Polarization-Maintaining Fiber Fusion Splicer

(patent pending)

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The TUNE PM 500 Splicer is an innovative device designed for fusion splicing polarization-maintaining (PM) fibers. It enhances traditional fusion splicing by incorporating manual rotary fiber holders and specialized software, enabling precise manual alignment of PM fiber axes while automating core alignment. This combination ensures low-loss, high-strength splices. Operators can manually rotate the fiber holders to align the PM axes by visually matching stress patterns displayed on the device, allowing for splicing at various angular offsets, such as 90 or 45 degrees. Once aligned, the splicer automates the fusion process with a single button press. Alignment accuracy can be further improved with optional tools like a fiber end-face magnifying scope or an active polarization extinction ratio (ER) power meter, achieving ER values greater than 22dB through visual methods and over 25dB with active monitoring.

The comprehensive kit includes the splicer, fiber stripper, battery pack, AC adapter, high-performance cleaver made in the USA, and a carrying case, all backed by a one-year warranty.

Features

- PM Fiber
- Multicore Fiber
- PhotonicCryFiber
- Low Cost
- Low Loss
- High ER
- Fast

Applications

- Production
- Test
- R&D

Specifications

Parameter	Min	Typical	Max	Unit
Fiber Type	Multicore, Panda , Bow-Tie, Photonic Crystal, Tiger			
Insertion Loss	0.01	0.1	0.3	dB
Polarization Extinction Ratio	22	23	32	dB
Fiber Glass Diameter	80		150	µm
Fiber Buffer Diameter	100		400	µm
Stripped Coating Length	7	9	10	mm
Splicing Strength		2		N
Electrode Life		5000		discharge
Cleaver Blade Life		30,000 [3]		cleavering
Remote Operation Battery		5200mAh included		
Real Time Arc Calibration		included		
Protection Shrink Oven		built-in		
Monitor TFT Color		4.3		inch
Image Magnification		320X		
Operating Humidity (non-condensing)			85	%
Operating Temperature	-20		45	°C
Storage Temperature	-40		80	°C

Notes:

[3]. Rotate 16 positions for every 1000 fiber cleaving

RoHS COMPLIANT

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Rev 05/05/26

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Optional Active Splicing Monitoring Kit

The optional active splicing monitoring kit achieves optimum splicing result of maximum ER and lowest insertion loss possible. It consists of a cost effective PM light source, a manual polarization extinction meter to precisely measure insertion loss and polarization extinction ratio.

The set forms a system that launches a polarization light source to one end of the fiber and connects the polarization extinction ratio and insertion loss meter at the other end of the fiber to be spliced.

This instrument is also a high-performance general instrument for fiber optical power and polarization extinction measurements

Fiber End Face Microscope

This scope provides a clear image of the stress pattern for verifying or fine tuning the alignment prior splicing. 400X is standard.

This is also a general fiber end face and connector inspection tool.

Ordering Information (Part Number)

	☐☐	☐	☐	☐☐	☐☐
Prefix	**500**	**Fiber Diameter**	**Battery**	**Live ER Measurement**	**End Face Monitoring**
PMSPL-	500 = 55	125 µm = 5 80 µm = 8 Special = 0	Yes = 1 No = 0	No = 00 Yes = 11	Yes = 11

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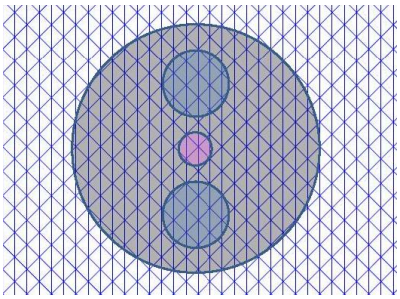
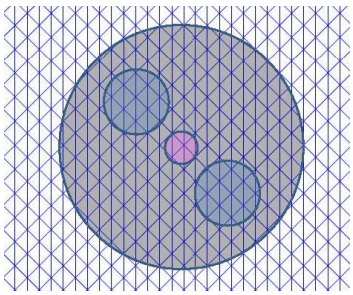
Visual Alignment Instruction

- Mount the fiber into the rotatable clamp
- Cleave the fiber using the special cleaver
- Perform the same procedure for another fiber
- Spark clean the fiber end by putting both cleaved fibers into the splicer and pushing the button once
- Insert the fiber with the clamp into the microscope and adjust focus to see the image
- Rotate the clamp to align the stress pattern vertically using the marking on the screen and tight the screw on the side to fix the fiber position on the clamp
- Remove the clamp along with the fiber and put it into the splicer
- Perform the same alignment procedure for the other clamp
- Push the splicing button again to complete the splicing with the pair of clamps on the splicer
- One can also perform splicing two fibers with any angle between them. The graphs below illustrate a case of -45 degree polarization axis splicing.





Procedure for Measuring PER During PM Fiber Splicing

1. Connect a PM fiber to be spliced to a PM light source, either by splicing or by attaching a connector to the fiber.
2. Prepare the fusion splicer and proceed through all steps up to — but not including — pressing the fusion (splice) button.
3. Connect the other end of the fiber to the polarization extinction ratio (PER) meter, using either a bare fiber adapter or a spliced connector. Measure the PER.
4. If the measured PER meets your requirement, proceed to complete the splice by pressing the fusion button.
5. If the PER is below the required level, repeat the procedure and slightly adjust the fiber alignment angle. Repeat the measurement process until the desired PER is achieved.

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Application Notes

Fiber Core Alignment
Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness
Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power
Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.

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