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WASTE FIBER REINFORCED COMPOSITE MATERIALS: PRODUCTION AND MECHANICAL PROPERTIES

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Today, the cost, excellence and availability of raw materials are of principal importance. Due to environmental concerns, a very large number of companies are currently developing manufacturing processes using alternative materials for their crop and in search of new markets for the sub-products of their first-line production.

Textile industry is an example of the reality that the industry is living these days. With a significant production of waste fibrous materials, textile companies are now looking for applications where waste materials could be an added-value material.

Composites reinforced by fibres are being considered for several uses when high performance is essential. The corrosion resistance, potentially high overall durability, light weight, tailor ability and high specific performance attributes enable the use of composite materials in areas in which the use of conventional material might be constrain due to durability, weight or lack of design flexibility

This paper describes the work that is being done at University of Minho concerning the development of waste fibres reinforced composite materials.

Different waste fibres reinforced composite materials have been produced varying the density and the variation in ratio of resin and waste fibres. Waste fibres have been collected within the Portuguese textile and processed in order to individualize the fibres and to allow subsequent processing. Composite panels have been produced by compression moulding technique, through the application of heat and pressure. Panel thicknesses of 5 mm using resin aminoplastic for urea-formaldehyde have been produced. Materials thus obtained have been tested in tensile, bending, compression test and water absorption. The results obtained are presented, discussed and compared to models. The Figure 1 shows the curves F- ε obtained in compressive strength.

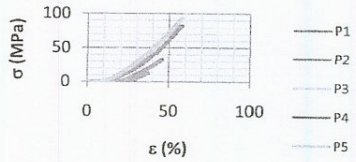

Figure 1 - Compressive F- ε, behaviour of waste fibres reinforced composite materials.

The Figure 2 shows the waste fibre and the panel produced.

Figure 2 - Waste fibre.

Keywords: Composite material; Waste fibres.