

The process of making fiber optic patch cords and pigtails



Overview

A fiber patch cord and pigtail production line typically involves several key processes to ensure high-quality output.

Key Takeaways

Fiber optic patch cords and pigtails are manufactured through a precise, multi-step process involving cable preparation, connector assembly, polishing, and rigorous testing to ensure high-performance optical connectivity.

Step 1: Cable Preparation

The process begins with selecting the appropriate fiber type (single-mode or multi-mode), connector type (SC, LC, FC, MTP), and jacket material (PVC, LSZH) based on application requirements. Fiber cables are cut to the required lengths using automated cutting machines for consistent output. The outer jacket and buffer coating (commonly 3.0mm, 2.0mm, or 0.9mm) are stripped, and the exposed fiber is cleaned with alcohol to remove dust and residues, ensuring a contaminant-free surface for connector insertion .

Step 2: Connector Assembly



Epoxy glue (typically 353 epoxy) is injected into the connector ferrule, and the cleaned fiber is carefully inserted. The assembly is then cured in a vertical or horizontal solidification furnace to secure the fiber within the ferrule. Connector housing and strain relief boots are assembled, and the ferrule end-face is polished using automated polishing machines to achieve the correct geometry and surface finish .

Step 3: Polishing and Cleaning

Polishing ensures the fiber end-face is smooth and aligned with the ferrule. Ultrasonic cleaning removes any remaining debris. End-faces are inspected under a 400x or 600x microscope to detect scratches, contamination, or misalignment. Any defects are corrected before proceeding .

Step 4: Testing and Quality Control

Each patch cord undergoes rigorous testing for insertion loss (IL) and return loss (RL) using calibrated automated test stations. MPO/MTP patch cords may require additional specific tests. Interferometers and video microscopes are used to verify optical performance and connector durability, ensuring compliance with international standards such as Telcordia GR-326-CORE .

Step 5: Final Assembly and Packaging

After testing, the remaining connector components are assembled, and the patch cords are labeled, packaged, and prepared for delivery. High-volume production lines are designed to manufacture hundreds of patch cords per hour while maintaining consistent quality .

Summary

The production of fiber optic patch cords and pigtails is a highly standardized process that combines precision machinery, careful handling, and strict quality control. Key stages include cable cutting, stripping, cleaning, epoxy injection, curing, polishing, inspection, and performance testing. This ensures that the final products provide reliable, low-loss optical connections suitable for high-speed data networks .

Article Content

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The Workflow of Fiber Optic Patch Cord Assembling Fiber Optic Cable Cutting Fiber optic cable Cutting worker must

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