

ULTRAGUARD®



ULTRAGUARD® Material Formulation

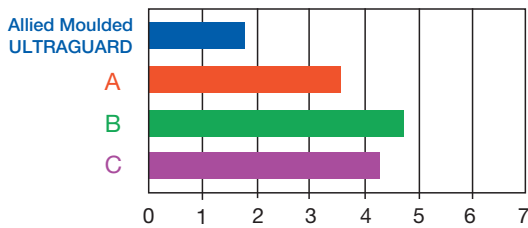
ULTRAGUARD is Allied Moulded's proprietary fiberglass reinforced polyester (FRP) material formulation. Our **Materials Research and Development** laboratory successfully optimized ingredients to create a formulation with the ability to resist the effects of UV degradation. The formulation was developed through the effective use of 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.

ULTRAGUARD Vs. the Competition

Allied Moulded's ULTRAGUARD formulation outperformed materials used by three leading fiberglass enclosure manufacturers. The following four key areas were benchmarked, with ULTRAGUARD easily coming out on top:

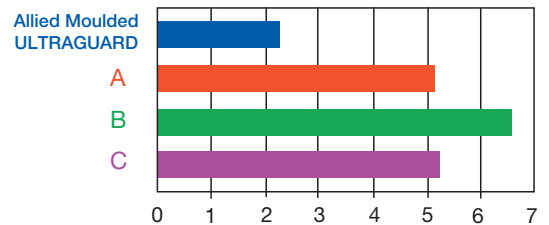
YELLOWING

- Delta b change from original
- 48-60% improvement over leading competitive enclosure manufacturers



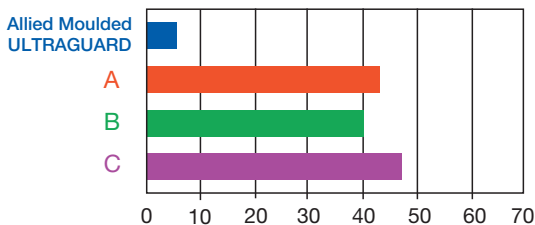
DISCOLORATION

- Delta E change from original
- 56-68% improvement over leading competitive enclosure manufacturers



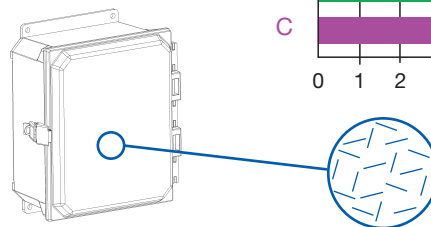
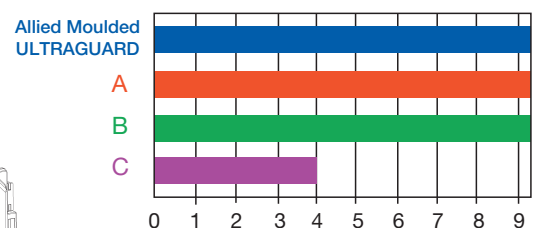
CHANGE IN GLOSS

- Percent (%) change from original
- 76-80% improvement over leading competitive enclosure manufacturers



FIBERBLOOM RESISTANCE

- Change in aesthetics and texture
- 60% improvement over one competitor
- Equivalent results compared to two remaining competitors



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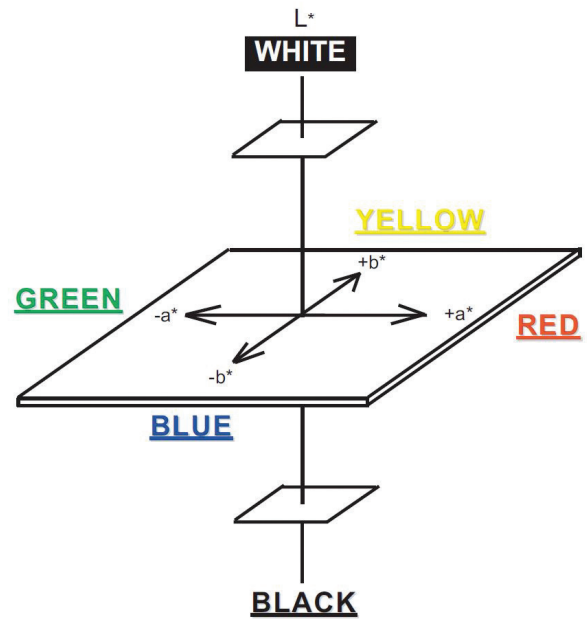


How ULTRAGUARD Benefits Customers

Allied Moulded's ULTRAGUARD formulation, while retaining its already robust structural integrity, has an enhanced surface finish with improved aesthetics. Based upon customer feedback, Allied Moulded recognized an increased number of customer applications requiring outdoor capability and the related challenges to nonmetallic enclosure designs. This is why Allied Moulded chooses to invest in continuous improvement of our material formulations. Customer applications often require enclosures to be mounted on expensive systems where aesthetic appearance is critical. Changes in enclosure color, texture, and gloss in these applications are not acceptable. Fiberbloom, for example, not only is aesthetically unattractive, but can also be a safety issue if people come in physical contact with the enclosure surface. Literally defined, fiberbloom is degradation of the polyester compound surface during long-term outdoor exposure, resulting in the eventual exposure of glass fibers. Fiberbloom does not affect the structural integrity or NEMA rating of the enclosures.

How ULTRAGUARD Results were Proven

Allied Moulded's Materials R&D lab team accepted the continuous improvement project challenge of finding a synergistic combination of compounds that would improve material resistance to color change, gloss change, surface degradation, and exposure of surface glass particles. Our team successfully met the challenge of maintaining standard material characteristics: UL 94 5V flame test standards and RoHS directive (Restriction of Hazardous Substances). The formulation does not contain antimony or halogens, which reduce the risk of smoke borne toxicity. Allied Moulded's research and development lab replaced subjective test results found in normal field testing with objective test results that were achieved with industry accepted lab equipment. Internal lab tests and outsourced, third-party, independent lab testing (by Q-lab Weathers Research Service) was conducted with a QUV accelerated weathering tester. Gloss readings were recorded using a BYK Micro Tri-Gloss machine and color data was recorded using a Hunter Lab ColorQuest sphere instrument. All test results were obtained and reported per ASTM and ISO standards.



L a* b* Color Space - Instrumental color readings utilize three numbers to describe a color baseline.*

ULTRAGUARD Vs. Steel Enclosures

There are many factors to consider when choosing an enclosure. Nonmetallic enclosures have proven to be a great alternative to steel enclosures in harsh environment applications. Properties that make the ULTRAGUARD FRP enclosures a prominent solution include their light weight, non-corrosive nature, ease of modification, resistance to dents, and inherent protection of seal integrity.

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