

## **Development of biocomposite wall cladding from kenaf fibre by extrusion molding process**

### **ABSTRACT**

Nowadays, natural fibre-thermoplastics composites (NFPC) are replacing the conventional wood and timber due to its lower cost, avoid deforestation, higher strength-to-weight ratio and resistant to termites. These composites can be utilized for non-structural components of a building system such as decking, wall cladding, floor tiles and window frame. A natural fiber/plastic composite was produced by extrusion molding process to create a wall cladding profile. The raw materials used for the composites are 40% kenaf fibre and 60% polypropylene (PP). These materials were compounded through a twin-screw extruder and then cut into pellets. The moisture content found in the kenaf/PP composites (KPC) pellets was 2.89%. Therefore, the pellets required to be oven dried every time right before entering the hopper of the extruder. The temperature along the barrel was set to 180°C and the die head temperature is set to 165°C. At the end of the extrusion molding process, pressurized air was used for cooling the profile. Then, samples of the wall cladding were taken back to the laboratory for product quality assurance. Measurements of the samples show that the product experiences 3% of shrinkage in term of width and 1% of shrinkage in term of thickness. Water absorption test indicates an increase of 13.6% of weight after 24 hours immersion of water. Impact strength test was also conducted on the wall cladding samples and the mean result was 2.55 kJ/m<sup>2</sup>. Tensile test on the extruded KPC product indicates a low tensile strength at 4.51 MPa and tensile modulus of 205.01 MPa. The sample also proven to be light weight as the density of the material was found to be 0.618g/cm<sup>3</sup>.

**Keyword:** Extrusion molding; Kenaf; Kenaf-plastic composite; Mechanical properties; Polypropylene