

Hemp fiber employment in Composites

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Hemp is a sustainable source of natural fibres that can contribute to meet the increasing demand for technical applications, in particular in the composite sector. Until recent years, in Europe, hemp fibres have been mainly used for non-structural components for the construction, insulation, automotive and plastic industries. The only really well-established markets are press moulding and injection moulding for automotive interior applications and wools for thermal insulation. In this type of products, hemp fibres are used in the form of short fibres or non-woven reinforcement. They are being employed primarily as light, cheap, and eco-friendly reinforcement playing only little or no structural role. Considering their high mechanical performance, the next step was to attract industrial interest towards the use of plant fibres as a substitute to the traditional composite reinforcement, specifically E-glass, in load-bearing materials. This was addressed during the European project SSUCHY (Sustainable structural and multifunctional biocomposites from hybrid natural fibres and bio-based polymers, www.ssuchy.eu). The main objective was to take advantage of availability, technical and environmental-friendly characteristics and moderate cost of hemp fibres to market a high-performance plant fibre reinforcement for composite application. During the project, numerous efforts were made to manufacture aligned and continuous reinforcement from discontinuous technical hemp fibres. Results demonstrated that using suitable retting and processing settings, hemp can achieve properties comparable to high quality long flax fibres for high-performance composites. The high technical potential and environmental benefits of hemp-based structural composites were demonstrated at the scale of four product demonstrators: floor and trim panel structures for car, a cockpit panel for electric aircraft, a monocoque structure for electric scooter and high-end green loudspeakers.