



Reactive Innovations, LLC

Weatherable, Transparent, Scratch & Corrosion Resistant Coating

In a recently completed Department of Energy funded program, Reactive Innovations, LLC (RIL) and its partners have formulated, designed and fabricated a coating for use in renewable energy (photovoltaic module) applications. *This versatile system can also be utilized in different applications where weatherable, transparent, scratch and corrosion resistant coatings are required.* Specifically, when coated onto Melinex 454 (Polyethylene terephthalate, PET) substrates and cured, the coating demonstrated:

- No cracking, voids, bubbles or delamination
- Excellent flexibility (no evidence of cracking) when tested per ASTM D522
- 5B rating on dry adhesion as tested per ASTM D3359
- 5B rating on wet adhesion per ASTM D3359 (after 4 hours DI water boil)
- Very high maximum use/operating temperature of 190°C
- No loss of adhesion or cracking in thermal cycling & humidity/freeze cycling
- Excellent dielectric properties per ASTM D149 (passed all testing)
- Minimal color change (delta a*, delta b* = +0.06, +0.26) during 500 hours of damp heat exposure (85%RH, 85°C)
- Coated PET showed reduced haze (~ 0.75% decrease) compared to the (uncoated) PET control during damp heat testing
- Excellent adhesion (5B rating, ASTM D3359) after 500 hours in damp heat
- Minimal color change (delta a*, delta b* = +0.13, -0.34) during 500 hours in weatherometer (65°C, 1 sun, Xenon Arc)
- Coated PET showed significantly reduced haze (~1.5% reduction) compared to the (uncoated) PET control during weatherometer testing
- Excellent adhesion (5B rating, ASTM D3359) after 500 hours in weatherometer
- Coated PET showed an increase in transmission (0.4 to 1.2%) when compared to the (uncoated) PET control
- Capability to be applied by both flow coating and solution casting
- A minimum 6 month coating solution shelf life
- Scratch hardness values [per ASTM D3363] between 7H and 9H

Additional in house testing of these coatings has demonstrated the following properties:

- Protects 6061 aluminum, steel, and copper from corrosion in a salt spray environment for periods in excess of 300 hours (per ASTM B117)
- Abrasion resistance is greater than 100 L/mil (ASTM D968, falling sand)
- Low VOCs, less than < 250 g/L (mainly alcohols)
- 5B rating on adhesion (ASTM D3359) after exposure to liquid N₂

Commercial rights to this technology are available from Reactive Innovations, LLC (RIL). The technology can be patented or can continue to be maintained as a trade secret. RIL is interested in working with commercial coating companies to further develop this technology for their specific applications. Interested parties should contact Mr. Richard M. Formato by phone [978-952-6947] or email [rformato@reactive-innovations.com] to learn more about this opportunity.