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AIMPLAS-coordinated PHOENIX Project Aims to Develop More Eco-friendly Fire-resistant Plastics

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VALENCIA, Spain -- PHOENIX, a Collaborative project from the 7th Framework Program, aims to develop a new generation of fire-resistant plastics refraining from the traditional halogenated additives. PHOENIX, with a 4 years duration and coordinated by AIMPLAS in Spain, is composed of 15 partners from 8 European countries.

Currently, fire-resistant halogenated additives are used in a wide range of commercial items such as electrical and electronic equipment, low-voltage cables or electrical appliances. The elimination of such additives from the composition of these products is important because they are substances hazardous to public health and to the environment and, in fact, its use and recycling are addressed by several European directives such as WEEE and RoHS.

The limitation with non-halogenated additives, currently used in the market as an alternative to the traditional ones, is that they are far less efficient. This means that polymers should contain between 30% and 60% of flame-retardant substances to achieve a better fire performance, while the halogenated polymers are efficient when containing only 15% of additives. However, by incorporating such high filler content in the polymer matrix, the processability and final product properties are significantly reduced whilst the cost of the parts is considerably increased. This severely limiting the range of applications and hindering non-halogenated flame retardant market introduction to replace dangerous halogenated flame retardants.

Maximum efficiency thanks to nanotechnology

PHOENIX aims to develop highly efficient flame-retardant non-halogenated additives that display an excellent fire performance while at the same time maintaining a low amount of additives in the final product (15%). For this, nanostructured materials will be developed based on the combination of different types of nanoparticles, among each other or in combination with biobased additives, so that each will provide functionality to the whole. Graphene, modified lignins, nanohydroxides and encapsulated phosphorus based flame retardants in hollow particles, will be combined and united by the self-assembling technology. All flame retarders will be produced with sustainable methods of production from the viewpoint of safety at work, consumer safety and environmental impact.

The research leading to these results has received funding from the European Union Seventh Framework Program (FP7/2007-2013) under Grant Agreement nº 310187.

About AIMPLAS

AIMPLAS, Technological Institute of Plastics located in Valencia, is a private, non-profit Association with about 400 associated companies (the majority of them SMEs). AIMPLAS has offered its services to the Plastic industry sector since 1990 and, nowadays, has a permanent staff of 110 people. AIMPLAS' fields of work are related to technological research and development on plastic materials & products and its transformation processes. AIMPLAS has a lot of knowledge and experience in the development of new biobased composites, working with many different fibers (rice husk, paper pulp, wood flour, modified and functionalized wood fibers, jute, hemp, kenaf, flax, cotton, asparagus' fiber, linseed) and a broad range of biopolymers (starch, PLA, PVOH, PCL, aliphatic and aromatic polyesters) and oil based (polyolefins and thermoset resins).

About PHOENIX Project

Thanks to nanotechnology, the European project PHOENIX allows the substitution of fire-resistant halogenated additives for substances that are more respectful of human health and of the environment. The technology developed in the project makes it possible to reduce the presence of additives down to 15%, against the 30% or 60% currently needed to incorporate in the case of other non-halogenated additives.

Source: PHOENIX Project

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