High Temperature Resistance Selection Guide for Vehicle-Mounted Fiber Optic Air-Cooled Switches

Article Overview

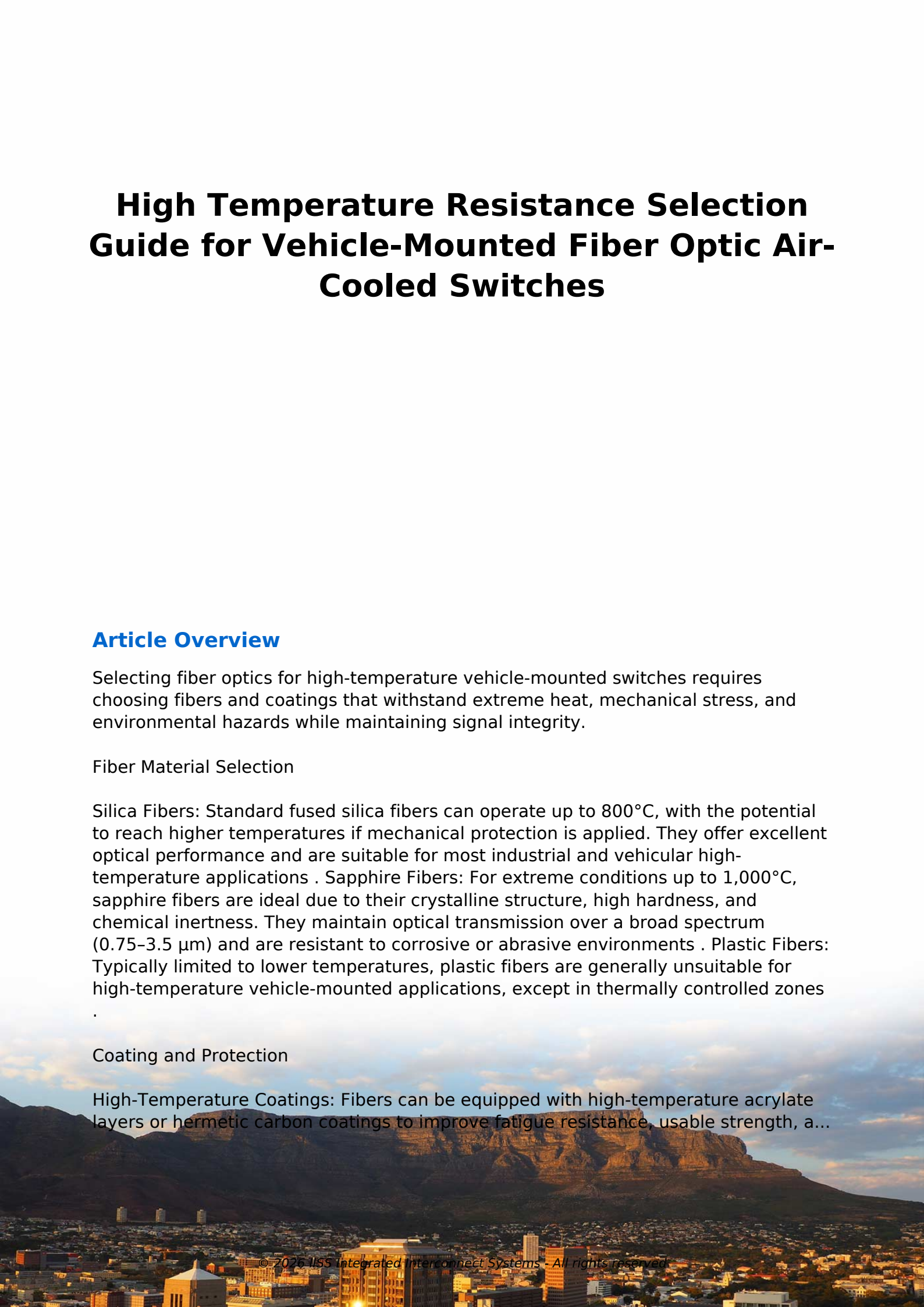
Selecting fiber optics for high-temperature vehicle-mounted switches requires choosing fibers and coatings that withstand extreme heat, mechanical stress, and environmental hazards while maintaining signal integrity.

Fiber Material Selection

Silica Fibers: Standard fused silica fibers can operate up to 800°C, with the potential to reach higher temperatures if mechanical protection is applied. They offer excellent optical performance and are suitable for most industrial and vehicular high-temperature applications . Sapphire Fibers: For extreme conditions up to 1,000°C, sapphire fibers are ideal due to their crystalline structure, high hardness, and chemical inertness. They maintain optical transmission over a broad spectrum (0.75–3.5 µm) and are resistant to corrosive or abrasive environments . Plastic Fibers: Typically limited to lower temperatures, plastic fibers are generally unsuitable for high-temperature vehicle-mounted applications, except in thermally controlled zones .

Coating and Protection

High-Temperature Coatings: Fibers can be equipped with high-temperature acrylate layers or hermetic carbon coatings to improve fatigue resistance, usable strength, a...



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