Explosion-proof requirements for optical cable splicing



Overview

AS6479/1: Splicer, Fusion, Fiber Optic, Aerospace, Explosion-Proof. This detail specification defines fiber optic fusion splicers acceptable for the inst.

Key Takeaways

Explosion-proof optical cable splicing requires certified splicing equipment, controlled optical power, and protective installation practices to prevent ignition in hazardous environments. Equipment StandardsSAE AS6479/1 specifies fiber optic fusion splicers suitable for installation and repair in potentially explosive atmospheres, particularly aerospace applications. These splicers must maintain low insertion loss while being certified for Type I hazardous environments, ensuring that the device itself does not ignite flammable gases or dust during operation.

IE

C 60079-28 addresses optical radiation in explosive atmospheres, requiring that fiber hardware limits optical power to safe levels and automatically shuts down if a fiber is damaged. This ensures that light energy cannot ignite surrounding flammable materials. Splicing Quality and PerformanceHigh-quality splices are critical for both safety and network reliability.

According to ITU-T L. 12, splices must provide low splice loss and tensile strength near the fiber's proof-test level, remaining stable over the system's design life under expected environmental conditions. Both fusion and mechanical splicing methods are acceptable, but the choice depends on performance requirements and maintenance considerations.

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Installation Practices in Hazardous Areas

Practical measures for explosion-proof splicing include: Housing connectors in explosion-proof enclosures and routing fibers through conduits or armored cables to contain any escaped light. Using certified fiber-optic interfaces and enclosures with energy-limited circuits to prevent sparks. Ensuring optical transmitter power remains within safe limits to avoid ignition.

Employing remote HMIs or thin client terminals connected via fiber to keep high-power electronics outside hazardous zones. Using durable jacketing or armored fiber cables to protect against mechanical damage and prevent flammable gas or dust propagation along cable paths.

Testing and Verification

Splice testing should follow recognized standards, using OTDRs, optical power meters, and laser light sources to verify splice loss, continuity, and proper fiber connections. Calibration of testing equipment is essential to ensure accurate measurements, particularly in long-haul or short-span applications. SummaryExplosion-proof optical cable splicing combines certified splicing equipment, controlled optical power, and protective installation practices.

Compliance with SAE AS6479/1, IEC 60079-28, and ITU-T L. 12 ensures both safety in hazardous environments and long-term network reliability. Proper conduit use, armored cables, and energy-limited circuits are essential to prevent ignition while maintaining high-quality fiber connections.

Article Content

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SAE AS6479/1 : 2015 (2020) Splicer, Fusion, Fiber Optic, Aerospace ...

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ITU-T Rec. L.12 (03/2008) Optical fibre splices

Summary Splices are critical points in the optical fibre network, as they strongly affect not only the quality of the links, but also their lifetime. In fact, the splice shall ensure high quality and stability of

Fibre Optic Cables in Hazardous Areas

As fibre optic connections become more and more often used within the process industry sometimes the connection of cables becomes a difficult task — especially in hazardous areas. Stahl

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Learn more about the requirements and current technology in optical explosion protection.

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5 vital safety rules for working with fiber optic cables

Fiber optic cable can seem safe; it doesn''t carry an electrical charge, and it''s not a heat source. More often it''s a lack of understanding of the real hazards of fiber optic cable that can be the

How Fibre Optic Cables Pose A Risk In Explosive Atmospheres

In short, while fibre optic cables are often perceived as completely risk-free in explosion-prone areas, that is only true under certain conditions. Proper protective measures – particularly

Explosion proof fusion splicer for optical fibers

The present invention relates to an explosion proof fusion splicing system for optical fiber. The system finds use in ambient conditions wherein explosive or hazardous gases are present or suspected to

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Cables and Lines for Hazardous Areas

1 Introduction This document is primarily intended for operators and installers of explosion-protected plants. The purpose of this brochure is to help them in the selection of suitable cables and cable

XXII. Fiber Optic Safety Procedures

Fiber Optic Safety Procedures 22A. Introduction This Program provides supervision, employees and safety managers with general safety rules, task safety procedures and best techniques for installation

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