

Characterization of TiO₂ Nanopaint for Automotive Application

S. Z. A Sakinah 1, W H Azmi 1,2,3,* , J. Alias 1, R Mamat 1,2,3

1 Faculty of Mechanical and Manufacturing Engineering, University Malaysia Pahang (UMP), Pekan 26600 Pahang, Malaysia

2 Automotive Engineering Centre, Universiti Malaysia Pahang, 26600 Pekan, Pahang, Malaysia

3 Centre of Excellence for Advanced Research in Fluid Flow, Lebuhraya Tun Razak, 26300 Kuantan, Pahang, Malaysia

*Corresponding author: wanazmi2010@gmail.com

Abstract:

Nanopaint is a coating that can modify the properties of a surface or substance according to user-defined parameters. Like ordinary paint, nanopaint is applied as a liquid and then hardens. Nanopaint is a suspension of liquid containing metal or non-metallic nanoparticles of typical size (1-100 nm) dispersed into the base coat paint. Single composite of Titanium oxide nanoparticle is consider an extension of research work for single nanopaint, which can be carry out through dispersed composites in basecoat paint. The objective of this study is to investigate characterize the single composition of TiO₂ nanopaint for automotive application. The nanopaint mixture was prepared at volume concentration of 1.0% using twostep method. The nanoparticles used namely TiO₂ is dispersed in a base fluid of polyester white paint. The investigation on the characterization for the nanopaint in the present study is conduct through adhesion cutter, SEM, Gloss meter and surface roughness meter. The findings from the investigations on the characterization of nanopaint show that the paint each all the required value for the normal paint characterization. Comparison data between 1% weight concentrations for nano painy to the normal paint also confirm the increase in the surface roughness quality which is 0.10 less surface deviation compare to normal paint and gloss value up to 26% more glossier. It can be concluded that the nanopaint were successfully prepared and achieved good characterization.

Keywords: Automotive Application; Defined Parameters; Characterization.

ACKNOWLEDGMENT

The authors are grateful to the Universiti Malaysia Pahang for financial supports given under RDU1803169. The authors also thank the research team from Automotive Engineering Centre (EAC) and Advanced Automotive Liquids Laboratory (AALL), who provided insight and expertise that greatly assisted in the research.