

## Study of the Effect of Sewing on Non Woven Textile Waste at Dry and Composite Scales

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**Abstract :** Textile waste recycling has become a necessity considering the augmentation of the amount of waste generated each year and the ecological problems that landfilling and burning can cause. Textile waste can be recycled into many different forms according to its composition and its final utilization. Using this waste as reinforcement to composite panels is a new recycling area that is being studied. Compared to virgin fabrics, recycled ones present the disadvantage of having lower structural characteristics, when they are eco-friendly and with low cost. The objective of this work is transforming textile waste into composite material with good characteristic and low price. In this study, we used sewing as a method to improve the characteristics of the recycled textile waste in order to use it as reinforcement to composite material. Textile non-woven waste was afforded by a local textile recycling industry. Performances tests were evaluated using tensile testing machine and based on the testing direction for both reinforcements and composite panels; machine and transverse direction. Tensile tests were conducted on sewed and non sewed fabrics, and then they were used as reinforcements to composite panels via epoxy resin infusion method. Rule of mixtures is used to predict composite characteristics and then compared to experimental ones.

**Keywords :** composite material, epoxy resin, non woven waste, recycling, sewing, textile

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