

Explosion-proof distribution box protective shell



Overview

Power Distribution Systems | Explosion Protected | R. STAHL This combination enclosure allows for non-rated breakers to be used by means of explosionproof p.

Key Takeaways

Explosion-proof distribution box shells are commonly made from fiberglass (GRP), aluminum alloy, or stainless steel, each offering specific advantages for hazardous environments. Fiberglass (Glass-Reinforced Polyester, GRP)

Fiberglass shells are widely used in offshore and coastal applications due to their excellent corrosion resistance and non-conductive properties. GRP enclosures do not corrode, form galvanic cells, or suffer from chloride-induced pitting, making them ideal for salt-laden, high-humidity environments. They are also lighter than metal alternatives, reducing structural load and installation costs. GRP boxes typically meet IECEx or ATEX explosion protection standards and have IP66/IP67 ratings for dust and water ingress, along with classification society approvals for marine use .

Aluminum Alloy



Aluminum alloy shells are high-strength, lightweight, and corrosion-resistant, suitable for chemical, refining, and offshore applications. They can be precision-machined and are often used in KNBXM-type explosion-proof boxes, which allow for large internal space and easy wiring. Aluminum enclosures are compatible with Zone 1 and Zone 2 hazardous locations and can withstand explosive gas environments while maintaining structural integrity .

Stainless Steel

Stainless steel shells, particularly 316 stainless steel, offer high mechanical strength and chemical resistance, making them suitable for industrial and chemical plant environments. However, in marine or highly corrosive conditions, stainless steel can still experience chloride-induced pitting and crevice corrosion, especially at joints and cable glands, which may compromise long-term certification .

Key Considerations

- **Environment:** GRP is preferred for marine and offshore; aluminum and stainless steel are common in chemical and industrial settings.
- **Weight:** GRP and aluminum are lighter than stainless steel, easing installation.
- **Corrosion Resistance:** GRP is inherently non-corrosive; stainless steel resists corrosion but may degrade in saltwater; aluminum offers moderate corrosion resistance.
- **Certification:** Ensure compliance with ATEX, IECEx, or GB3836 standards and appropriate IP ratings for dust and water protection. Choosing the right shell material depends on the specific environmental conditions, mechanical requirements, and regulatory compliance needed for safe and long-lasting operation.

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