



Protecting Electrical Enclosures from UV Degradation

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The function of an electrical enclosure in an outdoor application seems relatively simple – to keep dirt, wind, and rain out. Enclosures are used to protect electrical components, control panels, and data loggers from the elements. But there is a key element that is often overlooked when considering the proper electrical enclosure to use outdoors. The sun, and the constant threat of Ultraviolet (UV) degradation, effects all outdoor applications, from solar arrays to wastewater treatment plants, irrigation systems to marine equipment. The job of an electrical enclosure is not complete if it cannot protect against UV damage, such as discoloration, yellowing, change in gloss, and fiberbloom.



Thankfully, nonmetallic enclosures are capable of handling the sun's threat, through the use of specialized materials designed to withstand UV radiation. One such fiberglass reinforced polyester (FRP) material effectively utilizes UV absorbers that provide protection by physically absorbing light in specific ranges of wavelengths, HALS (Hindered Amine Light Stabilizers), and antioxidants. Together, all three classes of stabilizers provide specific protection to modes of failure associated with outdoor exposure.

When choosing an electrical enclosure, it's imperative to research the means by which the manufacturer tests and confirms their UV resistance. At Allied Moulded Products, not only is there a dedicated materials team and onsite chemist to ensure that every batch of sheet molding compound (SMC) meets the high quality standards set for production, but samples are routinely sent to third-party testing facilities to give an unbiased and fair assessment of UV protection and how materials compare across the market.



These independent tests are crucial for understanding the wide range of UV protection available in the electrical enclosure industry. For example, while fiberbloom resistance has grown and become a marketplace standard for most manufacturers, one FRP formulation is the clear winner in discoloration, performing approximately 60% better than its leading competitor. These aesthetic effects might not damage the overall structural integrity of the enclosure, but they are an important visual representation of the end-user's product.

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While fiberglass reinforced polyester is the most popular choice for nonmetallic enclosures in outdoor environments, due to its superior resistance to hazardous chemicals and extreme temperatures, polycarbonate enclosures are continuing to grow their market presence. Specifically, clear polycarbonate is being employed in HMI cover kits and inspection windows for enclosures, indoors and outdoors alike. These enclosure accessories are often relied on to provide the same level of NEMA and UL-rated protection to sensitive and costly electrical equipment and HMI panels.

As with FRP materials, rigorous testing is the key to ensuring that these covers and windows block UV radiation. With the growth of this industrial market, distributors and end-users should expect to see new research and analytics on the UV protection properties of not only electrical enclosures, but the nonmetallic accessories that help tailor each enclosure to fit the exact needs of any outdoor application.

The harmful effects of UV degradation are a key concern for any engineer designing and building equipment for outdoor applications. Nonmetallic enclosures are a cost-effective and efficient option in these scenarios, capable of providing superior protection against the elements. Make sure to choose a manufacturer committed to developing and maintaining the highest standards of material integrity.



About Allied Moulded Products, Inc.

Allied Moulded Products, Inc., established in 1958, is a leader in the production of fiberglass reinforced polyester and polycarbonate, nonmetallic electrical boxes and enclosures, for use in residential and industrial applications globally. The Bryan, Ohio-based manufacturer is continually perfecting material and design formulations that result in products with increased strength, reduced weight, corrosion resistance, non-conductivity, UV resistance and ease of installation.