Distribution boxes should not be made of plastic



Overview

Compare metal and plastic distribution boxes. Learn their pros, cons, and best applications to select the right enclosure for your electrical project.

Key Takeaways

Plastic distribution boxes are generally less suitable than metal ones for high-heat, industrial, or fire-prone environments due to lower thermal resistance and mechanical strength.

Fire and Thermal Safety

Plastic enclosures, even when made from high-grade thermoplastics like polycarbonate or ABS, have lower melting points compared to metal boxes. In extreme heat or electrical fire scenarios, plastic can deform or melt, potentially exposing live components and increasing fire risk, whereas metal boxes maintain structural integrity and contain heat more effectively. Although some plastics are flame-retardant, they cannot match the fire containment capabilities of metal.

Mechanical Strength and Durability

Plastic boxes are more prone to cracking or breaking under mechanical stress, impacts, or heavy loads. In industrial or high-traffic areas, metal boxes provide superior impact resistance, protecting internal components from accidental damage. Plastic may perform well in residential or light commercial settings but is less reliable in environments with forklift impacts, heavy machinery, or high physical stress.

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Long-

Term Reliability

Plastic is susceptible to UV degradation, chemical attack, and thermal cycling, which can reduce its lifespan outdoors or in harsh industrial conditions. Metal boxes, especially stainless steel or powder-coated steel, offer long-term durability and maintain performance under extreme environmental conditions, including high temperatures, humidity, and corrosive atmospheres.

Electrical Safety Considerations

While plastic is non-conductive and simplifies earthing requirements, it does not provide electromagnetic shielding and may be less effective in protecting sensitive electronics from interference. Metal boxes offer grounding capability and EMI shielding, which is critical in industrial and commercial installations.

Conclusion

Plastic distribution boxes are suitable for residential, indoor, or corrosive environments where weight, corrosion resistance, and cost are priorities. However, for industrial, high-current, or fire-risk applications, metal distribution boxes are preferred due to their superior fire resistance, mechanical strength, thermal stability, and long-term reliability. Choosing the right material should consider environmental conditions, electrical load, safety standards, and expected lifespan.

Article Content

Metal Vs. Plastic Distribution Boxes: Choosing The Right One For

The choice between metal and plastic distribution boxes requires careful consideration of multiple factors including application requirements, environmental conditions, safety standards, and

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How to Choose Between Plastic Distribution Boxes and Metal

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This article helps readers make informed decisions when selecting between plastic and metal distribution boxes by analyzing key factors like operating environment, electrical performance

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Distribution box material options include steel, aluminum, PVC, polycarbonate, and SMC, each offering unique benefits for safety and durability.

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What Are the Main Materials Used in Distribution Boxes

You can find distribution boxes made from various distribution box materials such as steel, aluminum, PVC, polycarbonate, high-density polyethylene, and thermoset

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Pros and Cons of Plastic Electrical Boxes vs Metal

Plastic and metal electrical boxes have pros and cons. Plastic is non-conductive, lightweight, and affordable. Metal is durable, heat-resistant, and suitable for outdoor use. Homes, businesses, and

Metal Vs. Plastic Electrical Boxes: Choosing The Right One For Your

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They are also not suitable for use with metallic-sheathed wiring unless extra precautions are taken to ensure proper grounding. Choosing the Right Box for Your Project The decision

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Usually, the choice of metal or plastic electrical boxes is a matter of ease, budget, and personal preference. However, in a few cases, especially for

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You know that moment when you''re rewiring your workshop and suddenly realize your junction box looks like it survived a tornado? We''ve all been there. Choosing between metal and

Distribution Boxes Explained: Types, Functions, and

Metal Distribution Boxes: Made from steel or aluminum, these are used in places that require higher safety standards, such as fire-resistant

Distribution boxes (plastic) | Sonderhoff

Sealing of control cabinets and electrical distribution boxes made of plastic The groove contours of electronic distribution boxes and the very narrow grooves of

18th Edition Consumer Units / Distribution Boards

The oustide distribution board will have an isolator switch and an MCB to protect the shed/garden circuits. My question is do the current regs require all distribution boards to be metal or

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