THE EFFECT OF THINNER TYPE VARIATIONS AND PAINT COMPOSITION ON GLOSS, ADHESION, AND COATING THICKNESS OF ABS (ACRYLONITRILE BUTADIENE STYRENE) MATERIAL

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ABSTRACT

This study aims to analyze the effect of thinner type variation and paint composition on the quality of coating results on ABS (Acrylonitrile Butadiene Styrene) material, specifically in terms of glossiness, adhesion, and coating thickness. The research was conducted using an experimental method with the Taguchi Orthogonal Array L9 (3^2) design, involving two main factors: thinner types (A Special, High Gloss, and Autoglow) and paint composition ratios (1:1.2; 1:1.3; and 1:1.4). The painting process was carried out using a spray gun at a distance of 20 cm in accordance with ISO 12944-5:2019 standards. Testing was performed using a glossmeter for gloss measurement, a cross-cut test for adhesion based on ISO 2409:2013, and a DeFelsko PosiTector 200 for coating thickness measurement. Data were analyzed using the Taguchi method with Signal-to-Noise Ratio (S/N Ratio), while thickness data were analyzed using bar charts. The results indicate that variations in thinner type and paint composition significantly affect coating thickness and gloss, but have less significant influence on adhesion. The highest thickness was obtained using Autoglow thinner with a composition of 1:1.2, reaching 83 µm. The optimal gloss performance was achieved with A Special thinner at a composition of 1:1.3 based on the highest S/N Ratio (larger is better). Meanwhile, the best adhesion was obtained at a composition of 1:1.4 under the smaller-is-better characteristic. Overall, paint composition is the most dominant factor affecting coating quality, while thinner type acts as a supporting factor. This study is expected to serve as a reference in determining optimal painting parameters for ABS materials to achieve high-quality coatings that meet industrial standards.

Key words: *thinner, paint composition, ABS, gloss, adhesion, thickness, Taguchi method.*