

**COMPARATIVE ANALYSIS OF THE PERFORMANCE OF BRAKE PADS
MADE FROM OIL PALM FIBER AND COFFEE HUSK AS
ENVIRONMENTALLY FRIENDLY MATERIALS**

Andik irawan, S.T., M.Eng., P.hD. *as chief counselor*

By

Muhammad Lutfi Kurniawan

*Automotive Engineering Study Program, Departement of Engineering, State of
Polytechnic of Jember*

ABSTRACT

This study aims to analyze the comparative performance of brake pads made from oil palm fiber and coffee husk as environmentally friendly alternatives to synthetic materials. The method used is experimental by producing composite brake pad specimens with variations in material composition, combined with epoxy resin as a binder and iron powder and ceramic as fillers. The tests include hardness (Shore D), wear based on mass loss, and braking performance at a speed of 40 km/h with a pressure of 1.5 MPa for 60 seconds. The results show that standard brake pads have the best performance, with a hardness of 81.50 HD and wear of 0.1 grams. Coffee husk brake pads perform better than oil palm fiber, with hardness values of 56.88–73.50 HD, wear of 0.1–0.5 grams, and more stable braking performance. Meanwhile, oil palm fiber brake pads have hardness values of 54.00–73.00 HD and wear of 0.1–0.6 grams with less stable performance. Overall, coffee husk is the most optimal material among the tested natural materials, although it has not yet matched the performance of standard brake pads.

Keywords: *brake pad, coffee husk, oil palm fiber, wear, hardness*