Formulation of eco-friendly lubricant from non-edible vegetable oils

 Juliana Basiron1, Mohd Fadzli Bin Abdollah1,2,\*, Muhammad Ilman Hakimi Chua Abdullah1,2,

Hilmi Amiruddin1,2

1) Fakulti Kejuruteraan Mekanikal, Universiti Teknikal Malaysia Melaka,

Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia

2) Centre for Advanced Research on Energy, Universiti Teknikal Malaysia Melaka,

Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia

\*Corresponding e-mail: mohdfadzli@utem.edu.my

**Keywords**: Non-edible vegetable oil; eco-friendly lubricant; tribology

# ABSTRACT – This study aims to examine the impact of eco-friendly lubricants on friction and wear characteristics. The formulation of eco-friendly lubricant is made by combining SAE 15W40 with non-edible vegetable oils (castor oil and jatropha oil) in a range of 0-100 vol.% using sonication technique. According to engineering standards (ASTM D4172-94), a four-ball tribometer was used to conduct the tribological test. The diameter of the wear scar was measured using a digital microscope. A tribological test reveals that the formulation of eco-friendly lubricant containing 80% SAE 15W40, 10% castor oil, and 10% jatropha oil has the lowest coefficient of friction and wear scar diameter of 0.07560 and 386.3 µm, respectively. Thus, the formulation of eco-friendly lubricants demonstrated superior lubricant performance when compared to pure SAE 15W40, castor oil, and jatropha oil.





Variation in the coefficient of friction and wear scar diameter of eco-friendly lubricants formulated from mixture of engine oil and non-edible vegetable oils.