Fiber Optic Cable LC Connector Fabrication

Overview

LC connectors play an integral yet often overlooked role in enabling high-speed fiber optic communications.

Key Takeaways

LC connectors are small-form-factor fiber optic connectors that require precise assembly using specialized tools to ensure low insertion loss and reliable performance.Overview of LC Connectors

LC (Lucent Connector) is a 1.25 mm ferrule small-form-factor connector widely used in high-density applications such as data centers, telecom networks, and SFP/SFP+ transceivers . LC connectors are available in simplex, duplex, UPC, and APC configurations, with duplex LC connectors supporting bidirectional communication. The ferrule, typically ceramic, aligns the fiber core precisely to minimize insertion loss (55 dB, APC >65 dB), . The connector body provides mechanical integrity and a push-pull latch for secure connections.

Components Required

- Ferrule: 1.25 mm ceramic or stainless steel, holds the fiber in precise alignment .
- Connector body: Provides structural support and coupling mechanism.
- Boot or strain relief: Protects the fiber from bending and mechanical stress.
- Adhesive or epoxy: Secures the fiber inside the ferrule.

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• Polishing film or machine: Ensures a smooth fiber endface for optimal light transmission.

Tools and Equipment

• Fiber strippers: For removing the outer jacket, buffer, and coating (e.g., Ripley Miller FO 103-S, Jonard JIC-375), .

• Kevlar cutters: To trim strength members without damaging the fiber .

• Cleaver: Produces a clean, perpendicular fiber endface.

• Epoxy dispenser or UV curing system: For bonding the fiber inside the ferrule .

• Polishing puck and films: For finishing the ferrule endface to UPC or APC specifications.

• Microscope or inspection scope: To verify fiber alignment and endface quality.

Fabrication Process

• Cable Preparation: Strip the fiber optic cable to expose the bare fiber, remove the buffer coating, and trim Kevlar strength members .

• Cleaving: Use a precision cleaver to create a flat, perpendicular fiber end.

• Ferrule Insertion: Insert the cleaved fiber into the LC ferrule, ensuring proper alignment.

• Epoxy or UV Bonding: Apply adhesive to secure the fiber inside the ferrule and cure as required.

• Polishing: Polish the ferrule endface using the appropriate film or machine to achieve UPC or APC finish, ensuring minimal insertion loss and back reflection .

• Assembly: Attach the connector body, boot, and strain relief to complete the LC connector.

• Testing: Inspect the fiber endface under a microscope and test insertion loss and return loss to verify performance.

Best Practices

• Work in a clean, dust-free environment to prevent contamination.

• Use precision tools designed for 1.25 mm ferrules to avoid misalignment.

• Follow manufacturer specifications for epoxy curing and polishing techniques.

• Always inspect and test each connector before deployment to ensure network reliability . By following these steps and using the correct tools, LC connectors can be fabricated to provide high-performance, reliable connections suitable for modern high-speed fiber optic networks.

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Common Fiber Connector Types in Optical Transceivers

Key Takeaways Fiber optic connectors link transceivers to cables for data transfer. SC connector features a square,

LC Connector Explained

LC Connectors are most often used in pairs, clipped together for use with duplex tight-buffered fiber cable in both

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Mastering LC Fiber Connectors: A Practical Guide

Jumper LC connectors are available in simplex (single fiber) and duplex (two fibers) formats; their compact bodies are designed to

LC Fiber Optic Connectors | TE Connectivity

Our portfolio includes a connector kit with a 1.25mm single-fiber ferrule. Reduce costs with small diameter

LC Fiber Connectors: What They Are and Why You

Small, efficient, and nearly ubiquitous, LC connectors have become the de facto

LC connector Assembly Manual

Hold the cable in one hand and hold the connector in the other hand. Rest your hands on the table or against each other and

LC Connector Assembly

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