CO_2 End-Cap Splicer

Capabilities

Splice

GLZ4001EC
CO_2 Laser End-Cap Splicer

vytran® CO_2 Laser End-Cap Splicer

The GLZ4001EC is an advanced splicer that is designed for splicing single mode, multimode, and specialty fiber directly to large-diameter end caps. Direct splices to end caps up to Ø5.0 mm are enabled by the use of a high-power CO_2 laser to precisely and uniformly heat the fiber and end cap during the fusion process. With a tapered lead-in, end caps up to Ø9.5 mm can be spliced.

This end-cap splicer system is equipped with a 40 W CO_2 laser that offers controlled, precise heating of optical fibers. The clean, high-temperature heating provided by the laser does not require purge gas or consumable filaments, which greatly reduces the maintenance needed.

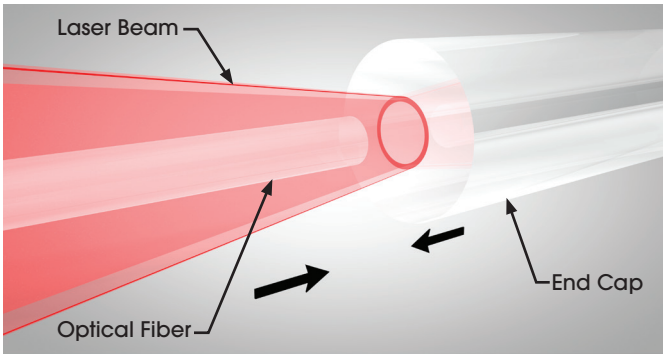
As with our other Vytran splicers and glass processors, the GLZ40001EC employs True Core Imaging® technology to provide high-resolution images for fiber measurement and alignment. Precise control of process parameters via an integrated control system enables highly automated processing for high-volume manufacturing.

THORLABS

Features

Integrated CO_2 Laser Platform

The primary heat source for the GLZ4001EC is a 40 W CO_2 laser with an annular beam output for uniform and clean heating of the fiber. The output power is adjustable and a feedback loop ensures stability during heating. Unlike filament furnace heating, laser-based heating does not require purge gas or a consumable filament for operation. This all-in-one platform has two separate optical heads; one is optimized for CO_2 laser splicing and the other is optimized for end capping.



When splicing, the laser forms an annular beam shape that uniformly heats the fiber end and end cap. When the temperature for splicing is reached, the fiber and the end cap are carefully pushed together.

True Core Imaging® for Automated Fiber Measurement and Alignment

The GLZ4001EC utilizes our True Core Imaging technology to provide high-resolution images for fiber measurement and alignment. An integrated digital CCD camera and mirror tower provide both side-view and end-view imaging of the fiber cladding and core. These features allow for automated measurement of fiber properties (core/cladding diameters, cleave quality evaluation, etc.) and precise alignment for splicing large end caps.

Specifications

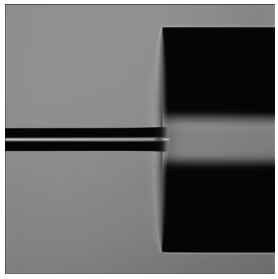
Heat Source	
Laser Wavelength	10.55 µm (Minimum) 10.63 µm (Maximum)
Laser Output Power	40 W[a]
Laser Safety Features	Metal Cover with Interlock; Class 1 Enclosure Automatic Laser Power Cutoff Double Redundancy Safety Measures CLASS 1 LASER PRODUCT
Laser Beam Control	Closed-Loop Feedback System
Splicing	
Accepted Fiber Diameters	Splice: 250 µm – 2 mm Coating End Caps: 250 µm – 5 mm Coating
Splice Loss (Typical)	0.02 dB for Ø125 µm Cladding Single Mode Fiber
Splice Strength (Typical)	>250 kpsi for Single Mode Fiber Prepared Using LDC401 Series Cleaver
Alignment	
Fiber Alignment Method	Fully Automatic – True Core Imaging
XY Fiber Positioning Resolution	0.2 µm via Stepper Motor
Z Travel	Furnace – 15 mm (Max) Fiber Holding Block – 10 mm (Max)
Z Positioning Resolution	0.25 µm via Stepper Motor
PC Control and Software	Control Software Pre-Installed on Included PC Common Splice Application Files Also Included

a. Output Power Measured at 25 °C

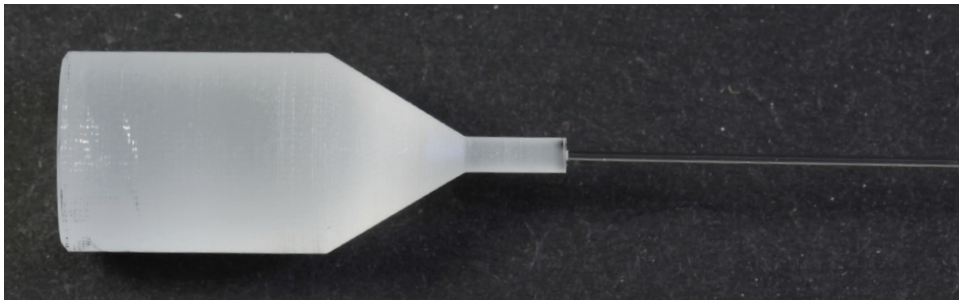
End-Cap Splicing

Vytran® Fiber Processing Systems are well suited for fusing silica end caps (up to Ø5 mm) to high-power-beam-delivery fibers. End caps reduce the power density at the glass-to-air interface, which enables higher power handling.

The 40 W CO_2 laser directly heats the fiber via absorption, and the adjustable annular ring of the laser enables precise heating of the targeted fusion area. This ensures higher quality splices by minimizing deformation of the fiber during heating and faster splice times by reducing the amount of mass heated during processing.



Ø1.25 mm Silica End Cap
Fused Onto Ø125 µm Fiber



Ø 8mm End Cap with Ø1 mm Lead-In Fused to Ø400 µm Core Fiber.

End-Cap Holders

These holders secure and position large-diameter end caps in the splicer during the fusion process. Holders for end caps with outer diameters ranging from 1.0 mm to 9.50 mm are available with vacuum suction, flexure clamp, or magnetic lid mounting methods. The holders are compatible with the fiber holding blocks used in the splicer.

Options

Item #	Type	Accepted Diameter
ECH1V	Vacuum	1.0 mm (Typ.)
ECH15V		1.5 mm (Typ.)
ECH2V		2.0 mm (Typ.)
ECH4C	Flexure Clamp	3.8 – 4.08 mm
ECH5C		4.8 – 5.08 mm
ECH8C		7.8 – 8.08 mm
ECH8L	Magnetic Lid	7.6 – 9.50 mm

ECH2V
Ø2.0 mm End-Cap Holder with Vacuum Suction

ECH5C
Ø5.0 mm End-Cap Holder with Flexure Clamp
Shown with End Cap (Not Included)

ECH8L
Ø8.0 mm End-Cap Holder with
Magnetic Lid

Contact Us

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

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