PARTNER SEARCH

7TH. EU FRAMEWORK PROGRAMME FOR RESEARCH, TECHNOLOGICAL DEVELOPMENT AND DEMONSTRATION (2007-2013)

PARTNER is looking for a Project

1.) PARTNER OFFERED

Organisation	**TECHNOLOGY CENTRE AIMEN**	**Type of organisation (IND, SME, RES, HE, others)**	**RES**
Contact person	**Ms. Gala Perez**		
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Role in desired project	**technology development :**	**research : X**	**training :**
	dissemination :	**demonstration : X**	**other :**
Expertise offered and what I would like to do	**Polymer blending** is a common technique used to obtain materials with properties better than those of the original polymers. The properties of **polymer matrix nanocomposites** are remarkably different from those of conventional materials. These altered properties include improved strength, toughness, heat distortion temperature, and UV resistance. In comparison with classic thermosetting composites**, thermoplastic composites** offer most of the benefits plus some others: rapid fabrication, no chemistry during processing, recyclable, high impact strength and no solvent used or volatiles emitted during processing and they can be welded. In general, **blends of polymers** are prepared by conventional melt compounding process (by twin-screw extruder, sigma-type mixers…), but they require special processing steps, chemical modification or compatibilizing additives, which increase the complexity and expense of manufacturing blends. In the case of nanocomposites, this process has the complication of phase separation during mixing and nanoparticle agglomeration. An alternate route can be used to produce highly dispersed polymer blends: **solid-state mechanical processing**. Recently, ball-milling technique has begun to be used as a mixing method of polymers in the solid state. First results of the application of ball milling to polymers showed that this procedure is adequate for making polymer blends. **Mechanical alloying (MA)** is a high-energy ball-milling process in which the repeated fracture and welding of powder particles, arising from ball-powder collision events, enables true alloy powders to be formed from mixtures of elemental powder. MA is a process used to produce powders having a fine microestructural scale and/or as a technique for alloying difficult or normally incompatible materials. Of		

	particular interest have been the low-temperature techniques (cryogenic) of the MA process which offer the possibility of forming metastable structures which exhibit new and peculiar properties, for example for polymer-polymer systems and polymer-reinforcements systems. This technique also allows decreasing the size of natural fibres to obtain nanofibres (or nanoparticles) with improved final properties. The advantage of this process is the low-temperature condition which reduces the thermal degradation problem of high-energy milling. **OBJECTIVES:** AIMEN has proved experience in the development of new materials and improving manufacturing processes. AIMEN facilities and qualified personnel can support the development of research involved in the topics above mentioned by High Energy Cryomilling to: - Decrease and control the reinforcement's size to obtain natural nano-fibres and nano-particles from diverse origin (bio-mass, mining…). - Solid state mechanical milling process of polymeric matrix and reinforcement (metal, ceramic, polymer fibres and particles). - Solid state mechanical alloy of polymer blends. **Application fields**: polymeric materials and polymeric blends including bio-polymers and recycled polymers, composites and bio-composites, new nano-reinforcements including fibres from biomass, biocompatibility materials, light materials for transport applications…

I am familiar with the European Framework Programme :

YES

2.) COORDINATOR / PROJECT sought after (for proposal submission only)

NMP WP topic : NMP.2010.1.2-2 Substitution of materials or components utilising "green nanotechnology" or NMP.2010.1.2-4 Adding value to mining at the nanostructure level (Coordinated call with Mexico)

Project type

Large scale integrating collaborative project	
Small or medium-scale focussed research project	**X**
Collaborative projects targeted to SMEs	
CA or SSA	
Network of Excellence	

Keywords of project:	**polymer matrix nanocomposites; thermoplastic composites; solid-state mechanical processing; mechanical alloying**

I AGREE WITH THE PUBLICATION OF MY DATA

PLEASE FILL IN THE PROFILE FORM AND RETURN IT TO: demiguel_mpilar@cdti.es