

White Paper: Molded FRP Doors Vs Steel in Laboratory Environment

Introduction:

Fiber-Reinforced Polymer (FRP) doors and steel doors are both commonly used in various applications. However, when it comes to corrosive environments, molded FRP doors offer distinct advantages over traditional steel doors. In this white paper, we will explore the reasons why molded FRP doors are a superior choice for such challenging conditions.

Material Properties Comparison

1. Corrosion Resistance:

- Molded FRP Doors - do not corrode, making them ideal for harsh environments where steel doors would deteriorate over time due to exposure to chemicals, salt, or moisture.
- Steel Doors - While stainless steel has good corrosion resistance, it is not immune to rust and degradation. In corrosive environments, even stainless steel doors can suffer from pitting and crevice corrosion.

2. Strength & Weight:

- Molded FRP Doors - FRP doors are lightweight yet strong. They offer excellent strength-to-weight ratios, making them easy to handle during installation.
- Steel Doors: Steel doors are heavier, which can complicate installation and maintenance. Additionally, steel's strength can be compromised by corrosion.

Manufacturing Process and Design Flexibility

1. Seamless Construction:

- Molded FRP Doors - FRP doors are molded as a single piece, eliminating seams and joints. This seamless construction minimizes potential weak points.
- Steel Doors - Steel doors have welded seams, which can be vulnerable to corrosion. Seams are often points of entry for corrosive agents.

2. Customization and Aesthetics:

- Molded FRP Doors - FRP can be molded into complex shapes, allowing for customized designs. They can mimic the appearance of wood or other materials.
- Steel Doors: Steel doors have a more rigid design and limited customization options. Their aesthetics are often utilitarian.



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Long-Term Performance and Maintenance:

1. Durability

- Molded FRP Doors - They are virtually maintenance-free. They do not require painting, sealing, or rust prevention treatments.
- Steel doors - Need regular maintenance to prevent rust and corrosion. Repainting and protective coatings are necessary.

2. Life cycle Cost

- Molded FRP Doors - Although the initial cost may be slightly higher, molded FRP doors offer long-term cost savings due to their durability and minimal maintenance requirements.
- Steel doors - While steel doors may have a lower upfront cost, ongoing maintenance expenses can add up significantly over time.

Molded FRP



Conclusion:

In corrosive environments, molded FRP doors provide superior performance compared to steel doors. Their corrosion resistance, lightweight design, seamless construction, and customization options make them an excellent investment for long-lasting and reliable door solutions.

For more detailed technical information, refer to the AMCA white paper on Fiberglass Reinforced Polymer (FRP) as an Alternative to Stainless Steel.
References: 1. AMCA White Paper: FRP as an Alternative to Stainless Steel