



Partners



The Esprit partners at Valencia's City of Arts and Science during the year 1 meeting



Esprit – a new project launched to expand the versatility of Self Reinforced Plastics with partners from across Europe

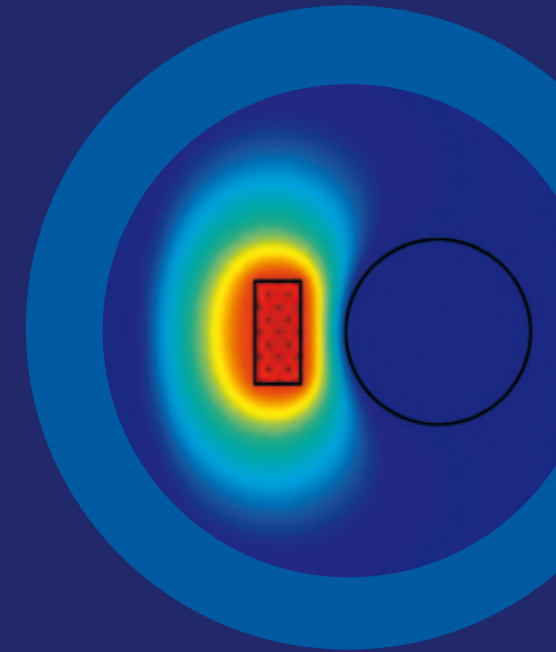
Contact:

For further information contact the Project Coordinator NetComposites

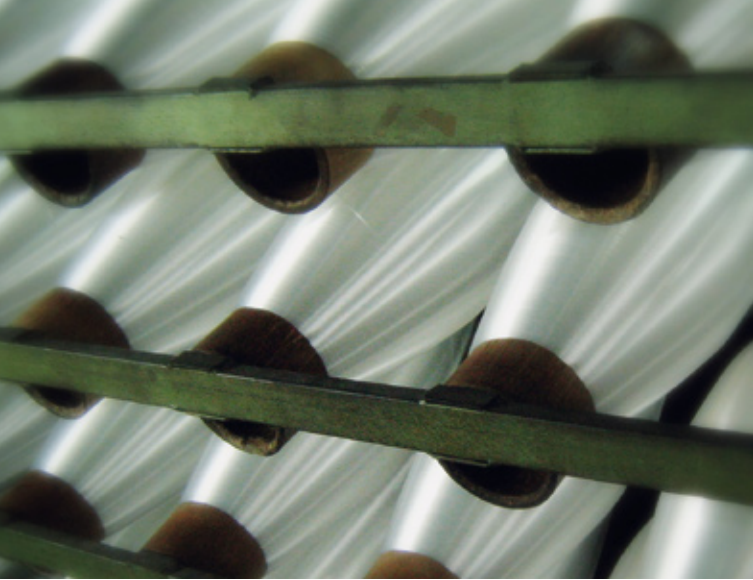
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The research leading to these results has received funding from the European Community's Seventh Framework Programme NMP-2007-2.4.1 under grant agreement 214355.

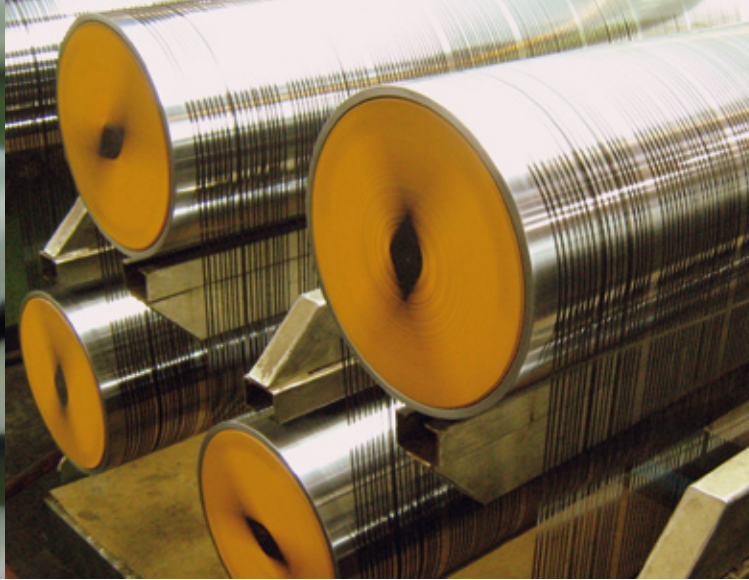
Early trials of selective heating by means of susceptor additives have shown strong promise and a variety of options are available for development. The aim is to have SRP systems for existing moulding technology and for new specialist moulding technology in order to maximise the commercial potential for these new materials. Trials have already resulted in fibre-reinforced samples from standard injection moulding equipment. The initial results show a highly attractive combination of high modulus, high strain at break, high impact resistance and low notch sensitivity. The partners are excited by the possibilities emerging.



Thermal analysis of induction heated thermoplastics



Thermoplastic yarns



Drawing of yarns



Self Reinforced Plastic pellets

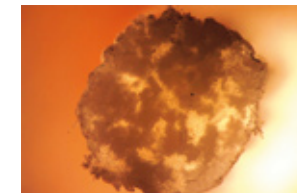
Objective of the project

Self Reinforced Plastics (SRP's) are now maturing into materials suitable for commercial exploitation in applications requiring lightweight, stiff and impact resistant mouldings, as well as possessing excellent recyclability. They are comprised of a thermoplastic fibre and matrix in a similar manner to conventional composites but with the added benefit that the fibre and matrix are derived from a common polymer. This has the advantage that the materials have a much higher stiffness and strength, while having the same low density as unfilled polymers. Self Reinforced polypropylene (SRPP) is a commercial reality and has begun to make in-roads into certain market sectors such as automotive, personal protective equipment, ballistics panels and other impact sensitive areas.

The ESPRIT project, funded by the EC FP7 programme, started in 2008 and is a three and a half year project which aims to take SRP technology to a new level by modifying the fibre and matrix and by radically improving the processing methods. The aim is to develop production-ready technology utilising advanced selective melting processes, allowing the materials to be flow-moulded without affecting the reinforcing fibre properties. The materials to be used are Polypropylene (PP), Polyethylene terephthalate (PET), Nylon (PA) and Polyethylene (PE) as well as other more unusual thermoplastics. Material usage and component weight is expected to be reduced by 30% for equivalent stiffness over conventional materials, resulting in energy saving in both manufacture and in use through, for example, lighter vehicles.

Initial results

The Esprit project has completed its first year of research and has carried out an extensive programme of locating, manufacturing and characterising the base materials from which the flowing Self Reinforced Plastics will be made. These are variations on Self Reinforced Polyolefins (srPO), Self Reinforced Nylons (srPA) and Self Reinforced Polyesters (srPet) and already significant improvements have been achieved in mechanical properties, particularly modulus and impact, above expectations for this stage of the project.



Cross section of reinforced rod