

Fiber Optic Cable Splice Materials



Overview

Its material selection is crucial to ensure the quality and service life of the fiber optic splice closure.

Key Takeaways

The core of a fiber optic cable splice is made of ultra-pure glass (silica, SiO_2) or, in some cases, plastic.

The core is the central part of the fiber that guides light signals along the cable. In most telecommunications and long-distance applications, the core is made from ultra-pure silica glass (SiO_2), which allows light to travel with minimal loss over long distances due to its high transparency and low refractive index variation. For single-mode fibers, the core diameter is typically 8-10 microns, while multimode fibers have larger cores, usually 50 or 62.5 microns, to allow multiple light paths. In some applications, especially for short-distance or flexible installations, the core may be made of plastic optical fiber, such as acrylate or polyimide, which is easier to handle but has higher signal attenuation compared to glass. The choice of material affects the fiber's performance, including signal loss, bandwidth, and installation requirements. During a fiber optic splice, the ends of the cores are precisely aligned and fused (in fusion splicing) or held in contact (in mechanical splicing) to ensure efficient light transmission. Regardless of the splicing method, the core material remains glass or plastic, as it is the medium that carries the optical signal. The surrounding cladding is made of a material with a slightly lower refractive index, often fluoride-doped silica for glass fibers, which keeps the light confined within the core through total internal reflection.

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