

How to make optical fiber cables using an optical fiber polishing machine



Overview

Scepter™ is PC controlled for consistent and Telcordia compliant mass polishing of optical connectors and bare fiber.

Key Takeaways

Optical fiber cables are prepared by carefully cleaving, securing in ferrules, and polishing the fiber endfaces using a polishing machine with controlled pressure, speed, and polishing films. Step 1: Fiber Preparation

Begin by stripping the protective coating from the fiber to expose the glass core and cladding. Clean the fiber thoroughly to remove any debris or oils. Insert the fiber into a ferrule and secure it with adhesive, ensuring the fiber is properly aligned and protrudes slightly for polishing .

Step 2: Polishing Machine Setup

Turn on the polishing machine and adjust the speed, pressure, and timer according to the type of fiber or connector being used. Prepare the polishing jig, pads, and films in advance. Ensure the polishing films are clean and properly mounted on the machine . Use flexible polishing pads to achieve the desired convex surface on the ferrule, which ensures proper physical contact between fiber cores .

Step 3: Multi-Step Polishing Process

Polishing is typically done in progressive steps using films of decreasing grit size:

- Start with a coarse grit to remove excess adhesive and protruding fiber.
- Move to medium grit to smooth the surface.
- Finish with fine grit for a high-quality optical finish. During each step, apply symmetrical pressure and maintain consistent motion to avoid uneven surfaces . For angled physical contact (APC) connectors, additional angle polishing steps are required.

Step 4: Inspection and Adjustment

After polishing, inspect the fiber endface using a fiber microscope or interferometer to check for surface quality, flatness, and proper curvature. If defects or improper angles are detected, repeat the polishing step as needed . Ensure the ferrule length is consistent and the fiber is slightly undercut for optimal contact .

Step 5: Cleaning and Finalization

Clean the polished ferrule with an air gun or lint-free cloth to remove any residual polishing compound or water. Record polishing parameters and results for quality control. Repeat the process for additional fibers as required .

Key Tips and Precautions

- Always adjust pressure, speed, and time before starting to protect the polishing film and fiber.
- Maintain a consistent polishing direction and avoid arbitrary changes in pressure.
- Use proper jigs to secure fibers and prevent breakage.
- Follow manufacturer guidelines for machine maintenance to ensure long-term precision . By following these steps, you can produce high-quality optical fiber cables suitable for connectors, splices, and other fiber optic applications.

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