

FUNFIREBIC

Functional fibre reinforced biocomposites

Project Start Month: 1/2008

Project Duration: 24months

Project Consortium

Project Coordinator

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Project Partners

Oy All-Plast Ab, Mr. Antti Vilenius, Muovilaaksontie 6, FI-82110 Heinävaara, Finland

Biomer, Mr. Urs Hänggi, Forst-Kasten-Str. 15, D-82152 Krailling, Germany

VTT Technical Research Centre of Finland, Dr. Anna Suurnäkki, Tietotie 2, FI-02044 Espoo, Finland

Swerea SICOMP Ab, Ms. Birgitha Nyström, Fiberv 2, S-94126 Piteå, Sweden

Project Objectives

The main objectives of the FUNFIREBIC project are to produce biocomposites from functionalised wood fibres and biopolymers and to evaluate the feasibility of these biocomposites in injection moulded parts for different industrial applications in construction and automotive industry and consumer products. Furthermore, the aim is to elucidate both the chemical and physical factors as well as the process technical issues affecting the chemical and physical compatibility of between the fibre material and biopolymer matrix in biocomposites.

Project Approach

FUNFIREBIC is an industry driven R&D project. Industrial partners represent the whole functional wood fibre-biopolymer composite technology chain; from raw materials (wood pulp and biopolymers/KCL and Biomer) to injection moulded composite manufacturing (All-Plast). Industrial partners will also subcontract the defined research and development work from VTT and Swerea SICOMP.

The work in the FUNFIREBIC will be carried out in five closely interlinked and synergistic workpackages (WPs) aiming at development of technology for producing injection moulded biocomposites. The WP1 concentrates in defining and developing composite raw materials to be used in the project, i.e. wood fibre materials and biopolymers. KCL, Biomer and VTT are active in the WP1. In WP2, the selected wood fibre materials will be modified, or functionalised, by suitable chemistry by available chemical, enzymatic or chemo-enzymatic functionalisation methods. Chemical, physical, and technical factors affecting the compatibility of modified wood fibres and biopolymers in fibre-biopolymer compounding will be elucidated. KCL and VTT are active in the WP2. WP3 concentrates in understanding the interactions between the fibre and biopolymer materials by micromechanical studies. Swerea SICOMP is active in the WP3. In WP4, the compounding and injection moulding technologies will be developed. Fibre-biopolymer matrix will be compounded to pellets and further to produce parts by injection moulding. All-Plast, Biomer and VTT are active in the WP4. In WP5 the technical and economical feasibility, innovative processing and process optimization of the biocomposites will be evaluated. All-Plast, Biomer and VTT are active in the WP5.

Expected Project Impact

The FUNFIREBIC project strongly aims at developing industrially feasible technology to produce injection moulded biocomposites with good properties from wood fibre materials and biopolymers. The project expected outcomes are: novel manufacturing technology for injection moulded biocomposites, adapted functionalisation chemistry for wood fibre materials to render them compatible for selected biopolymers, knowledge on the chemical, physical and technical effects of functionalisation on wood fibre materials as well as knowledge on the fibre-biopolymer matrix interactions and feasibility study of the technical and economical performance of biocomposites produced by the novel manufacturing technology.

The developed manufacturing technology is expected to be exploited by industrial project partners in their business. Knowledge on the functional fibre properties and fibre-polymer interactions will be exploited both by the industrial partners in their further development work and by the research partners in R&D work.

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