NANOFRABS

HALOGEN FREE FLAME RETARDANT ABS NANOCOMPOSITES FOR ELECTRIC AND ELECTRONIC DEVICES

HALOGEN FREE FLAME RETARDANT BASED IN THE SYNERGIC EFFECT OF NANOPARTICLES AND INTUMESCENT SYSTEMS

tecnalia Inspiring Business

Prolabin&Tefarm
Polymer Additives,
Cosmetic Ingredients,
Catalysts

SITRAPLAS engineered plastics

POLITECNICO DI TORINO 1859 1906

MASTER BATCH

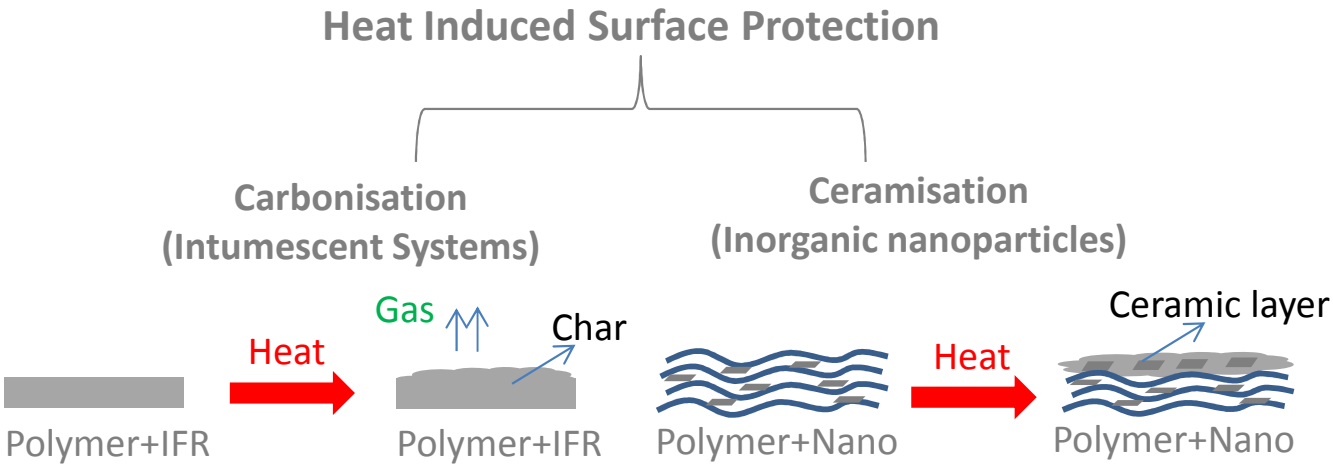
www.nanofrabs.eu

Dasyc S.A.
Defence Aerospace Systems Company

NANOFRABS CONCEPT

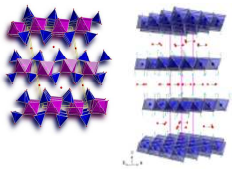
The last 10-20 years have seen an increase in the amount and variety of **Electrical and Electronic Equipment (EEE) in houses, offices and all sorts of other public buildings**. At the same time, the design of electrical and electronic equipment has changed just as radically, with the most obvious changes being an **increased use of plastics with inherent fire hazards.**

In the recent years much attention has been paid to the fire performance of **polymer nanocomposites**, especially polymer-layered silicate nanocomposites (PLSNs).
The inclusion of properly dispersed nanoparticles has been demonstrated to reduce significantly the heat release rate (HRR) as well as a reduced tendency for dripping of flaming polymer parts during material burning.



The mechanism involved in nanocomposites fire retardance is based on formation on heating of a **ceramic protective, insulating layer on the surface** of the burning material resulting from coalescence of nanofillers enclosing char from surface polymer charring.

PROLABIN & TEFARM



Nanoparticles

MASTERBATCH

FR masterbach

SITRAPLAS GMBH

ABS compound

DASYC

ABS injection

NanoFRABS project has joint relevant European experienced companies in the field of polymer compounding and injection as well as nanoparticles and flame retardant masterbatches production **(PROLABIN & TEFARM, MASTERBATCH, SITRAPLAS and DASYC)**. Additionally, those companies will account with the assistance of relevant Research and Development Institutions: **Politecnico Di Torino and TECNALIA Research & Innovation** (Project coordinator).

OBJETIVES

Scientific

The main goal is to develop a **new halogen free flame retardant (HFFR) for acrylonitrile-butadiene-styrene copolymers (ABS)**, based on the synergic combination of phosphorus compounds, and nanofillers in order to obtain:

*** An improvement over the standard halogen free flame retardant** effectiveness in order to obtain the same fire performance that the obtained with halogenated ones.

* Target flame retardance properties are as follows:
UL94 V0 [IEC 60695-11-10]
Glow Wire Flammability Index (GWFI) at 960°C [IEC 60695-2-12]
Glow Wire Ignition Temperature (GWIT) at 725°C [IEC 60695-2-13]

*** A decreasing (at least a 25 %) of the halogen free flame retardant dosage for ABS** in order to obtain better mechanical and rheological properties without decreasing the fire behavior of the final product.

* New ABS products (telephone housings, audio and electrical housings, high performance toys, computers) **easily recyclable and environmental friendly**, with low toxicity of the gases and vapors evolved during combustion.

Social

This project allows **sustainable development in the field of flame retardants**. It increases the employment of non hazardous materials and uses leading edge technologies developing more effective materials.

Improvement on citizen's safety by reducing the risks caused by the fire in buildings (80 % of the mortal victims in a fire, is due to the smoke generation).

To **safeguard the human health** and the environment, avoiding the release of toxic fire retardants.

Environmental

Reduction of **harmful** (or potentially harmful) **halogen fire retardants**.

Reduction of smoke and toxic gases generation (30% reduction in gas emission, VOF_4 and D_s parameters) in case of fire (in comparison with conventional flame retardants).

Increase of the **protection human health and aids the environmentally-sound recovery** and disposal of waste electrical and electronic equipment.

Facilitate the recycling of waste electric and electronic equipment (the main application of ABS products). Retention of 85 % of mechanical and/or fire properties after 3 subsequent extrusion processes.

Project Details

NanoFRABS is a collaborative project co-funded by the **European Community Seventh Framework Programme**, under the call 2011 of Research for the Benefit of SMEs

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Duration

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Coordinator Contact

Sara Villanueva Diez, PhD.
TECNALIA
Area Anardi, 5, E-20730 Azpeitia- Gipuzkoa (Spain)
E-mail: sara.villanueva@tecnalia.com M: +34647405139
www.tecnalia .com

Partners Contact

Politecnico di Torino. Alberto Fina, PhD.
E-mail: alberto.fina@polito.it Tel: +39 0131229316

Sitraplas. Ibrahim Assebban
E-mail: ibrahim.assebban@sitraplas.com Tel: +49 5223 / 4910916

Prolabin Tefarm. Roberto Spogli
E-mail: roberto.spogli@prolabintefarm.com Tel:+39 3395326995

Masterbatch. Domenico Anderlini
E-mail: domenico.anderlini@masterbatch.it Tel: +39 3355885889

Dasyc. George Lianos
E-mail: g.lianos@dasyc.gr Tel: +30 6985556970

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