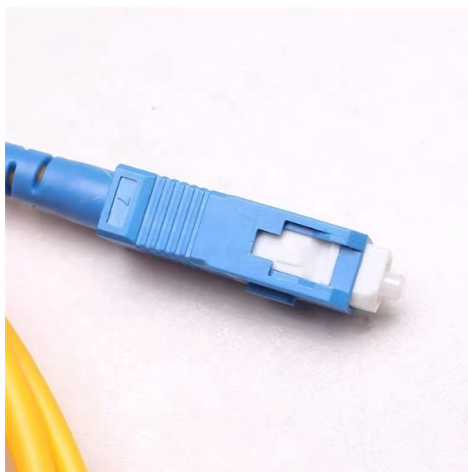


4-core single-mode optical cable for outdoor use



Overview

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Key Takeaways

A single-mode four-core outdoor optical cable is a fiber optic cable containing four single-mode fibers, designed for long-distance, high-speed data transmission in outdoor environments.

A single-mode four-core optical cable consists of four individual optical fibers enclosed within a single protective outer jacket, each capable of independent data transmission. The "single-mode" designation means each fiber has a core diameter of 8-10 micrometers, allowing only one light path to travel through the fiber, which minimizes signal dispersion and enables transmission over long distances up to 100 km or more without the need for signal regeneration. This makes it ideal for telecom backbones, FTTH (Fiber to the Home), GPON networks, and other high-speed outdoor applications.

Construction

The cable is specifically designed for outdoor use, providing durability against environmental factors such as moisture, UV exposure, and temperature fluctuations. Key components include:

- Optical Fibers: Four single-mode fibers that carry light signals.

- **Buffer Tubes:** Typically loose tubes filled with gel or jelly compound to protect fibers from mechanical stress and moisture.
 - **Strength Members:** Multi-strand aramid yarn (Kevlar) or steel wires to prevent stretching and provide tensile strength.
 - **Outer Jacket:** Polyethylene (PE) for waterproofing and UV resistance, ensuring suitability for aerial, duct, or direct burial installations.
- Functionality and Applications

A four-core configuration allows for two duplex links (one for transmitting and one for receiving per link) or a duplex link with two backup fibers for redundancy . This setup is cost-efficient while providing reliability for critical outdoor networks. Single-mode fibers operate at wavelengths of 1310 nm or 1550 nm, which are standard for long-distance optical communication .

Advantages

- **High Bandwidth:** Supports gigabit and terabit data rates.
- **Long-Distance Transmission:** Minimal signal loss over tens of kilometers.
- **Environmental Resistance:** Designed for outdoor conditions, including water-blocking and UV protection.
- **Redundancy:** Four cores allow backup links for network reliability. In summary, a single-mode four-core outdoor optical cable is a robust, high-performance solution for long-distance fiber optic networks, combining single-mode precision with outdoor durability and redundancy for reliable telecommunications infrastructure .

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