Lightera

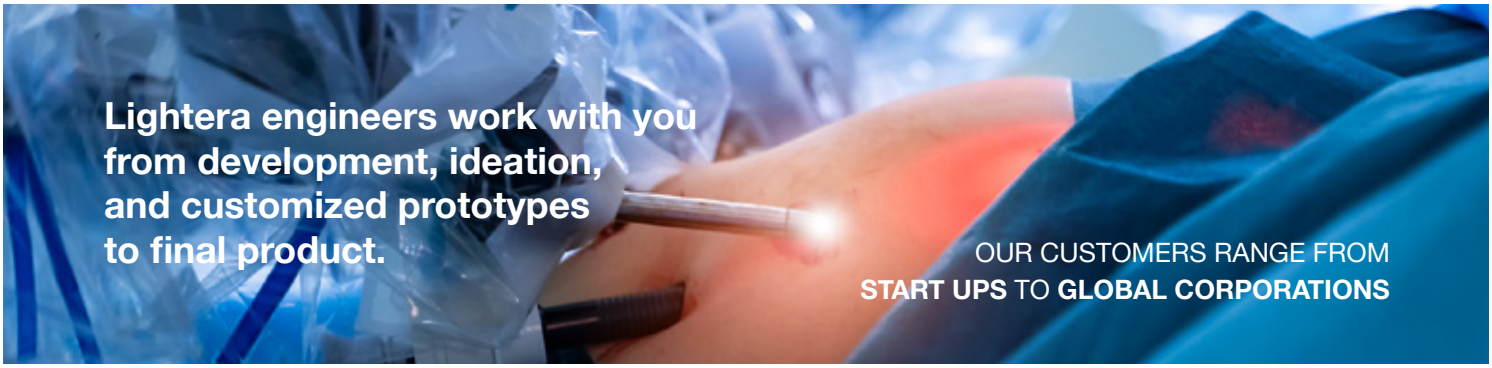
MEDICAL SOLUTION GUIDE

Optical Fiber Solutions for Medical Laser Devices

Fiber Optic Medical Technology

Optical Fiber, Cable, and Assemblies for
Power Delivery, Imaging, and Sensing Applications

LIGHTERA | LIGHTERA.COM | 55 DARLING DRIVE, AVON, CT 06001



About Lightera

With more than 35 years of experience in designing and manufacturing fiber optic products and solutions for the medical industry, Lightera continues to innovate in this area, working closely with its customers to help bring life-saving, life-enhancing medical technology to market.

Customized Solutions

We partner with innovative companies ranging from start ups to large global corporations seeking high quality, cutting edge and customized fiber optic solutions to match their specific needs.

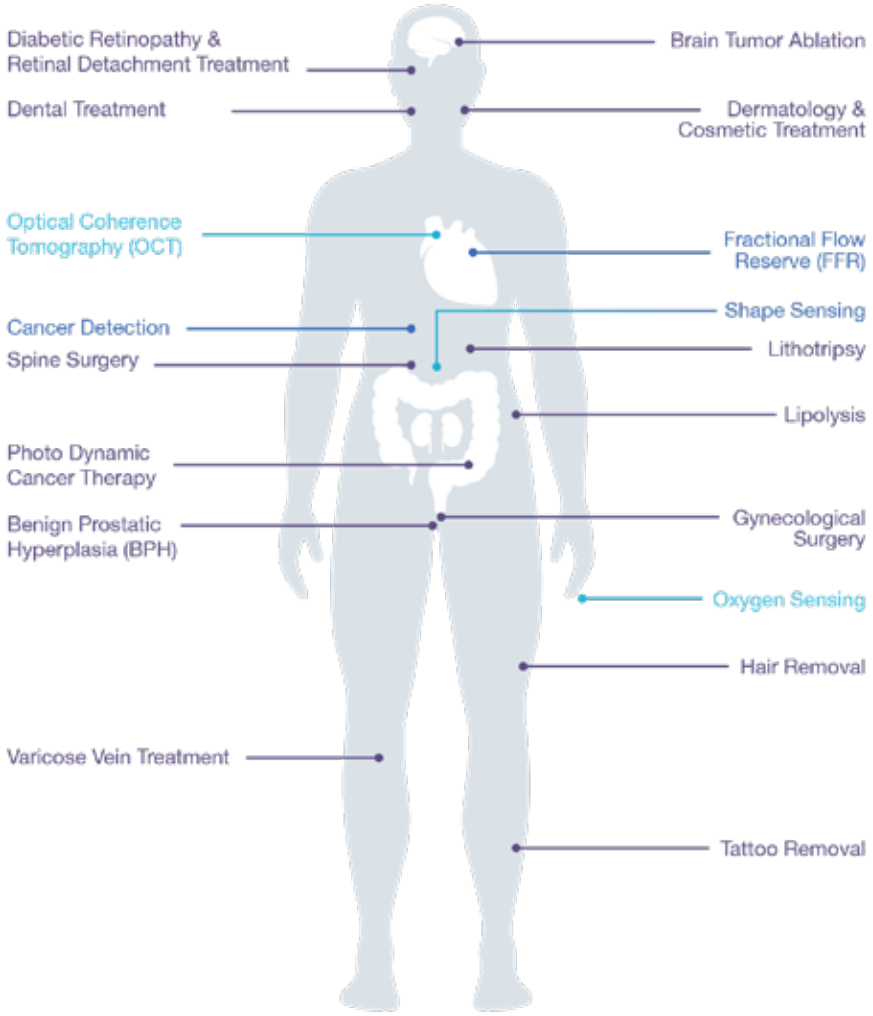
Global Premier Manufacturer

Lightera is a vertically integrated optical fiber manufacturer, from the glass preform to optical fiber and cable design to finished assemblies in a low-bioburden room. Our engineering and manufacturing expertise help make vision and custom design a reality in the design and production of specialty optical fibers.

Dedicated to Medical Standards

Lightera is ISO13485 certified, follows FDA Good Manufacturing Practices, and tests fibers to USP Class VI standards and ISO10993 for biocompatibility.

Medical Applications

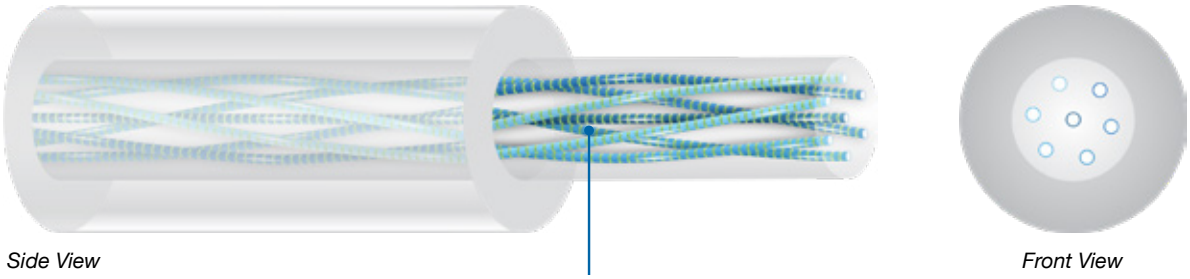


SENSING IMAGING POWER DELIVERY

Shape Sensing

Twisted Multicore Fiber with Continuous Gratings for Sensing

Optical fiber shape sensing is a form of distributed sensing that uses scattered signals from optical fibers to ascertain local curvature and twist and thus, the shape of a given structure.



Side View

Front View

Continuous Fiber Bragg Gratings (FBG)

KEY FEATURES

- Multicore fiber with continuous Fiber Bragg Gratings
- Designed for shape sensing applications
- Multicore connectorization and fan-outs
- Low back reflection termination

Product Specifications	
Fiber Dimensions/ Geometric Properties	
Fiber Core Geometry	6 around 1
Cladding Diameter	125 µm
Coating Type	Acrylate
Coating Diameter	200 µm
Coating Concentricity	< 8 µm
Core-to-Core Spacing	35 µm
Center Core Concentricity in Glass	0.5 µm
Twist Rate	50 twists/m
Numerical Aperture	0.21
Mode Field Diameter at 1550 nm	6 µm
Fiber Proof Strength	100 kpsi
Gratings Characteristics	
Grating Length	35 µm
Typical Spacing Between Gratings	125 µm
Grating Center Wavelength	1540 nm
Typical Integrated Grating Reflectivity in each Core for 1 cm of Grating	-70 dB
Typical Array Length	25 m

For further details and applications, request a copy of our white paper, entitled **“Multicore Optical Fiber Grating Arrays for Sensing Applications.”**

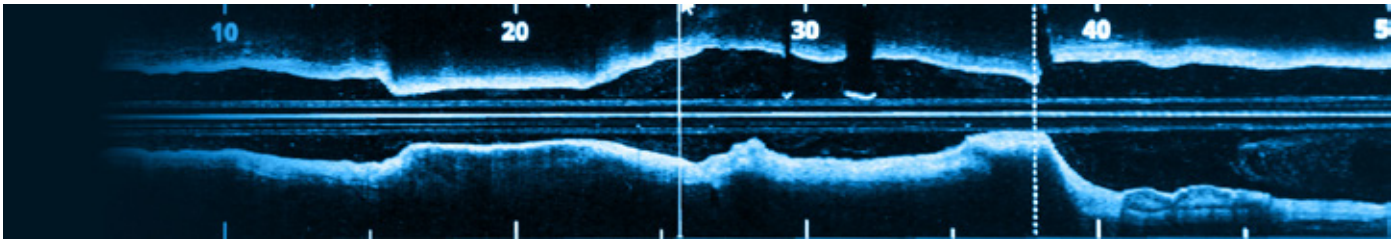
LIGHTERA.COM/ SHAPE-SENSING

Lightera

Optical Fiber Solutions
for Imaging & Sensing Medical Applications

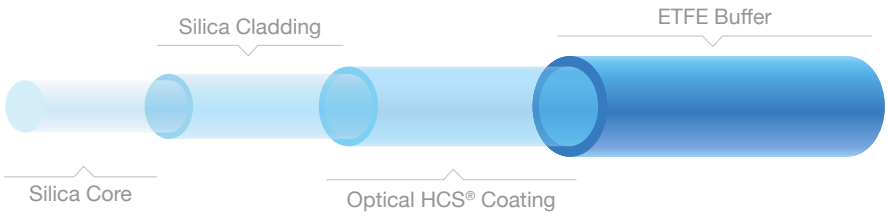
Lightera plays an important role in the expanding adoption of optical coherence tomography (OCT) in such applications as cardiology, oncology, and gastroenterology.

Single-mode						
Operating Wavelength	NA	MFD	Clad	Coating	Coating Material	Part Number
1310 nm	0.12	9.3	125 ± 1 µm	155 ± 5 µm	PYROCOAT®	**BF05717-01**
1270 - 1340 nm	0.12	9.3	125 ± 1 µm	155 ± 5 µm	PYROCOAT	**BF05717-06**
1310 nm	0.12	9.3	80 ± 2 µm	100 ± 4 µm	PYROCOAT	**BF04441-09**
820 - 850 nm	0.12	6.0	125 ± 1 µm	155 ± 5 µm	PYROCOAT	**BF04701**
Multimode Graded-Index						
	NA	Core	Clad	Coating	Coating Material	Part Number
	0.20	50 ± 3 µm	125 ± 1 µm	155 ± 5 µm	PYROCOAT	**F17015**
	0.275	62.5 ± 3 µm	125 ± 1 µm	155 ± 5 µm	PYROCOAT	**F19230-01**
PYROCOAT is a registered trademark of Lightera, LLC for polyimide coating.						



Multimode Step-Index Optical Fibers for High Power Delivery Under Tight Bends

HCXtreme® Product Family

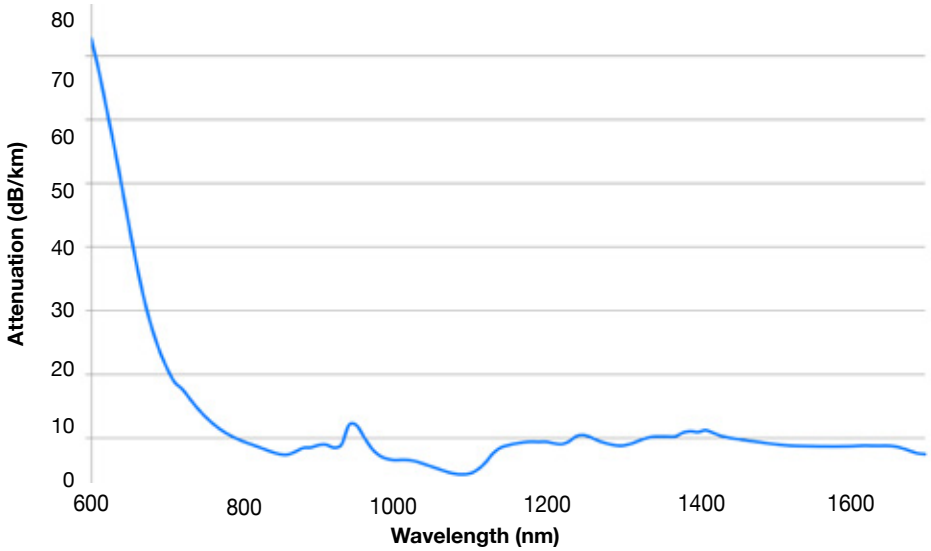


Reliable Laser Delivery Down to 5 mm While Under Power

HCXtreme® Optical Fiber technology addresses the problem of fiber failure due to tight bending of optical fiber under power. This optimized fiber design reduces bend loss and offers superior performance in high power laser delivery applications that require tight bending.

	Diameters in µm						
Item Name	Core	Cladding	Coating	Buffer	NA	Buffer Color	Part Number
200-22 HCX	200	240	270	375	0.22	Blue	**F26445**
272-22 HCX	272	299	330	400	0.22	Blue	**F24748**
365-22 HCX	365	400	430	550	0.22	Blue	**F18940**
550-22 HCX	550	600	630	750	0.22	Blue	**F18941**
940-22 HCX	940	1000	1035	1400	0.22	Blue	**F18942**

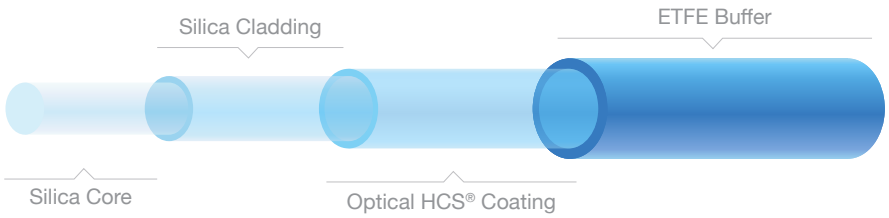
Typical Spectral Attenuation for HCXtreme Optical Fiber



For further details and testing methodology, request a copy of our white paper, entitled **"Study of Optical Fiber Damage Under Tight Bend with High Optical Power at 2140 nm."**

Multimode Step-Index Optical Fibers for High Power Delivery

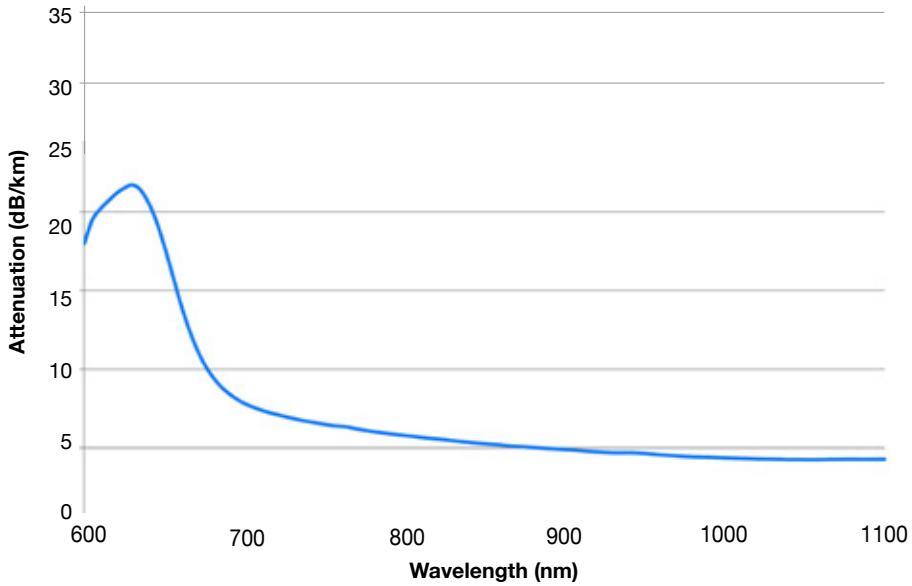
Improved Fiber Strength to Reduce Static Fatigue



HCL fibers are low-OH core/glass clad, coated with HCS® fluoroacrylate to improve both fiber strength and static fatigue resistance. ETFE is used as the outer buffer on these step-index, multimode fibers. They are available in a variety of core sizes and core/clad ratios.

	Diameters in µm						
Item Name	Core	Cladding	Coating	Buffer	NA	Buffer Color	Part Number
200-22 HCL	200	240	260	375	0.22	Blue	**BF06856-01**
365-22 HCL	365	400	430	550	0.22	Blue	**BF05147**
365-22 HCL	365	400	430	730	0.22	Blue	**BF06341**
550-22 HCL	550	600	630	750	0.22	Blue	**BF06338**
940-22 HCL	940	1000	1035	1400	0.22	Blue	**BF06337**

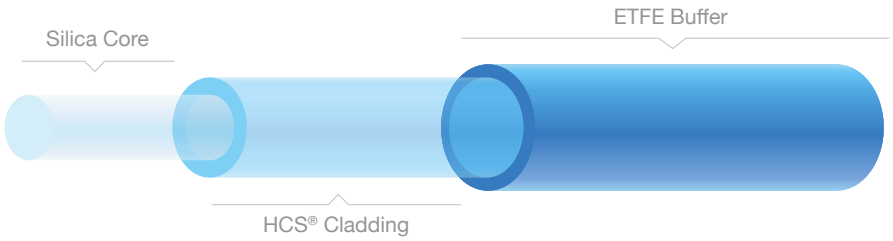
Typical Spectral Attenuation for HCL Optical Fiber



Multimode Step-Index Optical Fibers for a Broad Range of Power Delivery Procedures

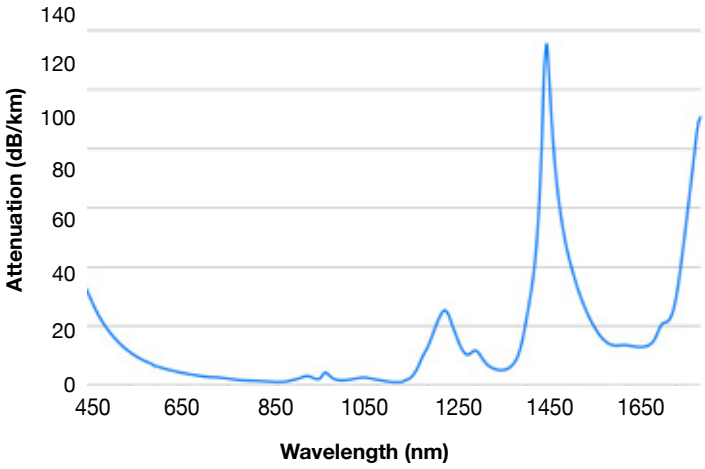
with High NA for Greater Illumination or Reflection Capture

The Lightera family of high-power delivery optical fibers includes the HCS product line. ETFE is used as the outer buffer on these step-index, multimode fibers. They are available in a variety of core sizes. HCS fibers have a pure silica core, a hard polymer cladding, and an ETFE outer buffer.

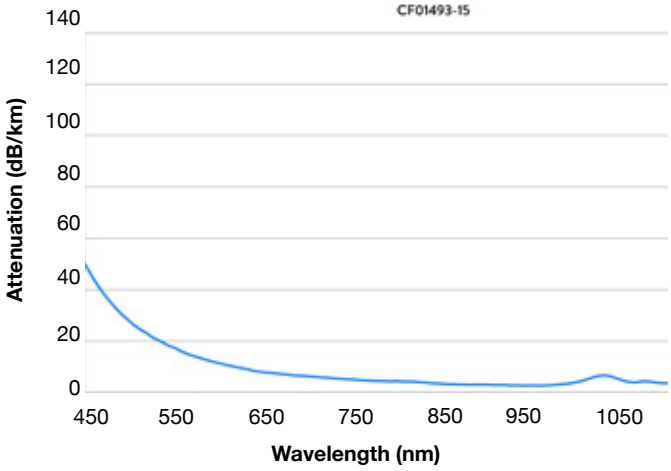


	Diameters in µm				
Item Name	Core	Cladding	Buffer	NA	Part Number
200 µm HCS Low OH Fiber	200	230	500	0.37	**CF01493-10**
300 µm HCS Low OH Fiber	300	330	650	0.37	**CF01493-11**
400 µm HCS Low OH Fiber	400	430	730	0.37	**CF01493-12**
600 µm HCS Low OH Fiber	600	630	1040	0.37	**CF01493-14**
800 µm HCS Low OH Fiber	800	830	1040	0.37	**CF01493-65**
1000 µm HCS Low OH Fiber	1000	1035	1400	0.37	**CF01493-15**
1500 µm HCS Low OH Fiber	1500	1535	2000	0.37	**CF01493-62**
200 µm HCS Low OH Fiber	200	230	500	0.43	**CF05578-01**
400 µm HCS Low OH Fiber	400	430	730	0.43	**CF05578-03**

Typical Spectral Attenuation for HCS 0.43 NA Optical Fiber

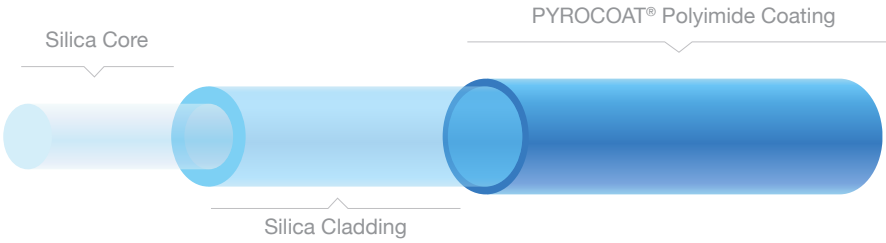


Typical Spectral Attenuation for HCS 0.37 NA Optical Fiber



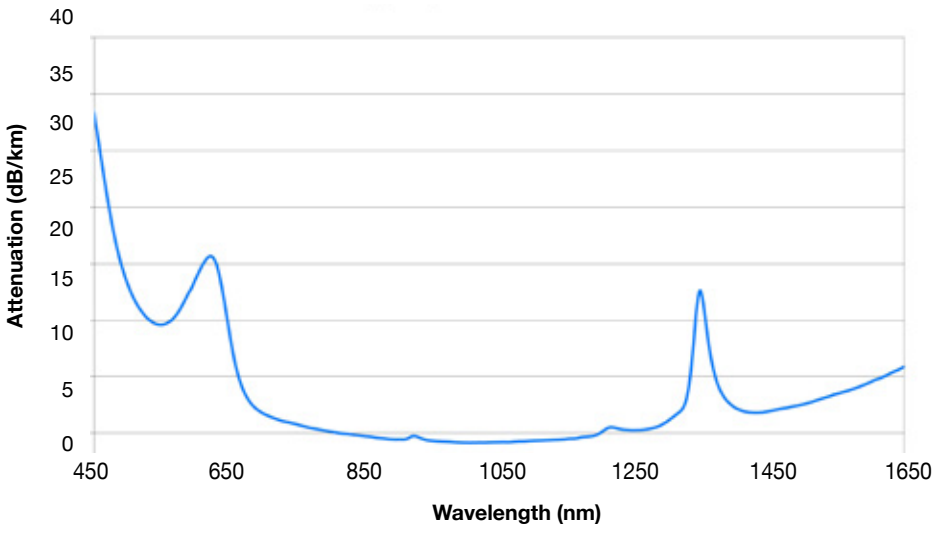
Multimode Step-Index Optical Fibers for Higher Temperature Requirements
with a Hard Thin Polyimide Coating Suitable for Small Lumens and Harsh Environments

The Lightera family of high-power delivery optical fibers includes the TCL product line. TCL fibers are low-OH, all-silica, and are polyimide coated.



	Diameters in µm				
Item Name	Core	Cladding	Coating	NA	Part Number
100 µm TCL Low OH Fiber	100	120	140	0.22	**CF04406-11**
200 µm TCL Low OH Fiber	200	220	250	0.22	**F17023**
200 µm TCL Low OH Fiber	200	240	270	0.22	**CF04406-14**
320 µm TCL Low OH Fiber	320	385	415	0.22	**F17850**
400 µm TCL Low OH Fiber	400	440	470	0.22	**F24963**

Typical Spectral Attenuation for TCL Low OH Optical Fiber



Cables for Harsh Environments

Device manufacturers depend on Lightera optical fibers to repeatedly and reliably communicate critical data.

Lightera has the ability to package your optical fiber-based solution with various coatings, buffers and cable jackets tailored to your critical application requirements.

Customizable Fiber Tips and Assemblies

Customizable assemblies for diagnostics and treatments.

From simple flat cleaving to complex-shape, Lightera offers highly customizable fiber tip assemblies for your needs.

Your products are made and packaged in an environmentally controlled room, ready for sterilization.

KEY FEATURES

- Single-use disposable products
- Multiple-use sterilizable products
- Sub-assemblies
- Final-assemblies
- Various connectors available

Lightera


Global Manufacturing
Our medical products are made primarily in our Avon, Connecticut (USA) location.


DENMARK
BRØNDBY
UNITED KINGDOM
SOUTH WALES
GERMANY
AUGSBURG
UNITED STATES
STURBRIDGE
AVON
SOMERSET
CARROLLTON
NORCROSS
SPAIN
MADRID
MOROCCO
TANGIER
JAPAN
TOKYO
ISHIKAWA
CHIBA
MIE
SAITAMA
MEXICO
MEXICALI
MEXICO CITY
THAILAND
BANGKOK
COLOMBIA
BOGOTA
INDONESIA
JAKARTA
TANGERANG
BRAZIL
CURITIBA
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CAMPINAS
SOROCABA
SANTA RITA DO SAPUCAI
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Lightera Marketing Communications

Date: 05/27/25

For a full list of our certifications, visit our website.