



Internship – 2nd year of Master (6 months)

Towards recycling of thermoplastic composite materials.

The development of thermoplastic composites and their manufacturing processes are environmental challenge for the years to come. They offer a unique mechanical performance/density ratio, can be provided with special features, and gradient properties in a wide range of areas. Finally, they are potentially recyclable, making them suitable candidates for the future in the fields of energy and mobility.

The AWESOME professorship (mAnufacturing of neW génération Sustainable and therMoplastic coMpositEs) offers a unique framework by bringing together quality partners with wide and varied expertise in the necessarily interdisciplinary approach of the actions to be carried out. Each partner is equipped with innovative and complementary technological platforms and characterization techniques, ranging from the molecular scale, to that of the part taking into account its high-speed production. The professorship activities are based on modelling, engineering, simulation and data analysis work, in order to propose solutions for advanced applications.

In the framework of the internship, exploratory work on the mechanical recycling of thermoplastic composites will be carried out. The aim is to study the influence of the pre-treatment of the composite (namely, the grinding step) on the properties of the recycled material. The student will work on production waste of composite with a PA or an polyacrylic matrix. The samples will be provided by industrial partners in the project.

The trainee will have to:

- Study the feasibility of grinding of the composites, in order to obtain different sizes of flakes
- Study the feasibility of processing these grinded samples with various TP processing techniques (extrusion, compression moulding)
- Characterize the obtained recycled material, particularly the rheological and mechanical properties.

Keywords:

Thermoplastic composite materials. Grinding. Mechanical and rheological characterization. Recycling, Dispersion of properties.

Activities:

Bibliography and study of local actors (25%)

Experimental work (grinding, test tube injection, mechanical characterization) (65%)

Analytical work and synthesis (statistical study of results obtained, writing of test reports and study) (10%)

Skills: curiosity, seriousness and autonomy, fluency in English (document reading)

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