

• **Flax and glass fibre reinforced PP composites: adhesion between PP and reinforcing fibres**

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Abstract content

The present work is focused on the creation of thermoplastic matrix composites with the appearance of natural materials. For this purpose, PP is reinforced with flax and glass fibres, taking special care in the interfacial adhesion between reinforcement-matrix. By using a low-pressure cold plasma surface treatment on the flax fibres, it was possible to decrease the contact angle, thus increasing the wettability of the thermoplastic on the reinforcement. The thermogravimetric analysis of the flax fibres provided the temperature at which the fibres start to degrade (250°C). The melting temperature of the polypropylene was obtained by DSC (165°C). The manufacture of the composites was carried out by means of a hot plate press, being necessary to optimise the pressure, temperature and time parameters. The materials obtained are mechanically characterised by means of tensile tests, obtaining the maximum tensile stress, modulus of elasticity and energy used to cause rupture. The results show that the inclusion of a glass layer between the flax layers increases the strength of the material by 40%. A second layer of fibre reduces the stress due to the increase in cross-section and only provides a 6% increase in deformation and a 15% increase in the energy required to cause the material to break. By SEM it is possible to observe the good interfacial adhesion between the flax and glass fibres and the PP matrix.