

**ELECTROCHEMICAL AND MECHANICAL PROPERTIES OF  
BINDER SYSTEM MIXED WITH NANO-CLAY**

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## ABSTRACT

### **ELECTROCHEMICAL AND MECHANICAL PROPERTIES OF BINDER SYSTEM MIXED WITH NANO-CLAY**

The purposes of this thesis were to investigate the mechanical and electrochemical properties of coating system. A Dammar-Polyol binder system was examined by adding with nano-clay, Bentonite. The coating system was coated on Aluminium Q-panel as substrate. Curing time was taken five days before coating were tested by using cross-hatch test (ASTM D 3359-87) and impact test. The results were presented in term of damage grids in each sample and investigated the extent of the coating ability toward adhesion. Both of two tests showed a similar result in which the good performance was performed in 0.2 D sample which containing 20 wt% of dammar. Meanwhile, coating resistance,  $R_c$ , property of sample was characterized by electrochemical impedance spectroscopy, EIS, while the coated substrate was immersed in 3wt% of NaCl for 30 days. The result indicated that the 0.5 D which containing 50 wt% of dammar showed higher coating resistance than the other samples. However, the mixing of nano-clay into the Dammar-Polyol binder system was resulted the coating resistance of the sample became worse. But the addition of nano-clay was enhanced the mechanical properties of Dammar-polyol binder system.

## CHAPTER 1

### INTRODUCTION

#### 1.1 Background of coating.

Coating was used for many reasons. People use coating for decoration, protection, instant recognition or corrosion prevention. For decoration, coating was used for the items such as bottles, boxes and cans as to attract customers to buy the products. Besides the aesthetic value, coating was used in building as a protection against weather. As sign to the road user, coating also was used for instant recognition and for metal application like cars, bridge, coating acts as a protection layer to metal surface, as corrosion prevention and form longer promoting life time of metal. (Turner, 1998)

All surface coating has two principle components. The first is a thinner or solvent, sometimes called diluents, the component which is to make the coating liquid enough to be easily and evenly applied by any method. The second is a film-form, also known as medium vehicle or binder. (Turner, 1998)

Paint binders was used to help bind the paint pigment to the surface and to bind the pigment into a continuous film. The type, quality and quantity of binder used in a particular paint will affect a wide range of performance characteristics, including durability, stain resistance, adhesion and crack resistance. In most cases,