

3SAE TAPER MANUFACTURING STATION (TMS)



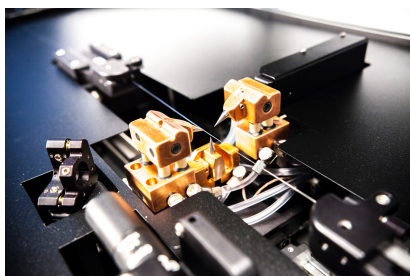
The Taper Manufacturing Station (TMS) is a production ready glass processing station for tapering of optical fibers with an integrated cleaving package. The TMS is designed for use in the manufacturing of optical fiber tapers and bundles.

The TMS features 3SAE's patented Thermally Stabilized Plasma®. The manufacturing friendly TMS is a dedicated fiber tapering system that provides easy fiber access, unparalleled heating source control, stiction-free pulling results in the highest quality, lowest loss and best repeatability in the industry.

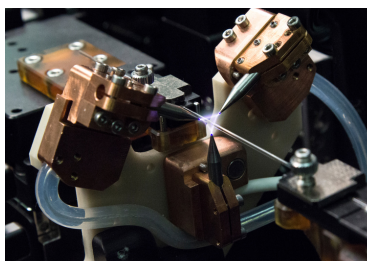
The TMS operates in partial vacuum which is advantageous in producing adiabatic fiber tapers. Operating 3SAE's patented Thermally Stabilized Ring of Fire® Plasma Technology in partial vacuum allows the width of the plasma field to expand up to 10x along the axis of the fiber. Heat sources with a wider heat profile are better for tapering and bundling of fibers because the pull distance per unit time is distributed over the molten region in accordance with the profile. Narrow profiles create modulations and stress concentrations that induce losses. Our wider plasma field flattens and reduces the frequency of modulations resulting in losses of less than 1% in tapers.

An additional benefit of operating in partial vacuum is oxidation of the electrodes is minimized during the tapering process, resulting in virtually debris free tapers. High power testing has confirmed the Thermally Stabilized Plasma does not contaminate the surface of the glass, eliminating the need for acid etching and reduces the risk and cost of production and rework.

The TMS features three customizable tapering modes: single direction tapering, bi-directional tapering and table based tapering. Table based tapering method allows the flexibility of a syntax based software program to create a custom taper program while using a simplified Lab VIEW based GUI. Alternately, programs such as "MATLAB" or Microsoft Excel can be utilized to develop the tapering program.



Three customizable tapering modes



3SAE's Ring of Fire® heat source provides circumferential heating around the fiber



Key Features: Taper Manufacturing Station (TMS)

- Extremely repeatable glass processing heat source ideal for high volume optical component manufacturing with a range of operation from ~300°C to >3000°C.
- Unsurpassed heat source provides circumferential thermal uniformity for symmetrical ultra-low loss fiber optic tapering and reduces thermally induced component stress.
- Contamination free heat source capable of producing ultra-clean multi kilowatt class optical components.
- On board electrode cooling system for cooling Ring of Fire® and electrical components.
- Exclusive controlled pressure modes provide the best possible application flexibility and repeatability while utilizing "Thermally Stabilized Plasma™".
- 5MP vision system with telecentric lenses providing 1.3mm wide x 1mm tall field of view and up to 15 frames per second.
- Live process monitoring via full resolution video imaging of the molten fiber optic glass without under or overexposure.
- In-situ cleaver supports fiber optic diameters from 20um to 500um.
- Integrated load cell feedback system for process development and monitoring.
- Capable of tapering optical fibers diameters to 2mm.
- Scanning software is capable of scanning optical fiber's diameter after fiber optic taper.
- "Hot Imaging" provides live viewing during fusion processing of optical fibers in real time.
- Photonic Crystal Fibers (PCF) can be tapered with little to no air hole collapse.
- Taper lengths of up to 150mm supported in bidirectional mode.*
- Taper lengths of up to 90mm supported in single directional mode.*
- Exclusive "Table Based Tapering™" software included for single direction, bidirectional taper, or custom algorithm program creation and nearly infinite engineer level process control.**

Technical Specifications

Feature	Specification
Dimensions	75cm (W) x 31cm (D) x 28cm (H)
Weight	~75 kg
Power Source	(2) 24V 200W
Compressed Air	6.2b (90psi) and 126 L/per min (~4.5cfm)

Standard Package

Part Number	Product	Includes
TMS-01-0400	3SAE Taper Manufacturing Station (TMS)	PC with all necessary software, 23" monitor and accessories. Accessory kit including qty (2) spare electrode sets, IPA bottle, all necessary PC and TMS interconnect cables, power supply, electronic user's manual Manufacturer's 1-year parts and labor warranty **Fiber Holder Cartridges sold separately

Accessories and Consumables

Part Number	Description
TMS-01-0101	TMS Fiber Holder Cartridge - 125um (pr)
TMS-01-0102	TMS Fiber Holder Cartridge - 250um (pr)
TMS-01-0103	TMS Fiber Holder Cartridge - 400um (pr)
TMS-01-0109	TMS Fiber Holder Cartridge - 550um (pr)
TMS-01-0104	TMS Fiber Holder Cartridge - 700um (pr)
TMS-01-0105	TMS Fiber Holder Cartridge - 1000um (pr)
TMS-01-0106	TMS Fiber Holder Cartridge - 1500um (pr)
TMS-01-0107	TMS Fiber Holder Cartridge - 2000um (pr)
CMS-01-0382	Magnetic Copper Electrode Holders (Set of 3) for ROF - CMS/TMS
ACC-01-0350	Capillary Speed Loader (CSL)
ACC-01-0143	3SAE Automatic Electrode Cleaner (AEC)
ACC-01-1224	Power Supply 200W 24V 8.33A 8-pin (TMS)
CON-10-0026	Electrode Set (CMS/PFS/TMS)

*Taper ratio dependent.

**User can adjust both fiber platform locations, the heat zone location, and the arc power setting 20 times per second for the entire process.