

Aluminium/floral foam laminated composites under flexural and compression test

Abstract

This study is concerned on evaluation of laminated composites of aluminium (Al) sheet and floral foam (FF) under flexural and compression test. Effect of different layers of Al/FF laminated composites was evaluated. Epoxy and hardener was used as the adhesive to bind the surface between the Al sheet and FF. The information on the functional group that exists in FF during the formation of the foam was verified by Fourier Transform Infrared Spectroscopy (FTIR) analysis. From flexural and compression test, the mechanical properties decreased with the increasing number of layers of Al/FF laminated composites. The load cannot be distributed uniformly across the composite layer thus results in failure. Optical Microscope (OM) was used to see the adhesion between the layers of Al/FF laminated composites. One layer (1L) of Al/FF shows good adhesion while for four layer (4L) of the composites show phase separation and the excess adhesive around the interface. This shows that the adhesion between the layers also contribute to the failure of the laminated composite. FTIR analysis shows that the FF consists of amine group (at 3587.95 cm^{-1}), alcohol group (at 3305.35 cm^{-1}) and alkyl group ($>900 \text{ cm}^{-1}$) which is the main functional group found in polyurethane foam.

Keywords — Aluminium, compression test, flexural test, floral foam