ANALYSIS OF THE EFFECT OF VARIATIONS IN DRYING TEMPERATURE OF *POWDER COATING* WITH OVEN MEDIA ON THE COATING ADHESIVE STRENGTH ON ALUMINUM MATERIAL

Wendy Triadji Nugroho, S.T., M.T., M.Sc., Ph.D. Supervisor

Muhammad Fachri Ali
Automotive Engineering Study Program
Engineering Department

ABSTRACT

This study aims to analyze the effect of varying curing temperatures in the *Powder Coating* process on coating quality on 6061 aluminum, specifically on adhesion, gloss, and coating thickness. The research method used was an experimental method, with varying drying temperatures of 100°C, 150°C, and 200°C, each with a curing time of 15 minutes. Prior to the coating process, the specimens underwent a pre-treatment process, including sandblasting, degreasing, and chrome plating, to improve surface quality. The coating process was carried out using an electrostatic spray gun, followed by an oven curing process at the specified temperature variations.

Coating quality testing was carried out through adhesion testing using the cross-cut method, gloss testing using a gloss meter, and thickness testing using a thickness gauge. The results showed that increasing the drying temperature significantly affected coating quality. At low temperatures (100°C), the coating was not fully cured, resulting in poor adhesion and potential peeling. At medium temperatures (150°C), coating quality began to improve but was not yet optimal. Meanwhile, at high temperatures (200°C), the best results were achieved, with strong adhesion, higher gloss, and a more stable and even coating thickness.

Based on these results, it can be concluded that drying temperature significantly influences *Powder Coating* quality, and 200°C was the most optimal condition in this study for producing a coating with the best characteristics on 6061 aluminum.

Keywords : *Powder Coating*, drying temperature, adhesion, gloss, thickness, 6061 aluminum