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f 1st AMI Fire Retardants Conference in USA is big success

On 16 and 17 June 2011, AMI held its first “Fire Retardants in Plastics” conference in the United States. 150 delegates gathered in Denver, Colorado, to discuss recent developments in flame retardants technologies and environmental aspects. Building on the experience of AMI’s Fire Resistance conferences in Europe, this new event for the American market featured leading experts covering the latest legislative issues, additive technologies, flame retardant compound formulations and applications. Dedicated sessions addressed key topics such as electrical and electronic applications, decaBDE replacements, halogen-free options, nano-technology, and minerals for flame retardant formulations. In addition to a general overview presentation on *pinfa* by the vice-chairman, Adrian Beard, several *pinfa* members made presentations on their products. The impressive turnout and lively discussions showed that there is a strong and growing interest in the United States for state-of-the-art, environmentally compatible flame retardants.

More info: <http://www2.amiplastics.com/Events/Event.aspx?code=C400&sec=1617>



f New US school bus fire safety requirements

The US states of Nevada and Maryland are the first to pass new legislation requiring up-to-date fire safety in school buses. The US National Transportation Safety Board (NTSB) reports that there are over 2 200 school bus fires annually in the USA. The Nevada legislation requires that school bus seating must respect heat release and mass loss criteria, and that plastic engine compartment components must be UL 94 V0. The Maryland legislation requires that seat upholstery meet National School Transportation fire block criteria.

Fire Safety for All, 1st July 2011: <http://firesafetyforall.com/2011/07/nevada-and-maryland-drive-school-bus-fire-safety-for-our-kids-with-new-law/>

Nevada Senate Bill 318: http://www.leg.state.nv.us/Session/76th2011/Bills/SB/SB318_EN.pdf

Maryland Senate Bill SB 369: http://mlis.state.md.us/2011rs/fnotes/bil_0009/sb0369.pdf



f European Commission publishes flame retardants study

A study dated April 2011 by Arcadis Belgium has been published by the European Commission, summarising risk assessment data for flame retardants (FRs) used in consumer goods and EU fire fatality statistics. The study concludes that to provide an opinion on the safety of the FRs, further data is required, so that conclusions are reached for only 6 of the 42 FRs considered. This data is now largely available or under development through REACH. The study also attempts to assess whether fire deaths are shown to be reduced in those EU Member States which have certain consumer product fire safety regulations in place stricter than European standards. However, only 7 countries have such legislation, and for only 3 of these are statistical data available and relevant. The study indicates that for these three Member States (the UK and Ireland - furniture, mattresses, and France - bedding), fire safety regulations for consumer products have been accompanied by a significant reduction in fire deaths. In the UK, where detailed analysis has been carried out and published by the Government (see *pinfa* Newsletter n°10), the furniture fire safety regulations are considered to demonstrably result in fewer fire deaths. UK furniture fire safety regulations are estimated to account for 54 fewer deaths per year, 780 fewer injuries and 1065 fewer fires, with an economic saving of UK£ 140 million per year.

Acradis EBRC Belgium "Study of flame retardant substances in consumer products in domestic environments", April 2011, published by the European Commission (DG Consumer Affairs) at:

http://ec.europa.eu/consumers/safety/news/flame_retardant_substances_study_en.htm

Statistical report on the effectiveness of the UK Furniture and Furnishings (Fire) (Safety) Regulations, 1988, Greenstreet Berman, December 2009: <http://www.bis.gov.uk/files/file54041.pdf>

f Halogen-free monitors achieve TCO Certified Edge

To date, three manufacturers have obtained the prestigious and innovative TCO Certified Edge label for their computer monitors: Lenovo, Philips and NEC (see below). The TCO Certified Edge goes beyond the standard TCO Certified label, in particular requiring that the product and its peripherals and cables be completely halogen free (see *pinfa* Newsletter n° 5). TCO's CEO Soren Enholm states "The fact that we are now able to announce a product that has eliminated the halogens chlorine and bromine completely is a huge step in creating greater sustainability in the design of PC products".

TCO Certified Edge displays to date:

*Lenovo LT1952pwD, LT2252pwD, L2321xwD, L2021 Wide, L2251xwD, 2578-HB6, Thinkvision L2251x Wide
Philips 220BL2, 225BL2, 225PL2,
NEC EA22MWe*

TCO certification product data base: http://www.tcodevelopment.com/pls/nvp/tco_search



f PIN resin wins innovation prizes

A new polyester resin for composites, meeting railway fire safety standards (EN 45545 highest fire rating), has been awarded the Total “Ecosolutions” label and the JEC Innovation Award 2011 for Materials. The FireBlock Intumescent UPR Resin offers a lower density than standard products, enabling carbon savings in transport applications, is free of halogens and carcinogenic, mutagenic or reproductive toxic substances, offers flexibility in shape, colour and design, and is compatible with carbon fibre technology. Cost-effectiveness for small-run production makes such composites well adapted for bus and railway interior parts, because of low viscosity compatible with hand lay-up, spray-up, RTM, BMC and pultrusion processes. The potential market is considerable as currently composites represent only a small percentage of bus and rail interior parts, compared to 20 – 50% in aircraft construction. Carlson Engineered Composites are using the resin for several parts on the New Flyer Xcelsior intercity bus, conform to US Federal Docket-90 fire safety standards.

Photo: New Flyer Xcelsior www.newflyer.com

Nordsodyne FireBlock is developed by Cray Valley www.crayvalley.com, with partners Mariskone (Spain), Diseñoe innovacion S.L. (Spain) and Crepim (France)



JEC Innovation Awards 2011: <http://www.jecomposites.com/events/innovation-awards-paris-2011>

Total Ecosolutions Label: <http://www.total.com/en/our-challenges/preserving-the-environment/combating-climatechange/improving-energy-efficiency/the-total-ecosolutions-program/total-ecosolutionsproducts-and-services-201012.html>

Carlson Engineered Composites Inc, Winnipeg, Manitoba, Canada: <http://www.carlsongrpco.com/the-carlson-blog/2011/07/tough-resins-for-aggressive-environments>

f Apple innovative fire safety product

Apple has published a patent application for “a new advanced halogen-free material that is likely to be integrated into the manufacturing of Apple products like keyboards, mice, iPods, the iPad, cabling and more”. Apple indicate that 19% of fire related injuries are caused by fires starting with electrical faults in wiring or equipment, and that the increased use of flame retardants can reduce the number of such fires. The Apple patent is for a composite resin, with excellent flame retardancy (self fire extinguishable), and offering physical qualities including electrical insulation and crack resistance. The included flame retardant system includes alkali earth metals, nitrogen, borates and silicon.

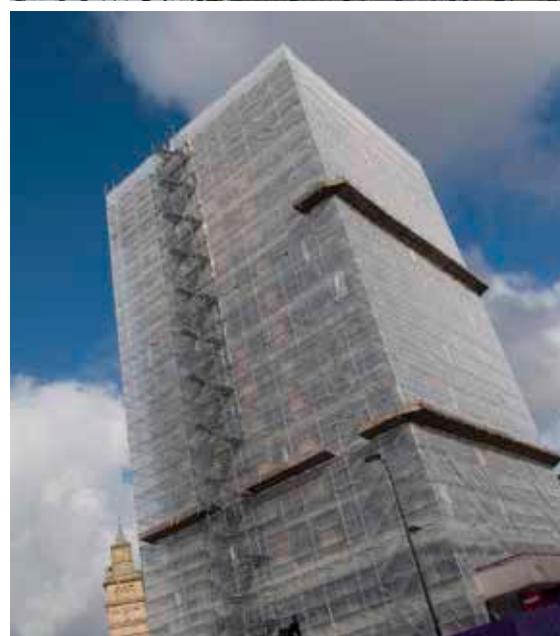
Patently Apple, 16th June 2001: <http://www.patentlyapple.com/patently-apple/2011/06/future-apple-products-likely-to-use-halogen-free-flame-retardant-materials.html>



f New performance PIN FRs for films and sheet plastics

The textile fire safety specialist Thor has released two new halogen-free flame retardants for thin films and thin polyolefin articles such as tapes, weaves and non-wovens. The FRs offer high mechanical performance (flexibility, stretching, tensile and tear strength) and excellent transparency, along with good fire resistance, reduced smoke production and carbon monoxide release. Effectiveness is further improved by combination with amino ether HALS synergists. Applications are also being developed in other resins. The organic nitrogen-phosphorus based AFLAMMIT® PCO 700 and 800 have both been successfully registered as new substances under REACH and on the USA TCSA inventory. Fire safety is critical for protective films used in transport and for plastic sheeting used in construction, because the risk of fire starting and propagating is particularly high during transport, manipulation and building works. Other applications include e.g. solar panel backsheets, insulating films and decorations in buildings, personal protective equipment, etc.

Further information www.thor.com "Innovative Flame Retardants from Thor" at <http://thor.adept.co.uk/news.asp>
Contact linda.green@thor.com



f TEHP under consultation in California

The Office of Environmental Health Hazard Assessment (OEHHA) of the California Environmental Protection Agency has included one PIN flame retardant, TEHP Tris (2-ethylhexyl) phosphate, in a list of 39 chemicals for discussion and possible preparation of hazard identification materials for consideration by the Carcinogen Identification Committee. This follows preliminary screening of several hundred chemicals not currently identified as carcinogenic. Public comment on this proposal is requested until deadline 17h00 on 20th September 2011 by email to coshita@oehha.ca.gov.

OEHHA list of 39 chemicals for discussion: http://www.oehha.ca.gov/prop65/public_meetings/prior072211.html

Summary of preliminary screening information on TEHP:

http://www.oehha.ca.gov/prop65/public_meetings/CIC101211/101211Tris2ethylhexylphosphate.pdf



f UK government report on flame retardant technologies

The UK Environment Ministry, DEFRA, has published a strategic report into fire retardant technologies: safe products with optimised environmental performance. The report particularly looks at how Ecolabel criteria and Green Public Purchasing can push towards environmentally preferable chemicals and technologies, without compromising fire safety, concluding “*There is general support from various industry sectors for inclusion of a flammability criterion in the EU Ecolabel*”. It is noted that design-based and inherent FR material approaches can avoid the use of chemical FR technologies, but that these may not in all cases offer the best whole life environmental performance and so chemical FR technologies that are good environmental performers should not be excluded.

DEFRA Science and Research Projects: Fire Retardant Technologies: safe products with optimised environmental performance - EV0432 (AEA Technology, GnoSys UK, University of Bolton, Oakdene Hollins Ltd.), November 2010:
<http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=16838>

f Lanxess develop performance PIN elastomers



Lanxess has published studies showing that new compounding of Levapren® (Ethylene Vinyl Acetate - EVM) and Therban® (Hydrogenated Nitrile Butadiene Rubber - HNBR) can produce high performance, media-resistant, halogen-free, low smoke toxicity, elastomer materials (HFFR/FRNC). Applications targeted range from renewable energies and offshore industries to ship building, construction, mass transit and railways. EVM offers excellent ozone and weather resistance. HNBR offers good resistance to oil, heat and abrasion. Both elastomers are halogen-free and, with suitable flame retardants, can achieve high fire resistance as well as mechanical strength. Tests of various PIN flame-retarded formulations based on EVM or EVM/HNBR blends are presented including oil resistance, fire resistance (heat release), and various mechanical properties.

Source: A. Roos, Lanxess Deutschland GmbH, “Halogen Free Flame Retardant (HFFR) Compounding with EVM and EVM/HNBR”, KGK Magazine (Raw Materials and Applications), March 2011: <http://www.kgk-rubberpoint.de/texte/anzeigen/2437/Halogen-Free-Flame-Retardant-HFFR-Compounding-with-EVM-and-EVM-HNBR>



f EVCCO HFT conduits protect cables and air systems

Australia's EVVCO HFT (Halogen Free Flame Retardant) polymer electrical and safety conduits offer protection of cable systems or of air conduits (eg. aspiration systems, air sampling systems) against fire and toxic gases, and against day-to-day wear (impacts, dust, water, cleaning agents ...). Because they are flexible and lighter than metal conduits, with glued or rubber-sealed connections, installation is faster and more economic. The conduits are available in 20 – 150 mm diameter, and offer advantages of very low smoke formation and no toxic or corrosive gas release, resistance to fire propagation and to high temperatures. EVCCO was selected as a finalist in the Big 5 Gaia environmental innovation awards, Dubai, 2009. Recent installations of EVCCO conduits include Fonterra dairy cool store (-10°C operation), with Calair Systems in Sydney's Epping-Chatswood rail link tunnel, the ANZ Bank headquarters Melbourne, Masdar EcoCity (Abu Dhabi).



The EVCCO range is conform to AS/NZS standards 2053:2001, BS/EN 61386-21, IEC 60423, Australasian Green Star, LEED (Leadership in Energy and Environmental Design) Green Building, Estidma (Arabic building sustainability).

EVCCO (Environmental Conduit Company) www.evcco.com.au part of Albatech Pty Ltd

Calair Pipe Systems www.calair.net.au

f Electrical fire kills in Netherlands

13th July 2011: A man was killed in Rijswijk (Southern Netherlands) in a house fire caused by overheating of video/audio electrical equipment. About 19% of fired deaths are caused by fires started in electrical and electronic equipment (source: Apple). One person dies every week in the UK because of electrical fires, and 80 preventable electrical fires occur, according to the UK Electrical Safety Council.

Source: http://www.rijswijktekijk.nl/rijswijks_nieuws_bulletin.htm

UK Electrical Safety Council : <http://www.esc.org.uk/public/news-and-campaigns/news/news/article/one-death-and-80-preventable-electrical-fires-every-week-means-lives-at-risk-this-bank-holiday-week/>



f Opportunities for PIN FRs in China

Industry experts foresee a rapid expansion of PIN flame retardant applications in China, through technological innovation and opportunities, and because of supply and cost issues with bromine and antimony. The issues were explained by Ryan Darmawan of A. Schulman, a leading international supplier of specialist plastics (custom compounds, masterbatches) at the 2nd International Conference on Flame Retardants China (May 2011). China supplies nearly 20% of world bromine demand, but Chinese sources are depleted and there is a global shortfall estimated at 10%. China supplies around 90% of world antimony demand, and like other rare earth metals, supply is environmentally critical. For both substances, recovery and recycling is important, but seems unable to prevent pressure on supply and resulting price increases in the short-medium term.

A. Schulman: www.aschulman.com

2nd International Conference on Flame Retardants Requirements, Challenges and Innovations, Guangzhou, China:
http://www.skz.de/en/training/conferences/international_conference/1499.html

f KONE elevators choose halogen-free wiring

KONE's new commercial elevators (lifts) use halogen-free, fire-resistant, low smoke cables. KONE has been selected to install the 40 elevators in the 6 stations of Delhi Metro's new Airport Express line in India, which opened in February 2011. The MonoSpace and TransSys models present "halogen-free" as one of the key, special safety features. KONE's ranges of TravelMaster and TransitMaster elevators (escalators, moving walkways) also boast halogen-free wiring as a valuable safety feature.

KONE elevators in Delhi Airport Express line:

http://www.kone.com/countries/en_IN/about_us/media/Pages/KONE%E2%80%99s-high-end-elevators-on-the-newly-opened-Delhi-Airport-Express-line.aspx

KONE TravelMaster: <http://www.infolink.com.au/c/Kone-Elevators-228196/Kone-Releases-New-TravelMaster-110-Commercial-Escalators-n898227>

f Carbon monoxide detectors mandatory in California

From 1st July 2011, carbon monoxide (CO) detector alarms will be mandatory in homes in California (all new and existing homes which have fossil-fuel burning appliances, fireplaces or an attached garage). The bill enacted in May 2010 requires installation by 1st July 2011 in all single-family homes which have fossil-fuel burning appliances, fireplaces or attached garages. For apartments, hotels and other residential buildings, the installation deadline is 1st January 2013. 30 – 40 people are estimated to die each year in California because of carbon monoxide poisoning. Battery-powered detectors, conform to standards, can be purchased for 25 – 30 Euros.

California Senate Bill 183: http://www.leginfo.ca.gov/pub/09-10/bill/sen/sb_0151-0200/sb_183_bill_20100507_chaptered.pdf



f Innovative, sustainable fire safety of recycled fabrics

A UK project is developing novel, environmentally sustainable fire safety solutions for non-woven fabrics manufactured from post-consumer recycled fibres, for use in furniture, car transport interiors, insulation. The Reduced Emissions by Development of Novel Sustainable Flame Retardant Products (REDFR) Consortium is addressing the fact that the proportion of wool fibres in “waste” fibres is decreasing as consumers are increasingly choosing fleeces and garments made from synthetic fibres. Traditional flame retardant products for recycled synthetic fibres “are available, but many of these have associated health concerns including bioaccumulation and carcinogenicity, and are harmful to the environment. The use of many previously commonplace FRs is now banned”. The Consortium’s alternative flame retardant system is halogen-free, Deflamo Apyrum product, developed for use in polyester, viscose cotton and blended fabrics. The life cycle assessment (by GnoSys UK) shows considerably lower environmental impact than manufacturing fabrics from virgin wool, and a lower impact than traditional FR systems in 7 out of 10 categories considered. Fire safety conform to UK Furniture Fire Safety Regulations is achieved.

REDFR (Reducing Emissions by Development of Novel Sustainable Flame Retardant Products):

<http://www.fira.co.uk/technical-information/article/240/redfr---reducing-emissions-by-dev>

Deflamo Apyrum range: www.deflamo.se

“Materials World” article: <http://www.iom3.org/news/waste-textiles-work-against-fire>

f 22 die in India bus fire

7th June 2011: the 22 passengers of a coach were killed when the vehicle caught fire, after toppling onto its side and leaving the road, near Vallore, Tamil Nadu, India. The KPN Travels coach was going from Tirupur to Chennai. The coach is stated to have burst into fire in seconds after the accident, and was in flames for nearly an hour and bodies were burnt beyond recognition. Only the driver escaped alive. It is suggested that a short circuit in the coach’s air conditioning equipment following the accident caused the fire. International coach and bus fire safety regulations can be considered the opposite of railway standards: little or no fire safety of materials is required in buses and coaches, for example only a simple horizontal flame spread test in Europe, with no requirements for smoke or heat release.

SP Sweden position on bus fire safety: <http://www.sp.se/en/press/news/releases/Sidor/20090306.aspx>

Vellore bus fire: <http://www.ndtv.com/article/india/22-dead-in-vellore-bus-fire-this-man-survived-110836>



f Other news on flame retardants

The Office of Environmental Health Hazard Assessment (OEHHA) of the California Environmental Protection Agency has proposed that the chlorinated flame retardant chemical TDCPP be classified as carcinogenic, following results of in vitro and in vivo studies. OEHHA emphasises that TCDPP is structurally similar to the halogenated carcinogens TDBPP and TCEP and is metabolised to other carcinogenic chemicals.

The EU Commission has opened a public consultation (**to 9th September 2011**) concerning how to assess the health and environmental impacts of mixtures of chemicals, or combinations of chemicals in the environment. At present, EU legislation (including REACH) only looks at the isolated effect of each chemical, as does all legislation elsewhere in the world.

OEHHA Proposition 65 "Announcement of Carcinogen Identification Committee Meeting Scheduled for October 12 and 13, 2011, and Availability of Hazard Identification Materials for Fluoride and Its Salts, and Tris(1,3-Dichloro-2- Propyl) Phosphate": http://www.oehha.org/prop65/hazard_ident/070811hid.html

EU consultation on the "Toxicity and Assessment of Chemical Mixtures" – to 9th September 2011:

http://ec.europa.eu/health/scientific_committees/consultations/public_consultations/scher_consultation_06_en.htm

f Abbreviations

PBDE:	Poly brominated diphenyl ethers	halogenated flame retardants
POP:	Persistent Organic Pollutant	
SPE:	US Society of Plastic Engineers www.4spe.org	
NFPA:	US National Fire Protection Association www.nfpa.org	
TCEP:	tris(2-chloroethyl) phosphate	halogenated flame retardant
TDBPP:	Tris(2,3-dibromopropyl) phosphate	halogenated flame retardant
TDCPP:	Tris(1,3-dichloro-2-propyl) phosphate	halogenated flame retardant
TEHP:	Tris (2-ethylhexyl) phosphate – C ₂₄ H ₅₁ O ₄ P	PIN flame retardant



f Agenda

Events with active pinfa participation are marked: ▶

11-15 Sept. 2011	Cagliari, Sardinia, Italy	7 th Mediterranean Combustion Symposium http://www.ichmt.org/mcs-11/
19-21 Sept. 2011	New Delhi, India	Fire India 2011 www.fire-india.com
20 Sept. 2011	Warrington, Cheshire, UK	Half-day Seminar: Flammability in Furniture and Furnishings http://www.bureauveritas.co.uk/ (see "Events" in top "News" menu)
21-23 Sept. 2011	Berlin, Germany	Thermosets 2011, from monomers to components (Fraunhofer PYCO) www.thermosets.de
27 Sept. 2011	Bruay-la-Buissière (near Béthune), France	CREPIM training: rail transport and fire, the new TS45545 specifications: http://www.up-tex.fr/actualites/article/journee-dinformatons-sur-la-reglementation-ferroviaire-du-crepim-1.html
23-28 Oct. 2011	Portland, Oregon, USA	Society of Fire Protection Engineers annual meeting http://www.sfpe.org/Education/2011SFPEAnnualMeeting.aspx
26-28 Oct. 2011	Nashville, Tennessee	Polyurethanes Technical Conference http://www.polyurethane.org/s_api/index.asp
8 Nov. 2011	▶ Taipei, Taiwan	pinfa workshop on sustainable flame retardants in E&E hosted by TCPA; Contact: sdl@cefic.be
9-11 Nov. 2011	Taipei, Taiwan	12 th Electronic Circuits World Convention (ECWC12) www.ecwc12.org in parallel to TPCA (Taiwan Printed Circuit Association) Trade Show http://www.tpca.org.tw/index.aspx?lc=2
9 Nov. 2011	Edinburgh, UK	Science of Suppression FIRESEAT www.see.ed.ac.uk/FIRESEAT/
29 Nov. – 1 Dec. 2011	▶ Cologne, Germany	Fire Resistance in Plastics 2011 (AMI conference) http://www2.amiplastics.com/Events/Event.aspx?code=422&sec=1836
12-14 Dec. 2011	Orlando, Florida	Fire & Life Safety Conference (NFPA) http://www.nfpa.org/displayContent.asp?categoryID=2088
14-16 March 2012	New York	5 th International Symposium on Tunnel Safety & Security http://www.istss.se/en/Sidor/default.aspx
25-29 March 2012	San Diego, California	ACS Fire and Polymers VI conference http://portal.acs.org
16-17 April 2012	Shanghai, China	3rd International Conference on Flame Retardants http://www.skz.de/en/training/conferences/international_conference/1499.html
11-14 June 2012	Las Vegas	NFPA Conference and Expo (US National Fire Protection Association) http://www.nfpa.org/displayContent.asp?categoryID=943
27-28 Sept. 2012	Chicago	2 nd International Conference on Fires in Vehicles (FIVE) www.firesinvehicles.com



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f 3rd E&E flame retardants workshop - Taipei

Following the success of the first two workshops on Green Electronics & Innovative Flame Retardants for the E&E value chain, held in Brussels in 2009 and 2010, pinfa is organising the third workshop in Asia, at the manufacturing hub of electronics. These workshops enable product electronics manufacturers to meet and interact with producers of alternative flame retardant technologies and of flame-retardant polymer compounds and materials, and with stakeholders such as regulators and environmental groups.

Building the Future for Flame Retardants in E&E, 8th November 2011, 8h30 – 17h15, TPCA Offices, Taipei, Taiwan:
http://www.pinfa.eu/uploads/Mediaroom/pinfa_E&E_WKS_Taipei_Agenda_2011-11-08_v03_xs_AB-4-2.pdf



f Zero halogen cables meet London Tube challenges

London underground transport poses particular fire safety issues: as the oldest metro system in the world, the tunnels were built small, deep and long, with very few escape exists, and are used daily by millions of people. Railway systems worldwide have strict smoke and fume standards (BS6853 UK, NF 16 101 France, DIN 5510 Germany and TS 45545-2 Europe) and the London tube requirements for low smoke and toxicity are amongst the most stringent in the world. PolyOne's ECCOH compounds provide LSFOH (low-smoke and fume, zero halogen) fire safety solutions for cables, as well as mechanical performance (mineral oil resistance IRM 903 for 7 days at 100°C, temperature rating from -40°C to +120°C) and have been accepted for installation in the London underground system. PolyOne ECCOH also includes a range conforming to the performance requirements of the nuclear industry, including radiation and chemical resistance.



PolyOne ECCOH Non-Halogen FR compounds: <http://www.polyone.com/en-us/products/lsoh/Pages/ECCOHLowSmokeandFumeZeroHalogen-LSFOH-Compounds.aspx>

f Sweden strategy for safe chemicals in articles

The Sweden Chemicals Agency KEMI has published a report outlining its strategy on chemicals in articles (that is, in consumer goods and other finished products). This issue is largely not addressed by the EU chemical regulation REACH, which regulates chemical manufacture, import and sale, but only to a limited extent chemicals contained in finished products (e.g. specifically identified SVHC Substances of Very High Concern). KEMI emphasises the increasing consumption of chemicals in articles, the importance of global trade: most chemicals are imported in articles not as chemicals, and the need to improve resource efficiency and material cycles. The proposed strategy involves combining legal instruments with other drivers (such as public procurement criteria), synergies with resource cycles and materials recycling, communication and collaboration, international action, research, and focussing on high exposure articles (building materials, furnishings, electrical and electronics, clothing and shoes, toys and items for children).

KEMI report n° 3/11 « Chemicals in articles » (in Swedish with 5 page English summary):
<http://www.kemi.se/upload/Trycksaker/Pdf/Rapporter/Rapport3-11-Kemikalier-i-varor.pdf>



f Major players implement IEC “non-halogenated” standard

IEC 61249-2-21:2003 defines requirements for “non-halogenated materials” for printed circuit boards and connecting electronics components. Leading manufacturers of boards and chipsets are increasingly implementing this standard, following increasing demand from computer manufacturers and achievements in technical performance over recent years. For Intel, halogen-free is part of the Eco-Smart programme (2011) and Intel Core processors are conform. Halogen-free is also part of AMD’s product stewardship policy. This enables computer manufacturers to ensure that this IEC standard is part of the offer for new top of the range, innovative and green products. The new Fujitsu Esprimo P5000 series, for example, with innovative energy and noise reduction, using Intel or AMD processors, boasts a halogen free main board. IPC, the Association Connecting Electronics Industries, is also currently developing a “Guideline for Defining ‘Low-Halogen’ Electronic Products” (IPC-4903A).

* IEC 61249-2-21:2003 (International Electrotechnical Commission) defines “non-halogenated” to cover parts not containing more than 900 ppm chlorine or bromine individually, and not containing more than 1500 ppm total bromine plus chlorine. http://webstore.iec.ch/webstore/webstore.nsf/Artnum_PK/31264

Intel Eco-Smart: <http://www3.intel.com/cd/channel/reseller/asm-na/eng/403012.htm>

AMD product stewardship 2011: <http://www.amd.com/us/aboutamd/corporate-information/corporate-responsibility/product-stewardship/Pages/products.aspx>

Fujitsu Esprimo: http://ts.fujitsu.com/products/deskbound/personal_computers/esprimo_p5x

f New “low halogen” microelectronics standard

JEDEC, the Solid State Technology Association, and ECA, the Electrical Components Association, have published a standard “defining ‘low halogen’ passives and solid state devices”. The document states that the electronics passive and solid state industries seek to further reduce the overall environmental impact of our products by working to develop reliable and cost-effective alternatives to brominated and chlorinated flame retardants and PVC. The standard can be applied to all non-metallic and non-ceramic materials of transistors, integrated circuits, memory modules ... but does not cover printed circuit boards, cables or assembled electronic products. “Low halogen” is defined as follows: all printed board laminates used shall meet the “halogen free” requirements of IEC 61249-2, IPC-4101 or JPCA-ES-01 and all other plastic materials shall contain <0.1% by weight of both bromine and chlorine. In addition, the international electronics manufacturing initiative (iNEMI) held a webinar in August 2011 on “Reducing HFRs and PVC in the Electronics Supply Chain”.

iNEMI webinar “Reducing HFRs and PVC in the Electronics Supply Chain” www.inemi.org/node/2118

JEDEC / ECA standard defining ‘low halogen’ passives and solid state devices, JS709, August 2011: <http://www.jedec.org/standards-documents/docs/js709>



f EU R&D call for alternative flame retardants

The European Union has opened a call for proposals for R&D into innovative materials for halogen free flame retardants under Seventh Framework Programme funding. R&D proposals should closely involve SMEs, and should include demonstration of fire classification for intended applications, technical performance, health, environment and cost factors. Priority will be given to projects producing such flame retardants from renewable sourced materials, and which take into account a life cycle approach. Submission deadline for proposals for the first call is 8th November 2011.

EU "Cordis" website, Seventh Framework Programme R&D funding portal:
http://cordis.europa.eu/fp7/cooperation/nanotechnology_en.html

f PIN FRs for wood fibre – polymer composites

Composite materials where wood or other natural fibres are included in polymers are emerging materials which offer performance, cost and sustainability advantages for applications in transports, military uses, building, packaging, consumer products ... Polypropylene is a choice polymer for such composites, with additives to improve fibre compatibility. Without flame retardants, such composites are however highly flammable. A recent paper in "Composites" indicates that ammonium polyphosphate (APP) and silica act in synergy and provide effective flame retardancy of wood fibre/polypropylene composites, with only marginal alteration of mechanical properties, and with effects on the structure of blown foamed /microcellular composites. Other authors cited have also investigated (APP and/or) borates, zinc borate, melamine compounds, magnesium hydroxide, montmorillonite and nanoclay as flame retardants for such composites.

"Effect of Flame Retardants on Mechanical Properties, Flammability and Foamability of PP/Wood-Fiber Composites", Z-X Zhang et al., *Composites Part B*, 2011: <http://dx.doi.org/10.1016/j.compositesb.2011.06.020>

f Dehumidifier fire hazard costs over \$1 million

98 000 dehumidifiers made by LG Electronics, and sold under Goldstar and ComfortAire brands) are being recalled in the USA following nearly 30 reports of arcing, smoke or fire resulting from an electrical fault. The power connectors to the apparatus' compressor unit can short and cause a fire. Nine reported significant home fires apparently caused by the electrical apparatus have resulted in over one million US\$ fire damage. The US CPSC (Consumer Product Safety Council) issued a product recall alert on 14th September 2011, following a first warning in late 2009, because only 2% of the apparatus sold have been returned by consumers to date. Appropriate use of flame retardants can reduce the fire risk inherent to all electrical equipment.

CPSC dehumidifier product recall: <http://www.cpsc.gov/cpsc/pub/prereel/prhtml11/11324.html>



f China RoHS certification updated

The rules for showing compliance with “Chinese RoHS” have been updated, applicable from November 2011. The Chinese law is similar to the EU RoHS Directive 2002/95/EC (Restriction of Hazardous Substances in electrical and electronic equipment, recently revised as 2011/65/EU), excluding the same six toxic or hazardous substances, but is for the present a voluntary certification whereas the EU Directive is mandatory for all items sold in Europe. The requirements for flame retardants in the revised China RoHS are unchanged, with PBBs (polybrominated biphenyls) and PBDEs (polybrominated diphenyl ethers) limited to 0.1% by weight (the same requirement as in Europe). Despite its name, the Chinese law is now widened in scope to cover household electronics, and electrical parts and components, and not only information technology products.

China RoHS update: Implementation Rules of Voluntary Certification on the Pollution Control of Electronic Information Products of 26 July 2011 and Circular on the List of Electronic Information Products requiring Voluntary Certification (First Batch) and Exemptions of 25 August 2011: http://www.ynpglobal.com/Onlinestore/china_rohs_2011.asp

EU RoHS Directive, revised 8th June 2011, 2011/65/EU: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:174:0088:0110:EN:PDF>

f Insulation materials blamed in deadly shoe factory fire

17 people died and 21 were injured in a fire at a shoe factory in the city of Hai Phong, Vietnam, on 29th July 2011. Reports suggest that sparks from welding work set fire to insulation material in the newly-opened factory roof, which then fell burning to the floor, trapping workers, and igniting the stockpile of shoemaking materials. Once again, flame retardancy of ceiling insulating and decorating materials is tragically shown to be essential in ensuring fire safety of buildings.

BBC News: <http://www.bbc.co.uk/news/world-asia-pacific-14352275>

f DfE evaluation criteria for alternative flame retardants

The US Environment Protection Agency (EPA) has circulated a finalised revised criteria document for assessing alternative chemicals under the “Design for the Environment” (DfE) partnership. The criteria include specifications for data availability and evaluation and categories for possible effects such as toxicity, carcinogenicity, environmental persistence and bioaccumulation. The DfE alternatives assessment for Deca-BDE, which is undergoing a voluntary phase out programme in USA, is expected to then be published as a draft for public comment later in 2011, addressing alternative flame retardants for products such as textiles, plastic transport pallets and electrical equipment and electronics, and the DfE assessment for alternative flame retardants to HBCD in polystyrene is now underway.

DfE Alternatives Assessments: http://www.epa.gov/dfe/alternative_assessments.html and revised criteria: http://www.epa.gov/dfe/alternatives_assessment_criteria_for_hazard_eval.pdf



f Nexans success with halogen-free cables

Worldwide leading expert in the cable industry, Nexans makes halogen-free, fire resistant cables a keystone of its offer to a range of demanding applications. Recent successes include: 500 km of halogen-free, fire-safe offshore control and instrumentation cable (ABS American Board of Shipping approved) for the conversion of the Espirito Santo FPSO (Floating Production Storage and Offloading) vessel serving the BC-10 deep water field development in the Campos Basin offshore Brazil; 1 100 km of low voltage power cables as well as Alsecure® Premium fire resistant cables that feature Nexans' innovative insulation technology for the Brisbane Airport project in Australia, 345 km of power and communication cables for GASCO Habshan 5



natural gas processing installations in Abu Dhabi, China's Taishan nuclear power plant lower voltage, control and instrumentation cables, 10 000 km of power control and data cables from its FLAMEX® range for China Railway High-speed train project between Beijing and Shanghai (CRH). Low fire hazard cables significantly delay the propagation of a fire and reduce heat release (thus gaining precious time for evacuation and fire-

fighting), they also ensure lower smoke opacity and gases emissions, the prime cause of fire-related deaths, and damage to equipment and structures. Fire Resistant cables ensure the integrity of function during a fire, thus enabling security systems (video surveillance, smoke ventilation, audio alarms...) to continue functioning for a certain time after the fire has started.

More: <http://www.nexans.com/eservice/Navigate.nx?navigationId=267713>

f Occurrence and fate of phosphorus FRs in freshwater

Data from Germany provides important indications as to the behaviour of different types of phosphorus flame retardants in the environment. Three chlorinated phosphorus esters and three non-halogen phosphorus esters were analysed in waters of a low mountain lake, a rural lake and an urban pond, and were studied for degradation in natural water in sunlight. Concentrations of the non-chlorinated compounds were often below detection limits in the remote lakes, whereas the chlorinated compounds were present, with TCPP in particular being identified as subject to atmospheric transport. The laboratory tests showed the rapid degradation of the non-chlorinated compounds and the resistance of the chlorinated compounds in natural waters subjected to sunlight. The study notes the high variability of concentrations in urban lake waters.

"Occurrence and fate of organophosphorus flame retardants and plasticizers in urban and remote surface waters in Germany", J. Regnery, W. Puttmann, Water Research n° 44, pages 4097-4104, 2010 www.sciencedirect.com



f Phosphorus FRs in air and in marine fish

Two recent studies show the presence of organophosphorus flame retardants in the atmosphere (North Sea) and in fish (Manila Bay, Philippines). In the North Sea air study, concentrations of the chlorinated flame retardant TCP are much higher than those of the other compounds analysed. The Manila Bay study shows concentrations of organophosphorus substances of total 0.2 – 1.1 ppm. Concentrations increased with fish size but were generally not related to lipid content, suggesting that most of these substances do not bioaccumulate, but are taken up and bioconcentrated by fish from the water. TEP and TPpP were however correlated to lipids and may bioaccumulate. Exposure of populations eating fish was assessed and considered to be 4-5 orders of magnitude lower than Reference Dose values. The authors conclude that organophosphorus flame retardants should be monitored in the future, because use will increase as brominated substances are phased out of many consumer products.

“Organophosphorus flame retardants and plasticizers in the atmosphere of the North Sea”, A. Möller, Z. Xie, A. Caba, R. Sturm, R. Ebinghaus, Environmental Pollution, in press, 2011 www.elsevier.com/locate/envpol

“Levels and distribution of organophosphorus flame retardants and plasticizers in fishes from Manila Bay, the Philippines”, J-W. Kim, T. Isobe, K-H. Chang, A. Amano, R. Maneja, P. Zamora, F. Siringan, S. Tanabe, Environmental Pollution, in press, 2011 www.elsevier.com/locate/envpol

f US home fires decrease in number but continue to kill

The total number of reported structural fires in the USA decreased in 2010, in line with a long-term decrease since comparable statistics were first collated in the late 1970's, achieving in total an all-time low number of fires. However, developments differ between types of building: from 2009 to 2010, the number of fires in public assembly and special structure buildings fell significantly (-17% and -11%), whereas they increased in stores and offices (+9%) and in residential properties (+2%). Nearly 80% of reported structural fires were residential. The number of home fires has generally been falling since the 1970's (a near 50% decrease since 1977), but the death rate per home fire has not fallen since the 1970's: once a fire does occur, it is just as lethal as 30 years ago. The annual death rate per home has thus fallen little (-12% only) since 1977. Overall, the 1.3 million fires reported in the USA in 2010 resulted in 3 120 civilian deaths, an increase of +3.7% from 2009, and in 17 720 civilian injuries. The NFPA report underlines that reducing home fire deaths must now be a priority, through public education, smoke alarms and sprinkler installation, addressing specific risk groups, and by making home products more fire safe.

NFPA (US National Fire Protection Association), “Fire loss in the United States during 2010”, M. Karter, September 2011: <http://www.nfpa.org/publicJournalDetail.asp?categoryID=2249&itemID=53060>



f Abbreviations

BFR:	Brominated Flame Retardant	
NFPA:	US National Fire Protection Association www.nfpa.org	
PBDE:	Poly brominated diphenyl ethers	halogenated flame retardants
POP:	Persistent Organic Pollutant	
PVC:	Poly Vinyl Chloride	
SPE:	US Society of Plastic Engineers www.4spe.org	
TCEP:	tris(2-chloroethyl) phosphate	halogenated flame retardant
TCPP:	tris(2-chloro-1-methylethyl) phosphate	halogenated flame retardant
TDBPP:	Tris(2,3-dibromopropyl) phosphate	halogenated flame retardant
TDCPP:	Tris(1,3-dichloro-2-propyl) phosphate	halogenated flame retardant
TEHP:	Tris (2-ethylhexyl) phosphate – C ₂₄ H ₅₁ O ₄ P	PIN flame retardant
TEP:	Triethyl phosphate	PIN FR
TPeP:	Tripentyl phosphate	PIN FR

f Agenda

Events with active pinfa participation are marked: ►

23-28 Oct. 2011	Portland, Oregon, USA	Society of Fire Protection Engineers annual meeting http://www.sfpe.org/Education/2011SFPEAnnualMeeting.aspx
26-28 Oct. 2011	Nashville, Tennessee	Polyurethanes Technical Conference http://www.polyurethane.org/s_api/index.asp
8 Nov. 2011	► Taipei, Taiwan	pinfa workshop on sustainable flame retardants in E&E hosted by TCPA; Contact: sdl@cefic.be
9-11 Nov. 2011	Taipei, Taiwan	12 th Electronic Circuits World Convention (ECWC12) www.ecwc12.org in parallel to TPCA (Taiwan Printed Circuit Association) Trade Show http://www.tpcpa.org.tw/index.aspx?lc=2
9 Nov. 2011	Edinburgh, UK	Science of Suppression FIRESEAT www.see.ed.ac.uk/FIRESEAT/
29 Nov. – 1 Dec. 2011	► Cologne, Germany	Fire Resistance in Plastics 2011 (AMI conference) http://www2.amiplastics.com/Events/Event.aspx?code=422&sec=1836
12-14 Dec. 2011	Orlando, Florida	Fire & Life Safety Conference (NFPA) http://www.nfpa.org/displayContent.asp?categoryID=2088
14-16 March 2012	New York	5 th International Symposium on Tunnel Safety & Security http://www.istss.se/en/Sidor/default.aspx
25-29 March 2012	San Diego, California	ACS Fire and Polymers VI conference http://portal.acs.org
16-17 April 2012	Shanghai, China	3rd International Conference on Flame Retardants http://www.skz.de/en/training/conferences/international_conference/1499.html
11-14 June 2012	Las Vegas	NFPA Conference and Expo (US National Fire Protection Association) http://www.nfpa.org/displayContent.asp?categoryID=943
27-28 Sept. 2012	Chicago	2 nd International Conference on Fires in Vehicles (FIVE) www.firesinvehicles.com



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f First pinfa workshop on E&E in Asia: a great success

On 8th November 2011 *pinfa* held its 3rd workshop “Building the Future for Flame Retardants in E&E” in Taipei, Taiwan. After two successful workshops in Brussels, *pinfa* decided to hold this workshop in Asia and go to the manufacturing hub of electronics in order to discuss technology, needs and trends with key players. In addition, an update on developments in Europe and America were presented to 120 participants.





The event was hosted by the Taiwan Printed Circuit Board Association (TPCA) at the Taoyuan office site which provided excellent meetings facilities. Frank Bei from TPCA welcomed the guests and introduced the organisation to the many attendees from abroad. The day gave attendees the opportunity to debate key questions on flame retardants with representatives from manufacturers of flame retardants, compounders, electronic manufacturers, regulators, environment groups and electronics associations. After an overview on key developments in the legal and ecolabel sector (mainly driven from Europe and the US) by Uli Wietschorke and Hideo Kawasaki from Adeka, Lauren Heine from Clean Production Action spoke about the environmental and health assessment of alternative chemicals and the US-EPA design for environment programmes. Presentations from local electronics and polymer companies included Foxconn (Dr. Chan), Shinkong (Ted Chang) and Chang Chun (An-Bang Duh) who gave an update on their transition



Frank Bei, TPCA

efforts to halogen free materials and the challenges remaining. Speakers from pinfa member companies Nabaltec (Carsten Ihmels), BASF (Jim Wu) and Clariant (Adrian Beard) highlighted the state of the art of halogen free flame retardants based on phosphorus, nitrogen and inorganic technologies as well as announcing new developments for epoxy resins systems. The workshop showed that the transition to halogen free technologies is well advanced in the consumer electronics industry in Asia. PIN flame retardant producers continuously develop new products and formulations to meet the remaining technical challenges.

For more information contact pinfa@cefic.be



f Pinfa sponsors ECWC12 electronics conference

The day after the *pinfa* workshop in Taipei, the Taiwan Printed Circuit Association (TPCA) trade show and the 12th Electronic Circuits World Convention (ECWC12) started in the Nangang exhibition centre in Taipei. *pinfa* sponsored the ECWC12 conference which featured several presentations on halogen free technologies for printed circuit boards and related electronic materials. Info <http://www.ecwc12.org/>



pinfa members at the TPCA show and ECWC12. The *pinfa* vice-chairman Adrian Beard receives the plaque of honour with other sponsors.



f Draka cables for Olympics and London Underground

Draka Firetuf and Saffire halogen-free cables and Connecta moulded socket outlets have been chosen for a number of installations where high fire-performance and conformity to exacting fire and smoke standards are required. Recent prestigious applications include the London Olympic Velodrome (24 km cable), Dockland Light Railway (London, 8 km of cable, 700 sockets), London Underground (LU 1-085 section 12 materials safety requirements), the new Glasgow Victoria Hospital, Channel Tunnel Rail Link, EuroStar Saint Pancras Terminal, Heathrow Airport Terminal 5 tunnels, Singapore Mass Transit.

The Draka Firetuf and Connecta ranges offer conformity to standards for 120-minute fire resistance (large diameter power cables, BS 8491:2008), smoke emission (BS EN 61034: 2005), acid gas emission (BS EN 50267-2: 1999 and IEC 60754-2), flame propagation (BS EN 60332-1: 2004), Building Regulations for England and Wales (BS8519: 2010 and Approved Document B Fire safety), LPCB (Loss Prevention Certification Board) and BASEC (British Approvals Service for Cables).

Draka cables UK: <http://www.drakauk.com> Photo: Draka Cables UK.



f Nordelys cruise ship fire

An explosion in the engine rooms of the Hurtigruten line cruise ship MS Nordelys, off the rocky coast of Norway, on 15th September 2011 tragically killed 2 of the 55 crew members and has left two in hospital, but the 207 passengers were evacuated safely, partly in lifeboats and partly after the ship reached port I Aalesund. Fire damage is almost entirely restricted to the engine rooms and staircase with virtually no damage to the public areas on the ship. Some flooding of the ship occurred because the hull was holed entering port as stabiliser fins were not retracted in time. The ship is expected to be back in service in early 2012. This incident once again demonstrates the effectiveness of the very strict fire safety regulations applicable in passenger ships (IMO International Marine Organisation standards)

IMO International Marine Organisation: www.imo.org

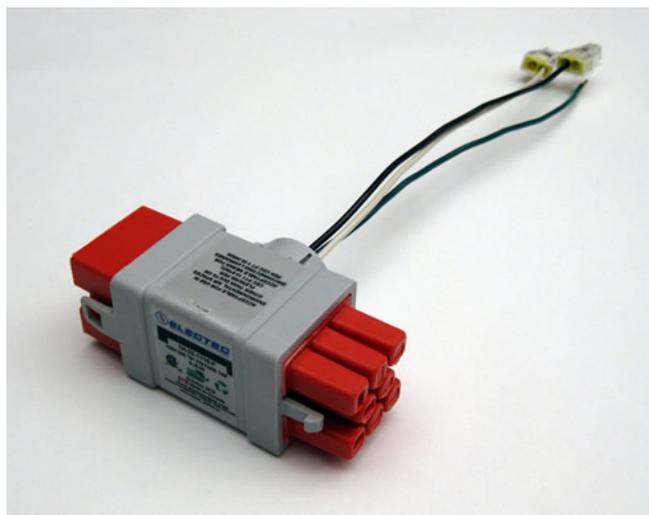
Hurtigruten lines : <http://www.hurtigruten.com>

Updated news summary of fire: <http://maritimematters.com/2011/09/fatal-fire-on-ms-nordelys/>



f Electec halogen-free cables awards

Electec Canada's modular wiring systems have been nominated as one of BuildingGreen's Top-10 products and nominated for a Manning Innovation Award. The modular wiring systems are LSZH (Low Smoke, Zero Halogen) and heavy metal free, with rapid 'plug and play' modular connections to speed up installation and reduce maintenance and downtime. Electec's connectors' LSZH are UL94-V0 (flame rating) classified with Low Optical Density. The Metal Clad AC90/MC cable uses halogen-free insulated conductors and conforms to CSA C22.2 No. 51-09, UL 1569, UL 1685 and FT4/IEEE 1202. The range includes wiring for mains connections, control systems and information technology, offering conformity to fire safety requirements and Manufactured Wiring Systems standards CSA 22.2 n° 203.1 and UL 183 (QQVX). The eco-friendly wiring design enables credits under US Green Building Council LEED Pilot Credit 2.



BuildingGreen Top10 awards:

http://greensource.construction.com/products/2011/1102_Products-1.asp

Electec: <http://www.electeconline.com/pressroom.html>

f Six die in Paris squat fire

Six people died, four of burns and two asphyxiated by smoke, in a fire in a squat in Pantin, near Paris, on 28th September 2011. A badly extinguished candle is thought to have caused the fire. Around 30 people, mainly immigrants from North Africa, were living in the building which was awaiting demolition as part of an urban reconstruction project. The media underline that this is just another in an ongoing series of tragic fires in immigrant lodgings in France, the most deadly of which killed 17 people (14 children) on boulevard Vincent-Auriol in Paris 2005. Nearly 175 000 private homes or accommodation are considered potentially insalubrious in France, of which 166 000 in or around Paris.

Media coverage: http://www.lexpress.fr/actualite/societe/fait-divers/un-incendie-fait-six-morts-dans-un-squat-de-migrants-a-pantin_1034790.html

f PIN flame retardant polymer foams

A US patent application has been published for halogen-free, styrene polymer base foams, in particular for use in construction, such as expanded polystyrene (EPS) and extruded polystyrene sheets (XPS) for insulation. The flame retardancy is achieved using phosphorus containing compounds and/or elemental sulphur. The foams can offer densities in the range 5 – 120 kg/m³. The foams were shown to be conform to fire test DIN4 102 B2 (extinguishing times 5 -14 seconds).

US patent application (Hahn et al., BASF) 20110196053, 11th Aug. 2011: search on <http://www.google.com/patents>



f China: coach fire dangers tragically shown again

67 people died in two bus fires in China in July 2011, showing yet again how inadequate standards are for fire safety in buses and coaches. On 20th July, a sleeper coach with 35 berths, but carrying 47 people, caught fire on the Beijing – Zhuhai Expressway in Xinyang City, Henan. 41 people died, unable to escape and others were seriously injured. A further 26 people died when a bus caught fire after being hit by a truck, overturning, and catching fire on the Xiantao section of the expressway between Suizhou in Hubei and Yueyang in Hunan. The widespread use of plastics and polymers in interior decoration and bodywork, and the presence of foams and textiles in seats, curtains and upholstery, means coaches contain large amounts of potentially flammable materials which accidents or electrical or mechanical faults can ignite. Over recent years, experts have repeatedly called for fire safety standards on buses and coaches to be reinforced, as they are on railways for example.

SP Sweden – bus fire safety report, 2009: <http://www.sp.se/en/press/news/releases/Sidor20090306.aspx>

DEKRA bus fire safety report, Germany, M. Egelhaaf, 2005: <http://www-nrd.nhtsa.dot.gov/pdf/esv/esv19/05-0094-O.pdf>

f New school bus fire seat test in USA

The international standards organisation ASTM has agreed a new test for fire resistance of school bus seating. This will replace the test currently used, originally developed by the US National Safety Council in which seats are subjected to fire from 200g of paper in a paper bag placed on and below the seat. This test is widely recognised, is obligatory for school transport buses in some US States, and is generally applied voluntarily by vehicle suppliers nationally. The paper bag test is however difficult to standardise. In the new test, two existing standardised gas burners are used. Duration of seat burn, extent of burning (weight loss) and spread from seat to seat are assessed. The new standard does not fix pass/fail criteria, but regulators or vehicle purchasers will now be able to do this against a clear and well defined test method. Also, the new NFPA guide to evaluating passenger vehicle fire risk is now published and can be purchased online at the NFPA website (see PINFA Newsletter n°3).

ASTM information on ASTM WK9805 - New Test Method for Fire Testing of School Bus Seat Assemblies (ASTM E2574) : <http://www.astm.org/DATABASE.CART/WORKITEMS/WK9805.htm>

NFPA "Guide on Methods for Evaluating Fire Hazard to Occupants of Passenger Road Vehicles", US\$ 37.50: <http://www.nfpa.org/catalog/product.asp?pid=55611>

Pinfa brochure Innovative & Sustainable Flame Retardants in Transportation : http://www.pinfa.eu/uploads/Documents/PINFA_Transportation_Brochure_2010_Final_Version.pdf



f Tata's Nano fire problems continue

Since its launch in 2008, the Tata Nano, the cheapest car in the world, has suffered from a number of fires resulting in media questions about its safety. In May 2010, the company announced that an investigation had concluded that the fires did not have a common cause, that the car is safe, but that the company will inspect "all cars with customers and, where necessary, add additional protection to ensure the car's safety ... these inspections do not constitute a recall". Nonetheless, further fires have occurred in September 2011 (Anand - Gujarat, Dehli, Chennai – India and Colombo – Sri Lanka) with wide media circulation of photos of the cars engulfed in balls of flame. Tata responded that the cause could be sabotage or improper use of non-Tata parts. These incidents demonstrate yet again that fire safety standards in cars are inadequate. FMVSS 302 and ISO 3795 date from 1969, when much less plastics and polymers were used in cars, and only tests flame spread, without considering ignition, smoke or heat release. Many plastics meet the test simply by melting. And this standard only applies to the car interior, there are no fire safety requirements at all under the dashboard or in the engine or wheel compartments, where risk of accidental electrical or mechanical heating is significant.

Summary of car fire statistics: <http://www.chandlerlawgroup.com/library/national-vehicle-fire-statistics.cfm>

Car fire dangers, UK, *The Telegraph*, February 2011: <http://www.telegraph.co.uk/motoring/road-safety/8323396/Car-fire-dangers.html>

f PIN flame retardancy for textile coatings

Clariant has developed new PIN flame retardant formulations using organic phosphinates to offer environmentally friendly, durable solutions for textile fire safety. Pekoflam STC is used for back-coating of textiles, to ensure fire safety without altering the appearance or feel of the outward textile, for example in furniture, seating, transport seats or mattresses. Pekoflam ECO and SYN combinations provide wash-durable fire safety treatment of natural fibres and of cotton/cellulose blend textiles, allowing application at high temperatures using existing industrial equipment. Pekoflam HFC provides a flame retardant coating, in powder form, for upholstery textiles and carpets, offering low smoke emissions. The formulations are not classified, and contain no Oeko-Tex Standard 100 or RoHS restricted chemicals.

[http://www.clariant.com/C12575E4001FB2B8/vwLookupDownloads/20110922_ITMA_Pekoflam.pdf/\\$FILE/20110922_ITMA_Pekoflam.pdf](http://www.clariant.com/C12575E4001FB2B8/vwLookupDownloads/20110922_ITMA_Pekoflam.pdf/$FILE/20110922_ITMA_Pekoflam.pdf)



f ASFP consults on passive fire protection guide

The Association for Specialist Fire Protection (ASFP) has published for consultation a draft guide to inspecting passive fire protection. Passive fire protection uses products “built-in” to the fabric of a building to restrict the development of fires, thus contributing to the move towards sustainable, zero-carbon building (both by reducing fire emissions, and by protecting insulation or renewable construction materials such as wood), and preventing dangerous deterioration of the building structure in case of fire. However, such products only achieve their objective if correctly installed. Effective inspection is therefore essential, both for fire safety, and to ensure and document conformity with building fire safety regulations. PIN flame retardants are a key component of fire protection coatings, contributing both to fire retardancy and to the protection of building materials from fire heat (by forming insulating foams), through the action of dedicated phosphorus, nitrogen or mineral based components.

ASFP draft Guide to inspecting Passive Fire Protection for Fire Risk Assessors:
http://www.asfp.org.uk/webdocs/Guide_to_inspecting_PFP_for_Fire_Risk_Assessors.pdf

f Update: WEEE and RoHS Directives recasts

The ‘recast’ of the EU Directive 2002/95/EC, which specifies that certain substances must not be present in electrical and electronic equipment sold or manufactured in the EU, has now been completed, and the revised text published as Directive 2011/65/EU. The Directive considerations state that “even if waste EEE were collected separately and submitted to recycling processes, its content of ... polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) would be likely to pose risks to health or the environment” and that “the risks to human health and the environment arising from the use of Hexabromocyclododecane (HBCDD) ... should be considered as a priority”. The exclusions of brominated flame retardants are unchanged, that is PBBs and PBDEs are both effectively excluded (limit of 0.1% by weight). The recast of the WEEE Directive 2002/96/EC (Waste Electrical and Electronic Equipment) is still under discussion in the EU decision making process. It is expected to significantly tighten the targets for recycling of E&E equipment and to widen the scope to cover nearly all such equipment, including photovoltaic panels.

EU RoHS Directive “restriction of the use of certain hazardous substances in electrical and electronic equipment”, revised 8th June 2011, 2011/65/EU:
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:174:0088:0110:EN:PDF>

EU Commission WEEE recast web page: http://ec.europa.eu/environment/waste/weee/index_en.htm



f Upholstered furniture fires continue to kill

Upholstered furniture was the first item ignited in over 7 000 reported home structure fires annually in the USA (2005-2009). These fires caused 500 civilian deaths, 890 injuries and US\$ 442 million property damage annually. Although upholstered furniture accounted for only 2% of report home fires, these causes 19% of home fire deaths, making furniture the leading item first ignited in fatal home fires. Smoking materials are the largest cause of furniture fires (28%), a figure which has fallen drastically since the 1980's (59 - 64%), thus contributing somewhat to the drop in furniture fires from nearly 37 000/year in 1980 to around 7 000 today, along with the introduction of cigarette-ignition resistant furniture across the USA. Other significant causes of furniture fires included children playing with matches or candles, arson and household equipment (electrical, heating ...). To date, only one State in the USA (California) requires furniture to resist ignition by a small flame.

US National Fire Protection Association, "Home fires that began with upholstered furniture", M. Ahrens, Aug. 2011: www.nfpa.org

f Abbreviations

BFR:	Brominated Flame Retardant	
DPCP	Diphenyl cresyl phosphate	
NFPA:	US National Fire Protection Association	www.nfpa.org
PBDE:	Poly brominated diphenyl ethers	halogenated flame retardants
POP:	Persistent Organic Pollutant	
PVC:	Poly Vinyl Chloride	
SPE:	US Society of Plastic Engineers	www.4spe.org
TCEP:	tris(2-chloroethyl) phosphate	halogenated flame retardant
TCEPP:	tris(2-chloro-1-methylethyl) phosphate	halogenated flame retardant
TDBPP:	Tris(2,3-dibromopropyl) phosphate	halogenated flame retardant
TDCPP:	Tris(1,3-dichloro-2-propyl) phosphate	halogenated flame retardant
TEHP:	Tris (2-ethylhexyl) phosphate – C ₂₄ H ₅₁ O ₄ P	PIN flame retardant
TEP:	Triethyl phosphate	PIN FR
TPeP:	Tripentyl phosphate	PIN FR



f Pinfa General Assembly 2011

pinfa's General Assembly took place in Brussels on 11th October 2011, with some 30 participants from the association's 19 member companies, plus two further candidate companies. Michael Klimes (Nabaltec), President, explained that with probably soon over 20 members, pinfa will be one of the European chemical industry Cefic's largest Sector Groups, and this reflects the number of dynamic medium-sized companies in the PIN fire safety industry, proposing specialist solutions to a variety of evolving markets. The General Assembly welcomed Margaret Baumann (FRX Polymers) representing pinfa North America, whose establishment is currently being finalised. Anja Hofman, from the German Federal Materials Research and Testing Institute (BAM), presented ongoing research into bus and coach fire safety, where fire tests and modelling have confirmed the severe smoke and fire dangers of materials currently used and the inadequacy of current fire resistance standards for buses and coaches. This work is funded by the German authorities and follows the fire in a coach, started by an electrical fault, and which killed 20 passengers on a motorway near Hannover on 4th November 2008.





f Agenda

Events with active pinfa participation are marked: ▶

23-24 Nov. 2011	Ghent, Belgium	Fire-safe textiles, foams and composites for a changing society http://www.centexbel.be/international-fr-conference
28-29 Nov. 2011	St Avold, near Metz, France	Comportement au feu et approche globale de la conception des matériaux polymers (French chemical society SCF) mferriol@univ-metz.fr or programme
28 Nov. – 1 Dec. 2011	▶ Cologne, Germany	Fire Resistance in Plastics 2011 (AMI conference) http://www2.amiplastics.com/Events/Event.aspx?code=422&sec=1836
7 Dec. 2011	Online	FR systems selection for E&E (SpecialChem) with Dr. S. Rampalli http://www.specialchem4polymers.com/resources/etraining/register.aspx?id=896
8-9 Dec. 2011	▶ Berlin, Germany	Railways materials symposium www.bahntechnik-symposium.de
12-14 Dec. 2011	Orlando, Florida	Fire & Life Safety Conference (NFPA) http://www.nfpa.org/displayContent.asp?categoryID=2088
28-31 Dec. 2012	Tehran, Iran	11th International Paint, Resin, Coatings & Composite Fair www.ipcc.fr
6-8 March 2012	Cologne, Germany	Cables 2012 (AMI): http://www2.amiplastics.com/Events/Event.aspx?code=C441&sec=2105
14-16 March 2012	New York	5 th International Symposium on Tunnel Safety & Security http://www.istss.se/en/Sidor/default.aspx
20-22 March 2012	Cologne, Germany	Green Polymer Chemistry 2012 www.amiplastics.com
25-29 March 2012	San Diego, California	ACS Fire and Polymers VI conference http://portal.acs.org
1-5 April 2012	Orlando, Florida	National Plastics Exhibition www.npe.org , SPE Conference www.spe.org
16-17 April 2012	Shanghai, China	3 rd International Conference on Flame Retardants (SKZ) http://www.skz.de/en/training/conferences/international_conference/1499.html
18-21 April 2012	Shanghai, China	Chinaplas (Asia Plastics and Rubber Trade Fair) http://www.chinaplasonline.com
18-21 April 2012	Miami, USA	7 th International Conference on Wood & Fire Safety http://www.sfs.au.com/documents/Wood%20&%20Fire%20Safety%20Conference%2020121.pdf
8-10 May 2012	Indianapolis, Indiana	American Coatings Show (Vincentz Network) http://www.american-coatings-show.com/
11-15 May 2012	Strbske Pleso, Slovakia	7 th International Conference on Wood & Fire Safety http://www.sfs.au.com/documents/Wood%20&%20Fire%20Safety%20Conference%2020121.pdf
20-23 May 2012	Cambridge, Massachusetts	BCC Flame Retardancy conference http://www.bccresearch.com/conference/
4-6 June 2012	Lausanne, Switzerland	Trends im Brandschutz/Flammschutzmittel (SKZ) www.skz.de
23-24 May 2012	Würzburg, Germany	ETTC European Technical Coatings Congress www.etcc2012.ch
11-14 June 2012	Las Vegas	NFPA Conference and Expo (US National Fire Protection Association) http://www.nfpa.org/displayContent.asp?categoryID=943
14-15 June 2012	Denver, Colorado	Fire Retardants in Plastics (AMI) http://www2.amiplastics.com/Events/Event.aspx?code=C448&sec=2199
27-28 Sept. 2012	Chicago	2 nd International Conference on Fires in Vehicles (FIVE) www.firesinvehicles.com



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f World fire statistics: fire as vulnerability

“World Fire Statistics” is the annual bulletin of the World Fire Statistics Centre, operated by the Geneva Association, which brings together 90 of the world’s principal insurance companies. The October 2011 bulleting shows that the cost of fire (direct losses) continued to rise in nearly all of the 13 countries for which yearly data are available across the world from 2006 to 2008 (most recent available data), Only Germany, Japan and Singapore showed reductions in fire costs. Direct cost of fire is estimated at 0.05 – 0.22% of GDP, for different countries, plus indirect losses of 0.002 – 0.095 % of GDP. Fire deaths fell in some countries but increased in a number of others. The Bulletin emphasises the need to take into account the increasing vulnerability of society to fire, which does not necessarily appear in statistics, but relates to increasing risks in increasingly urban, sophisticated, technological and globally interdependent communities, and is exacerbated by climate change.

“World Fire Statistics n°27”, 2011 Annual Bulletin of the World Fire Statistics Centre (Geneva Association – International Association for the Study of Insurance Economics) www.genevaassociation.org



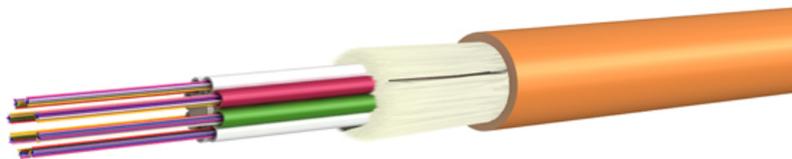
f New amino phosphate based flame retardant approved for use in construction materials.

JJI Technologies' amino phosphate based flame retardant system JJAZZ has passed the ASTM E84 Class B Standard Test Method for Surface Burning Characteristics of Building Materials. The test looks at surface burning, measuring flame spread, temperature and smoke density. The product is designed to improve materials' physical performance, increase fire extinguishing efficiency, and simplify compounding. The flame retardant is available as a powder and pelletized concentrate form intended for use in polyolefin plastics, is halogen-free and conform to EU Restriction of Hazardous substances (RoHS), EU Waste Electrical Electronic Equipment (WEEE), and Canadian Challenge regulations.



Further information: "Non-halogen flame retardant meets ASTM B&C standard", 31st March 2011, www.jji-technologies.com contact: David.Diefenthal@jji-technologies.com

f Halogen free cables approved for underground



Halogen-free, low smoke and self-extinguishing fibre optic cables from HUBER+SUHNER have obtained authorisation for use throughout the London Underground, by meeting the fire, smoke and toxic fume requirements of LUL's 1-085 standard. The multi-fibre cables can

thus be used for high-speed, high reliability data transmissions used for example for platform information systems, video links, ticketing as well as CCTV systems. Beside this HUBER+SUHNER has also been chosen by Downer EDI Rail to equip 78 new passenger trains (624 double-deck carriages) for RailCorp's Sydney suburban network in Australia. Over 12 000 km of RADOX halogen-free, fire resistant cables will be supplied.

Your Fibre Optic News, 1st July 2011: http://www.yourfibreopticnews.com/news_item.php?newsID=30734

HUBER+SUHNER, 11th May 2010:

<http://www.hubersuhner.com/ie70/news.htm?org=49080A5CE5408626&newsid=96C2963D98380B55>



f HDPUG cables project

HDPUG has completed a first “Analysis of Halogen Free Cables”. Led by Dell Computer Corp., with participation of compounders, cable manufacturers and electronics producers (OEMs), the project looked at the feasibility of moving to halogen free cables for different electronics applications: internal such as ribbon cables, external data cables such as HDMI, high speed data cables such as MiniSAS, desktop and notebook power cords. The project concluded that no drop-in substitute for PVC was found, but several halogen free solutions exist with development and specification changes. A follow-up project is being considered to improve understanding of processing of halogen-free materials as a function of required performance.

HDPUG, High Density Packaging User Group (incorporated in the State of Arizona, USA), is an international, non-profit organisation of companies involved in the electronics supply chain: <http://www.hdpug.org/content/bfrpvc-cables-wires>

f Improving standardisation of Halogen Free PWBs

HDPUG (see above) is also working on standardising specifications for Halogen Free Printed Wiring Boards (PWBs). The equipment manufacturers (OEMs) defined and proposed to materials manufacturers a list of desirable materials properties, test methodologies and conditions, summarised in the [HDP Database Project Report](#). In order to avoid having a second database of materials data, additional to the existing industry standard (IPC slash sheets IPC4101C), the HDPUG project team is now working with the IPC standards committees to tighten the slash sheets to render data more comparable, using the conclusions of the Database Project Report.

HDPUG Database Project: <http://hdpug.org/content/halogen-free-materials-database>

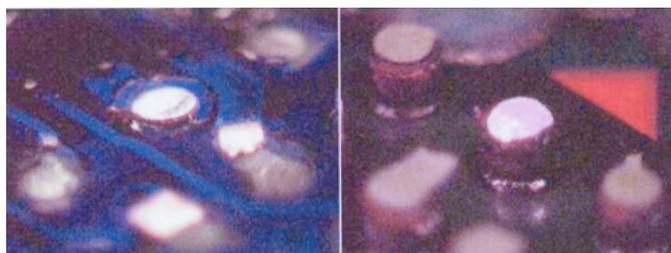
f Proving reliability of alternative computer components

HDPUG (see above) has completed Phase 2 of a full scale project assessing purchasing and reliability of Halogen Free computer components. In Phase 1, a BOM (Bill of Materials) was established for parts for a complete laptop computer, and purchase orders were made to attempt to purchase all needed parts. At this stage, many suppliers indicated that the halogen free components were not yet available but were expected soon. In Phase 2, a second round of purchasing obtained 87% of the whole computer's components and structures halogen free. Several computers were assembled using these parts and tested to manufacturers' specifications. No problems or weaknesses were detected. Other HDPUG projects are now addressing the remaining 13% of parts, in particular the Halogen Free Cables project (see above).

HDPUG Halogen-Free Assembly Reliability project: <http://hdpug.org/content/halogen-free-assembly-reliability-phase-2>

(Full report project HDPUG members only – summary on public website)

With thanks to Marshall Andrews, Executive Director, HDP User Group for providing this information.



Alternative component testing (PCB: dye- and pull on U100 following shock and vibration): no anomalies found.



f Green flame retardant for Nobel party

EcoFlameProtect's EFP flame retardant has been chosen to ensure the fire safety of the NightCap Nobel event, the party after the Nobel Prize Banquet, with over 1 000 guests in the Stockholm City Hall, 10th December 2011. EFP is based on ammonium sulphate and disodium hydrogen phosphate, available as a water-based spray on fire safety treatment for textiles, building materials, particle boards decorations, shop displays, and as a powder for use in plastics. Fire test results are included in the published US Patent.



EcoFlameProtect AB, Sweden: www.ecoflameprotect.se Photo: Malmö Arena, where EcoFlame is widely applied.
US Patent 20110204304 of 25th August 2011: on <http://www.google.com/patents>

f Biomass derived phosphorus flame retardant

Research suggests that polyphosphate flame retardants based on biomass-derived chemicals can be an effective flame retardant component for ABS plastics. A novel polyphosphate polymer, poly(DPA-PDCP), was produced from diphenolic acid, a chemical which can be produced large scale and low cost from biologically sourced levulinic acid. This was included in ABS alone or in combination with ammonium polyphosphate (APP) and different fire tests were carried out (weight loss, limiting oxygen index, cone calorimeter heat release) showing significantly improved fire performance and a formation of a rich and compact protective char layer (under SEM).

"Flame retardant ABS with a novel polyphosphate derived from biomass", Y. Zhang, X. Chen, F. Zhengping, Advanced Materials Research, Vols. 284-286, pages 187-192, online 4th July 2011 at www.scientific.net

f Bio-sourced PIN flame retarded resin

A US patent assigned by Fuji Xerox Ltd, Tokyo, presents a biologically sourced resin and mouldings with flame retardant properties, for example for electronic and electrical product housings. Polylactic acid (PLA) is a thermoplastic aliphatic polyester derived from renewable resources, such as corn starch, tapioca or sugarcane. The patent indicates that a wide range of flame retardants can be used, but that phosphorus based ones are preferable, in combination with an ammonium organic acid compound. Fire test results are given, showing UL-94 V0 or V1 flammability resistance results depending on composition, both on newly moulded articles and on articles aged for 1,000 hours at 55°C-85%RH.

US Patent n° US 2011/0207865 A1, dated 25th August 2011. "Polylactic acid – based resin composition and molded article of polylactic acid – based resin". Search using patent number on <http://www.google.com/patents>



f Other News

New York State has adopted legislation banning the chlorinated flame retardant “TRIS” (TCEP, see abbreviations) from all products intended for use by children under 3 years old (baby products, toys, children’s car seats, nursing pillows, crib mattresses, strollers, etc). TRIS is already banned in Europe and in children’s clothing (by the Consumer Product Safety Commission) in the USA. The ban is applicable from 1st December 2013.

The European Chemical Agency (ECHA) has published proposals for evaluation of substances proposed for review by Member States (termed CoRAP for Community Rolling Action Plan). Some 91 substances will be evaluated in 2012-2014, with others being progressively added to the list as the process progresses. The aim is to assess whether these substances pose a risk to human health or the environment, and if so what further data or action is required. Three of the 91 substances are flame retardants: short chain chlorinated paraffins (SCCPs), Triphenyl phosphate and Tris(methylphenyl) phosphate.

The Stockholm Convention Expert Committee has recommended that the brominated flame retardant HBCD be added to Global Treaty list of POPs (Persistent Organic Pollutants). This United Nations administered Treaty currently requires global control measures or elimination of 22 substances, including several brominated diphenyl or biphenyl flame retardants.

*New York State legislation, search for Bill A06195: <http://assembly.state.ny.us/>
Summary of bill and TCEP: <http://cga.ct.gov/2011/rpt/2011-R-0298.htm>*

ECHA CoRAP list 21 October 2011: http://echa.europa.eu/news/na/201110/na_11_50_corap_en.asp

*United Nations press release, 14th October 2011, “Hazardous chemical recommended for elimination by UN experts”:
<http://www.un.org/apps/news/story.asp?NewsID=40063&Cr=environment&Cr1>*

f Electrical fire shuts down New York PATH subway

An electrical fire at Journal Square Station, New Jersey, resulted in complete shutdown of the PATH underground railway on 11th November evening because of impacts on signalling systems. The fire caused no injuries, passengers were safely evacuated at stations and rerouted to other transit systems, and system was restored to operation after 5 hours. The very rigorous fire safety requirements required for all materials and electrical components by underground transit systems doubtless contributed to limiting this incident.



f Abbreviations

<i>BFR:</i>	<i>Brominated Flame Retardant</i>
<i>DPCP</i>	<i>Diphenyl cresyl phosphate</i>
<i>NFPA:</i>	<i>US National Fire Protection Association www.nfpa.org</i>
<i>PBDE:</i>	<i>Poly brominated diphenyl ethers</i>
<i>POP:</i>	<i>Persistent Organic Pollutant</i>
<i>PVC:</i>	<i>Poly Vinyl Chloride</i>
<i>SPE:</i>	<i>US Society of Plastic Engineers www.4spe.org</i>
<i>SCCP:</i>	<i>Short Chain Chlorinated Paraffins (Alkanes C14-17 chloro)</i>
<i>TCEP:</i>	<i>tris(2-chloroethyl) phosphate (known as "TRIS")</i>
<i>TCPP:</i>	<i>tris(2-chloro-1-methylethyl) phosphate</i>
<i>TDBPP:</i>	<i>Tris(2,3-dibromopropyl) phosphate</i>
<i>TDCPP:</i>	<i>Tris(1,3-dichloro-2-propyl) phosphate</i>
<i>TEHP:</i>	<i>Tris (2-ethylhexyl) phosphate – C₂₄H₅₁O₄P</i>
<i>TEP:</i>	<i>Triethyl phosphate</i>
<i>TPeP:</i>	<i>Tripentyl phosphate</i>

halogenated flame retardants

halogenated flame retardant
PIN flame retardant
PIN FR
PIN FR



f Agenda

Events with active pinfa participation are marked: ►

7 Dec. 2011	Online	FR systems selection for E&E (SpecialChem) with Dr. S. Rampalli http://www.specialchem4polymers.com/resources/etraining/register.aspx?id=896
8-9 Dec. 2011	► Berlin, Germany	Railways materials symposium www.bahntechnik-symposium.de
12-14 Dec. 2011	Orlando, Florida	Fire & Life Safety Conference (NFPA) http://www.nfpa.org/displayContent.asp?categoryID=2088
28-31 Dec. 2012	Tehran, Iran	11th International Paint, Resin, Coatings & Composite Fair www.ipcc.fr
6-8 March 2012	Cologne, Germany	Cables 2012 (AMI): http://www2.amiplastics.com/Events/Event.aspx?code=C441&sec=2105
14-16 March 2012	New York	5 th International Symposium on Tunnel Safety & Security http://www.istss.se/en/Sidor/default.aspx
20-22 March 2012	Cologne, Germany	Green Polymer Chemistry 2012 www.amiplastics.com
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18-21 April 2012	Shanghai, China	Chinaplas (Asia Plastics and Rubber Trade Fair) http://www.chinaplasonline.com
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