

## **Effect of oil palm fiber on mechanical properties of sandwich-structured glass**

### **ABSTRACT**

The aim of this study was to develop a sandwich-structured glass using a conventional stacking method. The sandwich-structured glass comprised two facesheets of silicate glass, and the interlayer part was made up of different core elements, which are epoxy and oil palm fiber, to yield impact resistance features on the glass structure. Scanning electron microscopic image showed a modification in surface morphology of spikelet and stalks fibers, with a formation of fibrils in helical spirals and an appearance of a rougher surface after chemical treatment during extraction process. Mechanical properties of the sandwich-structured glass increased from 280.60 MPa to 402.46 MPa after the incorporation of oil palm fiber and epoxy in the interlayer part. The interlayer part acted as a platform to distribute applied stresses and enhanced the compressive strength of the glass. The generation of cracks on the glass surface varied significantly, depending on the type of fibers used as fillers and the interfacial bonding in the interlayer part of the sandwich-structured glass. The current design of sandwich-structured glass showed the desired mechanical properties and moderate appearance of glass fractures, which can be used as an impact-resistant glass in the construction field.