

Filament Fusion Splicer

LFS4200
Filament Fusion
Splicer for Soft
Glass Fibers



Capabilities



Splice

vytran® Filament Fusion Splicer

Thorlabs' Filament Fusion Splicer is ideally suited for splicing applications involving a wide variety of similar and dissimilar fibers. The LFS4100 is capable of splicing standard optical fiber as well as polarization-maintaining, photonic crystal, non-circular, hollow-core, and other specialty fibers, while the LFS4200 is capable of low-temperature splicing for soft glass fibers such as fluorozirconate, fluoroindate, or chalcogenide.

The LFS4100 and LFS4200 splicers use a proven filament fusion heating process, which enables the stable, controlled, and precise heating of both standard and large-diameter or soft glass optical fibers. By using an inert gas in the splicing region to isolate the heat source from the environment, the heat source is not dependent on ambient conditions, which ensures repeatable performance for every splice.

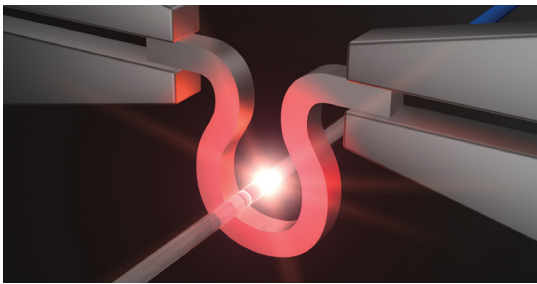
Integrated True Core Imaging® technology provides high-resolution images of the sides and end faces of the fibers for precise measurement and alignment. An array of stepper motors position, align, and rotate the fibers for high-quality, low-loss splicing.

THORLABS

Features

Filament Fusion Splicing

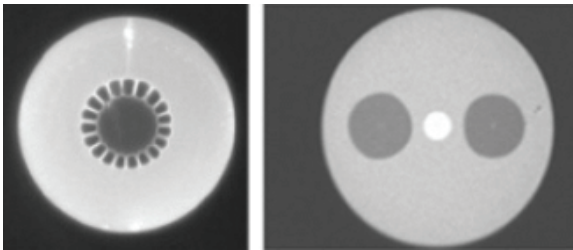
The primary heat source for the LFS4100 and LFS4200 splicers is an omega-shaped resistive filament of graphite, iridium, or tungsten. The unique shape of the filament allows for uniform heating around the splice. Filaments of different sizes can fuse fibers up to Ø1.25 mm. Purging the splice region with an inert gas provides precision control of the fusion process. Post-fusion, a fire polishing process significantly increases splice strength through a rapid heat treatment of the splice region.



The filament uniformly heats the fiber which enables the fabrication of low-loss splices.

True Core Imaging® for Fiber Measurement and Alignment

True Core Imaging technology provides high-resolution images for fiber measurement and alignment. A digital CCD camera and mirror tower integrated into the fiber processing workstation enable both side-view and end-view imaging of the fiber cladding and core. Side view images of fibers can be acquired for all fiber diameters and used for automatic or manual XY alignment with the motion control system. In addition, end-view imaging allows for rotational alignment of polarization-maintaining and other specialty fibers.



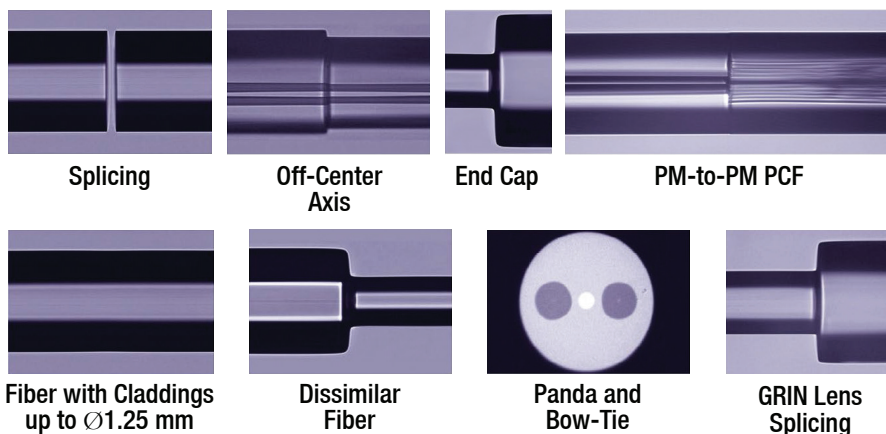
End-View Imaging for Rotational Alignment of Polarization-Maintaining and Specialty Fiber

Specifications

Item #	LFS4100	LFS4200
Fiber Type	Non PM: Single Mode (SM), Multimode (MM), Photonic Crystal (PCF), Large Mode Area (LMA), Non-Circular, Hollow Core PM: PANDA, Elliptical-Core, Bow-Tie	Soft Glass Fibers: Fluorozirconate (ZBLAN), Fluoroindate (InF ₃), Chalcogenide
Fiber Cladding Diameter	≤1.25	≤1.25 mm (Material Dependent)
Fusion Method	Filament Fusion	
Filament Temperature Range	3000 °C	1000 °C
Splice Loss (Typical)	0.02 dB for Single Mode Fiber	Application and Material Dependent
Typical Splice Strength	250 kpsi for Single Mode Fiber	Application and Material Dependent
Strength Enhancement	Fire Polish	
Fiber Alignment Method	Manual or Fully Automated	
X-Y Fiber Positioning Resolution	0.25 µm via Stepper Motor	
Fiber "Z" Movement	7 mm (Max)	
"Z" Movement Resolution	0.25 µm via Stepper Motor	
Rotational Alignment	Fully Automated and Manual	
Rotation Drive Resolution	0.02°	
Rotation Travel	200°	
PC Control and Software	Control Software Included Common Fiber Library Also Included	

Fiber Splicing

Thorlabs' LFS4100 and LFS4200 are dedicated process tools for splicing standard, large-diameter, and specialty fibers. Designed for volume production of fiber assemblies, they are intended for manufacturers that want the splicing performance of Vytran's proven filament fusion, multi-function splicing, and glass processing products from a stand-alone, easy-to-use tool.



Build Your System

All the fiber processing units in our Vytran line have separate, modular components allowing you to tailor your system to the sizes and types of fibers you commonly use. Specifically, the LFS4100 and LFS4200 have separate fiber holder inserts and filaments. The filaments come in several sizes and three different materials to best match your application. The fiber holder inserts fit into the top and bottom of the fiber clamps and come with various groove sizes to hold a variety of fibers.

Required for Basic Setup

- ◆ One LFS4100 or LFS4200 Fusion Splicer
- ◆ Two Fiber Holder Top Inserts
- ◆ Two Fiber Holder Bottom Inserts



Additional Customization

- ◆ Filament Options
 - Filaments for Claddings from $\text{Ø}80 \text{ }\mu\text{m}$ to $\text{Ø}1.25 \text{ mm}$
 - Graphite Filaments for High-Heat, Large-Core Applications
 - Tungsten Filaments for Highly Doped or Structured Fibers
 - Iridium Filaments for Soft Glass Fibers Requiring Lower Heat
- ◆ Fiber Holder Insert Options
 - Standard Top and Bottom Inserts for $\text{Ø}57 \text{ }\mu\text{m}$ to $\text{Ø}3198 \text{ }\mu\text{m}$ Fibers
 - Transfer Bottom Inserts for Fiber Diameters $\leq 1047 \text{ }\mu\text{m}$
 - Corresponding Clamp for Transferring Fiber Between Processing Stations in Assembly
 - Graphite Tips for Supporting Cladding or Buffer During Transfer
- ◆ Ultrasonic Cleaner for Preparing Fibers Prior to Splicing

Contact Us

Contact Vytran for assistance in selecting components for your specific application.

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