

## Your newsletter for non-halogen fire safety solutions No. 69 September 2016

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### 28<sup>th</sup> September 2016, Anaheim, California:

pinfa-na panel at [CAMX 2016](#) (Composites and Advanced Materials Expo) - Flammability, Smoke and Toxicity (FST) Requirements in Transportation, Building and Construction. [Contact](#).

For full events listing, see [www.pinfa.eu](http://www.pinfa.eu)

*Fires that don't happen don't make the news. As a result, the most effective fire safety standards are often hardly noticed despite saving lives every day. Three recent incidents are significant. Fires started in aircraft engines in Japan and Singapore, in a French TGV electrical system, and in each case hundreds of passengers were safely evacuated. Materials used in aviation and in railways are subject to stringent fire resistance requirements. On the other hand, Dubai has suffered yet another major sky-scraper fire in non flame retardant insulating cladding material (sandwich panels) and, tragically, 35 people died in another bus fire in China. Experts worldwide have repeatedly called for tighter fire safety requirements for buses and coaches.*



### pinfa's first China workshop confirms interest in PIN FRs

In June 2016, over 250 people from academia, industry, and material science organizations attended the ISFRMT conference in Changchun - China's 4<sup>th</sup> International Symposium on Flame-Retardant Materials and Technologies. As a session within the conference, pinfa organised its first workshop in the People's Republic of China.

Adrian Beard, vice-chairman of pinfa and Kan Zhou from Presafer, China, welcomed attendees and explained the raison-d'être of pinfa and the benefits of membership for Chinese flame retardants' producers like Presafer.

Serge Bourbigot University of Lille, France, demonstrated recent developments in the area of PIN flame retardants including approaches for bio-based flame retardants.



Anteneh Worku from the USA highlighted the role of flame retardants for fire safety in general – that they are an essential element in the toolbox for consumer safety.

Hans Wendschlag from Hewlett Packard, Sweden, presented the equipment manufacturers' perspective on environmental requirements for flame retardants including ecolabels and the substitution of critical legacy flame retardants.

Xu Fuchao from the University of Antwerp, Belgium, summarized recent research into consumer exposure to flame retardants which has led to concerns, primarily on certain small-molecule chlorinated and brominated flame retardants, as well as phosphate esters. He urged producers to transition to more sustainable solutions.

Tim Reilly from pinfa North America told the audience about flame retardants' usage in North America, their fire safety benefits, societal concerns and the future. There is a worrying trend to reduce flammability and fire safety standards in order to avoid use of some problematic chemicals, instead of requiring improvements in health and environmental safety of flame retardants.

Jessie Kang from Clariant China addressed a different: "Protecting your inventions - counterfeiting and intellectual property for flame retardants." Multinational companies are sometimes faced with illegal copy-cat activities by local producers in China, whereas the Chinese government is promoting the build-up of Chinese intellectual property and patents in particular.

The lively discussions showed the strong interest in China to ensure product fire safety and conform to international standards by using PIN flame retardants to improve environment and health profiles.

Pictures [http://www.burning-questions.eu/2016-06\\_pinfa\\_ISFRMT](http://www.burning-questions.eu/2016-06_pinfa_ISFRMT) - Presentations [www.pinfa.org](http://www.pinfa.org)



## All passengers evacuated safely in two plane fires

A Singapore Airlines Boeing 777 caught fire on landing at Singapore airport on [June 27<sup>th</sup>](#) and all 241 passengers and crew were evacuated safely. On [May 27<sup>th</sup>](#), 319 passengers and crew escaped safely when a Korean Air Boeing 747-400 caught fire during take off (which was successfully aborted) at Tokyo-Handeda airport. Both fires apparently started in the airplane engines. These incidents, without injury or death, show the effectiveness both of fire safety standards in aircraft and of airport fire intervention organisation.



## Cladding fire spreads over 30 floors of Dubai skyscraper

Dubai has suffered another major fire in a building covered in non flame-retardant foam insulating sandwich panels. The fire spread over more than 30 floors of the 63-storey Sulafa Tower residential building, causing a number of minor injuries and resulting in evacuation of hundreds of families. This is the fourth major skyscraper cladding fire in Dubai since 2012 (see pinfa Newsletter n° 62). Reports say that the fire in the building insulation covering panels "spread like wildfire" and led to chunks of burning debris falling on surrounding buildings, swimming pools, passers-by and workmen. Dubai introduced fire safety standards for composite cladding materials in 2013 for all new buildings over 15m tall, but older buildings are not yet being modified because the cost would be considerable.

BBC [News](#) 20th July 2016.



## Questioning exterior cladding and fire safety

Marcello Hirschler, in the editorial of the industry newsletter FS&TB July 2016 ([Fire Safety and Technology Bulletin](#)), summarises questions around fire safety of building insulating external cladding materials (facades). This was widely discussed at Interflam 2016 and at IBC and NFPA fire code meetings. Testing is not standardised between different countries, e.g. ISO 13785 parts 1 & 2, NFPA 285 or FM4880 in the USA, DIN E4102 Germany, BS 8414 in the UK, LEPIR France, and others. Mr Hirschler underlines that the fire testing should consider the whole cladding system as used (not just whether or not the insulating material is combustible). Fire tests should realistically reflect real situations. He states that fire retardant treated wood (FRTW) also needs to be better regulated and assessed. In addition, decorative materials or other potentially flammable items (such as garbage containers or laundry carts) should not be placed against building walls.



## 35 die in Hunan bus fire

26<sup>th</sup> June: Another deadly bus fire has again shown just how inadequate are fire safety standards in buses and coaches, see e.g. pinfa Newsletter n° 67. A tourist bus carrying 56 people is reported to have [burst into flames](#) after crashing into a barrier, resulting in 35 deaths and 21 hospitalisations.

## Nabaltec takes innovation award for 9<sup>th</sup> time



pinfa member company, Nabaltec, a world leader in minerals chemistry, has for the 9<sup>th</sup> time received the “TOP 100” award for SME innovation [www.top100.de](http://www.top100.de) designated by Vienne University of Economics and Business Administration, Fraunhofer Society for Applied Research and the German Association for Small and Medium-Sized Businesses (BVMW). Nabaltec produces APYRAL® and APYMAG® PIN flame retardants based on aluminium hydroxide and magnesium hydroxide. The company underlines that innovation is driven by employee commitment, with ideas being collected and tested to take to implementation for new performance products.

*“Nabaltec AG recognized for innovativeness for the ninth time”* [27/6/2016](#)

## Growing demand for PIN FRs driven by health & safety



[Plastics Today](#) says the market for PIN flame retardants will grow by 8.4% per year to 2021, to reach US\$ 5.4 million (based on MarketsandMarkets report, see pinfa Newsletter n°66). Flame retardants’ health and safety are identified a key drivers. Action on flame retardant safety in the USA is cited and SPI, the US Plastics Industry Association is asking Congress to adopt Bill H.H. 2576 (Chemical Safety for the 21<sup>st</sup> Century, see below) to update TSCA (Toxic Substances Control Act, 1976). FRX Polymers is cited as an innovating company to benefit from the growing PIN FR market, referencing the company’s Frost & Sullivan Product Innovation of the Year Awards 2008 and 2013 and US Environmental Protection Agency Environmental Merit Award 2014, for its environmentally-friendly phosphorus FR polymers.

*“Sizzling demand for halogen-free flame retardants”, Plastics Today* [1<sup>st</sup> June 2016](#)



## US Chemical Safety Act signed into law with consensus

On 22<sup>nd</sup> June, President Obama signed into law the US Chemical Safety for the 21<sup>st</sup> Century Act, with applause from industry and environmental NGOs and with political consensus. The Act considerably updates the 1976 TSCA (Toxic Substances Control Act) which failed even to enable the US EPA to fully regulate substances such as asbestos. The new Act empowers the EPA to prevent chemicals identified as problematic from being placed on the market or to request further information (placing on the market will require some evidence of safety), to require testing of chemicals without first showing potential risk (and by a simple Order rather than by Rulemaking as at present), mandates EPA to review safety of existing chemicals (based on a risk-based prioritisation process), rationalises requirements for cost-benefit analysis of proposed measures and will improve data transparency (limits to Confidential Business Information). NGO critics however say the Act will limit individual States legislating chemicals and that EPA does not have adequate resources for implementation.

*US Frank R. Lautenberg Chemical Safety for the 21<sup>st</sup> Century Act, [Bill HR2576](#) and [analysis](#) of how the new Act will change compared to TSCA.*

## PHOSAVE

## Phosphorus recycling from expired fire extinguishers

The [PHOSave](#) project (Horizon 2020 SME Instrument), led by [PROPHOS](#) Chemicals will construct a pilot plant near Cromona, Lombardy, to recover and recycle phosphate from exhausted fire extinguishing powders. Over recent years, problematic chemicals in fire extinguishers have been largely replaced by phosphate based dry powders, considered as not posing environmental or health issues and effective in combating fire. Phosphates are also widely used in water sprayed on forest and wildland fires, again because they are considered (see e.g. review [Kalabokidis 2000](#)) to have minimal health impacts and to generally not harm ecosystems. Prophos Chemicals is Italy's only producer of dry fire extinguisher chemicals of all classes. Fire extinguishers have to be periodically emptied, overhauled, refilled and re-pressurised, to guarantee reliable performance in case of fire. The recovered phosphate will be recycled into the chemical industry or as fertilisers.



## SCHULAKETON® helps reduce greenhouse emissions

The high-performance plastic compounds supplier A. Schulman offers SCHULAKETON, based on polyketones composed of the molecules ethylene, propylene and carbon monoxide. 1 kg of polyketone avoids 0.5 kg equivalent CO<sub>2</sub> emissions by using carbon monoxide before emission to the air. SCHULAKETON grades offer efficient processing, especially in injection molding, extrusion and blow molding, as well as chemical resistance, hydrolytic stability, barrier properties, high impact strength, scratch, wear and abrasion resistance. Compounds are available in neat or colored grades and as mineral or glass filled. Applications include transportation chains, gears, bearings, sealings and piston rings, including applications where noise reduction is a key requirement. Flame Retardant SCHULAKETON uses PIN FRs (Phosphorous, Inorganic and Nitrogen Flame Retardants) to produce V-0 materials and can meet European railway standard EN45545 for limiting oxygen index, optical smoke density and smoke toxicity.

<http://www.aschulman.com/Europe/Engineered-Plastics/Products/40/5866/SCHULAKETON.aspx>



## Polyonics fire safe labels and adhesive tapes

Polyonics continues to expand its range of flame retardant label and adhesive tape materials, enabling use in harsh and high-temperature applications where fire safety of all materials is important, and avoiding risk of fire starting or spreading in labels or tapes on elements which generate heat. Applications include labelling components for barcodes, assembly / disassembly, insulation of batteries and power supplies, attaching components to printed circuit boards (exposure to high temperature wave flow solder), bonding solar panels, assembling transformers, motors and other components, attaching smartphone and tablet components. Polyonics product range includes ultra-thin, double coated tapes for high-temperature bonding applications in electronics, where high mechanical performance and dielectric strength are necessary. The double coated polyimide (PI) and polyester (PET) tapes, using a range of acrylic and silicone adhesives offer dielectric strength up to 13.2 kV, low peel voltages (<100v) and ESD static dissipative surface resistances of  $10^5 - 10^9$  Ohms, as well as thermal insulation of fastened components. Their thin design and capacity for die-cutting to specific shapes enable space and weight savings in complex electronic assemblies. The halogen free and REACH and RoHS compliant tapes use Polyonics' FlameGard™ flame retardant technology to meet stringent flame, smoke and toxicity standards including aerospace fire standard UL94 VTM0, FAR 25.853 and BSS 7238/7239. [Latest](#) additions are new coloured labels combining fire safety with visual added value.

See also articles on Polyonics aviation tapes, *pinfa* Newsletter n° 18 and 44. <http://www.polyonics.com/EngineeredTapes/press.html> and <http://www.polyonics.com/PerformanceLabels/flame-retardant-labels.html>

## Bio-based PIN flame retardants polymers for electronics



DSM has expanded its PIN flame retardant range of high-temperature resistant bio-based polymers with new ForTiiEco 4T nylon grades, using up to 30% renewable resources based on castor beans. The compounds offer high-flow processing, mechanical robustness, high-temperature soldering resistance, stable dielectric constant and loss tangent. Applications target high performance and thin-wall electronics, including surface-mount technology (SMT) connectors (such as the new micro USBs), antennas, RFID (Rapid Frequency Identification) security casings and switches for mobile devices. The LDS62 grade in particular offers the technology to incorporate fine electronics circuitry by laser direct structuring (LDS). Today, DSM's entire plastics portfolio for the electronics market is non halogenated.

"DSM expands its bio-based portfolio with ForTii Eco", [13<sup>th</sup> April 2016 www.dsm.com](http://www.dsm.com)



## French high speed train does not catch fire

On 19<sup>th</sup> June, 250 passengers were able to safely leave a French TGV (high speed train), running from Milan to Paris, in which a fire started. A problem in the air conditioning unit situated under the floor resulted in "dense smoke" entering the bar carriage. The train stopped at Chambéry station and the passengers were evacuated. Ten people suffered smoke intoxication, of which only one required hospitalisation. This incident shows the effectiveness of fire safety requirements in materials used in trains in Europe (EU railway safety standard EN45545) which inhibit ignition and combustion of materials and so ensure that possible electrical and mechanical faults do not lead to significant fire development.

[Europe1](#) "Savoie : 250 personnes évacuées d'un TGV en raison d'une fumée"



## Partition fire performance label scheme

The UK Association for Specialist Fire Protection (ASFP) and Finishes and Interior Sector industry association (FIS) have launched a new “Fire Performance Partition Labelling Scheme”. The label will identify fire resistant partitions for information of cable installers, contractors, building owners and facilities managers. The objective is to ensure both that fire safety is correctly engineered during initial construction and also that holes are not pierced in such partitions during later renovation or modification work, which could reduce the partition’s fire barrier function or allow smoke to get through in case of fire. Holes pierced in fire partitions must be made good with ‘fire stop’ materials, including when hidden for example above false ceilings. The self-adhesive labels are printed on 60m rolls.

ASFP – FIS Fire Performance Partition Labelling [Scheme](#)



## PIN FR epoxies for transport performance parts

Sicomín’s PIN flame retardant foaming epoxy systems enable cost-effective production of strong, high quality, structural parts too complex for using rigid foam or honeycomb core materials. They achieve demanding requirements for aircraft and railroad applications, as well as performance automotive or construction elements. The halogen-free SR1126, SR1124 and SR1526 systems offer low smoke opacity and toxicity. SR1126 is self-extinguishing and achieves both Boeing and Airbus FST (fire smoke toxicity) standards and laminate fire classification UL94-V0 and FAR 25-853(a). SR1124 is particularly adapted for hand laminating and filament winding, offering exceptional fire resistance with SC FW16 coating (ASTM E84 class A). The new SR1526 is a PIN flame retardant two-part epoxy resin system with viscosity and a hardener range designed for in-house prepregs, and has achieved accreditation for aircraft cabin interiors.

“Sicomín [presents](#) clear coating, laminating and foaming epoxy systems for the automotive industry and accredited resins for rail and aerospace”: [www.sicomín.com](http://www.sicomín.com)



## Phosphorus FR market to grow 5.2 % per year to 2021

Organophosphorus markets are predicted to grow significantly over the coming five years in a study by [Lucintel](#). Key drivers of this growth are identified as the phase-out of PBDEs, increasing awareness of fire safety and increasing market penetration of phosphorus flame retardants in different applications, in particular in engineering thermoplastics. North America offers high growth potential as equipment manufacturers (OEMs) look for safer and more sustainable fire safety solutions. Growth is also expected in the rest of the world especially in construction, electrical and electronics and transport applications.

“Global Organophosphorus Flame Retardant Market 2016-2021: Trends, Forecast, and Opportunity Analysis”, [July 2016](#)



## Siemon acquires Gigaduct fibre containment system

Siemon, a leading global communications network infrastructure specialist based in Connecticut, USA, has acquired the Gigaduct fibre containment system from Gigacom UK. Gigaduct is a flexible cable raceway system for routing, protecting and managing fibre optic cables in data centres, service providers, computer centres and other information centres. Gigaduct components are made of halogen-free, flame-retardant plastics, the Gigaduct system features easy-to-assemble ducts, fittings, bends and tees in various sizes to meet a wide range of fibre deployment needs. Gigaduct will integrate into Siemon's Wheelhouse™ Advanced Data Center Solutions, which include copper and fibre cable connectivity, high-speed interconnect assemblies, cabinets, cable management, power distribution and data centre design services and installation.

"Siemon [Announces](#) Acquisition of the Gigaduct Fiber Containment System", 7th March 2016  
[www.siemon.com](http://www.siemon.com)



## Shengyi and FRX Polymers® copper clad laminates

Shengyi Technology Co. China and FRX Polymers (pinfa member) have jointly developed a copper clad laminate (CCL) with high-performance dielectric properties, using FRX Polymers' Nofia® phosphonate based FR polymer. The product offers mechanical performance (high modulus), thermal and moisture resistance (low thermal expansion, good peel strength, pressure cooker resistance) and UL94 V-0 fire resistance rating. Applications include smartphones and computer server printed circuit boards. Nofia phosphonates can also be used in a range of electrical and electronics applications, including housings, electrical connectors and internal plastic parts.

[http://www.kunststoffe.de/en/products/overview/article/copper-clad-laminate-flame-retardant-hardener-nofia-frx-polymers-0\\_subhead\\_p-1407752.html](http://www.kunststoffe.de/en/products/overview/article/copper-clad-laminate-flame-retardant-hardener-nofia-frx-polymers-0_subhead_p-1407752.html) and  
<http://www.plasticstoday.com/business/sizzling-demand-halogen-free-flame-retardants/191780651024718>



## Other News

**Great Lakes:** The US and Canada have designated ([31<sup>st</sup> May 2016](#)) a first set of 'Chemicals of Mutual Concern for the Great Lakes' under the Canada-US Great Lakes Water Quality Agreement. The list of eight chemicals / families of chemicals, published following a science review process and public consultation, includes three halogenated flame retardants: HBCD, PBDEs and short chain chlorinated paraffins (SCCPs).

**Canada Chemicals Management Plan (CMP):** Canada has launched the third phase of the CMP and updated the rolling risk assessment publication [plan](#). The 6<sup>th</sup> CMP [progress report](#) specifies that risk assessments for 10 organic flame retardants will be published summer 2016 (melamine, bromo-ATE, dechlorane plus, TDCPP, TBPH, EBTBP, DBDPE, TBB, TPP, TCPP). A public [consultation](#) concerning boric acid and boron salts is **open to 21<sup>st</sup> September 2016**

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