

Your newsletter for non-halogen fire safety solutions No. 66 May 2016

pinfa workshop at ISFRMT China, 17 th June	2
Two tower fire in UEA: non fire retardant cladding again	2
Aflammit® listed for Oeko-Tex	2
Sweden proposes chemicals tax on all E&E goods.....	3
Denmark publishes screening of flame retardants	4
PIN flame retardant market growth expected	5
Cogegum® HFFR cables for safety and sustainability	5
PIN FR labels “Keep danger at bay”	5
Cradle-to-Cradle certified PIN FR sun control fabric	6
Visico™ scorch resistant FR compounds for cables.....	6
High temperature resistant polyamide PA6T	6
Hewlett Packard strong awareness on safer chemicals	7
UL summary of 2 nd furniture flammability summit	7
PIN based FR fire safety for construction work.....	8
PIN FRs reach 450 km/h within 5 seconds	8
Competitive Enterprise Institute on halogen FRs	8
Firefighter health and personal protective equipment.....	9
Other News	10

Upcoming pinfa events:

15 June	Brussels	pinfa General Assembly
17 June	Changchun, China	pinfa stakeholder & industry workshop at ISFRMT : fire safety and flame retardant standards, regulations and trends

For complete, up to date events listing, see www.pinfa.eu

This month sees many developments in PIN flame retardants. Market reports confirm expected continuing growth in PIN flame retardant use worldwide, to meet demands for fire safety and health and environmental chemical safety. Chemical companies, compounders and users are showing new performance applications of PIN fire safety, including below BASF, Borealis, VampTech, Solvay, Phifer, Avery Dennison, Hewlett Packard. At the same time, regulators are posing challenges with proposals for legislation or chemical taxation in Denmark and Sweden. In both cases the objectives are positive, but the proposals need rethinking to be effective and workable. Denmark’s proposals, based on GreenScreen, pose problems of over-simplification and legal clarity. In Sweden, the tax penalty proposed on additive phosphorus-based PIN flame retardants (as well as on halogenated FRs) is opposed by the health and environmental ecolabel organisation TCO because it goes against the objective of halogenated FR substitution, and the overall flame retardants chemical tax does not appear workable or susceptible to effectively promote safer flame retardants as currently proposed.



pinfa workshop at ISFRMT China, 17th June

pinfa's first workshop in the People's Republic of China will take place on 17th June Changchun, China, as a session within the well-known scientific **ISFRMT 4th International Symposium on Flame Retardant Materials and Technologies**. Key questions on flame retardants standards, regulations and trends as well as fire safety issues in Europe and the Americas will be presented. Their impact on the Chinese and Asian market can be substantial, because many electronic and electrical products are exported globally. For local products like building and construction materials, more stringent fire standards are evolving. In addition, flame retardants must increasingly prove their environmental and health compatibility.

No additional fee for ISFRMT Conference participants <http://www.isfrmt.org/2016/index.html> and www.pinfa.org



Two tower fire in UEA: non fire retardant cladding again

Yet another major fire has hit two 26-storey skyscrapers in the twelve tower Ajman One residential complex, United Arab Emirates, 28th March. This is the fourth major skyscraper fire in the UEA since 2012 (see pinfa Newsletter n° 62) and experts are again pointing to non fire safety treated aluminium – polymer composite cladding used for facades. In this case, the fire spread rapidly from the side of one tower to an adjacent one and up the sides of the buildings. There were no casualties but hundreds of families have lost their possessions and their homes.

Aljazeera 29th March 2016 "UAE - Ajman fire: Massive blaze engulfs skyscrapers - Firefighters tackle huge fire engulfing two towers of residential high-rise buildings".



Aflammit® listed for Oeko-Tex

Thor, one of Europe's leading producers of durable flame retardants for textiles and fibres, has been accredited by the Oeko-Tex Ecolabel (health, safety and environment) for several of the company's AFLAMMIT® phosphorus based PIN flame retardants. AFLAMMIT SAP, TL1127 and KWB are listed by Oeko-Tex as durable treatments for all cellulose fibres and blends and for all uses, including with skin contact. AFLAMMIT KRE, TL1025 and PE Conc are also Oeko-Tex listed for class 4, which includes applications such as decorative textiles and curtains, carpets, automotive textiles. This year, AFLAMMIT PCO 900 has been added to the Oeko-Tex list of approved flame retardants. This PIN FR can be used both as a textile coating and in extrusion, for example blended into the mass of polypropylene fibres. AFLAMMIT PCO 900 is available in granular form from various masterbatch producers, ensuring easy handling and no dust. Combined with radical generator synergists such as NOR HALS high levels of fire performance are achieved in a wide range of fibre configurations, for example in polypropylene: FMVSS 302 with loadings of <1%, DIN 4012 B2, B1, NFPA 701 with loadings of < 3-4%.

Oeko-Tex www.oeko-tex.com - THOR News "AFLAMMIT® Oeko-Tex listing" <http://www.thor.com/flameretardantstextilesdurable.html>





Sweden proposes chemicals tax on all E&E goods

A proposed “chemicals tax” currently being considered by the Swedish Government would impose a minimum 2.50 €/kg (up to 9.25 € per product) on a wide range of electrical and electronic goods sold in Sweden, with a tax penalty of 100% or 300% of this tax for products containing certain types of flame retardants (up to a maximum tax level of 13 €/kg or 35 €/product). Product categories proposed for taxation include e.g. washing machines, fridges, computers, mobile phones, televisions and monitors, CD and DVD players. Strong opposition is expressed both by the European electronics and chemical industries (Digital Europe, Cefic), by E&E manufacturing companies, but also (for reasons of implementation feasibility) by Sweden’s own tax and customs authorities. The tax proposal follows a Government order requiring action to reduce public exposure to brominated flame retardants, but the current proposal also includes tax penalties for additive (but not reactive) phosphorus flame retardants. Objections to the proposal include:

- Conflict with EU single market (1)
- Impossibility to tax internet purchases, currently nearly 1/3 of electronics sales and rising
- No scientific criteria for tax differentiation: this is based only on whether FRs contain bromine (reactive or additive), chlorine (reactive or additive) or phosphorus (additive) and not on hazard or risk
- There is no legally reliable nor scientific method for establishing whether FRs in a product are “reactive” or “additive” (2) and no way to verify declaration of such information for imported goods
- Given the considerable implementation issues above, and the high impact of declaration and administration on electronics manufacturers and sellers (especially SMEs), there is no evidence that the tax will be cost effective

Pinfa already wrote to the Swedish authorities on 10th April 2015, following first discussions of this chemicals tax proposal. pinfa recently restated this position to the Swedish authorities. **pinfa underlines:**

- phosphorus flame retardants (P-FRs), often in synergy with other PIN FRs, are the most effective fire safety treatment alternative to halogenated FRs
- additive P-FRs are essential and currently non substitutable for fire safety in applications including high-performance polymers, textiles, intumescent protective coatings
- their action mechanism in polymers (surface char layer) can reduce smoke emissions in case of fire
- phosphorus probably does not generate persistent toxins in case of fire
- the term “additive P-FRs” includes inorganic phosphates which have no environmental or health issues, natural and bio-sourced flame retardants (e.g. DNA, phosphorylated saccharides or cellulose ...)
- a tax penalising additive P-FRs would penalise PIN flame retardant systems which can provide optimal solutions for fire safety, health safety and environmental impacts

TCO, the health, environment and worker protection label, has also taken position against the tax as currently proposed (3). TCO underlines that by also including phosphorus-based products, the proposal will not achieve its goal of inciting industry to substitute flame retardants with more positive health and environment profiles.

Sweden Government report on new economic instruments in the area of chemicals, 30th March 2015 and report SOU 2015:30 “Report of the Chemical Tax Commission, Stockholm 2015: chemical tax on certain consumer goods containing chemicals” (in Swedish with English summary)

<http://www.regeringen.se/sb/d/19734/a/256626> See pinfa Newsletter n° 52

Proposal for legislation (“Kompletterande förslag avseende kemikalieskatterna” Ministry of Finance Tax and Customs Department - Additional proposals for chemical taxes), March 2016, and list of 140 flame retardants indicating if they are identified as reactive or additive see note (1) above): <http://www.regeringen.se/rattsdokument/departementsserien-och-promemorior/2016/03/kompletterande-forslag-avseende-kemikalieskatterna/>

Swedish Council opinion of 12/5/2015 considering that “the impact assessment does not meet the requirements of the (2007) impact analysis of regulations” http://www.regelradet.se/wp-content/files_mf/1431952219RR_2015_000140_YTTRANDE.pdf

(1) See Korea comments that the Sweden tax could be a considered a barrier to trade by the World Trade Organisation, WTO Committee on Technical Barriers to Trade (TBT), 17-18 June 2015 http://www.inmetro.gov.br/barreirastechnikas/PDF/atas_comercio/TBT_M_6.pdf

(2) At present, proposal is to refer to a list of FRs specifying which are additive and which reactive, but the currently proposed list of 140 FRs contains errors and is incomplete, and no process is proposed for ensuring accurate and objective update and enlargement of this list

(3) TCO “Chemical tax on products misses the mark”, N. Rydell, [June 2015](#)



Miljø- og Fødevarerministeriet
Miljøstyrelsen

Denmark publishes screening of flame retardants



The Danish Government has published three reports on flame retardants: “Fire safety requirements and alternatives to brominated flame retardants,” “Pre-screening of REACH registration dossiers for nine brominated flame retardants” and “Environmental and health screening of phosphorus flame retardants.” The [Government website](#) states that “*electronics, construction, transport and offshore are among the sectors to most use brominated flame retardants ... GreenScreen® can be used by importers and manufacturers to risk assess chemicals, in order to facilitate deselection and substitution of dangerous flame retardants in their products.*”

The report on screening of phosphorus-based flame retardants, presents an adaptation of the GreenScreen method to the European context, and applies this to PIN phosphorus flame retardants. An initial list of 88 phosphorus flame retardants was reduced to 28 based on US EPA Design for the Environment (DfE) conclusions and on criteria of use status, fire safety performance, REACH registration. The [pinfa Product Selector](#) was used to define applicability of the selected FRs to different materials. Three of the 28 PIN phosphorus FRs assessed obtained Benchmark 4 or 3 (Safer or Use but opportunity for improvement) - that is ammonium polyphosphate, poly[phosphonate-co-carbonate] and phosphinic acid, aluminium salt. Sixteen were assessed as Benchmark 2 (Use but search for safer substitutes) and 13 as Benchmark 1 (Avoid) – in particular the aryl phosphates. The report suggests that an intermediate Benchmark “1½” would be useful to better distinguish between the currently Benchmark 2 chemicals. One pinfa member company has identified and communicated to the Danish authorities some confusion in the report between blends of chemicals (commercial FR products) and pure chemicals. Furthermore, the report includes adjustments to the GreenScreen methodology which make it difficult to compare benchmarks with previous assessments or to understand the reasons for different benchmarks.

The report on alternatives to brominated flame retardants states as its objectives: “to support the phase-out or reduction in the use of brominated flame retardants”. This report concludes that alternative PIN flame retardants are already developed and on the market for a majority of products in the sectors of E&E, construction, transport and shipping. However, some challenges remain, such as EPS (expanded polystyrene). The use cost of PIN flame retardants is not considered to be significantly higher, but there can be significant transition costs as user industries may need to adapt production processes, and carry out new fire and product performance tests in order to ensure that substitutes are effective. Specific detailed information is provided on substitution and PIN flame retardants for building insulation materials, cables, profiles – composites – films and sheets, E&E wiring boards and enclosures.

Ministry of Environment and Food of Denmark website 25th January 2016 “Three new reports examining flame retardants and looking at new tool to assess risk substances”

Denmark Ministry of Environment and Food – Environmental Protection Agency – LOUS (List of Undesirable Substances) follow-up reports, 2016:

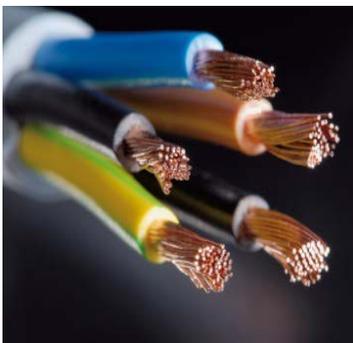
- “Pre-screening of REACH registration dossiers for 9 brominated flame retardants”, 74 pages, Environmental project [No. 1821](#), ISBN: 978-87-93435-21-6
- “Fire Safety Requirements and Alternatives to Brominated Flame-Retardants”, 72 pages, Environmental project [No. 1822](#), ISBN: 978-87-93435-22-3
- “Environmental and health screening profiles of phosphorous flame retardants”, 260 pages, Environmental project [No. 1823](#), ISBN: 978-87-93435-23-0



PIN flame retardant market growth expected

A study by MarketsandMarkets predicts 8% annual growth of the global “halogen-free flame retardant market” from 3.4 billion US\$ in 2015 to 5.4 billion US\$ in 2021. E&E, already the largest market sector for PIN FRs in 2015, including casings, circuit boards and wires and cables, is expected to grow strongly, whilst transport is expected to be the highest growth sector. The market is expected to be driven by growth in consumer electronics, “rising demand for safer consumer electronics and stringent fire safety regulations for residential and commercial building materials” and stringent regulations regarding the use of safer chemicals. Aluminium hydroxide is expected to remain the biggest volume PIN FR.

“Halogen-Free Flame Retardant Market by Type (Aluminum Hydroxide, Organo-Phosphorus and Others), Application (Polyolefins, UPE, ETP, and Others), End-Use Industry (E&E, Construction, Transportation, and Others) & by Region - Global Forecasts to 2021” MarketsandMarkets April 2016 <http://www.marketsandmarkets.com/Market-Reports/halogen-free-flame-retardants-market-32144405.html>



Cogegum® HFFR cables for safety and sustainability

Solvay has launched three new grades of Cogegum® silane grafted, polyolefin-based, 'ambient cure' cross-linkable and halogen-free flame retardant (GFR XLPO-HFFR) compounds intended for safe, fire resistant and environmental friendly cables. Solvay HFFR grades combine good processing and flame retardant characteristics along with high cable flexibility. GFR 903 is a sheathing grade targeted at special cables in oil and gas and the chemical industry, enabling to meet NEK TS 606 and IEC 60092-360 and is resistant to water and oil-based fluids. GFR 1401 is an insulation grade designed to meet ISO 6722 and major automotive standards, such as T3 for engine compartments requiring heat resistance of up to 125°C. It offers abrasion resistance and zero-halogen to help implement strict end-of-life vehicle regulations. GFR 1301 is an insulation/sheathing grade for demanding electrical and electronics cables with working temperatures from -40°C to +105°C. It provides flame retardancy rated to UL 1581 VW-1, UL44 and UL758. PIN flame retardancy is based on light metal hydroxides, ensuring self-extinguishing and minimised generation of toxic fumes, corrosive gases and dark smoke in case of fire.

“Solvay Launches Three New Cogegum® GFR XLPO-HFFR Compounds for Wire & Cable Applications in Oil & Gas, Automotive and E&E”, 6th April 2016. See also pinfa Newsletter n°44. Photo: Solvay Polymers.



PIN FR labels “Keep danger at bay”

Avery Dennison, supplying label and packaging materials to more than 10 000 customers worldwide, is promoting PIN flame retardant labelling solutions to reduce fire risks of portable electronics equipment, and to reduce smoke toxicity in case of fire. The company’s PET labels meet UL94-V0 fire performance standard, are resistant to high temperatures, non conductive and sealing (reducing risks of battery leakage, which are a potential cause of fire in electronics equipment), low thickness (so leaving more space for battery capacity) and printable, enabling inclusion of technical, recycling and safety information and branding. Applications include mobile electronics, automobile and aircraft and fire safety materials.



Avery Dennison Flame Retardant Labels on [YouTube](#), 1 minute 45”



Photo courtesy of M+N Textiles, The Netherlands

Cradle-to-Cradle certified PIN FR sun control fabric

Phifer, Tuscaloosa, Alabama, is a world leader in screening products for insect and sun control with 60 years industry and design experience. Phifer's interior and exterior sun control fabrics combine design and style with energy savings (reduced solar heat gain) and protection of materials from ultraviolet deterioration. The company is committed to environmental protection and to improving indoor air quality. Phifer's new Sheerweave® Style 8000 interior sun screening fabric is [certified](#) Cradle-to-Cradle Bronze, [certified](#) Greenguard (UL Environment) Gold and is LEED (Leadership in Energy and Environmental Design) Material Ingredient Disclosure Credit Eligible. Style 8000 is 100% polyester 2x2 basketweave for improved dimensional stability and is available in 7 natural colours. The product is Melanoma International (prevents skin sun damage) Foundation approved and uses PIN flame retardants to ensure commercial standard flame retardancy.

Phifer Sheerweave® Style 8000 <http://www.phifer.com/suncontrol/interior/product/81/8000>

"Phifer Introduces New Sheerweave® Style 8000, Cradle To Cradle Certified™ Bronze", *Textile World*, [30th March 2016](#)



Visico™ scorch resistant FR compounds for cables

Borealis and Borouge have launched Visico™ FR4450 (for construction cables) and FR4451 (for photovoltaic PV cables). The silane cross-linkable compounds contain inorganic based flame retardants and scorch resistant additives based on Borealis proprietary technology. The cable compounds used together with specific catalysts (LE4439, LE4433) provide excellent processability, flexibility and compound shelf life. FR4450 is recognised by UL for low voltage cables according to UL44 and UL854 meeting horizontal flame test (HB-1). FR4451 based cables meet requirements for PV insulation and jacketing according to TÜV 2 Pfg 1169/08.2007 and EN50618. FR4451 also contains UV stabiliser. Borealis is a leading worldwide provider of polymers, chemicals and fertilisers, and a founding member of the trade association of FROCC. Borouge is a joint venture with the Abu Dhabi National Oil Company ADNOC.

www.borealisgroup.com

www.borouge.com



High temperature resistant polyamide PA6T

Italy based compounder Vamp Tech specialised in flame retarded compounds, has launched a PIN flame retarded PPA (PA6T) with 30% glass fibre. Vampamid HT 3028 V0 offers resistance to high temperatures (continuous operation at up to 155°C at all thicknesses, which is the highest rating for PPA in the UL database). The use of PIN flame retardants enables fire performance UL94.V0 down to 0.4mm thickness and HL3 in R22/R23 certification under the new EU railway safety standard EN45545. The product can be delivered in a range of colours and is adapted to electrical and electronics and lighting applications where thin-wall designs require high production temperatures and finished products must offer high-temperature operation, low moisture absorption and demanding fire performance.

"[Cost saving with Halogen Free PA66 in the Domestic Appliances of the future](#)"

www.vampotech.com



Hans Wendschlag, Hewlett Packard

Hewlett Packard strong awareness on safer chemicals

A case study in SpecialChem's 'Business Guide to safer chemicals in the supply chain' presents Hewlett Packard's strong action to move towards safer chemicals, responding to drivers including green procurement, ecolabels and regulation. The company's policy is to take a proactive and voluntary approach to restricting the use of substances where scientific studies prove a risk and where a technically feasible alternative has been shown to be safer for use and to have lower environmental impact. Examples cited include HP's work with producers of PIN flame retardants to accelerate the rate of substitution. Working with the NGO [Clean Production Action](#) and using [Green Screen](#), 45 non-halogenated flame retardants have been assessed. 20 of these were acceptable and one was "preferred". An identified issue is the cost of changing to and using alternatives, often 5-10% higher. HP's Hans Wendschlag identifies as challenges the lack of action by national chemical authorities to support substitution, ecolabels which exclude substances without adequately assessing replacements and the need for chemicals manufacturers to engage testing beyond REACH obligations to ensure complete data. He notes that after long discussions, the TCO eco label adopted in November 2015 the Green Screen™ (GS) chemical substance assessment methodology. As per today, they have published a list of 13 PIN flame retardants, all GS benchmark 2 or better on their [accepted substance list](#).

Chemical Watch Special Report Autumn/Winter 2015 "[Business Guide to Safer Chemicals in the Supply Chain including alternatives assessment](#)"



UL summary of 2nd furniture flammability summit

UL (Underwriters Laboratories) has published the summary record of the 2nd Furniture Flammability and Human Health Summit, Atlanta, Georgia, May 2014. This brought together 40 experts from fire prevention organisations, regulators, scientists, environmental and health NGOs and industry. The 43 page document includes summaries of presentations and of discussions for the two days, covering furniture fire standards, codes and testing, fire statistics, new flame retardant solutions (in particular, reactive phosphorus based PIN FRs 'bound-in flame retardants permit minimal exposure'), environment and health questions related to flame retardant use in furniture, smoke toxicity and fire fighter health risks, consumer information and furniture industry product strategies. Marty Ahrens, NFPA (US National Fire Protection Association) underlined the importance of accurate fire statistics data to support decision making. Data in the USA shows that (for 2006-2010) one in four home fire deaths was attributable to upholstered furniture, as the first item ignited or the primary item contributing to fire spread: that is 610 civilian deaths per year. Final conference comments underlined the complexity of furniture fire testing, the interest of already implementing a smoulder resistance requirement as a first step to improve fire safety, the importance of transparency, consumer information and awareness and of cost-benefit analysis.

UL Initiative on Safety Convergence "Proceedings of the Furniture Flammability and Human Health Summit", 20-22 May 2014, Atlanta GA <http://library.ul.com/?document=proceedings-of-the-furniture-flammability-and-human-health-summit>





PIN based FR fire safety for construction work

BASF, world leader in chemicals with around 112 000 people worldwide, has exhibited a nitrogen based PIN flame retardant polyolefin for fire safe shade nets for use in building construction, renovation and maintenance work. The nets protect workers from climate and protect the space below work from falling debris, tools or other items. Flamestab® NOR 116 is used as a PIN flame-retardant additive which does not negatively interact with Hindered Amine Light Stabilizer (HALS), used to ensure UV resistance. It is also melt processable and does not reduce the mechanical properties of the polymer. Fire standards achieved include FMVSS 302, DIN 4102 (B2 classification requirements), UL-94-VTM and NFPA 701. BASF presented this new material, alongside other innovations for fire safety including thermoplastics for fire-fighters helmets and fire hoses, at [Chinaplas 2016](#), underlining that nearly 340 000 fire incidents per year are recorded in China.

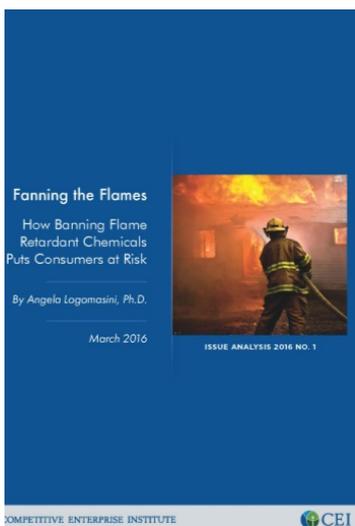
“BASF launches solutions to improve fire protection in China” – “Flamestab NOR116 keeps shade nets safe during building construction” [4th March 2016](#)



PIN FRs reach 450 km/h within 5 seconds

Clariant phosphorus-based PIN flame retardants are used in high fire security flexible polyurethane foams in the Florida Institute of Technology / Larsen Motorsports [dragster](#), testing new limits for automotive performance flame retardancy. Powered with a General Electric J-85 jet engine, the dragster can reach 450 km/h in around five seconds with a thrust of 2 300 kg. The dragster is built using aerospace technology, including aerospace fire safety requirements, with the objectives for Florida Tech of bridging the gap between aerospace and automotive technology developments, and of offering students hands-on experience of application, representing a clear plus for top-level employability in the automobile industry.

Clariant news [1 April 2016](#)



Competitive Enterprise Institute on halogen FRs

A 27 page paper by Angela Logomasini, for the Competitive Enterprise Institute, USA, indicates that banning halogen flame retardants could result in *“unnecessary and preventable loss of life from fires”*. This is presented as a response to a petition by environmental NGOs, currently under consideration by the US federal CPSC (Consumer Product Safety Commission), to ban all halogenated FRs in domestic furniture, mattresses and electronics. The paper states that *“The risks associated with traces of flame retardants do not warrant bans”* and that *“There is little evidence that any trace synthetic chemicals found in consumer products have a significant impact on human health”*. Instead of regulation, the paper proposes *“A voluntary, flexible market-based system (to) allow standard-setting organizations and furniture manufactures to adjust standards as knowledge evolves”* because *“government regulators lack the necessary information and ability to respond, they serve political interests often at the expensive of science and even public safety”*

“Fanning the flames. How banning flame retardant chemicals puts consumers at risk”, Angela Logomasini, Competitive Enterprise Institute (CEI), USA, 23rd March 2016
<https://cei.org/content/fanning-flames> CEI is a US think-tank dedicated to the principles of free enterprise and limited government known for positions denying anthropogenic climate change.



Firefighter health and personal protective equipment

The US NFPA (National Fire Protection Association) has received a US\$ 900 000 grant to study how cleaning affects contamination of firefighter personal protective equipment (PPE). This is part of ongoing work in the USA to reduce firefighter exposure to hazardous substances emitted during fires or present at intervention sites, and builds on the NFPA Fire Protection Research Foundation (FPRF) [project](#) on PPE cleaning validation. This project aims to identify chemical and biological contaminants to which firefighters are exposed, to define PPE cleaning and sanitisation procedures and to establish appropriate fire service guidance, in order to probably update NFPA 1851 [Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting](#). This important work on addressing firefighter exposure to hazardous substances is engaged parallel to the US NIOSH (National Institute for Occupational Safety and Health) studies on cancer incidence and health of firefighters. The [NIOSH 2013 epidemiological study](#) of nearly 30 000 firefighters in 3 large US cities concluded that firefighters showed higher incidence of certain cancers, but not significantly different long-term mortality (see pinfa Newsletter n° 37). In particular malignant mesothelioma (asbestos related lung cancer) was elevated in firefighters. The study also points to possible but unconfirmed risks from PAHs, formaldehyde, benzene, 1,3-butadiene and arsenic. A [2013 study](#) of 16 400 firefighters in Nordic countries found similar results. A further [NIOSH 2015 study](#) on 19 300 firefighters confirmed these results, showing correlations between firefighter fire hours or number of fire runs and lung cancer or leukaemia. The issue of whether combustion by-product carcinogens are increased when materials are flame retarded (maybe by smouldering instead of burning, lower fire temperatures) or decreased (lower quantities of material burned) is very complex and further research is important. Overall, flame retardants will reduce emission of toxic smoke and soot by reducing the incidence and the extent of fires.

Update NFPA research, [March 2016](#) "Cancer Threat Research combats the illness and disease hazards associated with firefighting"

NIOSH 2013 study: "Mortality and cancer incidence in a pooled cohort of US firefighters from San Francisco, Chicago and Philadelphia (1950– 2009)", Daniels et al., *Occup Environ Med* 2014 <https://dx.doi.org/10.1136/oemed-2013-101662>

NIOSH 2015 study "Exposure–response relationships for select cancer and non-cancer health outcomes in a cohort of US firefighters from San Francisco, Chicago and Philadelphia (1950– 2009)", Daniels et al., *Occup Environ Med* 2015 <https://dx.doi.org/10.1136/oemed-2014-102671>

Nordic 2013 study: "Cancer incidence among firefighters: 45 years of follow-up in five Nordic countries", Pukkala et al. *Occup Environ Med* 2014 <https://dx.doi.org/10.1136/oemed-2013-101803>

NFPA FPRF firefighter "PPE cleaning validation" [study summary](#) and [detail](#)

Other News



IEC (International Electrotechnical Commission), the international standards and conformity assessment body for all electrical, electronic and related technologies, voted on 3rd March 2016 approval of the joint JEDEC/ECA standard JS709B IEC/PAS 63015/Ed1: 'Definition of "Low-Halogen" For Electronic Products' as a Public Available Specification'. In addition, there is an approved new work item (ANW) IEC 63031 Ed. 1.0 "Definition of Low Halogen Materials used in Electronic and Electrical Products" which will lead to a new IEC standard, for which the first committee draft is expected for 2016-09 and will cover all materials used in electrical equipment, thus harmonising existing standards for certain sectors such as the JEDEC definition of "low-halogen" for electronics [JS709B](#) or TC20 for cables.

IEC www.iec.ch see IEC – TC 111 and 4th March 2016 [voting result](#). See also pinfa Newsletter n°55.



Washington State, USA, has enacted a bill banning from 1st July 2017 the sale of "children's products or residential furniture" containing more than 0.01% (in any product component) of five flame retardants: TDCPP, TCP, Deca BDE, HBCD, additive TBBPA. Additionally, the following FRs will be assessed within one year: IPTPP, TBB, TBPH, TCPP, TPP and V6. This is the first State ban of TBBPA in the USA

Washington State Bill [HB2545-2015-16](#) « Reducing public health threats that particularly impact highly exposed populations, including children and firefighters, by establishing a process for the department of health to restrict the use of toxic flame retardant chemicals in certain types of consumer products ».

Products indicated above: State ban: TDCPP = tris(1,3-dichloro-2-propyl)phosphate, TCEP = tris(2-chloroethyl)phosphate, decaBDE = decabromodiphenyl ether, HBCD = hexabromocyclododecane, additive TBBPA = additive tetrabromobisphenol A; assessment: IPTPP = isopropylated triphenyl phosphate, TBB = [2-ethylhexyl]-2,3,4,5- tetrabromobenzoate, TBPH = bis [2-ethylhexyl]-2,3,4,5- tetrabromophthalate, TCPP = tris [1-chloro-2-propyl] phosphate, TPP = triphenyl phosphate); V6 = bis[chloromethyl] propane-1,3-diyltetrakis [2-chloroethyl] bisphosphate).

Correction

Correction to article in pinfa Newsletter n°64 "Recycling of plastics containing hazardous substances". This article reported a Netherlands RIVM report which referred to the Solvolys process which re-dissolves EPS (expanded polystyrene) to remove HBCD and enable recycling. It should be noted that this process, now CreaSolve®, has been improved to achieve well below 100 ppm HBCD (the EU POP regulation limit).

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