Fiber Optic Test Equipment

OZ Optics Limited

June 2020
Corporate Background

- Founded in 1985;
- Corporate headquarter 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, Fiber Optic Test Equipments, and Fiber Optic Sensor Systems;
- Sales offices in Canada, USA, Europe, Turkey, and China.
Corporate Statements and Quality Policy

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 to non-telecom sectors

Our Core Value
- Leadership
- Teamwork
- Boldness
- Commitments
- 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, continuous improvement and to abide by any applicable requirements

Promote opportunities of professional development for all members of our company through education, training and personal challenge
Company Profile

Over 450 employees worldwide:

- **OZ Canada:** 250+ employees
- **OZ China:** 120+ employees
- **OZ Turkey:** 80+ employees
Company Profile

ISO 9001:2015 Certified

Advanced Proprietary Processing Technology

Broad Patent Portfolio
Company Profile

* **Ömür Sezerman**, Chairman, President & CEO  
  * Founder and CEO since inception (35 years)

* **Zahide Sezerman**, VP of Human Resources  
  * With OZ Optics since inception (35 years)

* **Garland Best**, VP of Components Division  
  * 28 years at OZ Optics

* **Gordon Youle**, VP of Test Equipment Division  
  * 21 years at OZ Optics

* **Martin Powell**, Operation Manager  
  * 16 years at OZ Optics

* **Metin Sezerman**, General Manager of OZ Turkey  
  * 19 years at OZ Optics

* **Bing Li**, General Manager of OZ Optics China  
  * 16 years at OZ Optics
Company Profile

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

- **CNC Machine Shop**
- **Femto-Second Laser Lab**
- **AR Coating**
- **Clean Room**
- **Laser Conditioning/Cleaving**
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
* Now available: Bias Controllers, Spectrometers, Optical Noise Generators and Broadband Polarization-Entangled Photon Source,
Leading Technology

Three Product Groups

- Fiber Optic Components, 85%
- Fiber Optic Sensor, 5%
- Optical Test Equipments, 10%

Over 1,000 Products

Leading Edge R&D
Leading Technology

Featured Products
Leading Technology

Featured Products

Fiber Optic Attenuators
for SM, PM, and MM Fibers

Fiber Optic Components for Optoelectronic Packaging
Detected by Brute Force with Costly CPMs by Defense

Laser & Laser Diode to Fiber Delivery Systems

Fiber Optic Test Equipment
Industry Standards

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

- Qualified for F35 JSF and F18 Program
- Telecordia Compliance
- CE Compliance
- RoHS Compliance
- REACH Compliance
- ISO 9001:2015 Certified (Canada, China and Turkey)
- Controlled Goods Directorate Registered
Marketing Strategy

Application Market:

Using our strong direct sales and distributors, we address the following markets:
By leveraging the technology and expertise gained since its inception, OZ Optics has attracted a broad range of customers in the telecom / datacom, medical, military, security, industrial, construction, aerospace, power utilities, petrochemical and educational sectors.
Marketing Strategy

Global Sales Network

OZ Optics has resellers and distributors in over 30 Countries & Regions with over 10,000 customers worldwide:

- Austria
- Belgium
- Netherlands
- Luxembourg
- Brazil
- Canada
- China
- Denmark
- France
- Germany
- Greece
- Hong Kong
- India
- Ireland
- Italy
- Japan
- Norway
- Poland
- Portugal
- Singapore
- South Korea
- Switzerland
- Sweden
- United States
- Taiwan
- Turkey
- United Kingdom
- Thailand
Marketing & Operation Strategy

Competitive Advantage

- Exceptional Quality And Service
- Extensive Experience In Fiber Optics Manufacturing
- Superior Technology Innovative Engineering
- Competitive Pricing
- Global Presence

Success
Branch Network

OZ OPTICS CANADA
(Headquarters)

OZ OPTICS TR
(Turkey Factory)

OZ OPTICS CHINA
(Jiaxing Factory)
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 Facilities
Branch Network

- Facility - Ottawa Headquarters

- Production Area
- Training Centre Building
- Meeting Room
- Swimming Pool
Branch Network

Facility - Turkey Factory

Izmir, Turkey

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

Facility - China Factory

Jiaxing, China

- Operational since June 2010
- Wholly Foreign Owned Enterprise
- Cost Effective Manufacturing
- High Quality Labor
- Supply Chain Integration
Branch Network

Facility - China Factory

Jiaxing, China

- Located in Economic Development Zone
- 4000+ sq meters - Total Area
- 500 sq meters - Admin, Sales and Marketing
- 3500 sq meters - Manufacturing Area
- ✓ 500 sq meter - Class 10,000 Clean Room
- ✓ 300 sq meter - ESD Working Area
OZ Optics China

Zhejiang OZ Optics Technologies Co., Ltd

- Operational since June 2010
- Wholly Foreign Owned Enterprise
- NPI & Production Line Setup
- On-site Training by OZ CND
- Began Mass Production in September 2010
- Completed Main Facility Expansion in 2019
Fiber Optic Test Equipment

OZ Optics offers a wide range of standard test equipment, as well as a range of specialized equipment for polarization related measurements.

Features:

* Many types of optical sources are offered
* Fixed and tunable filters are available
* A variety of types of optical power meters are available
* Instruments for measuring polarization are offered
* Fixed or Variable Delay Lines for Polarization Compensation are offered
Fiber Optic Test Equipment

Recent additions to the OZ line of Test and Measurement Equipment Includes:

* Benchtop Fiber length meter
* Benchtop Backreflection Meter for Visible and Near Infrared
* Swept Laser Source
* Tunable Fabry Perot
* High speed polarization controller and scrambler
* Bandwidth Tunable Variable Filter (manual and motorized version)
* Low Cost Smart Detector Head Power Meter
* Broadband Polarization-Entangled Photon Source
* 600ps Optical Delay Line (manual and motorized version)
* OEM laser diode sources
Fiber Optic Test Equipment

Many types of interfaces to OZ Optics instruments are offered, including:

* USB - standard (for speed and ease of use)
* RS-232 - standard on Legacy products
* SPI - for embedded systems
* GPIB - for multi-instrument environments
* Wireless - for remote access

Custom interfaces are also available.
Polarization Extinction Ratio Meters

* Measure up to 40dB Extinction Ratio
* 0.3 Degree Angle Resolution
* Up to 2 Watts with removable fix no filters
* Broadband wavelength: 400-2050 nm
* USB or RS-232 interfaces available
Benchtop Polarization Extinction Ratio Meter

* Automatically Positions Fiber for Optimum Power
* Measures Angles to within 1°
* Measures up to 50dB ER and up to 2W
* Color touch screen display
* Removable receptacle
Highly Stable Polarized Sources

- As Good as 40dB Extinction Ratio
- Pigtail & Receptacle Versions
- 375 nm to 2050 nm Wavelengths (no isolator for <600 nm)
Fiber Optic Polarized Sources

* As Good as 40dB Extinction Ratio
* Pigtail & Receptacle Versions
* 635nm to 2050 nm Wavelengths
Polarization Measurement System for V-Groove PM Fiber Assemblies

- Automatically Positions Fiber for Optimum Power
- Measures Angles to within 1°
- Measures up to 40dB ER
Polarization Measurement System for V-Groove PM Fiber Assemblies

• Automatically Positions Fiber for Optimum Power
• Measures Angles to within 1°
• Measures up to 40dB ER
Electrically Driven Polarization Controllers

- Continuous Control of Polarization
- No Insertion Losses or Return Losses
- > 100 Hz Response Speed
- Low activation loss
High-Speed Polarization Controller-Scrambler Optical Module

* Continuous Control of Polarization
* Negligible Insertion Losses, Return Losses or PDL
* Up to 30 kHz response speed
* Inline and Low activation loss
* Compact and PCB mountable
Polarization Dependent Loss Emulator

* 0.05dB To 10dB Polarization Dependent Loss
* Fixed Or Manually Variable PDL
* Broad Wavelength Range, Compact, And Low Cost
* PMD Free optional (<0.1 ps)
* Very low wavelength dependence
Highly Stable Laser Diode Source

* Stable to ±0.001dB @ 1550 nm with FC/APC
* 375nm to 2050 nm Wavelengths (no Isolator for <600 nm)
* Built in TE Cooler and Isolator
Light Sources

* Stable to ± 0.01dB, LED, LD Source @ 1550 nm with FC/APC
* 635nm to 2050nm Wavelengths
* TE Cooled Versions Available with OZ-X000 and HI FOSS styles
Laser Diode/LED Source

* 1, 2, or 3 wavelengths in one unit
* Selectable power levels
* Continuous or modulated output
* MM, SM, or PM versions available
* Long battery life (more than 40 hours)
Laser Diode/LED Source

- Insertion loss measurement
- Fiber identification using internal modulation
- Splicing and connection testing
- FTTX/PON
- Quality assurance
Ultra Stable OEM Laser Diode Source

- Output powers to > 100 mW
- Power stability to better than 0.025 dB * depending on the wavelength
- Wavelength stability to < 0.1 nm
- Wavelengths from 375 to 2100 nm available
- External modulation to 50 MHz available
Ultra Stable OEM Laser Diode Source

- Multimode, Singlemode, or PM fiber versions
- Free Space, Pigtail or receptacle styles
- Guaranteed lifetime 18 months or 5000 hours
- Power control via external analog voltage
- Custom versions available
Ultra Stable OEM Laser Diode Source

* Multimode, Singlemode, or PM fiber versions
* Free Space, Pigtail or receptacle styles
* Guaranteed lifetime 18 months or 5000 hours
* Power control via external analog voltage
* Custom versions available
Ultra Stable OEM Laser Diode Source

- Insertion loss or attenuation measurement
- High power or remote fiber delivery system
- Materials evaluation and testing
- Life science illumination
- Laser scanning microscopy
- Red/Green/Blue illumination systems
Ultra Stable Narrow Linewidth Source

* 1550nm narrow and single longitudinal Single mode, or PM fiber versions
* Selectable peak wavelength on C-band: ITU-T, DWDM
* Pigtailed or receptacle styles
* Low RIN and High SMSR
* Wavelength tunable and power modulation options are available
Broadband Polarization-Entangled Photon Source

- High-quality polarization and frequency entanglement
- Broad bandwidth covering C- and L- bands
- High fidelity and excellent stability
- Turn-key and room-temperature operation
- Low power consumption
- Compact and light weight platform
- Rugged, alignment free, all fiber design
High-speed Benchtop Polarization Controller-Scrambler

* LCD touch screen operation
* Fixed or random polarization state generation covering 1260 nm to 1650 nm
* High Speed up to 2 KHz in Scrambling mode
* User selectable frequencies
* User control of polarization state
* Compact and light weight platform
* Rugged Casing
Benchtop Optical Signal-to-noise Ratio Generator

- Automatically set user designated optical signal-to-noise ratio
- Automatically set user designated optical output power level
- Stand-alone with Touch-screen
- GPIB and Ethernet interfaces for computer control
- Optical port for connecting an external OSA
- Built-in tunable filter
- Provision for external filter
Optical Power Regulators

- Controls output power to ± 0.1 dB
- 50 dB dynamic range
- Millisecond response speed
- Single and multi-channel versions
- Singlemode and PM fiber versions
- Color touch screen display
**Benchtop Fiber Length Meter**

- Measures lengths from a few mm up to 500 m
- No dead zone. Can measure fibers less than 1 cm long
- Better than 2 mm resolution and <0.1 % measurement error
- Works with singlemode, multimode, polarization maintaining and specialty fibers
- Color touch screen display

![Image of Benchtop Fiber Length Meter]
Backreflection Meter

* Sensitive to – 70dB
* 1300/1550nm Dual Wavelength Source
* Also Measures Insertion Losses
* RS-232 or USB Interfaces available
Benchtop Backreflection Meter for Visible & Near Infrared Wavelengths

* Sensitive to - 70dB
* Wide wavelength offering for special applications: 635-1625nm
* Built in Broadband SLED for improved stability
* Optional Insertion Loss measurement capability
* Color touch screen and USB Interface available
**Benchtop Optical Switch**

- Multiple ports 1x4 to 1x32
- Standard wavelength option is at 1310 and 1550 nm, other options are also available upon request
- High Adjacent Channels Isolation
- Touch screen display with High resolution
- Fast switching time
- High repeatability
ASE Broadband Light Source

* High output power from 13 dBm to 27 dBm
* Wide Spectral bandwidth: C-band, L-band or both
* High Stability and Unpolarized output light
* USB and RS-232 interface
* Optional built-in attenuator and optical power monitor
* High performance to cost ratio
Super Fast EDFA

- Gain controlled
- Suppress the transient effects
- For DWDM systems
Digital Variable Reflectors

- Test Sensitivity to Backreflection
- -1.5dB to -60dB Backreflection
- RS-232 or USB Interfaces available
Digital Variable Attenuators

* 0.01dB Resolution, Fast Response Time
* 0.6dB to 60dB Attenuation Range
* Low PDL and High Power Capability
* RS-232 or USB Interface
* Wavelength Flatness in L, C, S Band
Digital Tunable Filters

- < 1.2nm Line Width, 0.1nm Resolution
- 50nm Tuning Range, Fast Response Time
- RS-232 or USB Interfaces available
Manually Adjustable Polarization Insensitive Variable Bandwidth Tunable Filters Module

- 45 nm tuning range with 1 to 18 nm continuously adjustable bandwidth
- Independently tunable both wavelength and bandwidth (Flat-top), polarization insensitive
- High out-of-band suppression
- SM, PM and Multimode version
Motor Driven Adjustable Polarization Insensitive Variable Bandwidth Tunable Filters Module

* 45 nm tuning range with 1 to 18 nm continuously adjustable bandwidth
* Independently tunable both wavelength and bandwidth (Flat-top), polarization insensitive
* Built-in microcontroller with RS-232, IIC, or SPI interface
* High out-of-band suppression
* SM and PM version
Inline Fabry-perot Tunable Filters

* High resolution, Super-cavity finesse and low loss design
* Vibration and shock resistant and Thermally stable
* Fast scanning permits fast, accurate measurements
* Customizable center wavelength, FSR, Finesse, and Bandwidth
* Center wavelength bands from 800 to 2000 nm
* Small footprint and Low power requirements
* Telcordia GR 2883 qualified
Polarization Maintaining Fiber Switch

* > 20 dB Polarization ER
* Latching and Non-Latching versions
* < 0.6 dB loss
* Now offering MEMS based 1 x N optical Switches (Non-Latching)
Handheld Optical Spectrometer

* No Moving Parts
* Cellphone interface through Bluetooth
* Detachable Transmittance or Reflectance modules
* High Signal to Noise Ratio (10000:1, 50 dB)
* Spectrum UV/VIS, VIS, UV/VIS/IR
Modulator Bias Controllers

- Broad line of MODULATOR BIAS CONTROLLERS
- Most can lock to the NULL, PEAK +QUAD, OR -QUAD points
- Or can be offered to lock to any arbitrary working point
- Different models are optimized for specific applications
- Some do not use DITHERING
Differential Polarization Delay Lines

* Varies the Delay Between Two Polarizations
* ±50psec Delay, 0.1psec Resolution
* < 1.2dB Losses over the Delay Range
Variable Optical Delay Lines

* Motor Driven Version is Available
* Over 600ps Delay Range, < 1.5dB IL
* As Fine as 0.003ps Resolution
Variable Optical Delay Lines

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Polarization Rotators / Analyzers

* Motor Driven Version is Available, 1dB IL
* Fiber to Fiber & Fiber to Photodiode Versions
* -40, -50, -60dB Backreflection Levels
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Non Contact High Power Visible Fiber Optic Fault Finder

* High Visibility

* Higher Output up to 30mw

* Available with 520nm (green) or 635nm (red)

* Non-contact fiber and suitable with bare fiber adapter
Pen & Pocket Size Fault Locators

* Detect Breaks in Fiber Optic Cables
* Use as an End-To-End Fiber Identifier, 635nm
* Up to 30 mW (Bench-top version)
* Up to 40 hours of battery operation
Pen & Pocket Size Fault Locators

- Detect Breaks in Fiber Optic Cables
- Use as an End-To-End Fiber Identifier, 635nm
- 0.5 mW for pen-sized version
Pen & Pocket Size Fault Locators

* Detect Breaks in Fiber Optic Cables
* Use as an End-To-End Fiber Identifier, 635nm
* Up to 30mW, Inexpensive
Power Meter with Smart Detector Heads

- 85dB Dynamic Range, Fast Response Time
- 400 - 2050nm Wavelengths (not calibrated for > 1700nm), Built-in Attenuator
- Dual Detector Head Capability
- RS-232 or USB Interfaces available
Power Meter with Smart Detector Heads

- 85dB Dynamic Range, Fast Response Time
- 400 - 2050nm Wavelengths (not calibrated for > 1700nm), Built-in Attenuator
- Dual Detector Head Capability, USB or RS232 Port
Power Meter with Smart Detector Heads

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* Dual Detector Head Capability, USB or RS232 Port
Smart Detector Head Accessories

- Integrating spheres for high power measurements
- Optical filters
- Attenuators
- Lenses
- Custom designs
Inline Optical Power Meter/Monitor

- Calibrated Power Meter
- Wide Wavelength Range, up to 2 Watts Power
- SM and PM Fiber Versions
Mini Power Meter

* Calibrated Power Meter
* Measures up to 10 mW
* Small size
* Low Cost
* Good for FTTX applications
Pocket Optical Power Meter

- Slim and compact
- Wide wavelength range
- Interchangeable optical connectors available
- Long battery lifetime
- Rechargeable battery or AC adaptor
- USB, RS232 and other interfaces offered upon demand
- OEM version with no display for embedded system
Low Cost Smart Detector Head/optical Power Monitor

- Low cost
- Slim and compact
- Built-in InGaAs detector for IR range or Si detector for Visible
- Interchangeable optical connectors available
- Calibrated and uncalibrated versions available
- Customer may perform their own calibration
- USB and RS232 interfaces
Handheld Optical Power Meter

* Wide dynamic range
* Wide wavelength range
* Long battery life
* Interchangeable optical connectors
* RS-232, GPIB, and USB Interfaces available
Handheld Optical Power Meter

- Fiber optic assembly and testing
- Quality control
- Network installation
- Component and system troubleshooting
- Education
Smart Patchcord

* Low cost
* Miniature size
* Continuous fiber – no interruptions to optical path
* RS-232, USB, or wireless communications
* High power handling
Smart Patchcord

- Low insertion loss and return loss
- Specialty fiber and PM versions available
- High extinction ratios for PM versions
- Versions available for any wavelength
Smart Patchcord

- Monitoring in FTTX networks
- Channel balancing in WDM systems
- Dynamic amplifier gain monitoring
- Polarization stabilization
- PMD compensation
- Real-time in-line test and measurement
Smart Patchcordon

* Monitoring in FTTX networks
Wireless Fiber™ (Smart Patchcord)

- Monitoring in FTTX networks
OZ- Guard™ Fiber Optic Fault Finder

* Provide continuous real-time fiber optic health monitoring for your network.
* Automatic determination of faults
* Transforms data into actionable information
* Sends time and location stamped alerts via email, SMS and IM
* Escalates alarms until problem solved
Polarization Dependant Loss Test Sets

- Broadband & Wavelength Sweep Capability
- Insensitive to Input Power Drift
- Fast Measurements
- 0.001dB Resolution
Polarization Dependant Loss Test Sets

- Broadband & Wavelength Sweep Capability
- Insensitive to Input Power Drift
- Fast Measurements
- 0.001dB Resolution
Environmental Test Set

- Long Duration Testing for Reliability Studies
- Multiple Wavelength Configurations
- Insertion Loss
- Optional ORL or PDL Measurements
Custom Designs

* OZ Optics welcomes the opportunity to provide custom designs. Our optical and electronics expertise can solve tough test and measurement problems.

* Custom software for specialized monitoring and control applications can also be provided.
Thank You for Choosing OZ Optics

Please Contact Our Sales Dept:

Tel: 613-831-0981 ext 3370

Toll Free: 1-800-361-5415

Email: sales@ozoptics.com.