ZITHA TECH SPECIALTY CABLES (Pty) Ltd

How to differentiate between indoor and outdoor optical modules



Overview

Indoor vs Outdoor Fiber Optic Cable: Differences, Types & Selection Learn the key differences between indoor and outdoor fiber optic cables, including stru.

Key Takeaways

Indoor optical modules are designed for controlled environments with flexibility and fire safety, while outdoor modules are ruggedized for harsh conditions, long distances, and mechanical stress.Key Differences



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1. Construction and Materials Indoor optical modules typically feature a plastic sheath or LSZH (Low Smoke Zero Halogen) jacket that protects the fibers while remaining lightweight and flexible, suitable for office or data center environments. Outdoor modules, in contrast, often include HDPE jackets, metal armoring, or additional protective layers to withstand moisture, UV exposure, extreme temperatures, and physical impacts such as rodents or mechanical stress . 2. Environmental Resistance Indoor modules are not designed for exposure to harsh weather and are intended for controlled indoor conditions. Outdoor modules are engineered to endure rain, UV radiation, temperature fluctuations (-40°C to +70°C), and direct burial or aerial installation . 3. Tensile Strength and Durability Indoor modules have lower tensile strength because they are not expected to bear heavy loads. Outdoor modules are reinforced with aramid yarn, fiberglass rods, or metal armor, providing high tensile strength to survive long-distance installations, aerial suspension, or underground burial . 4. Fire Safety and Codes Indoor modules must comply with fire safety standards, such as plenum or riser ratings, to prevent smoke and toxic emissions in enclosed spaces. Outdoor modules prioritize mechanical and environmental protection over fire ratings . 5. Typical Applications

• Indoor modules: Short-range connections within buildings, horizontal and vertical backbone networks, linking computers, switches, and servers. They are lightweight, flexible, and easy to terminate .

• Outdoor modules: Long-distance links between buildings, campuses, or wide-area networks. They can be buried, installed in conduits, or mounted aerially, and are designed to maintain signal integrity under environmental stress . 6. Weight and Flexibility Indoor modules are lighter and more flexible, facilitating installation in tight spaces and around bends. Outdoor modules are heavier and less flexible due to additional protective layers and reinforcement .

Practical Identification Tips

• Check the jacket material: LSZH or PVC usually indicates indoor use; HDPE or armored jackets indicate outdoor use.

• Look for metal reinforcement or aramid yarn: presence suggests outdoor suitability.

• Assess fire ratings: plenum or riser ratings are typical for indoor modules.

• Consider installation environment: modules intended for direct burial, aerial, or conduit installation are outdoor-rated. By evaluating these factors—construction, environmental resistance, tensile strength, fire safety, and intended application—you can reliably differentiate between indoor and outdoor optical modules and select the appropriate type for your network deployment .

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