

THE NATURE FOR THE FUTURE

PALM OIL BASED MAGNETORHEOLOGICAL BRAKING SYSTEM



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INTRODUCTION

- Magnetorheological fluid consider as intelligent material where it state can be change from liquid to solid with presence of magnetic field.
- This properties used in this invention to design and develop a braking system for any moving system such as automotive and machine tool.
- Magnetorheological braking system offers several advantages such as fast response, low heat dissipation, controllable deceleration, long-life braking system and, no brake pad.
- In order to support a green technology novel palm oil based magnetorheological fluid was invented in this project to act as an active material in the braking system. The novel fluid give a significant improvement in term of viscosity and fast response compared with petroleum based magnetorheological fluid.

PROBLEM STATEMENT

- Heat dissipation in drum brake reduce the efficiency of braking system and increase a maintenance cost. Complex mechanism and numbers of component deduce the reliability of conventional braking system.
- Embedding a green technology concept for any single component such as braking system in industry is compulsory nowadays. Thus, the solution for any industrial problem should lead to energy efficient and organic based material.



MAGNETORHEOLOGICAL FLUID (MRF) BRAKING PROTOTYPE

- Weight = 3 kg
- Diameter = 158 mm
- Coil wire size = AWG 21 (236 turns)
- Max current = 2 A
- Magnetic material = Steel 1018
- Non-magnetic material = AL T6061
- Max Braking Torque = 23 Nm @ 2 A

NOVELTY

- Geometrical design
- Palm oil based magnetorheological fluid
- Brake disc design
- Controller algorithm

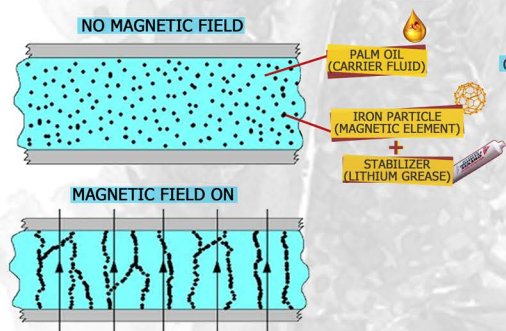
GREEN ASPECT

- Promoting used of nature material
- Support for degradable
- Renewable source

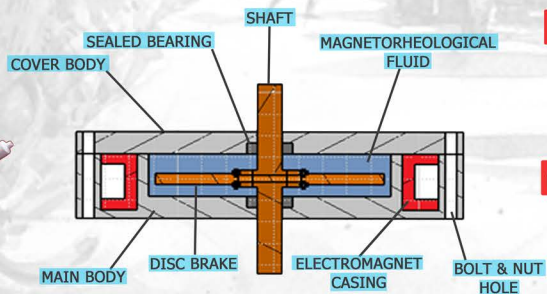
POTENTIAL MARKET & APPLICATION

- Automotive industry
- Hydraulic system
- Robotic mechanism
- Machine tool industry

MRF WORKING PRINCIPLE



MRF BRAKING CROSS-SECTIONAL



ANALYSIS

