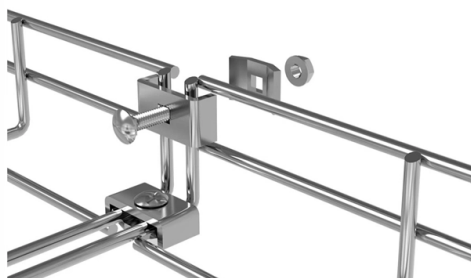


Material Requirements for Explosion-proof Boxes and Distribution Boxes



Overview

Explosion-Proof Distribution Boxes for Hazardous Areas Expert guidance on specifying, installing, and maintaining explosion-proof distribution box solutions.

Key Takeaways

Explosion-proof distribution boxes are typically made from high-grade stainless steel (304 or 316L) or Q235 steel, with strict thickness and certification requirements to ensure safety in hazardous environments.

Common Materials

Stainless Steel: Most explosion-proof distribution boxes use 304 or 316L stainless steel, which provides excellent corrosion resistance, mechanical strength, and durability in harsh environments such as petrochemical plants, coal mines, and textile facilities .

Carbon Steel (Q235): Some enclosures use Q235 steel, which is a low-carbon structural steel offering good strength and weldability, often coated or painted for corrosion protection .

Aluminum and GRP: In certain applications, aluminum or glass-reinforced polyester (GRP) may be used for lighter weight and corrosion resistance, provided they are certified for the specific hazardous zone .

Thickness and Construction

- Stainless steel boxes should have a minimum wall thickness of 4.0 mm to withstand internal explosions and prevent flame propagation .
- Specialized hinge structures are recommended to protect flameproof joints during opening and closing, extending service life .

- All fasteners should be galvanized, and internal wiring should maintain proper electrical clearance and creepage distances according to component specifications .
Standards and Certifications
- National Standards: In China, distribution boxes must comply with GB7251 design requirements .
- International Standards: Look for ATEX, IECEx, and NEMA certifications, which validate suitability for hazardous environments and ensure compliance with global safety regulations .
- Protection Types: Common markings include Ex d (flameproof), Ex i (intrinsically safe), and Ex tb (dust-proof), indicating the type of explosion protection provided .
Additional Considerations
- Ensure the enclosure material is compatible with the hazardous zone classification (e.g., Zone 1, Zone 2, Class I/II Division 1).
- Regular inspection is recommended, at least annually, to verify seals, fasteners, and internal wiring integrity .
- Modifications to certified enclosures (drilling, cutting, or machining) can void certification, so any changes must be performed by approved manufacturers . By selecting high-grade stainless steel or certified materials, adhering to minimum thickness requirements, and following national and international standards, explosion-proof distribution boxes can reliably contain internal explosions and prevent ignition of surrounding flammable atmospheres, ensuring safety and compliance in hazardous locations.

Article Content

Terminal and Junction Boxes (Ex d) | Explosion Protection

To meet diverse installation requirements, a variety of enclosure dimensions, terminals, and cable gland options are available. The

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

