



A STUDY TO INVESTIGATE THE IMPACT RESISTANCE OF CEILING SHEETS AND SEPARATION BOARDS MADE USING TEXTILE WASTE

*M.A.D.S. Priyakumari, M.E.R Perera**

Department of Textile and Apparel Technology, The Open University of Sri Lanka

Textile waste generation has rapidly increased with the rising levels of garment production. At present, all the textile waste is not being reused; they are generally dumped in open areas. That has created a huge environmental problem in Sri Lanka and all over the world. The main objective of this research is to investigate the impact resistance of ceiling sheets and separation boards made using textile waste.

The types of textile waste material and their combinations, resin type, suitable thicknesses for the planned composites and the weight ratios of textile waste material to resin were selected to perform the investigation. The test results of the composite samples were evaluated for various aspects to determine their suitability for the intended end uses. Thirty (30) composite samples were produced in 1x1foot size. In this study, the impact resistance and the weight of the samples were determined. The impact resistance of the composite samples of 25 mm thickness showed higher values than the impact resistance of the composite samples of 5 mm thickness for each of the three (03) fabric to chemical ratios. When each thickness was considered separately, it was evident that the breaking load of the tested composite samples increased with the increment of the chemical component. However, it was difficult to establish a relationship between impact resistance and fabric ratios used with the collected data. Further investigations should be carried out to determine the optimal fabric ratios. The values of the tested samples were compared with the two selected commercial products. As per the test results of the impact resistance of the tested composite samples, it is evident that the resulting values are higher than the selected commercially available products. It was also found that the developed composite samples can also be coloured using rubber, varnish paints and pigment dyes. Further studies should be carried out to investigate the compressive strength, tensile strength, thermal conductivity and possible water absorption etc. of the developed samples to perform a comprehensive comparison with commercially available products.

Keywords: Textile waste, Textile reinforced composites, Impact resistance, Ceiling and separation boards

**Corresponding author: meper@ou.ac.lk*