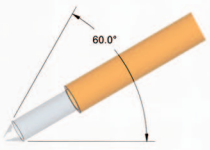
ULTRAPOL

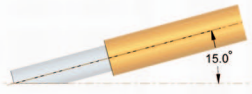
FIBERLAB™ Module System

The Standard for Optical Fiber Lensing

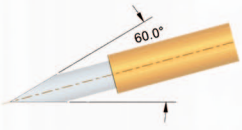
CONE TIPS



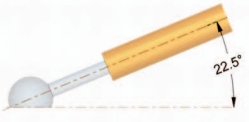
BEVELS



CHISEL TIPS



BEVELED BALL TIPS



ULTRA TEC MANUFACTURING, INC.

FIBER LENSING PRIMER

FIBER LENSES – APPLICATIONS THROUGHOUT INDUSTRY & RESEARCH

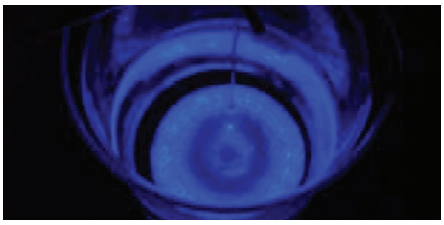
The use of fiber lensing -- that is the shaping of optical fibers to act as integrated lenses in addition to the fibers' light delivery requirements -- is widespread through high-tech Industry & Research.

Bare fibers may need to be polished with a range of end geometries -- flat, cone-shaped, beveled or chisel-shaped ends -- at various angles, to enable specific 'lensing' effects. This takes advantage of focal points and spot sizes for various material and optical properties. Lensed fibers can be used for pigtailing active devices, sensors, data-collection, detectors and laser power delivery for communications, medical, optoelectronics and biophotonics and many more fields. The opposite end of a cable is often connectorized with standard communications or military connector types.

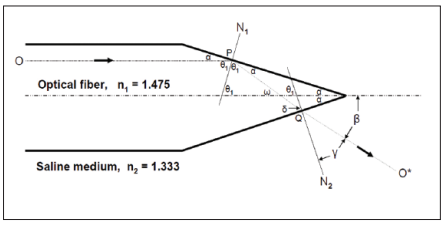
CUSTOMIZED LENSING TECHNIQUES

Bare fibers are generally fragile, especially when of small diameter, and must be held and manipulated safely during the mechanical lensing operation. Effective one and two-step preparation techniques have been developed which utilize fixed abrasive films.

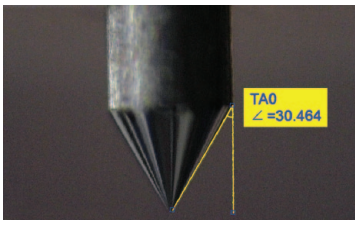
COMMUNICATIONS, MEDICAL, OPTO-ELECTRONICS, VIDEO-ON-DEMAND, BIOPHOTONICS...



LASER RING BEAM – 351nm laser ring beam is emitted from a 100um diameter optical fiber terminated with a conical surface ground at an included angle of 18.4 degrees. After Watson et al. Dept of Neurology, University of Miami.



RAY TRACE RING BEAM – Ray trace of 100um diameter optical fiber used for the ring beam



It is also possible to produce shaped ends on other materials, in this case a cone-shape on a small diameter hard metallic wire, to enable an industrial electronic microscopy probing application.

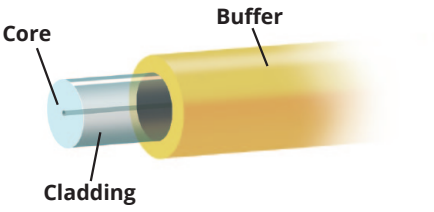
GLOSSARY OF TERMS

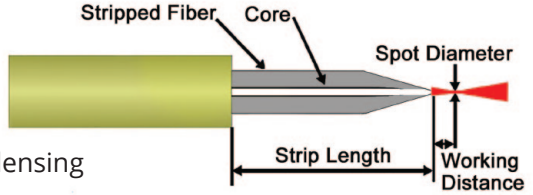
Core: The center of the fiber where the light is transmitted.

Cladding: The outside optical layer of the fiber that traps the light in the core and guides it along – even through curves.

Buffer coating or primary coating: A hard plastic coating on the outside of the fiber that protects the glass from moisture or physical damage (when the fiber is stripped, it is the buffer that is removed).

Jacket: The tough outer coating on the cable. Cable installed inside buildings must meet fire codes by using special jacketing materials.



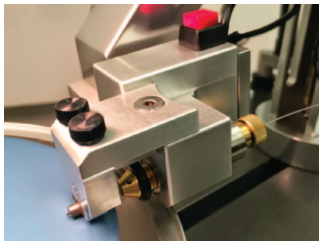


Strip Length: The length of unsupported stripped fiber made available for lensing

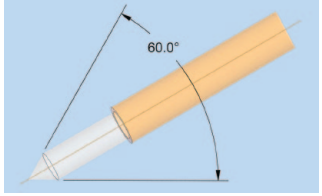
Included Angle: The angle between the two lensed sides of the tapered 'triangle'.

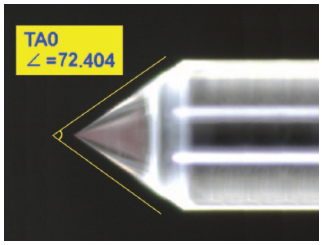
CONE TIP MODULE

Order Code	Item
1851.06A	**Lensing Module Add-on BF Cone Tip (50um to 500um)** This MODULE allows the user to polish CONES from 5 degrees to 83 degrees onto the end of the fiber. For fibers that range in diameter from 50um to 500um. In additon to the MODULE the user will need ferrules for each fiber size.
1851.06B	**Lensing Module Add-on BF Cone Tip (500um to 1000um)** This MODULE allows the user to polish CONES from 5 degrees to 83 degrees onto the end of the fiber. For fibers that range in diameter from 500um to 1000um. In addition to the MODULE the user will need ferrules for each fiber size.
1851.06C	**Lensing Module Add-on BF Cone Tip (1000um to 1500um)** This MODULE allows the user to polish CONES from 5 degrees to 83 degrees onto the end of the fiber. For fibers that range in diameter from 1000um to 1500um. In additon to the MODULE the user will need ferrules for each fiber size.



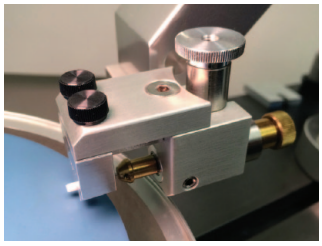
Polishes from 5° to 83° to fiber axis.
INCLUDED ANGLES from 10° to 166°



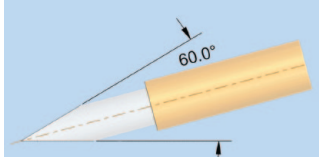


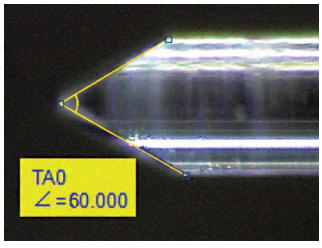
CHISEL TIP MODULE

Order Code	Item
1851.05A	**Lensing Module Add-on BF Dual Flat Tip (50um to 500um)** This MODULE allows the user to polish Dual Flat Tips (Chisel-tips) from 5 degrees to 85 degrees on each side of the fiber – like a screwdriver tip – for fibers that range in diameter from 50um to 500um. In addition to the MODULE the user will need ferrules for each fiber size.
1851.05B	**Lensing Module Add-on BF Dual Flat Tip (500um to 1000um)** This MODULE allows the user to polish Dual Flat Tips (Chisel-tips) from 5 degrees to 85 degrees on each side of the fiber – like a screwdriver tip – for fibers that range in diameter from 500um to 1000um. In additon to the MODULE the user will need ferrules for each fiber size.
1851.05C	**Lensing Module Add-on BF Dual Flat Tip (1000um to 1500um)** This MODULE allows the user to polish Dual Flat Tips (Chisel-tips) from 5 degrees to 85 degrees on each side of the fiber – like a screwdriver tip – for fibers that range in diameter from 1000um to 1500um. In additon to the MODULE the user will need ferrules for each fiber size.



Polishes from 5° to 85° to fiber axis.
INCLUDED ANGLES from 10° to 170°

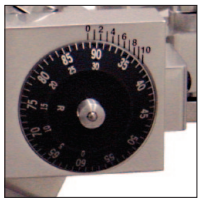




Custom fixtures and complex (multiple) angles are available. Please consult with ULTRA TEC on your own applications.

KEY ACCESSORIES & FEATURES

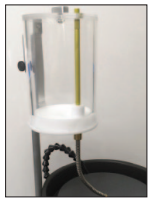
Lamp (1301.5)



Analog

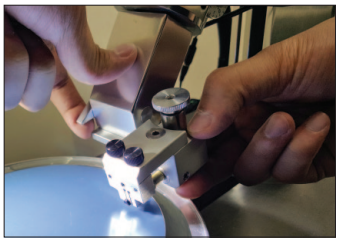
Digital

System available as analog (0.1 degrees accuracy) and upgradable to digital (0.01 degrees accuracy) – highly recommended!



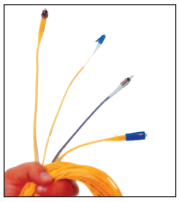
Drip Tank (1535.U)

Available for labs without a water source



Quick Release Fixtures

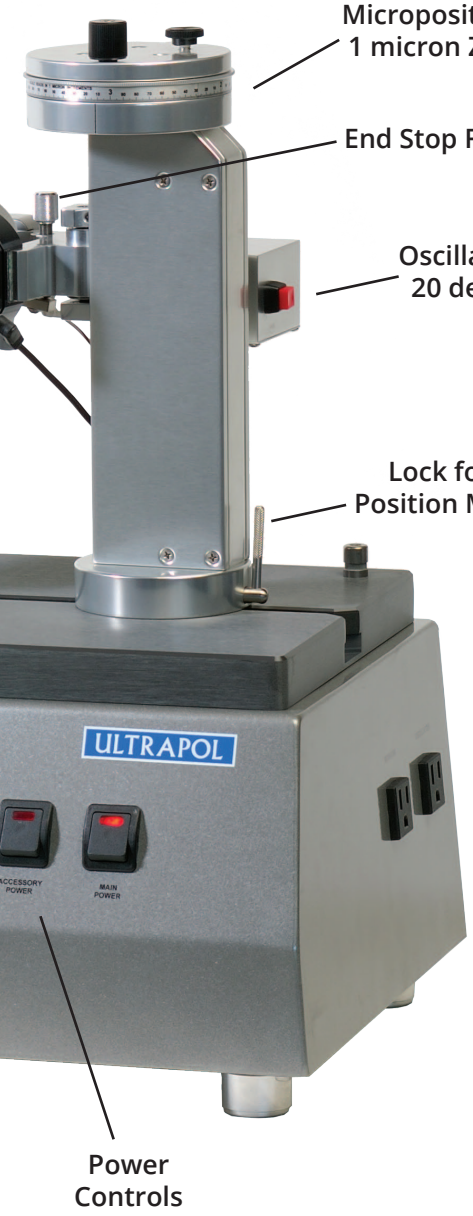
All modules are quick release (QR) making system setup fast and effective.



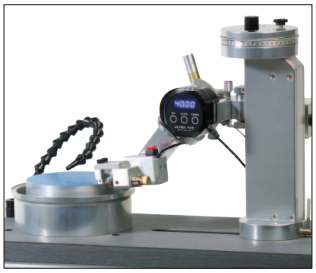
Connector Polishers

ULTRA TEC manufactures a range of connector polishers for polishing the opposite end of a lensed fiber.

THE WIDEST ANGULAR RANGE & ADVANCED SHAPE CONTROL



Steep Angles

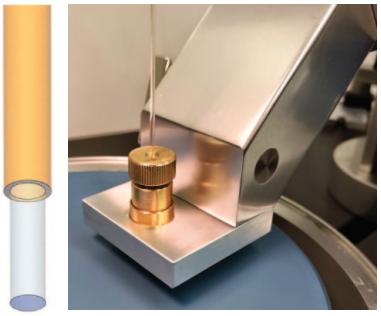


Shallow Angles

Wide angular range made possible by the full-length micropositioner lead screw, in conjunction with the two included QR interfaces (45 and 90 degrees).

REPLACEMENT FERRULES FOR LENSING MODULES

Order Code	Description
1871.0125	Ferrules, 125um ID (set of three)
1871.0250	Ferrules, 250um ID (set of three)
1871.0360	Ferrules, 360um ID (set of three)
1871.0440	Ferrules, 440um ID (set of three)
1871.XXXX	Custom Ferrules, XXXXum diameter (set of three) – Customer Specified ID size >125um)
Note: Please Contact ULTRA TEC for ID sizes less than 125um	



FLAT END MODULE

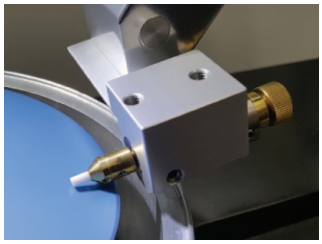
2707.125	**125um Bare-Fiber Workholder - flat (used with 45 degree QR interface)** For polishing bare fibers from zero to five degrees to the end face. In addition to the workholder, the user will need ferrules for each diameter of fiber they wish to polish.

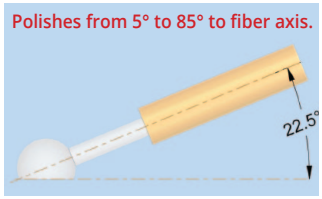
PRODUCT HIGHLIGHTS

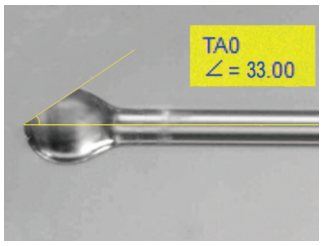
- Fast Load & Unload
- Fast, Effective Polishing
- Wide Angular Range
- Digital Angle Readout Option
- Large ULTRAPOL Install Base

BALL TIP BEVEL MODULE

Order Code	Item
1851.01A	**Bare-fiber BEVEL Lensing Module Ball Tip (50um to 500um)** This MODULE allows the user to polish BEVELS on ball-lensed fiber from 5 degrees to 85 degrees for fibers that range in diameter from 50um to 500um. In additon to the MODULE the user will need ferrules for each fiber size.
1851.01B	**Bare-fiber BEVEL Lensing Module Ball Tip (500um to 1000um)** This MODULE allows the user to polish BEVELS on ball-lensed fibers from 5 degrees to 85 degrees for fibers that range in diameter from 500um to 1000um. In additon to the MODULE the user will need ferrules for each fiber size.
1851.01C	**Bare-fiber BEVEL Lensing Module Ball Tip (1000um to 1500um)** This MODULE allows the user to polish BEVELS on ball-lensed fibers from 5 degrees to 85 degrees for fibers that range in diameter from 1000um to 1500um. In additon to the MODULE the user will need ferrules for each fiber size.

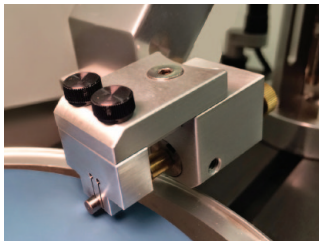


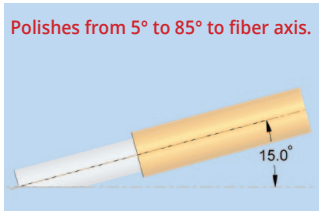


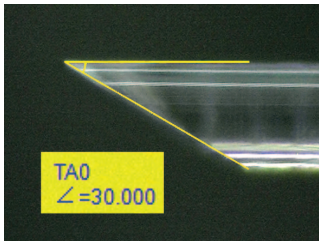


BEVEL MODULE

Order Code	Item
1851.07A	**Bare-fiber BEVEL Lensing Module (50um to 500um) used with 90 degree interface** This MODULE allows the user to polish BEVELS from 5 degrees to 85 degrees on bare-fibers that range in size from 50um to 500um. In additon to the MODULE the user will need ferrules for each fiber size.
1851.07B	**Bare-fiber BEVEL Lensing Module (500um to 1000um) used with 90 degree interface** This MODULE allows the user to polish BEVELS from 5 degrees to 85 degrees on bare-fibers that range in size from 500um to 1000um. In additon to the MODULE the user will need ferrules for each fiber size.
1851.07C	**Bare-fiber BEVEL Lensing Module (1000um to 1500um) used with 90 degree interface** This MODULE allows the user to polish BEVELS from 5 degrees to 85 degrees on bare-fibers that range in size from 1000um to 1500um. In additon to the MODULE the user will need ferrules for each fiber size.

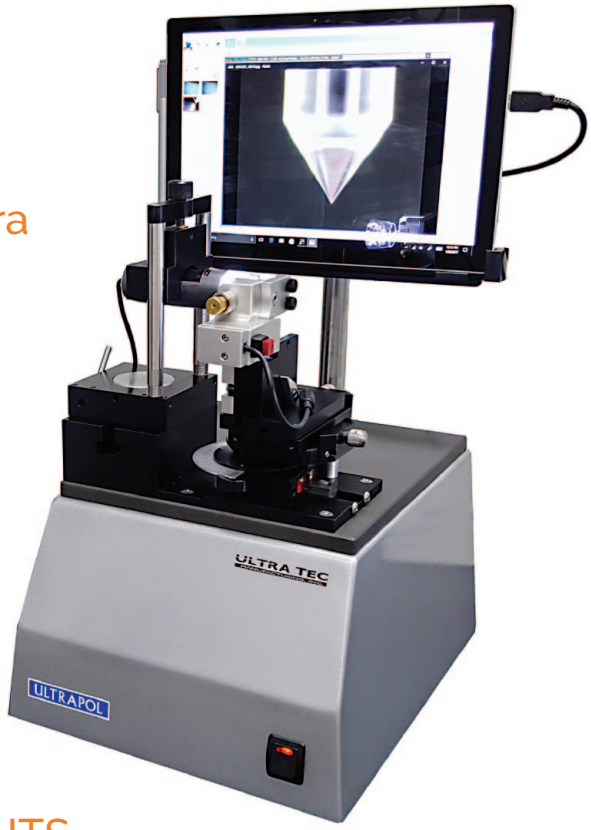






Custom fixtures and complex (multiple) angles are available. Please consult with ULTRA TEC on your own applications.

FIBERLAB™ MICROSCOPE

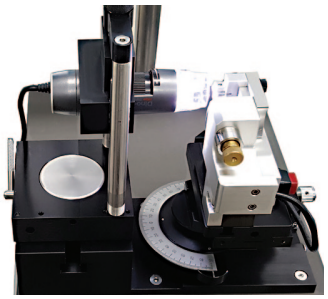


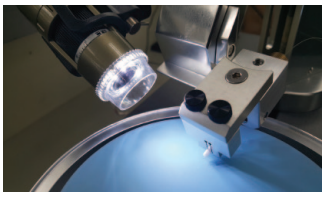
QA and Optical Measurement Module for Fiber Lensing with optional on-line camera

FIBERLAB™ Microscope works in conjunction with the ULTRAPOL FIBERLAB™ Module System.

The Microscope incorporates a high magnification **'Off-line'** Camera to provide measurement and QA capabilities. The Microscope provides full 360 degree viewing of the formed fiber at selectable magnifications.

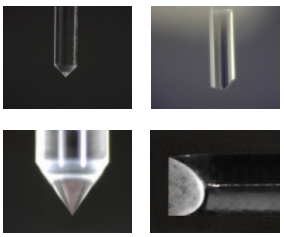
An optional **'On-line'** Camera is used to monitor the fiber's progress on the ULTRAPOL Polisher – showing realtime positioning on the lap.





PRODUCT HIGHLIGHTS

- Accepts ULTRAPOL Quick Release Fiber Lensing Fixtures
- USB Camera(s)
- QA tools for improving polishing yields and results
- Advanced Suite of Angular and length measurement characteristics in software



Order Code	Item
3780.1	**ULTRAPOL FIBERLAB™ Microsope** - with high-mag off-line USB camera. Includes Windows 10 Tablet Computer (min 10" screen), with custom software and In-built USB Hub. Sample interface, with X, Y, Z and rotary positioning, to accept 'Quick Release' Module fixtures from the ULTRAPOL Module Polishing System(6370.1). 100 – 240VAC Operation. Footprint - 12.5 inches (32 cm) wide x 14 inches (36 cm) deep x 21.5 Inches (55 cm) high; Unit weight 11kg (26 lbs)
3780.BYO	**ULTRAPOL FIBERLAB™ Microscope** - with offline USB camera and custom software and In-built USB Hub. Sample interface, with X, Y, Z and rotary positioning, to accept 'Quick Release' Module fixtures from the ULTRAPOL Module Polishing System (6370.1) Note: Customer supplies own suitable computer or Windows Tablet (BYOC)
3782.1	'On-line' Microscope Camera, USB-style with mounting bracket for ULTRAPOL FIBERLAB™ Module System (6370.1)
3784.1	Mounting Bracket to fit ULTRAPOL Polisher - for Customer's own on-line camera

ULTRAPOL

FIBERLAB™ Module System

Order Code	Item
6370.1	**ULTRAPOL FIBERLAB™ Module System:** System package includes: ULTRAPOL Polishing Base with 5 inch (125mm) diam. lap, timer, tachometer, solenoid coolant system. 1 micron Micropositioner with Quick Release (QR) Mechanism. Wide angular range (set by module); QR Interfaces (45 and 90 degrees) – 197196 and 107330, Oscillator, Weight Kit. 100 – 240VAC Operation. Footprint - 22 inches (55 cm) wide x 12 inches (30 cm) deep x 19 Inches (48 cm) high; Unit weight 25kg (60lbs)
6314.1	**DIGITAL Angle Dial (Upgrade)** For setting and reading desired angles to be created/polished on the ends of bare-fibers
1301.5	**Lamp** Direct light is essential for proper viewing and polishing
4023.1	**5" (125mm) Diam. Aluminum Carrier Plate (Standard)** A carrier plate is used to hold abrasive polishing films/discs to perform the polishing of bare-fibers
5010.01	**5" Splashpan for Shallow Angles** For use with the DOUBLE THICKNESS Carrier Plate. This allows very shallow angles to be created & polished
4023.02	**5" (125mm) Diam. Aluminum Carrier Plate (DOUBLE THICKNESS) use with 5010.01 for Shallow Angles** For use with the Shallow Angle Splashpan
2358.1	**5" (125mm) Diam. Ferrule Forming Lap** For grinding the desired angle into the ferrule to prepare for bare-fiber polishing applications
8010.5	**Ferrule Clearing Wire** Sometimes debris accumulates in the ferrule. The Ferrule Clearing Wire lets you clear the ferrule for the next project
5555.5	**5" (125mm) Diam. Bare-fiber Polishing Film Package (2 Step Process)**

ULTRA TEC is proud to operate a continuous product improvement program. Product specifications and appearance are subject to modification without prior notification.

ULTRA TEC MANUFACTURING, INC.

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