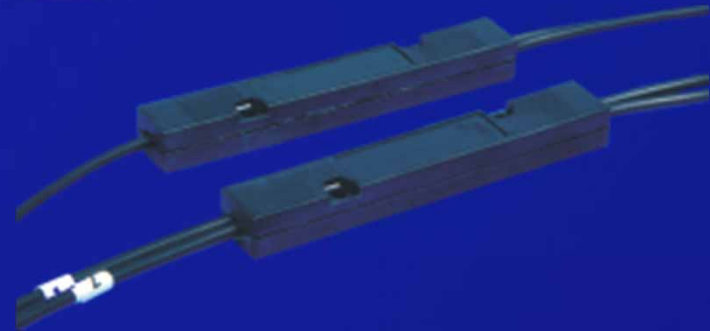


Fused Fiber Optic Couplers

DTS0033: Fused Couplers – Fiber Optic

FUSED-14-532-3.5/125-25/25/25/25-3A3A3A3A-1-0.5-SP

- **1x2, 2x2 & 1xN Couplers Available**
- **0.5dB Typical Insertion Losses, SMF & MMF**
- **488nm to 2050nm Wavelengths**



Fused Fiber Optic Couplers

DTS0033: Fused Couplers – Fiber Optic

FUSED-14-532-3.5/125-25/25/25/25-3A3A3A3A3A-1-0.5-SP

- **1x2, 2x2 & 1xN Couplers Available**
- **0.5dB Typical Insertion Losses, SMF & MMF**
- **488nm to 2050nm Wavelengths**



Fused Fiber Optic Couplers

DTS0033: Fused Couplers – Fiber Optic

FUSED-14-532-3.5/125-25/25/25/25-3A3A3A3A3A-1-0.5-SP

- **1x2, 2x2 & 1xN Couplers Available**
- **0.5dB Typical Insertion Losses, SMF & MMF**
- **488nm to 2050nm Wavelengths**

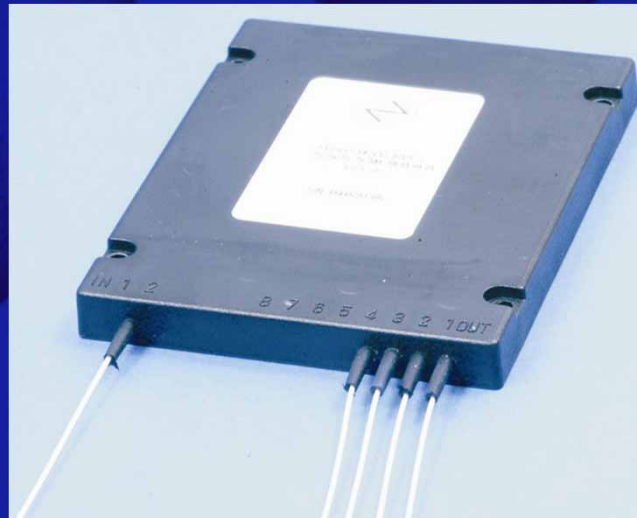


Fused Fiber Optic Couplers

DTS0033: Fused Couplers – Fiber Optic

FUSED-14-532-3.5/125-25/25/25/25-3A3A3A3A3A-1-0.5-SP

- **1x2, 2x2 & 1xN Couplers Available**
- **0.5dB Typical Insertion Losses, SMF & MMF**
- **488nm to 2050nm Wavelengths**



Fiber Pigtailed Isolators

DTS0016: Isolators – Fiber Optic

FOPI-21-11-1550-9/125-S-50-3A3A-1-1-55

- $\leq 0.8\text{dB IL}$, As Good as 60dB Isolation
- -40dB, -50dB, -60dB Backreflection SMF & PMF
- 633nm to 2050nm Wavelengths



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Fiber Pigtailed Isolators

DTS0016: Isolators – Fiber Optic

FOI-11-11-1064-6/125-P-40-3A3A-1-1-30-HP

- **$\leq 0.8\text{dB}$ IL, As Good as 60dB Isolation**
- **-40dB, -50dB, -60dB Backreflection SMF & PMF**
- **633nm to 2050nm Wavelengths**



Fiber Pigtailed Isolators

DTS0016: Isolators – Fiber Optic

FOI-11-11-850-6/125-S-40-3A3A-1-1-30

- $\leq 0.8\text{dB}$ IL, As Good as 60dB Isolation
- -40dB, -50dB, -60dB Backreflection SMF & PMF
- 633nm to 2050nm Wavelengths



Fiber Pigtailed Isolators

DTS0016: Isolators – Fiber Optic
FOI-11-11-850-6/125-S-40-3A3A-1-1-30

- $\leq 0.8\text{dB}$ IL, As Good as 60dB Isolation
- -40dB, -50dB, -60dB Backreflection SMF & PMF
- 633nm to 2050nm Wavelengths



Fiber Pigtailed Isolators

DTS0016: Isolators – Fiber Optic

FOI-11-11-850-6/125-S-40-3A3A-1-1-30

- $\leq 0.8\text{dB}$ IL, As Good as 60dB Isolation
- -40dB, -50dB, -60dB Backreflection SMF & PMF
- 633nm to 2050nm Wavelengths



Fiber Pigtailed Isolators

DTS0016: Isolators – Fiber Optic
FOI-11-11-850-6/125-S-40-3A3A-1-1-30

- $\leq 0.8\text{dB}$ IL, As Good as 60dB Isolation
- -40dB, -50dB, -60dB Backreflection SMF & PMF
- 633nm to 2050nm Wavelengths

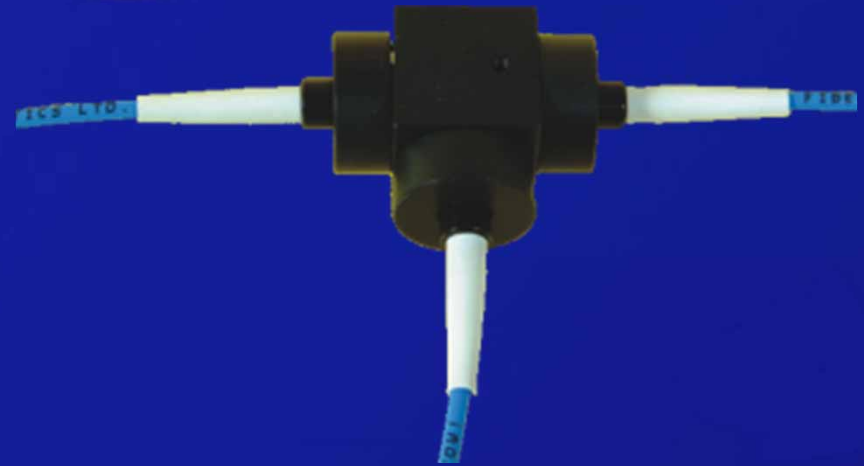


Wave Division Multiplexers

DTS0089: Wave division Multiplexers

WDM-13P-1111-405/532/650-3.5/125-SSSS-40-3A3A3A3A-3-1

- **0.8dB Insertion Losses, 65dB Isolation**
- **Up to 2 Watt Power Handling**
- **-40dB, -50dB, -60dB Backreflection**



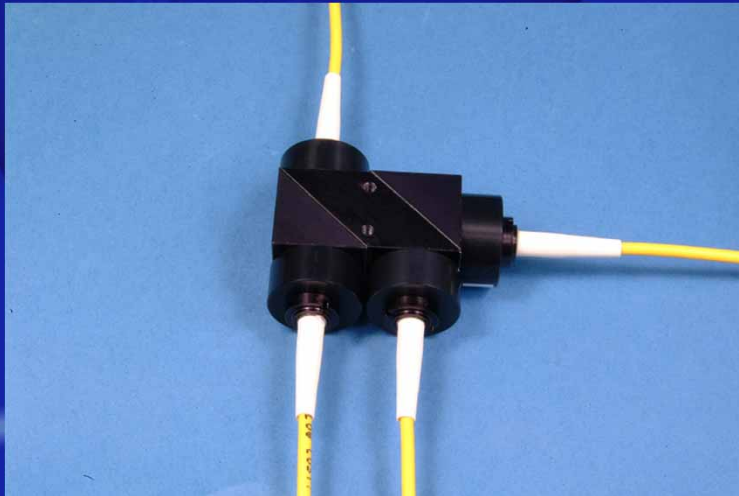
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Wave Division Multiplexers

DTS0089: Wave division Multiplexers

WDM-13P-1111-405/532/650-3.5/125-SSSS-40-3A3A3A3A-3-1

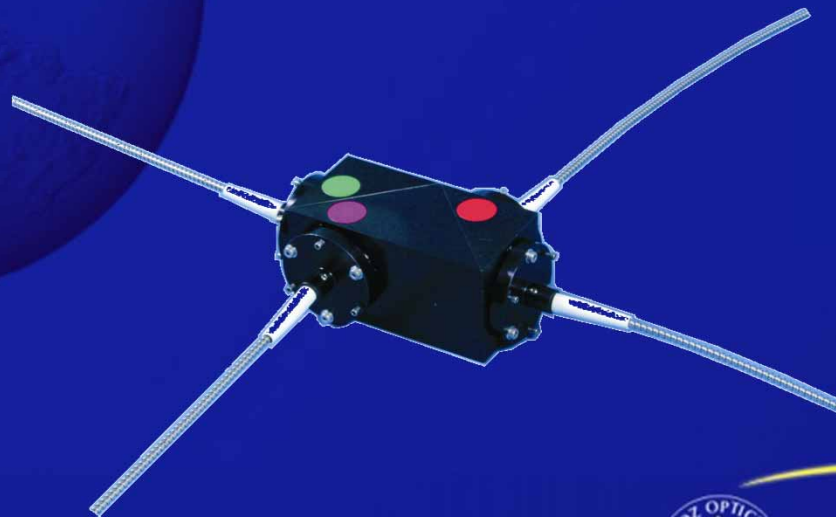
- **0.8dB Insertion Losses, 65dB Isolation**
- **Up to 2 Watt Power Handling**
- **-40dB, -50dB, -60dB Backreflection**



RGB Wave Division Multiplexers and Delivery Systems

DTS0089 and DTS0117: Wave division Multiplexers, White Light (RGB Laser Sources)
WDM-14-33333-690/750/797/847-50/125-MMMMM
RGB-100-442/532/635-3.5/125-P-3A-3AS-1-15

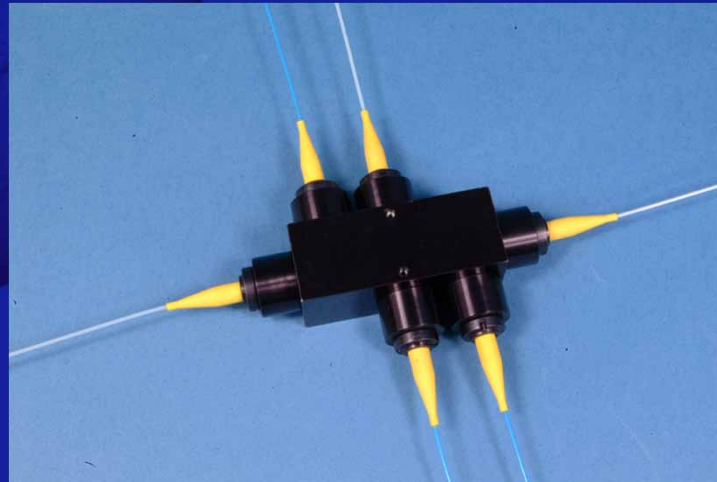
- **Combines Red/Green/Blue Visible Wavelengths**
- **Two, Three, and Four Wavelength Versions**
- **MM, SM and PM Fiber Versions**



RGB Wave Division Multiplexers and Delivery Systems

DTS0089 and DTS0117: Wave division Multiplexers, White Light (RGB Laser Sources)
WDM-14-33333-690/750/797/847-50/125-MMMMM
RGB-100-442/532/635-3.5/125-P-3A-3AS-1-15

- **Combines Red/Green/Blue Visible Wavelengths**
- **Two, Three, and Four Wavelength Versions**
- **MM, SM and PM Fiber Versions**



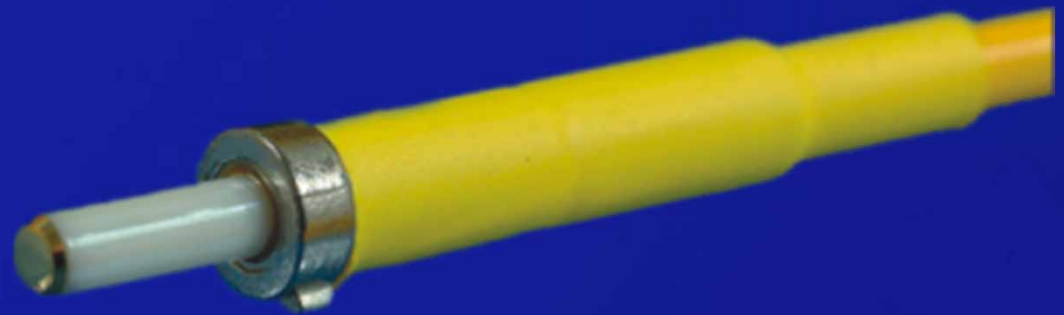
Gold / AR / HR Coated Fiber Ends

DTS0020: Reflectors- Fiber Optic (Fixed or Variable)

FORF-11P-1300/1550-9/125-S-3S-3A-1

FORF-31P-1550-50/125-M-X-1-1-HR

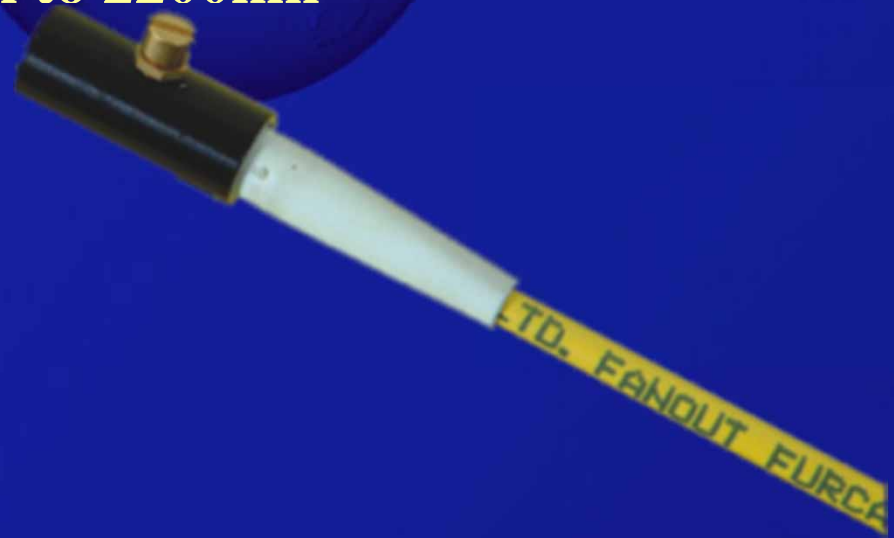
- **Gold Over 96% , AR: < 0.1% Reflection Levels**
- **High reflection coating >99% reflection**
- **700nm To 2000nm Wavelengths**
- **SMF, MMF & PMF Versions**



Variable Fiber Reflectors

DTS0020: Reflectors- Fiber Optic (Fixed or Variable)
FORF-21P-1550-9/125-S-60-50-3A3A-3-1

- **Used for Backreflection Measurements**
- **0.6dB Typical Insertion Losses, SMF, MMF & PMF**
- **Available from 400nm to 2200nm**



Fiber Optic Filters

DTS0031: Fixed and Removable Filters
FF-11-1064-6/125-P-40-XX-3-1-1.4-HP2
FF-21-1550-8/125-P-50-3U3U-1-2-200GHz

- **400nm to 2200nm Wavelengths, SMF, PMF & MMF**
- **-40dB, -50dB, -60dB Backreflection**
- **Filters Can Be Fixed or Removable**



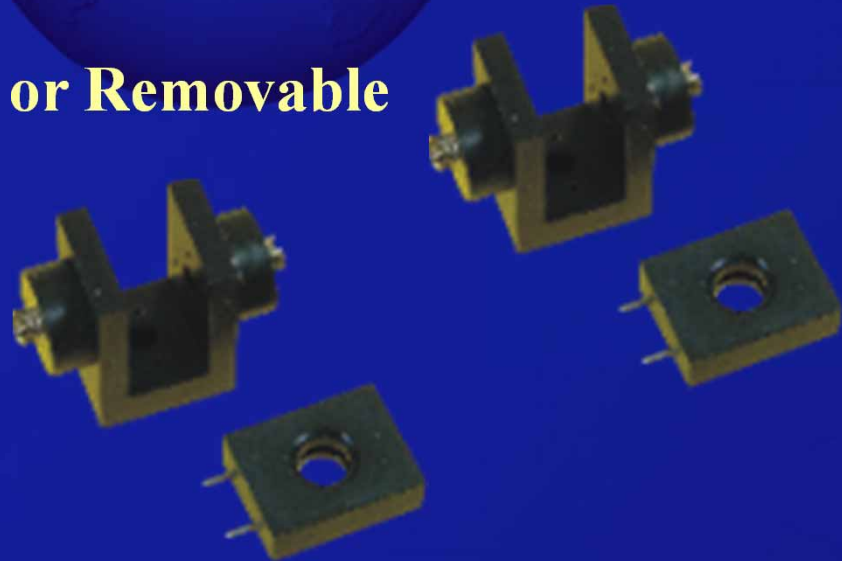
Fiber Optic Filters

DTS0031: Fixed and Removable Filters

FF-11-852-5/125-S-40-3S3S-3-1-1.2

RFF-11-1064-6/125-P-40-XX-1-1-CSP-HP

- **400nm to 2200nm Wavelengths, SMF, PMF & MMF**
- **-40dB, -50dB, -60dB Backreflection**
- **Filters Can Be Fixed or Removable**



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Fiber Optic Educational Kits

*DTS0015: Educational Kits - Fiber Optic
FOEK-03-1,2,3,4,5-633-M-11-NTSC*

- **Teaches Basics of Fiber Optics**
- **Easy to use, Affordable**
- **Wide Range of Labs Available**



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Fiber Optic Termination Kits

*DTS0021: Termination Kits - Fiber Optic
OFOC-01-FC/SC/ST UNIVERSAL*

- **For FC, ST, SMA or SC Connectors**
- **Contains all the necessary Polishing Films, Tools, Epoxies & Accessories**



Alignment Kits and Tools

DTS0097: Alignment Tools and Kits
START-03AF-DVD-UVVIS

- **Simplify Alignment of Laser to fiber Couplers**
- **Available with video instructions in NTSC, PAL, or DVD formats.**
- **Polarization Alignment Tool Simplifies Polarization Alignment**



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