

## Your newsletter for non-halogen fire safety solutions No. 71 October 2016

Consultation on UK furniture fire safety regulations update.....	1
US CPSC seminar on sleepwear (Flammable Fabrics Act).....	2
Paxymer position on Sweden E&E/FR Ecotax proposal .....	2
Fire dangers of building insulation materials.....	2
Radiflam® and PIN FRs for Rio 2016 Olympics .....	3
Paediatric nurses' knowledge of flame retardants .....	3
Alpha Wire EcoWire™ & EcoGen® zero halogen cables .....	4
Review of phosphorus textile flame retardancy .....	4
J-Flex low smoke toxicity specialist rubbers .....	5
Dietzel Univolt PIN flame retardant cable conduits .....	5
Phosphorus conservation in epoxy resin flame retardancy .....	5
Tests show speed of fire spread in cars .....	6
PIN FR transparent performance polycarbonates .....	6
14 killed in bar fire by non flame retarded foam insulation .....	6
PIN FR masterbatch for textile transparency and colour .....	7
Fire is biggest threat to shipping in Europe .....	7

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

*The tragic fire at the Cuba Libre bar, Rouen France, has demonstrated yet again the dangers of non fire-safety treated polymer foam insulation materials, particularly in public places with limited escape exits. At the same time, concerns about fire safety standards for external building claddings are raised in the USA, by the National Fire Protection Association NFPA, and in Europe at the InterFlam 2016 fire safety conference in London. Polymer foam or extruded materials are used for building cladding, providing lightweight, high performance heat and sound insulation, but also solid polymer materials, as supports for decorative finishing such as aluminium. Both papers at Interflam and NFPA concur that such materials can be used safely in buildings, offering design flexibility, cost-effective aesthetic quality and major energy savings, provided that they are appropriately fire safety treated (flame retardants, protective coverings) and are installed appropriately. Fire safety regulations in many countries need to be improved to ensure this.*



Department for  
Business, Energy  
& Industrial Strategy

CONSULTATION ON UPDATING  
THE FURNITURE AND  
FURNISHINGS (FIRE) (SAFETY)  
REGULATIONS

SEPTEMBER 2016

### Consultation on UK furniture fire safety regulations update

The UK Government has opened a public [consultation](#) on updates to the 1988 Furniture and Furnishings (Fire) (Safety) Regulations. **Closes 11<sup>th</sup> November**. The proposals are based on those already circulated and discussed over the last two years (see pinfa Newsletter n° 45) and involve modifying which types of furniture are covered, adjusting the match flammability test, removing the cigarette flammability test when not needed, traceability requirements to facilitate verification of furniture on sale.

UK Government open consultation: "Furniture and furnishings fire safety regulations: proposed changes (2016)" – to 11<sup>th</sup> November: <https://www.gov.uk/government/consultations/furniture-and-furnishing-fire-safety-regulations-proposed-changes-2016>



## US CPSC seminar on sleepwear (Flammable Fabrics Act)

The US federal Consumer Product Safety Commission is holding a one-day seminar on the Flammable Fabrics Act (FFA) Children's Sleepwear, addressing testing, certification, and other compliance guidance relating to mandatory FFA standards and requirements for children's sleepwear.

20<sup>th</sup> October, Bethesda, Maryland <http://www.cpsc.gov/newsroom/public-calendar/register-for-cpsc-public-meetings-workshops-and-forums/childrens-sleepwear-seminar/>



## Paxymer position on Sweden E&E/FR Ecotax proposal

Swedish PIN flame retardant producer, Paxymer, has [published](#) proposals to modify the Sweden government's proposals for an 'Ecotax' on electrical and electronic equipment, targeting flame retardants (pinfa Newsletter n°66). The company says that the current proposal, by punishing all flame retardants, will block innovation by failing to distinguish FR's with better environmental and health profiles. Paxymer says that the proposed Sweden legislation should be modified in order to achieve substitution of hazardous FRs by defining the tax by hazard not by function, by referring to existing classification systems and by fixing a clear timeline for implementation. For information: pinfa has submitted that the current text, by proposing to tax all phosphorus flame retardants, would impact research and innovation aimed at finding better alternatives to currently used FRs which can offer fire safety, reduced smoke emissions and optimal health and environmental safety. pinfa has also met with the Swedish Authorities to propose the elaboration of better targeted proposals.

*"Debate: Chemicals tax in Sweden hampers innovation. Here is how to fix it."* NyTeknik, 31 August 2016. Full in Swedish <http://www.nyteknik.se/opinion/nya-kemikalielagen-bromsar-innovationer-6779702> and summary in English <http://paxymer.se/paxymer-nyteknik-fix-new-chemicals-legislation/>



## Fire dangers of building insulation materials

Many very efficient heat and sound insulation materials are highly flammable, e.g. polymer foams, cellulose fibres, straw, recycled newspaper or textile fibres. This has been tragically shown in deadly fires, including recently in France (see this Newsletter). Several papers at [Interflam 2016](#) looked at different aspects of façade cladding and foam insulation fire safety.

T. Hakkareinen et al. (VTT Finland) explained that rigid polyurethane foam provides better thermal insulation than all other standardly available building materials. He considers that a combination of flame retardant use, fire resistant coverings (e.g. aluminium, gypsum board) and appropriate installation (including protection of penetrations) can enable its use in large public buildings without compromising fire safety. Euroclass C-s2,d0 or B-s1,d0 can be achieved.

A. Hofmann (BAM Germany) discussed differences in testing of façade materials and implementation in building regulations in Europe. She underlined fire safety challenges for façade materials which need to be better taken into account including external storage of flammable materials next to buildings (including dustbins), weathering and modifications during building renovations (penetration of protective coverings).

M. Smokka et al. summarised different test methods to assess fire spread over façade

materials in Europe, USA-Canada, Japan, South Korea and Australia.

J. Hidalgo et al., M. Janssens & A. Joyce and D. Kolaitis et al. presented tests and modelling of fire performance, charring behaviour and installation of insulation materials. Their conclusions suggest that, if appropriately protected (e.g. 13 mm gypsum), these materials will not contribute to fire development or to pyrolysis gas release until after a room fire has in any case become untenable and has spread to other parts of the building.

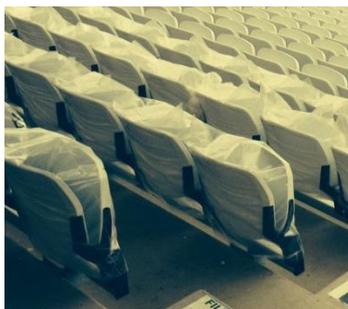
B. Messerschmidt et al. compared fire regulations for insulating materials in ten EU member states, concluding that although combustibility is generally considered, the levels of fire safety are very different, in particular because reaction to fire is only taken into account at the product level with only two countries considering the performance of the complete assembly. Fire compartmentation application also varies widely. Most countries do not require active fire protection (sprinklers) even in high-rise buildings, and sprinklers are considered to not replace the need for passive fire protection (flame retardants).

*Interflam 2016, London 4-6<sup>th</sup> July 2016*

<http://www.intersciencecomms.co.uk/html/conferences/Interflam/If16/if16.htm>

*Proceedings of Interflam 2016 are now available at*

<http://www.shop.intersciencecomms.co.uk/publications/products.asp?cat=10>



## Radiflam® and PIN FRs for Rio 2016 Olympics

RadiciGroup, a leading supplier of engineering plastics, provided fire safety treated seats, using PIN flame retardants, to five of the venue stadiums for the Rio de Janeiro Olympic Games in August 2016. Radiflam® S RV300UKHF 3010 BK is a PIN flame retardant 30% glass fibre polyamide offering high levels of mechanical resistance, fire safety, aesthetic quality and weather and ultra-violet light resistance, compliant with the Olympic Committee’s stringent regulations on sports stadium safety. The performance polyamide will be used to produce stadium seats and accessories including armrests, bolts and supports. Jane Campos, CEO of Radici Plastics Ltda: “The fact that Radiflam® is going to be at the Rio games makes us really proud. We have always strived to provide our customers with technological innovation, quality, safety and the highest degree of customization. This is the kind of work we continue to do, thanks to our R&D facilities and our on-site technical support for customer development projects created here in South America, as well as the contribution of our knowledge acquired in Europe and North America.”

See also Radici solar photovoltaic applications in pinfa Newsletter n°55

“Rio 2016: RadiciGroup at the Olympics with Radiflam®”, [15<sup>th</sup> March 2016](#) and Radiflam® A [RV300 HF](#) [www.radicigroup.com](http://www.radicigroup.com)

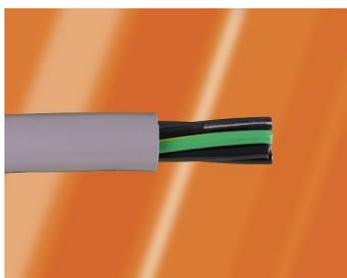


## Paediatric nurses’ knowledge of flame retardants

A study based on an online survey (c. 40 questions) of 417 paediatric nurses in the USA claims to provide a scientific assessment of their level of knowledge concerning flame retardants. Scientific methods (e.g. “Walz and Baussel internal question content validation”) unfortunately do not modify the inherent initial bias of the approach, which starts from the claim that “flame retardants do not protect from fires” and that “they” cause a range of medical / toxicological problems. The latter claim appears to be based on five listed halogenated flame retardants for which such problems are indicated in the paper, in

contradiction to the survey's second question "There are many different types of flame retardant". The paper specifies the percentage of nurses giving the "correct" answer to each survey question – but does not specify what the authors consider to be the correct answer. Assuming that the authors do recognise that there are many different types of FR, then 77% of nurses also are informed of this. Assuming that the authors consider that FRs do not stop the spread of fires and do not protect children from fire injuries, then 64% and 83% of nurses disagree with these statements and on the contrary do consider that flame retardants are effective and useful.

*"Assessing Pediatric Nurses' Knowledge About Chemical Flame Retardants", L. Distelhorst et al., J. Pediatric Nursing 2016 <http://dx.doi.org/10.1016/j.pedn.2016.06.007>*



## Alpha Wire EcoWire™ & EcoGen® zero halogen cables

Alpha Wire, New Jersey, has over 90 years of experience in engineered wire and cables for demanding conditions, from factory work situations to offshore and medical. The company's EcoWire and EcoGen range offer "eco-friendly zero halogen" solutions, with resistance to oils, solvents and hazardous liquids. mPPE (modified polyphenylene ether) insulation is used to prevent the release of acids in case of fires. EcoWire Plus achieves ISO 6722 for ultra-thin-wall applications, offering cost and space savings by replacing XLPE wires. EcoFlex® PUR continuous flex cables offer 600 V performance, reduced size, and lightweight with a resistant polyurethane jacket for mining and industry applications, in particular outdoor cable tracks.

*"Alpha Wire [Unveils](#) Latest in Environmentally Friendly Hook-up Wire: EcoWire™ Plus"*

*"Alpha Wire [Introduces](#) EcoFlex® PUR A New Family of Zero Halogen, Oil Resistant, Reduced Diameter Continuous Flex Cables"*



## Review of phosphorus textile flame retardancy

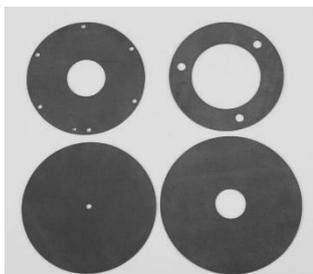
A detailed 36 page review in "Polymers" presents current technologies and innovation in phosphorus-based flame retardants for textiles. The paper notes that (except for a few inherently flame retardant polymers) textiles are made of natural or man-made organic polymers which are dangerous in case of fire, with upholstered furniture, bedding and nightwear being involved in most domestic fire incidents. The paper notes that phosphorus flame retardants are being actively developed for textiles, to improve environment and health profiles. Challenges include durability (resistance to water soaking and washing), ease of application to the textile and compatibility with other processes such as dyeing, textile properties (comfort, strength, aesthetics), specific toxicological and safety profile of each phosphorus chemical. The paper summarises textile fire testing, mode of action of P-FRs on textiles, and presents 17 different phosphorus FR chemicals (including both synthetic and bio-derived molecules), applicable to a range of natural and man-made fabrics. The authors conclude that there is an increasing and wide range of phosphorus FRs for different textiles, that toxicity must be taken into account and assessed for each molecule, and that new P-FR molecules as evaluated to date show low toxicity.

*"Recent Advances for Flame Retardancy of Textiles Based on Phosphorus Chemistry", K. Salmeia, S. Gaan, G. Malucelli, Polymers 2016, 8, 319; <http://dx.doi.org/10.3390/polym8090319>*



## J-Flex low smoke toxicity specialist rubbers

J-Flex Rubber Products, UK-based rubber gasket and seals specialist for over 30 years, indicates that [RAILFLEX®](#) offers low smoke toxicity, zero halogen, fire resistant EPDM (ethylene propylene diene monomer (M-class) synthetic rubber) for railway and mass transport applications. The material is used for gaskets, joints, seals, strips, caps, profiles, sections and pads, in extruded and moulded forms. Properties include tensile, elongation and tear resistance, electrical resistivity and ozone resistance. Fire performance is certified to the European railways materials fire performance specifications EN 45545-2 (2013: R22/R23 HL3 and 2015: A1) and is tested to a range of other specifications including UL94-V0 and NFPA 130. J-Flex underline that these high performance elastomer products offering “low smoke without toxic fire” fire resistance are essential to ensuring safety in interiors, mechanical and electrical installations and engines in modern mass transport applications such as high speed trains, urban transport vehicles and stations.



[www.j-flex.co.uk](http://www.j-flex.co.uk)

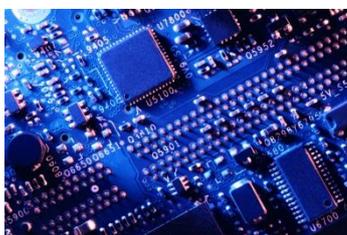


## Dietzel Univolt PIN flame retardant cable conduits

Since 1938, Dietzel Univolt, Austria, has led innovation and customer service in conduits for electrical systems, selling plastic conduits since 1953. The company first introduced halogen-free (HFT) conduits in 1980 and now offers low-smoke, PIN flame retardant installations including cable conduits, trunking and ducting, installation boxes, lightning protection and complete system installations. Dietzel Univolt HFT® (H = halogen free, F = flame retardant, T = temperature resistant) Next Generation product range includes rigid and pliable conduits, indoor and outdoor protective cable conduits. They are PIN flame retardant, ensuring no contribution to corrosive and acidic gases, lower smoke density and no aggressive fumes in case of fire. They are conform to the internationally recognised [LSFOH terminology](#) (Low Smoke, Flame Retardant, Zero Halogen). The products are thus adapted to application in buildings with high concentrations of people, including residential, offices, hospitals, hotels. The materials offer high impact resistance and high temperature resistance, UV and outdoor weathering, resistance to acids and lubricants, compatibility with use in concrete and flexibility in cold conditions to facilitate installation.



Dietzel Univolt “HFT® Next Generation - an outstanding development” [website](#)



## Phosphorus conservation in epoxy resin flame retardancy

Melamine poly(zinc phosphate), MPZnP, a PIN FR combining phosphorus, nitrogen and inorganic zinc was tested as a flame retardant for epoxy resin. The resin was generated by reacting DGEBA (Araldite MY740) with IPDA (isophorone diamine) and 20% of different PIN FR combinations: MPZnP, melamine polyphosphate (MPP) and aluminium hydroxide AlO(OH). Lowest peak heat release was achieved by combining MPZnP and MPP, five times lower than for non-FR resin, indicative of the effectiveness of these PIN FR systems in reducing fire development. This is considered to be the result of structural resistance of MPZnP – resin char combined with high char expansion by MPP blowing. In all cases, most or all of the phosphorus in the PIN FRs was conserved in the fire residues and not lost in fire gases.

“Melamine poly(zinc phosphate) as flame retardant in epoxy resin: Decomposition pathways,

*molecular mechanisms and morphology of fire residues”, P. Müller, Polymer Degradation and Stability 130 (2016) 307e319 <http://dx.doi.org/10.1016/j.polyimdegradstab.2016.06.023>*



## Tests show speed of fire spread in cars

A paper at [Interflam 2016](#) presents four full-scale fire tests on cars manufactured in Europe in 2014. An electrical failure initiated within the dashboard led to flames in the car interior in 8 minutes and the car interior reached 500°C in less than 20 minutes. A small fire in a front wheel arch spread to the car interior in less than 10 minutes, with the dashboard area already reaching 160°C. A gasoline fire on the bonnet resulted in the whole car being engulfed in flames in 12 minutes. The aim of the research was to contribute to identifying the origin point of fire in burnt vehicles, but it also shows the rapid flammability of modern cars, for which fire standards are very low, with consequent risk to life if exit is hindered, for example after an accident.

*“Fire spread over the Sedan type passenger cars with the emphasis on the origin and cause of the fire”, JL. Hasalava et al., Interflam 2016, Windsor UK, 4-6 July 2016, proceedings page 479 <http://www.intersciencecomms.co.uk/html/conferences/Interflam/If16/if16%20Table%20of%20Contents.pdf>*



## PIN FR transparent performance polycarbonates

Dow Corning’s new 40-001 liquid additive offers silicone-based PIN flame retardancy for low MFI (melt flow index) transparent polycarbonates. It enables high clarity, maintains tensile strength and modulus and meets UL94 V-0 fire performance at 1.5 mm pure or 1 mm with synergists in e.g. MFI 3 polycarbonate. Applications included consumer electronics, LED lighting, car light lenses and exterior lighting as well as sheet extrusion. Dow Corning is a global leader in silicones and silicone based technologies and solutions and adheres to the ACC [Responsible Care Initiative](#).

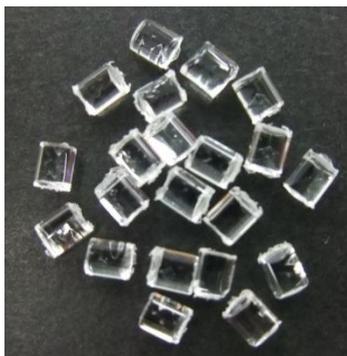
See also *pinfa* Newsletter n° 61

*“Dow Corning Showcases Newest Performance-Enhancing Silicones, Launches New Masterbatch, Delivers Four Presentations at Chinaplas” April 2016 and [www.dowcorning.com](http://www.dowcorning.com)*



## 14 killed in bar fire by non flame retarded foam insulation

13 young people were killed and others seriously injured in a fire at the ‘Cuba Libre’ bar, Rouen, France on 6th August. The bar was hosting a private birthday party. The fire was started by candles when the birthday cake was accidentally dropped. Initial reports suggested that the carpet caught fire, but official statements as quoted by media point to sound insulation foam on walls, which is said to have caught fire instantly, spreading the fire and emitting fatally toxic smoke. Such dangerous flammability can be prevented by appropriate use of flame retardants in insulating materials. Questions are also raised about the number of emergency exits to the cellar in which the fire occurred, which had the stairway up to the bar in which the birthday cake was dropped and the fire started and another door out to a garage area. The importance of ensuring regulatory conformity and fire resistance of insulating foams used in such premises is again tragically demonstrated.



## PIN FR masterbatch for textile transparency and colour

Teijin have launched a new masterbatch combining their FCX-210 phosphorus-based PIN flame retardant with polymer for use on both fibres and in resins. FCX-210 is effective in a range of resins including styrenes (e.g. ABS, polystyrene / HIPS) and polyamides, used in electronics and automobiles. It enables UL94 V-0 at 0.8 mm with 15% loading in PBT or at 3mm with 25% loading in HIPS/PPE. The new masterbatch enables application of FCX-210 to textiles, such as curtains carpets and wallpapers. The product is insoluble, enabling easier draining in application processes, and offers exceptional transparency and colorability.

*“Teijin Develops New Masterbatch Flame Retardant with High Transparency and Colorability for Textile Manufacturing”, Teijin [23 May 2016](#) and data [sheet](#) See also pinfa Newsletter n°50 Teijin DuPont Films.*



## Fire is biggest threat to shipping in Europe

Nautilus International (union of 22 000 maritime professionals in Europe) is calling for increased resources for at-sea fire-fighting services, based on research showing that there were nearly 800 ship fires in Europe over the last ten years (2004-2014), of which a quarter occurred on passenger ships but only 6% of the total resulted in fatalities or serious injuries. Ships pose significant fire dangers because of the difficulty of escape and the specific risks of motors and heavy equipment on board, and cargos and goods transported can be flammable or dangerous. However, ships have high levels of fire safety regulation for both materials and active fire protection. The effectiveness of these shipping fire safety standards is shown in the low number of fire casualties.

*“Nautilus backs boost of at-sea fire fighting resources”, [10/8/2016](#)*

## Publisher information:

This Newsletter is published for the interest of user industries, stakeholders and the public by pinfa (Phosphorus Inorganic and Nitrogen Flame Retardants Association), a sector group of Cefic (European Chemical Industry federation). The content is accurate to the best of our knowledge, but is provided for information only and constitutes neither a technical recommendation nor an official position of pinfa, Cefic or pinfa member companies.

For abbreviations see: [www.pinfa.org](http://www.pinfa.org)