

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:

- FRP Doors - do not corrode, making it 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 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:

- FRP Doors - do not corrode, making it 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 can suffer from pitting and crevice corrosion.

2. Customization and Aesthetics:

- 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.



White Paper: Molded FRP Doors: The Superior Choice for Cleanrooms

Disadvantages of Powder Coated Steel Doors:

1. Corrosion and Maintenance

- While powder-coated steel doors can resist common alcohol-based cleaners, they may degrade over time when exposed to harsher chemicals used in cleanrooms. This can lead to increased maintenance and potential replacement costs.

2. Weight and Installation

- The weight of steel doors can pose challenges during installation, requiring special equipment and care to handle and position correctly. This can increase the complexity and cost of installation.

3. Aesthetic Limitations:

- Powder-coated steel doors may not offer the same level of customization and aesthetic options as molded FRP doors, which can be finished with various colors and textures.

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