

**STUDY ON MECHANICAL PROPERTIES AND RHEOLOGICAL
BEHAVIOUR OF POLYPROPYLENE REINFORCED PALM OIL EMPTY
FRUIT BUNCH**

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ABSTRACT

In this project focused on the mechanical properties and rheological behavior of Polypropylene (PP) reinforced with Palm Oil Empty Fruit Bunches (POEFB). The aim of this project is to determine the properties of PP/POEFB with different concentration 2wt%, 4wt%, 6wt% and 8wt% of POEFB fibre. The particle size of POEFB is carried out in the range of 45 to 56 μm . The POEFB powder was sieved and mixed by using dispersion machine technique at a temperature 200 °C to form a pellet. The pellets were hot pressed at a temperature of 190 °C and pressure of 500 psi. The mechanical properties of the sample were evaluated by tensile test, flexural test and impact test according to BS EN ISO 527-2, BS EN ISO 178 and BS EN 6603-2 respectively. From the tensile test, 6 wt% of reinforcement fiber of tensile strength (MPa) is higher which value 23.32 MPa compare to unreinforced fiber while 4wt % of reinforcement fiber is greater of modulus (MPa). For flexural test result obtain, flexure strength (MPa) and modulus (MPa) at 6wt% has greater value which are 82.01 MPa and 6605.95 respectively compare to unreinforced fiber which are 69.84 MPa and 6605.95 MPa. However, different result gained on the falling weight impact test, which shows the unreinforced fiber has greater energy to maximum load (J) at value 1.708 J compared to the reinforcement fibre at 4wt% that obtained 1.489 (J) at full penetration. From observation of rheology analysis, 2 wt% is the best feedstock by considered to be a shear thinning or pseudoplastic fluid, which indicate a decreasing of viscosity at value 21.42 Pa.s but increase shear rate at 4176.82 s^{-1} compare to 4wt% and 6wt%.

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