

Anticorrosive Polyurethane Clear Coat with Self-Cleaning Character

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Abstract : We have aimed to produce a self-cleaning transparent polymer coating with polyurethane (PU) matrix as the latter is highly solvent, chemical and weather resistant having good mechanical properties. Nano-silica modified by 1H, 1H, 2H, 2H-perfluorooctyltriethoxysilane was incorporated into the PU matrix for attaining self-cleaning ability through hydrophobicity. The modification was confirmed by particle size analysis and scanning electron microscopy (SEM). Thermo-gravimetric (TGA) studies were carried to ascertain the grafting of silane onto the silica. Several coating formulations were prepared by varying the silica loading content and compared to a commercial equivalent. The effect of dispersion and the morphology of the coated films were assessed by SEM analysis. All coating standardized tests like solvent resistance, adhesion, flexibility, acid, alkali, gloss etc. have been performed as per ASTM standards. Water contact angle studies were conducted to analyze the hydrophobic character of the coating. In addition, the coatings were also subjected to salt spray and accelerated weather testing to analyze the durability of the coating.

Keywords : FAS, nano-silica, PU clear coat, self-cleaning

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