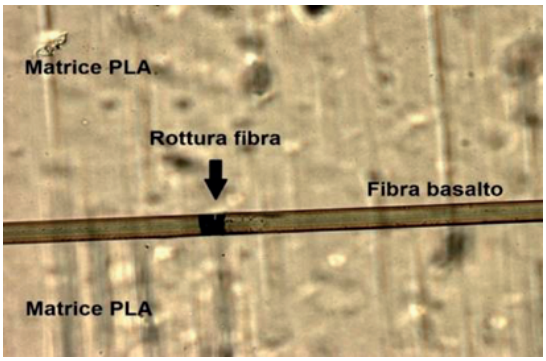
NACE CODE C13, C22, C29, C30, C31, C32, E38, F41, F42

DEVELOPMENT OF HIGH PERFORMANCE POLYMER COMPOSITES AND RELATED PROCESSES FOR THE PRODUCTION OF COMPONENTS

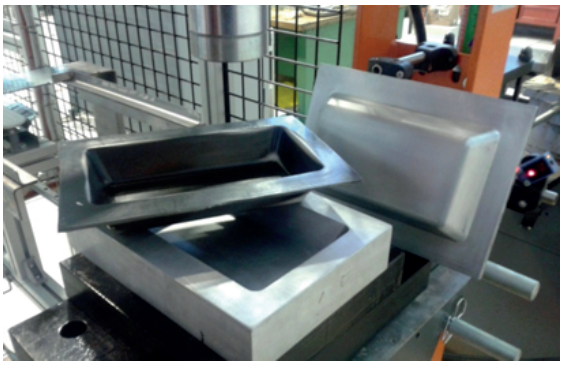
Innovations and Benefits - Polymer composite materials are increasingly popular since they allow the components produced with them to achieve performances unreachable by traditional materials (e.g. lightening, resistance to environmental conditions, resistance to fatigue, cost reduction, environmental sustainability). ENEA has infrastructures and skills able to design innovative composite materials according to the specific application.
Study and testing of new base materials for composites (matrix, fibers, additives and fillers) and their best combinations.
Development of innovative techniques for the production of composite materials with thermoplastic or thermosetting matrix, with long or short fibers. Development of jointing systems for polymer composites, also with materials of different nature such as metals.
Development of low-environmental-impact composite structures using biopolymers, natural fibers and recycled fibers.

Use - Composite materials for: vehicle lightening, furniture and design, for sport equipment, the wind sector, the reinforcement and insulation of building and civil structures.
Innovative fibers for technical textiles, starting from natural and recycled materials.
Development of welding processes of thermoplastic matrix composite materials.

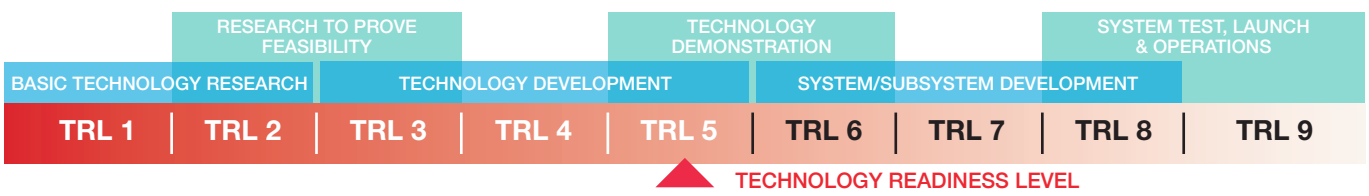
Applications and ongoing Activities - Development of thermoplastic compounds reinforced with innovative basalt fibers, in collaboration with Adler Plastic and FIAT Research Center (MATRECO project - PON01_02239).
Set up of an induction welding process of thermoplastic matrix composite materials, in collaboration with CETMA.
Set up of a "Method for making recycled carbon fiber yarns" [WO 2013050942 A1N].
Set up of an "Apparatus and method for making recycled carbon fiber felts" [WO2013144844 A1].
Development of a process for spinning glassy industrial waste.



1) Optical microscope image: fiber/matrix adhesion test



2) Biocomposite component made by thermoforming technique



Italian National agency for new technologies, Energy and sustainable economic development
www.enea.it

Department for sustainability
Division Sustainable Materials
Laboratory Functional materials and technologies for sustainable applications
Contact: Flavio Caretto - flavio.caretto@enea.it