ABSTRACT

EFFECT OF INCREASING NBR (NITRILE BUTADIENE RUBBER) TOWARD THE WEARABILITY OF FLY ASH PHENOLIC COMPOSITE ON BRAKE CANVASS

By:

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Brake canvass is a component that is being used everyday when driving and it has function to decelerate or stopped vehicle speed. Our research was make a brake canvass specimen for train using composites. The composite is made using materials that good for nature, like phenolik resin, fly ash, NBR (Nitrile Butadine Rubber), BaSO4, graphite, iron powder.

The composition of the materials for composite is 60%, 15%, 10%, 5%. The manufacture of the specimen is done by holding time method at desired temperature and compacted in the suppression of 5 tons and held for 30 minutes. Furthermore is curing process with furnace for 4 hours with temperature at 150°C. After obtaining the desired specimen with variations specified and conducted the testing process of wear and tear with ASTM G 99-95.

The result is that the composite with 15% of NBR have the lowest wear and tear rate. Average results of wear and tear on upper surface of composite is $1.97 \times 10^{-6}$ mm$^3$/mm, and average results of wear and tear on under surface is $2.00 \times 10^{-6}$ mm$^3$/mm. That is because the more the percentage of NBR, the higher the wearability capabilities composite to withstand loads friction.

The test results of composite wear and tear rate is not low enough, because of the uneven distribution during the fabrication process and mixing the powder particles. SEM photograph conducted to determine the wearability and identify the cause of failure in composites. Results of SEM photo shows the bonding in the composite structure Nal53 better than composite Nal51.

Key Word: Brake Canvass Composite, Phenolic Resin, Fly Ash, NBR (Nitrile Butadine Rubber), Graphite, Iron Powder, Wear And Tear, SEM