

END-CAP FUSION SPLICER™ (ECS)

The rapid developments in fiber laser technologies and the increased demand of high-power fiber laser component fabrication has created the need for a dedicated and cost-effective end-cap splicer. It must be capable of processes outside of those available with standard production fusion splicers and glass processing equipment. These new capabilities must be ideal for production and R&D environments yet sophisticated enough to satisfy the stringent requirements of fiber laser fabrication.

3SAE Technologies End-Cap Splicer™ (ECS) is the world's first portable end-cap fusion splicer that provides capabilities that overcome the limitations of current end-cap splicing processes to meet the most

demanding requirements for the high-power fiber laser component fabrication. The ECS was specially designed for volume production, repeatability, precision and user-friendly operation while maintaining unprecedented end-cap splice quality. The ECS leverages 3SAE's patented PentaPod™ alignment stages and latest 3rd generation Ring of Fire® (ROF) heat source. The combination of a precision mechanical design, high contrast optics, absolute control of relative positional and angular fiber-to-endcap alignment, and a next generation highly stable ROF plasma source, sets the ECS apart from any existing technologies. Additionally, a new splice scanning technology provides a detailed analysis of the splice quality and facilitates 3SAE's "Curvature-Based Thermal Splice Calibration™".



END-CAP FUSION SPLICER™ (ECS)

Key Features:

- Specifically designed to accurately splice end-caps to fibers for R&D and production environments
- The ECS can also be used to perform bundle-to-fiber splices of various diameters.
- The unique, patented PentaPod™ alignment stages are compact, rigid, and stable.
- Both the fiber and end-cap stages provide individual alignment in X, Y, and Z as well as Pitch, Yaw, and Theta yielding 6-axes of motion control (X, Y, Z, X θ , Y θ , Z θ) per side.
- ± 6 mm of relative linear alignment (X, Y, Z axes) with positional accuracy $< 0.1\mu\text{m}$
- $\pm 6^\circ$ of angular alignment (X θ , Y θ , Z θ axes) with positional accuracy $< 0.01^\circ$
- A new implementation of the 3SAE Ring of Fire® (ROF) technology provides superior thermal stability for applications from 125 μm to 2.5mm fiber diameter.
- Sophisticated machine vision provides the highest alignment quality and facilitates detailed process evaluation. Two Orthogonal (X & Y) live views of the splice during the splicing process
- New splice scanning technology provides a detailed analysis of the splice quality and facilitates 3SAE's Curvature Based Thermal Splice Calibration™.
- Fiber and end-cap are fixtured in removeable, interchangeable carriages that can be customized to specific applications.
- Accurate control of the vertical alignment of the ROF with respect to the end-cap & fiber ensures even circumferential thermal distribution during the splice.
- Highly flexible splice process allows continuous control of arc temperature and fiber placement during the splice.
- Pre & post splice data export for convenient splice tracking and data analysis.
- An optional, integrated active feedback module is available facilitating output beam steering during the splicing process.

Technical Specifications:

- Dimensions: 398 (W) x 305 (D) x 250 (H) mm
- Weight: ~27lbs
- Power Source: (1) 24VDC, 8.3A
- Control / Operation: Included high -performance Windows PC
- Glass Diameter: 125 μm to 2.5mm
- Slice Programs: > 1000
- Splice Data Storage: Max. 20,000

Standard 3SAE End-Cap Splicer™ (ECS) Package

Includes

- ECS Main Body
- (1) Left FH Carriage
- (1) Right FH Carriage
- (1) AC Adapter
- (1) AC Power Cord
- (1) Spare set of ROF electrodes
- (1) Electrode Cleaning Disk
- User Manual
- 1-Year Manufacturer's Warranty
- PC/Monitor with all necessary software, accessories and interconnect cables.

Accessories

- Left ECS Fiber Holders: 250 μm , 400 μm , 700 μm , 1000 μm , 1500 μm , 2000 μm , 2500 μm
- Right ECS Fiber Holders: 250 μm , 400 μm , 700 μm , 1000 μm , 1500 μm , 2000 μm , 2500 μm
- Right ECS End-Cap Holders: 1.1-7mm & 5-12mm (all are non-vacuum)
- Vacuum based end-cap holding system for supporting end-caps during splicing (will support most end-caps < 10 mm in length)
- Hard Transport Case