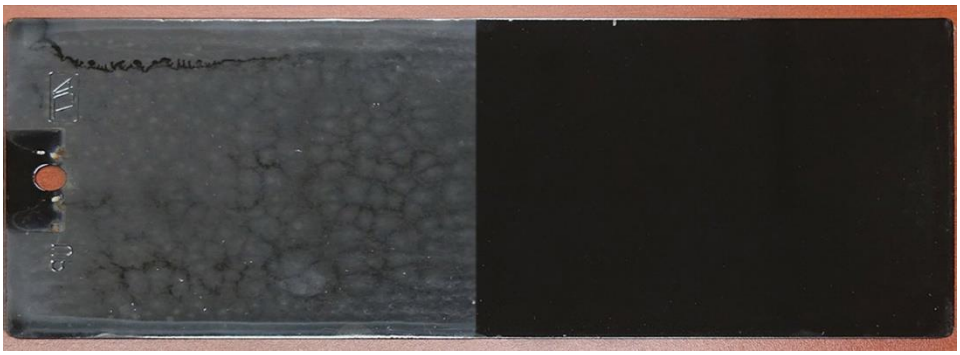
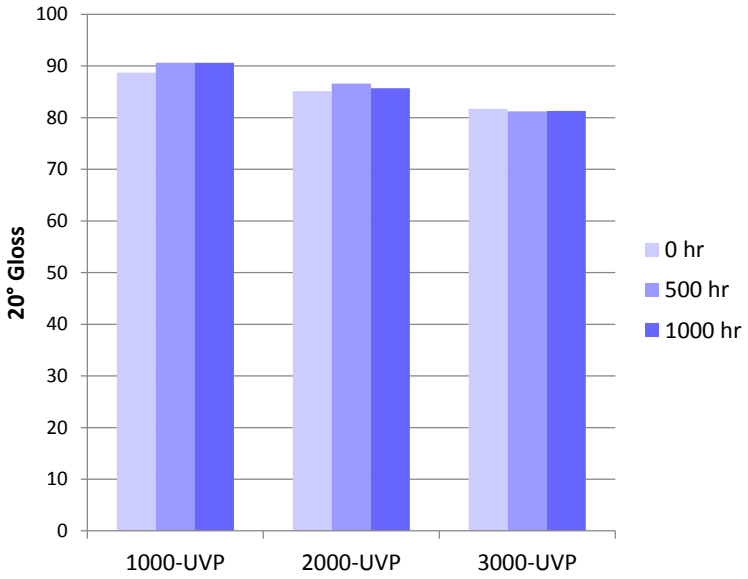
UV-Protect (UVP) Technology Brief

NANOMYTE® UV-Protect (UVP) technology preserves surface quality while providing UV protection for underlying coatings or primers. NANOMYTE® coating products with UVP technology have demonstrated their ability to endure a minimum of 1000 hours of weatherability testing per ASTM D4587, "Accelerated Weathering under Fluorescent UV-Condensation Exposure". The testing was performed in a QUV chamber under the conditions specified in ASTM G154, Cycle 1, the most commonly used exposure cycle designed to simulate severe outdoor service conditions. After 1000 hours of QUV exposure, the NANOMYTE® MEND-UVP product line is able to maintain excellent gloss and appearance for outdoor applications, such as automotive clear coats.



A test panel (primed with black epoxy) after 1,000 hours of QUV exposure:
(Left) coated with a non-UV protective urethane; (Right) coated with NANOMYTE® MEND-3000UVP

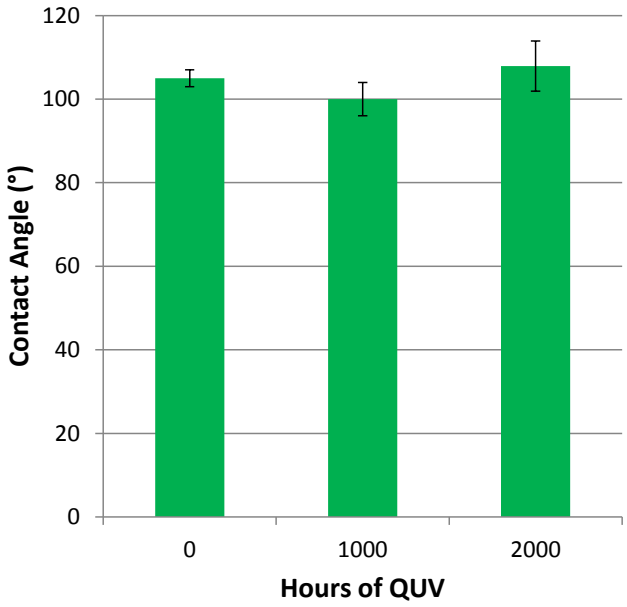


20° gloss measurements for black test panels coated with MEND-UVP before QUV exposure (0 hours) and after (500, 1000 hours) QUV exposure, demonstrate essentially no change in gloss.

Polymer and composite surfaces tend to have poor weatherability due to their high sensitivity to UV exposure. The UV-induced damage can have a variety of undesirable effects, beginning at the surface, and often spreading throughout the bulk of the material. When a coating with no UV-blocking functionality is applied to a UV-sensitive material, the surface degradation that results from outdoor exposure can rapidly degrade the coating/substrate interface, causing the coating to delaminate. UVP coatings have the ability to block UV radiation, helping to maintain excellent coating adhesion in outdoor applications. Additionally, for materials prone to yellowing, these coatings can provide a dramatic reduction in the rate and severity of color change.

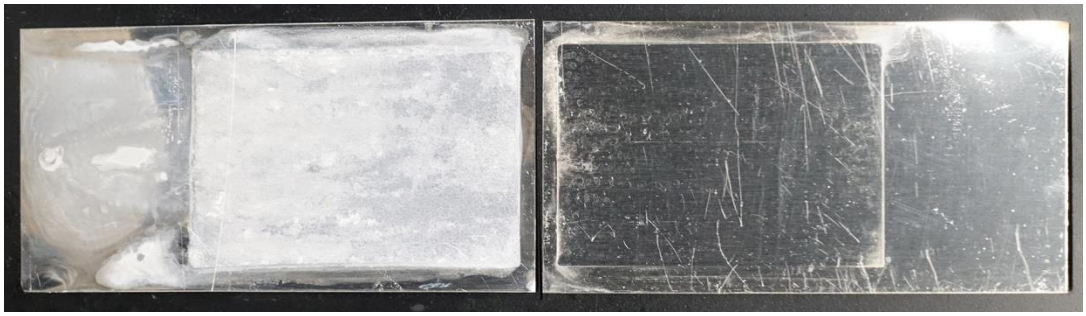
Glass fiber-reinforced epoxy composite with a non-UV protective coating (left) compared with an identical panel coated with NANOMYTE® SuperAi-UVP (right) after just one week of QUV exposure.

Coatings with easy-to-clean and anti-icing features can benefit from UV protection to help maintain these unique properties throughout long durations of outdoor exposure. Their excellent anti-stick properties and hydrophobicity help them to resist buildup of dirt, airborne contaminants, corrosion, and even ice. Measurements of hydrophobicity, as determined by average static water contact angle, show essentially no change, even after 2,000 hours of QUV exposure.



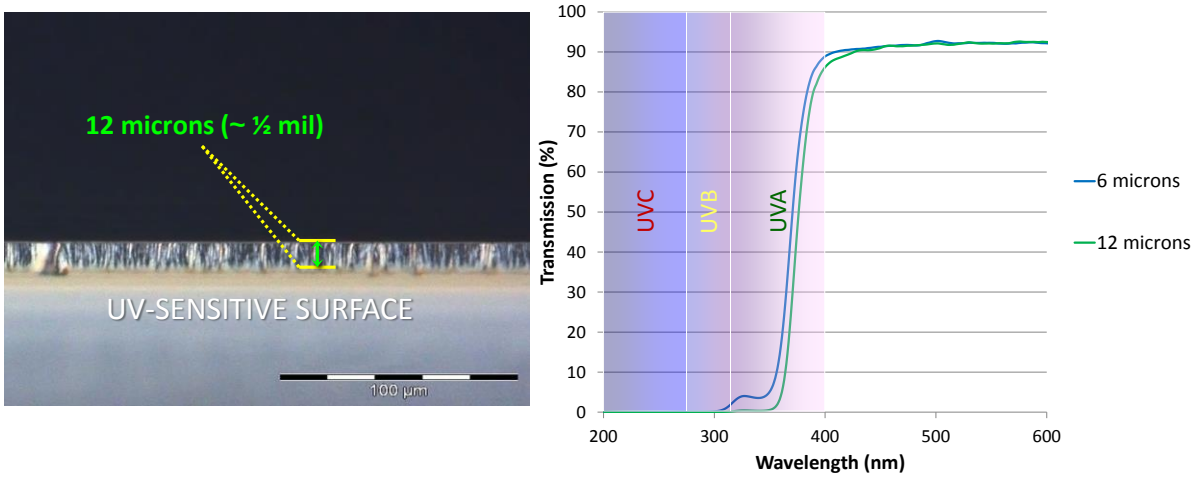
Static water contact angle measurements for SuperAi-UVP before QUV exposure (0 hours) and after (1000, 2000 hours) QUV exposure

NEI's line of thin and durable protective topcoats, formulated as one-component, ambient cure systems for ease-of-use, have been enhanced with UVP technology to extend their performance and shield sensitive surfaces. NANOMYTE® SR-500EC-UVP and SuperAi-UVP form translucent films with excellent durability, a trait not commonly associated with such coatings. NANOMYTE® TC-4001-UVP and 5001-UVP, while applicable to most surfaces, have been optimized for metals to form a hard, durable coating with excellent barrier properties to prevent moisture penetration.



Bare aluminum (left) compared with an identical panel coated with NANOMYTE® TC-4001-UVP (right) after 1,000 hours of QUV exposure.

To obtain good long-term weatherability performance when applied to UV-sensitive surfaces, the topcoat should transmit very little light at wavelengths shorter than approximately 350 nm, which includes the most damaging UVB and UVC parts of the spectrum. For relatively thin films, such as those formed by NANOMYTE® TC-4001-UVP, SR-500EC-UVP and SuperAi-UVP, obtaining the proper thickness is imperative to ensure adequate protection of the underlying substrate. Films with UVP technology supply a high degree of UV blocking, even when applied very thin. A thickness of 6 microns applied to a glass slide (¼ mil) brings 350 nm UV transmissions below 5%, while 12 microns (½ mil) provides nearly complete absorption of wavelengths below 350 nm.



Effect of dry film thickness on UV-VIS transmission

About NEI Corporation:
NEI is an applications-driven company that manufactures and sells Advanced Materials products and provides materials development services. NEI's products, which are sold under the registered trademark NANOMYTE®, are backed by a suite of issued and pending patents. The company has a nearly 10,000 square foot, state-of-the-art materials manufacturing and testing facility in Somerset, New Jersey. In addition to supplying products and services, NEI has partnered with small companies and large multinational corporations. The relationships take on different forms, ranging from strategic partnerships to joint development efforts targeted at specific applications.

For more information, contact us at : +1 (732) 868-3141 or productinfo@neicorporation.com