

Grenfell fire safety review	1	PIN flame retardant market growth	2
US plastics industry commits to circular economy	2	Padanaplast HFFR wire & cable compounds	5
Consultation on US fire safety codes	3	HFFR polyarylamide for electric vehicle connectors	6
Philadelphia hard-wired smoke alarm obligations	3	Fire Brigade calls for FR backings for fridges & freezers	6
Eureka project new PIN FR moves to production	3	Timber fire protection relates to nitrogen content	7
ECHA chemicals substitution strategy	4	ECHA proposes restriction on chlorinated P-ester FRs	7
Swedish national chemical substitution	4	Cost impacts of home sprinkler regulation	7
Ex civil servant criticises UK furniture fire regulations	4	Other News	8
30% increase proposed for EU R&D “Horizon Europe”	5		
Research roadmap to reduce materials’ fire hazards	5		

A year on from the tragic fire of 14th June 2017 in the 24-storey Grenfell Tower social housing block, London, in which 72 people died, no clear tightening of fire safety regulations or procedures is yet enacted. A series of tests of mineral and polymer foam building cladding sandwich panels were commissioned by the UK Government, showing that appropriate combinations including FR foams passed tests (pinfa Newsletter n°87). Media, consumer associations and firefighters continue to call for tighter fire safety requirements on insulation materials and on E&E equipment (the Grenfell fire was started by a Hotpoint - Whirlpool fridge/freezer). The official UK fire safety review (Hackitt report), see below, following this fire, is now published, and centres on recommendations to improve the responsibility chain in design, construction, product purchasing and record keeping for buildings and materials used. This is coherent with the information that the external insulation materials used in the Grenfell Tower renovation (completed in 2016) were not conforming to applicable fire safety regulations: non flame retardant polyethylene in aluminium sandwich (for rain proofing and aesthetics) and polyisocyanurate (PIR) boards for insulation.



Grenfell fire safety review

Final conclusions are published of the “Independent Review of Building Regulations and Fire Safety” (Dame Judith Hackitt report), ordered by the UK Government following the Grenfell Tower fire (May 2017). The report concludes that “the current system of building regulations and fire safety is not fit for purpose and that a culture change is required”. In particular the report underlines: unclear responsibilities in building, design, construction and maintenance; ambiguous regulations; weak compliance system and poor record keeping; opaque and inadequate product testing regime and inadequate attention paid to residents’ voices on safety. The report’s recommendations mainly address clarifying regulation, compliance, responsibilities, procurement and record keeping, but also include clarifying rights and obligations for residents and defining a “more effective testing regime with clearer labelling and product traceability” with periodic reviews of test methods and better market surveillance. Critics of the report regret that its regulatory recommendations are proposed for buildings of 10 storeys or more and that complete replacement of the current test methodology for insulation panels is not recommended (BS8414). The UK Government has however commissioned BSI to develop a new standard to define when “desk assessments” can be used instead of product testing (to replace current BS EN 15725:2010). The report does recommend that critical materials be re-tested every three years, that the testing regime should be regularly reviewed, and that product labelling and traceability be improved “throughout the life cycle of a building through the golden thread of building information”.

In response to this review, the UK Government (James Brokenshore, Housing Secretary) has announced a number of commitments, including the intention to



Building a Safer Future
Independent Review of Building
Regulations and
Fire Safety: Final Report

engage a consultation on “banning the use of combustible materials in cladding systems on high-rise residential buildings”. Other actions promised include probably banning the use of “desktop studies” to replace fire testing (for this a [consultation](#) closed 25th May), enabling resident “whistle blowing” on non-conformity and reforming the building regulatory system and fire safety guidance.

“Building a Safer Future. Independent Review of Building Regulations and Fire Safety: Final Report”, Presented to Parliament by the Secretary of State for Housing, Communities and Local Government by Command of Her Majesty, May 2018, Dame Judith Hackitt, refs. Cm 9607 - ISBN 978-1-5286-0293-8

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/668747/Independent_Review_of_Building_Regulations_and_Fire_Safety.pdf

UK Government reaction to the Hackitt Review “Government commits to major building safety reforms”, press release, 17th May 2018 <https://www.gov.uk/government/news/government-commits-to-major-building-safety-reforms>



PIN flame retardant market growth

The global PIN FR market is expected to reach 6.9 billion US\$ by 2024, according to a market study by Zion Market Research, more than doubling from an estimated 3 billion in 2016. That is an annual growth rate of over 8% (value) and 7% (tonnage). The study indicates that growth will be driven by increasing use of plastics in many industries, often replacing metals to reduce weight and save costs, as well as end-user industry fire safety awareness and regulatory restrictions on halogenated FRs. Construction, wire and cable and E&E are indicated as main use growth sectors. In a separate study, Technavio estimates annual growth of over 8.5% for low smoke halogen-free flame retardant polypropylene for 2017-2022, driven particularly by growth in the construction industry.

“Global Halogen Free Flame Retardant Market — Global Industry Analysis, Size, Share, Growth, Trends, and Forecast, 2016 – 2024”, Zion Market Research, 16 Feb. 2018

<https://www.zionmarketresearch.com/news/halogen-free-flame-retardant-market>

“Global Low Smoke Halogen Free Flame Retardant Polypropylene Market 2018-2022”, Technavio, 11 April 2016 <http://beforeitsnews.com/...logen-free-flame-retardant-polypropylene-market-to-set-phenomenal-growth-from-2018-to-2022-3487818.html>



US plastics industry commits to circular economy

The American Chemical Council (ACC) Plastics Division has announced targets for plastics recycling: 100% of plastics packaging re-used, recycled or recovered by 2040, 100% of plastics packing “recyclable or recoverable” by 2030, 100% of US production sites covered by [Operation Clean Blue Sweep](#) by 2022 (campaign to achieve zero pellet, flake and powder loss). Actions will include designing products for efficiency, recycling and reuse; new technologies for sorting and recycling; facilitating consumer participation; expanding the types of plastics recycled; aligning recycled products with end markets and enhancing awareness. In Europe, Plastics Europe is committed to zero plastics to landfill by 2025 (but this includes plastic in waste to incineration)

American Chemistry Council (ACC) 9 May 2018

<https://www.americanchemistry.com/Media/PressReleasesTranscripts/ACC-news-releases/US-Plastics-Producers-Set-Circular-Economy-Goals-to-Recycle-or-Recover-100-Percent-of-Plastic-Packaging-by-2040.html>

Plastics Europe, May 2016 https://www.plasticseurope.org/download_file/force/42/180



Consultation on US fire safety codes

The ICC/IBC (International Code Council / Building Code), are currently under revision, with **consultation for public comment to 16th July 2018**, in particular IBC Fire Safety, the principle building code used in the USA (referred to as ‘International’ code). Proposed modifications include in particular fire protection of timber constructions up to 18 storeys and modifications concerning fire safety requirements for external walls. IBC currently relies mainly for cladding materials on the NFPA 285 (Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components), a two-storey test of vertical and horizontal fire spread, including testing whether flames penetrate into a window. A concern in the current IBC proposals, according to Marcelo Hirschler ([Fire Safety & Technology Bulletin](#)), is exemptions for some external cladding materials on sprinklered buildings, whereas sprinklers inside the building will not act in time for external cladding fires. US NFPA 70 (NEC National Electrical Code) modifications are open to **public comments to 30th August 2018**

ICC – IBC public consultation to 16th July 2018 <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/2018-2019-group-a/> IBC – Fire Safety proposals for consultation (340 pages) <http://media.iccsafe.org/codes/2018-2019/GroupA/CAH/IBC-FS.pdf>

NFPA 70 public consultation page <https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=70&tab=nextedition> **deadline 30th August 2018**



Philadelphia hard-wired smoke alarm obligations

Philadelphia City Council is considering a Bill to make hard-wired (not only battery operated) smoke alarms obligatory in all boarding houses, as part of a number of improvements to social lodging regulations. Installation by end 2019 would be required. This follows a [tragic fire](#) in a house operating illegally as boarding rooms, in which four people died. The city already requires hard-wired smoke alarms in all sleeping rooms in all new housing, including one family dwellings.

<https://philly.curbed.com/2018/5/11/17345974/deadly-blaze-council-members-fire-code-smoke-alarm-boarding-rooming-house>



Eureka project new PIN FR moves to production

Through the inter-government supported Eureka [SUSPUR](#) project, the Swiss research centre EMPA has developed a new phosphorus and nitrogen PIN flame retardant for polyurethane foams, EDA-DOPO (ethylenediamine - 9,10-dihydro-10-oxa-phosphaphenanthreneoxide). The new PIN FR will now enter industrial production by Metadynea (under license), after REACH Registration, and is planned for use in upholstered furniture and mattress foams by the global FoamPartner Group. EMPA indicate that the new PIN FR can replace halogenated FRs conventionally used in foams, benefits from an innovative, economic and environmentally preferably synthesis route for DOPO derivatives, has low toxicity, offers stable dispersion and good mixing with foam polyols and can achieve UL94 HB fire classification.

“Non-toxic ingredients. New flame retardant enters market”, EMPA News 26 September 2017 <https://www.empa.ch/web/s604/eda-dopo-flame-retardant>



ECHA chemicals substitution strategy

The European Chemicals Agency (ECHA) has published a “Strategy to promote safer chemicals through substitution”. Actions will include organising dialogue along the supply chain, mapping and informing of possibilities for funding and technical support, using ECHA’s data on chemicals (registration, classification and risk assessment data) support substitution and developing a multi-stakeholder network ([NeRSAP](#) Network of REACH SEA and Analysis of Alternatives Practitioners). ECHA has already started sending letters to registrants of substances identified as being structurally similar to problematic substances, using the QSAR toolbox, and will manually screen these for possible regulatory action in order to try to avoid “regrettable substitution”. Other options considered by ECHA include enabling searching of registration data for uses, monitoring submitted PPORD data (Product and Process Orientated Research and Development), developing a public database of alternatives

ECHA substitution strategy (January 2018)

https://echa.europa.eu/documents/10162/13630/250118_substitution_strategy_en.pdf/bce91d57-9dfc-2a46-4afd-5998dbb88500



Regeringskansliet

Swedish national chemical substitution

The Swedish Government has established at the state research centre RISE, Borås, a centre to help SMEs substitute hazardous chemicals, especially in the textile sector. Borås is Sweden’s historic textile capital. The centre will receive 0.7 M€/y from the State and 0.5 M€/y from RISE with the objective of becoming self-funding through company fees in the long term. It will facilitate cooperation and information sharing on alternative chemicals and non-chemical techniques. Sweden’s Environment Minister, Karolina Slog, stated that the aim is for Sweden to become world leader in sustainable textile production and consumption, through reuse, recycling and phase out of hazardous chemicals.

Swedish Government, 8 November 2017 (in Swedish)

<http://www.regeringen.se/debattartiklar/2017/11/boras-gar-fore-for-hallbara-textilier/>



Ex civil servant criticises UK furniture fire regulations

Terry Edge, lead civil servant in the UK Ministry BIS responsible for the proposed update of the UK’s 1988 Furniture Fire Safety Regulations in 2014, which has never been implemented, has published an article (and recently featured on BBC radio) claiming that the regulations are not effective at present, but that the update has been blocked by the furniture industry. He notes that one of the engaged MPs has since been employed on the board of a furniture company. Mr Edge cites UK Government research (Trading Standards, 2014 and 2015) showing that 80% of furniture in the UK fails the current Regulation match test, as confirmed and mediated by the BBC “Fake Britain” programme (13 January 2014, see pinfa Newsletter n°41). Mr Edge considers that the new test in the proposed Regulation update would prevent “corner cutting” practices by the furniture industry, leading to this situation. pinfa expressed support for most of the proposed test modifications in the public consultation 2017 (see pinfa Newsletter n° 74).

“The UK’s ineffective and dangerous furniture flammability regulations”, Terry Edge, in Fire Magazine July/August 2017 http://www.toxicsofa.com/uploads/9/3/9/1/9391783/2017-08_fire_magazine_terry_edge.pdf



30% increase proposed for EU R&D “Horizon Europe”

The European Commission’s initial proposal for the next budget period 2021-2027 includes a 30% increase for research and innovation, despite budgetary challenges posed by Brexit. This will fund the new “Horizon Europe” R&D funding programme, which will follow on from the current “Horizon 2020”. The Commission also proposes new revenue sources for the EU, proposing “own resource” taxes including a % of the EU Emissions Trading System revenues, a contribution from consolidated corporation taxes and a levy on non-recycled plastic waste. The EU budget now enters political discussion between Member States and the European Parliament.

European Commission press release 2 May 2018

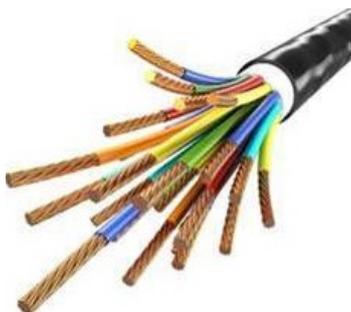
<https://ec.europa.eu/programmes/horizon2020/en/news/commission-proposes-biggest-ever-investment-ri-programme-europe>



Research roadmap to reduce materials’ fire hazards

A report from NIST (USA) aims to identify research priorities, “to enable the global fire community to develop a multi-year R&D plan to improve the fire resistance of products”. The report is based on a stakeholder workshop involving industry, researchers, public authorities and fire testing laboratories. It looked at future construction materials, advanced polymers and composites, transport and infrastructure and next generation flame retardants. Questions particularly raised included use of wood in sustainable construction (fire safety of tall timber buildings, fire behaviour of CLT – cross-laminated timber), cellulose- and fibre-polymer composites, future electrical and electronic systems (high-energy concentrating batteries, multiplication of remotely controlled devices, increasing electrical connections and loads). Key conclusions were that “materials are the single largest factor in fire safety – the largest contributor to the severity of a fire and the largest contributor to eliminating the fire risk”. Test methods need to be updated and correlated with real fire scenarios, and to take into account tomorrow’s fire fuels (new materials). Current tests tend to be reactive (not proactive), pass/fail and focus on individual components or materials not systems. Smoke toxicity is important, especially in transport applications, but current tests of smoke toxic potency (ISO 16312) need to be improved. For flame retardants, minimising impacts on human health and the environment is essential. Research priority applications identified were: residential upholstered furniture, WUI (wildfire urban interface) communities, multi-storey timber construction, passenger railway vehicles and high-rise exterior insulation.

“Workshop Report: Research Roadmap for Reducing the Fire Hazard of Materials in the Future”, NIST (US National Institute of Standards and Technology) Special Publication 1220, March 2018 (report of workshop 18-19 August 2016, Gaithersburg, Maryland)
<https://doi.org/10.6028/NIST.SP.1220> or <https://www.nist.gov/publications/workshop-report-research-roadmap-reducing-fire-hazard-materials-future>



Padanaplast HFFR wire & cable compounds

Padanaplast has launched seven new HFFR (halogen free flame retardant) grades of Cogegum® wire and cable compounds, for building and construction (Construction Products Regulation compliant, up to classification B2ca) and for automobile applications (ISO 6722 compliant and T3 – 125°C). Among them, Cogegum® GFR380 offers HFFR conform to marine and railway performance requirements (see pinfa Newsletter n°44). All the compounds are self-extinguishing, low smoke, low gas

emission corrosivity and toxicity, as well as offering high performance extrusion characteristics. They are all silane crosslinkable (Sioplas® technology) except one all-thermosplastic HFFR sheathing grade. Padanaplast, based in Roccabianca near Parma, Italy, produces wire and cable compounds since 1971, and is part of the international Finproject group. The group bought Solvay's cross-linkable compounds including Cogegum® in 2017.

"Padanaplast to Unveil HFFR Technology-based Compounds for Wire 2018", 14 March 2018
<https://omnexus.specialchem.com/news/product-news/padanaplast-new-hffr-compounds-wire-2018-000213826>



HFFR polyarylamide for electric vehicle connectors

Solvay has launched a halogen-free flame retardant (HFFR) glass fibre reinforced polyarylamide (PARA) for high-performance electric vehicle charging connectors. The material is supplied in the signal orange specifically used for such connectors. It offers the high flowability, so enabling complex designs and thinner walls (down to 0.5 mm even with glass fibre loadings of 50 percent) so contributing to material savings and lower weight components with high injection speeds and short cycle times. PARA also delivers high strength and stiffness and an aesthetic surface finish, because during injection, near the mold surface, the glass fibres align parallel with a high resin content.

"Solvay Ixef® 1524 RD 001", World of Chemicals 12th March 2018
<http://www.worldofchemicals.com/media/solvay-introduces-orange-coloured-flame-retardant-for-ev-connectors/782.html>
https://www.solvay.com/en/media/press_releases/20171023_Solvay_launches_signal_orange_colored_IXEF_1524_HFFR_grade.html



LONDON FIRE BRIGADE

Fire Brigade calls for FR backings for fridges & freezers

London Fire Brigade (LFB) has written to the UK Government calling for "fridges and freezers to be properly covered with fire retardant backing", including ensuring that there are no holes to enable fire to spread to insulation materials inside the equipment. The fire brigade made this recommendation following a fire in a tower block in 2016 which started in an Indesit tumble dryer. The Brigade also states that the Grenfell Tower fire started in a Hotpoint (Whirlpool) FF175 fridge-freezer. The call for FR backings has been taken up by leading UK consumer magazine Which with an "End Dangerous Products" campaign, calling to "Stop making cold appliances with non-flame-retardant plastic backs" (see pinfa Newsletter n°90). The London Fire Brigade states that there have been nearly 2 200 fires in London involving white goods since 2010. LFB is also calling for improvements in the product recall system, to better address fire risks identified.

"Fridge freezer delay putting lives at risk", London Fire Brigade 9th February 2018 Fridge freezer delay putting lives at risk <https://www.london-fire.gov.uk/news/2015-news/fridge-freezer-delay-putting-lives-at-risk/> *"Ministers 'must act on faulty white goods fire risk", BBC, 21st August 2017* <http://www.bbc.com/news/uk-40991800>



Timber fire protection relates to nitrogen content

Scots pine boards (12 mm thickness) were tested for fire resistance without treatment after 2 hours impregnation (part vacuum) with solutions of a PIN fire retardant based on MAP, DAP and boric acid, plus urea or guanidine carbonate at 10%, 15% and 20%. Fire testing used the standard cone calorimeter (ISO 5660-1) and a modified ASTM E 69 Mini Fire test (MFT) method. Maximum heat release was reduced by a factor of 4-5 with all FR treatments, achieving EuroClass C. The fire resistance effectiveness increases with the number of nitrogen atoms present in the FR preparation.

"Effectiveness of new wood fire retardants using a cone calorimeter", W. Grzeskowiak, J. Fire Sciences 2017, Vol. 35(6) 565–576 <http://dx.doi.org/10.1177/0734904117737464>



ECHA proposes restriction on chlorinated P-ester FRs

The European Chemical Agency, ECHA, has proposed to restrict the use of chlorinated phosphorus ester flame retardants (TCEP, TCPP and TDCP, and a mixture of these) in flexible polyurethane foams (PUR) in certain products. The proposal is justified by a screening assessment which identifies a cancer risk for children exposed to these chlorinated substances, and considers that they have similar properties and uses. Restriction in childcare products (baby mattresses, car seats, baby slings) and residential upholstered furniture is proposed. Options to extend the restriction to textiles, adult mattresses, toys and non-residential furniture were considered but not recommended by ECHA. The report suggests that substitute PIN FRs are available, although probably not as straight drop-in replacements, but with a higher cost. ECHA recommends to the European Commission that a REACH Annex XV restriction dossier be prepared.

TCEP: tris(2-chloroethyl) phosphate; TCPP: tris(2-chloro-1-methylethyl) phosphate; TDCP: tris[2-chloro-1-(chloromethyl)ethyl] phosphate. ECHA "Screening report. An assessment of whether the use of TCEP, TCPP and TDCP in articles should be restricted" 5th April 2018 https://echa.europa.eu/documents/10162/13641/screening_report_tcep_tcpp_tdc_cp_en.pdf/e0960aa7-f703-499c-24ff-fba627060698



Cost impacts of home sprinkler regulation

A report by NFPA-FPRF assesses the impacts of regulations requiring installation of fire sprinkler systems in homes, based on statewide regulations introduced in California. The report concludes that there was no significant impact on building permit activity, with "early adopter" jurisdictions (localities which required earlier implementation) showing in fact slightly higher activity. The report cites studies which show no impact on water supply, and an average US national cost for fire sprinkler installation of c. 12. €/m² dropping by c. 14% when with statewide obligation.

"Impact of Home Fire Sprinkler System Requirements in California", S. Bowles, US National Fire Protection Association - Fire Protection Research Foundation, April 2018 <https://www.nfpa.org/News-and-Research/Fire-statistics-and-reports/Research-reports/Suppression/Impact-of-Home-Fire-Sprinkler-System-Requirements-in-California>



Other News

Flame retardants from infants sleeping mats in dust. A study at seven Seattle, USA, childcare centres suggests that replacing flame retardant infant mats by non-FR mats led to very considerable reductions (-90% to -42%) in levels of four flame retardants in dust (BEHTBP, EHTBB, TBPP and TDCIPP). Calculated exposure levels for the flame retardants were however below established reference values.

“Exposure to brominated and organophosphate ester flame retardants in U.S. childcare environments: Effect of removal of flame-retarded nap mats on indoor levels”, W.A. Stubbings et al., Environmental Pollution 2018 <https://doi.org/10.1016/j.envpol.2018.03.083> Acronyms: BEHTBP = bis(2-ethylhexyl) tetrabromophthalate, EHTBB = 2-ethylhexyl tetrabromobenzoate, and bis(2-ethylhexyl), TDCIPP = tris(1,3-dichloroisopropyl) phosphate (TDCIPP)

Dechlorane Plus declared SVHC. ECHA has added a further seven chemicals to the list of SVHCs (substances of very high concern), bringing the number to 181. Dechlorane Plus is a chlorinated flame retardant and is considered by ECHA to be vPvB (very persistent, very Bioaccumulative). Other chemicals added to the list include three cadmium salts (adding to five other cadmium compounds and the metal itself which are already classed SVHC). Suppliers of products containing more than 0.1% ww of any SVHC must inform customers and consumers, and importers or producers of such articles must inform ECHA.

“The Candidate List of substances of very high concern (SVHCs) for authorisation now contains 181 substances” ECHA/PR/18/01, 15 January 2018 <https://echa.europa.eu/-/seven-new-substances-added-to-the-candidate-list-entry-for-bisphenol-a-updated-to-reflect-its-endocrine-disrupting-properties-for-the-environment>

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