



**Project title:** FIBERCARE

**Project objective:** The aim of this project is to develop a prototype machine for the production of prepregs (PrePreg) in composite with recycled carbon fibres, validating the material through its characterization and creating products for the automotive industry. The use of recycled fibers in prepregs offers numerous advantages over traditional continuous fiber prepregs, such as considerable impact resistance and ease of processing. Prepregs are composite materials in which a reinforcing fiber is pre-impregnated with a thermoplastic or thermosetting resin matrix. Prepregs have high mechanical properties, compared to the materials most used in the manufacturing industry, combined with light weight and are polymerized at high temperatures and pressures. Once molded through a preform, the prepreg is heated and cured at high temperatures to achieve complete polymerization. The reinforcement in a prepreg can be made up of unidirectional fibers (UD Tape) or a fabric (Twil or Plain type). The project involves the use of recycled carbon fibers used to create an innovative prepreg strongly oriented towards respecting the environment and reducing energy consumption. Using recycled variable size fibers provides an important innovation in terms of research and development on current technology. In fact, the carbon fibers that derive from the separation process from the resin do not have geometric continuity and therefore it is not possible to create a regular weight, furthermore the mechanical characteristics tend to change. In fact, the molecular discontinuity between the various carbon fibers leads to having different characteristics in the direction of the three fundamental axes. The project therefore involves the study, analysis, development, design and construction of a machine that will produce prepreg from recycled carbon fibres, to achieve a TRL of 8. The main innovative results of the project are the prototype production line and a line of new prepreg materials for use in the automotive field, which maintain mechanical and physical characteristics similar to those currently most used, in line with the proposed requirements of the tender. The possibility of being able to enter a sector mainly oriented towards the development of prepreg from continuous fibres, allows the creation of a competitive advantage both for the user company and for Comec; for the first both thanks to the lower environmental impact, therefore the possibility of recognizing itself within the ISO 14001 regulation, and to the lower cost. For Comec both thanks to an increase in company turnover, the increase in construction capabilities and the growth of mechanical and technical knowledge..



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