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POLICY



Have your say

EU consultation on RoHS

To 14th March 2022. Questions whether RoHS Directive should be maintained, updated, tightened, repealed or replaced. The current [RoHS Directive](#) (Restriction of Hazardous Substances in electrical and electronic (E&E) equipment, [2011/65/CE](#)) restricts some heavy metals and phthalates as well as certain brominated flame retardants (HBCD, PBBs, PBDEs including Deca-BDE) . Restriction of other halogenated FRs has also been discussed (TBBPA, MCCP) as well as the synergist ATO. In contrast to REACH (which does not cover imported articles), the RoHS Directive covers the restricted chemicals in all E&E articles placed on the European market, including imported articles - an area where REACH has been very weak (apart from substances of very high concern and substances intended for release). RoHS was “invented” to eliminate problematic chemicals from E&E in order to facilitate the safe recycling of the ever increasing amount of electronic waste. The current consultation proposes a range of approaches: maintain RoHS as is and improve guidance, simplify and reform substance assessment and application exemption processes, improve coherence with REACH, transform RoHS into an EU Regulation (directly applicable in all Member States without ‘transposition’), repeal RoHS and integrate provisions into REACH, repeal and address requirements under EU sustainable products legislation and Ecodesign.

EU public consultation (“Call for Evidence”), open to companies, stakeholders and individuals “Review: Restriction of the use of hazardous substances in electronics”, open to 14th March 2022 (input 4000 characters maximum and/or upload document)

https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13137-Review-Restriction-of-the-use-of-hazardous-substances-in-electronics_en



New York Br-FR ban in TVs amended

The NY ban on brominated FRs in TV/display stands and casings now requires notification of any organohalogen FRs. The New York State 'Family and fire fighter protection act' (S4630, 5418-B), signed into law 2nd January 2022, bans "organohalogen" flame retardants in the enclosure and stand of electronic displays >100 cm², and also "halogenated, organophosphorus, organonitrogen or nanoscale chemical" flame retardants and FR synergists in upholstered furniture and mattresses (see pinfa Newsletter n°133). The ban on halogenated FRs in TV stands and enclosures reflects closely the ban now applicable throughout the EU since 1st March 2021 under the EU EcoDesign Regulation (see pinfa Newsletter n°108). An amendment to the New York State bill, signed into law on 24th January 2022 ([bill S07737](#)), makes minor changes: a longer delay time for implementation (now enters into force 1st December 2024) with a supplementary delay for furniture repair, a wider TV stand and enclosure organohalogen FRs ban, (to ban presence above a concentration to be defined, as well as if "intentionally added"), a requirement (from the date of entry into force) to notify all organohalogen flame retardants present in TV stands and enclosures irrespective of the concentration.

New York State bill NY S07737 "Relates to the ban of the use of certain flame retardant chemicals in furniture and mattresses and in electronic casings", 24th January 2022 <https://legiscan.com/NY/text/S07737/2021> amending New York State Family and Fire Fighter Protection Act (S. 4630-B/A. 5418-B) <https://www.nysenate.gov/legislation/bills/2021/s4630>



Consultation on supply chain transparency

To 25th March, Canada, consultation on information and labelling on chemicals in products, including FRs in furniture. Under the Canadian Environmental Protection Act, this Canada Government consultation aims to define actions to enhance transparency throughout the supply chain, and to strengthen consumer labelling, for several types of chemicals including flame retardants in upholstered furniture. An online stakeholder questionnaire seeks information on questions concerning chemicals transparency and labelling (such as proprietary information, costs, technologies, regulatory complexities, consumer understanding) and on how to address these.

Consultation to 25th March 2022. Canada Government "Supply chain transparency and consumer product labelling: notice to interested parties" <https://www.canada.ca/en/services/environment/pollution-waste-management/managing-substances-environment/supply-chain-transparency-labelling-consultations/notice-to-interested-parties.html>

COMMUNICATIONS



EU EcoDesign sells TVs in the Americas

'Best Buy' announces EU TV EcoDesign criteria for its leading TVs, so excluding halogenated FRs from enclosures and stand.

The company is one of the world's biggest electronics retailers [with](#) nearly US\$50 billion turnover and nearly 1 200 stores worldwide. The company has announced that its Exclusive Brand TVs (own brands, including Insignia, Rocketfish, Dynex, Platinum and Modal), will respect worldwide the EU EcoDesign Regulation (EU)2019/2021 criteria for electronic displays. These criteria, which are mandatory in the EU since March 2021, ban halogenated flame retardants in the enclosure and stand of TVs and electronic displays > 100 cm² (see pinfa Newsletter n°108).

["Best Buy commits to eco-friendly television displays"](#), 21 January 2022



UK businesses fail on fire safety

Survey by equipment & servicing company [JLA](#) says UK companies do not ensure fire safety for sites, staff and visitors.

38% of 250 UK businesses surveyed do not have adequate fire risk assessments, 40% have not provided all staff with training on avoidance of false fire alarms (75% in restaurants and bars), 80% do not have written procedures to avoid false alarms and 20% do not have fire alarms tested more than once per year. Pater Martin, Operations Director for Fire & Security at JLA: "if a fire were to occur, many organisations could be placing their customers, and employees, under extreme risk."

["A third of UK businesses are failing to test their fire alarms as often as legally required"](#), JLA, 15th December 2021



WWF on chemical recycling of plastics

NGO says top priorities are to reduce and reuse, and chemical recycling must show verifiable, positive carbon footprint. WWF suggests that chemical recycling should show at least 20% lower GHG emissions than virgin-fossil plastic. WWF also says chemical recycling must not compete in waste management systems with mechanical recycling, and must recycle to materials (that is, not downcycling of plastic to energy or fuels). WWF's proposed ten "Principles for Credible and Effective Chemical Recycling" also include safety and environmental impact, material efficiency, recyclability of the new material, transparency of claims and of material chain performance.

["WWF Releases New Position: Chemical Recycling Implementation Principles"](#), 26 January 2022

PINFA IN ACTION



Annual Report
2021

pinfa

pinfa Annual Report 2021

An active year for pinfa in Europe & worldwide: five new members, strategy and advocacy, new communications tools. pinfa's Annual Report presents an overview of activities in Europe, North America and China. Policy areas in focus are the new EU Chemicals Strategy for Sustainability, Swedish ecotax and pinfa taskforces on melamine and phosphorus. Highlights of conferences and webinars cover Safe and Sustainable-by-Design Chemicals, the fire safety and sustainability future for flame retardants and electric vehicles. New communications tools include the PIN FR slide toolkit and the pinfa-NA formulators' training. The Annual Report also presents the pinfa EU team, the Advisory Board, pinfa organisation and full members list.

<https://www.pinfa.eu/wp-content/uploads/2022/02/Annual-report-2021.pdf>



Recycling and perspectives for FRs

pinfa has launched an analysis of how recycling regulation and technologies will offer opportunities for PIN flame retardants. The study, contracted to PNO, will provide pinfa members with an overview of how plastics recycling will impact technical requirements for FRs in different sectors, a mapping of policy and regulatory developments and an assessment of possible impacts on flame retardant technologies and applications. This will be based on analysis of technical literature and interviews with industry and experts. The report should be available Q2 2022 and will enable pinfa to define possible research projects to collect technical data or further demonstrate compatibility of PIN FRs with specific material recycling routes as well as identifying priority areas for discussion with regulators and downstream users.

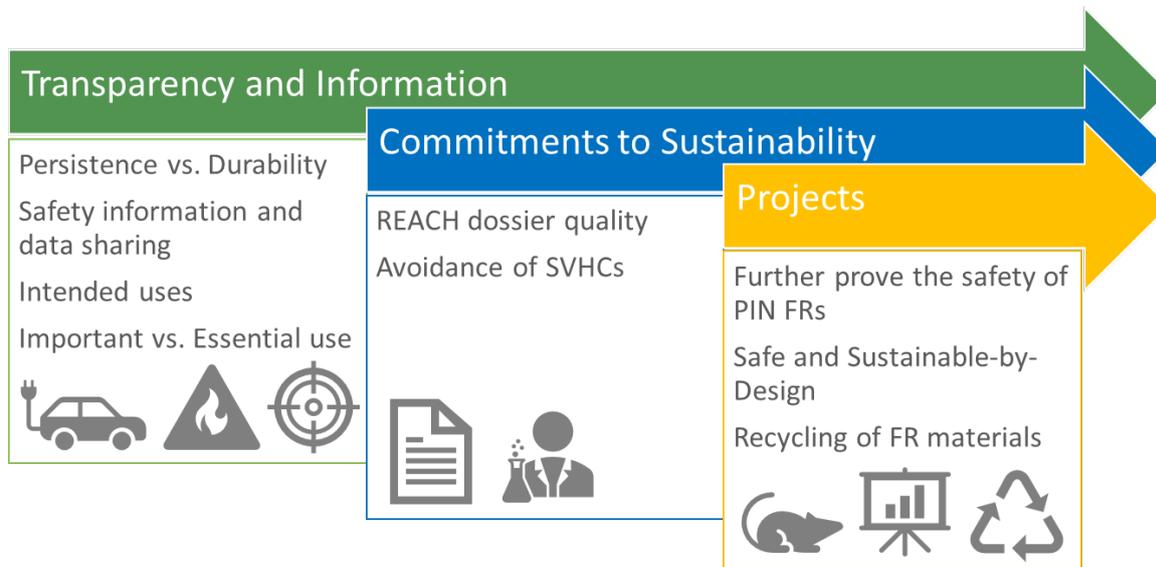


pinfa roadmap for Chemicals Sustainability

pinfa has outlined a Chemicals Strategy for Sustainability roadmap for FRs to address Green Deal opportunities. The EU [Chemicals Strategy for Sustainability](#), part of the Green Deal, was published in October 2020 and foresees far-reaching developments in chemicals regulation and policies in Europe (summary [pinfa Newsletter n°119](#)). This will place pressure on those flame retardants which show environmental toxicity, persistence, mobility, bioaccumulation or endocrine disruption.

pinfa thus sees important opportunities for PIN FRs. pinfa's outline roadmap for Chemicals Sustainability for FRs was elaborated in discussion with pinfa members, in dialogue with the pinfa Advisory Board which brings together independent experts and scientists from varying fields of material sciences, fire safety, environmental sciences, and toxicology. This outline roadmap will be implemented in 2022, in close collaboration with Cefic and with value chain stakeholders, through a dedicated pinfa project with specific studies, leading to definition of policy proposals and stewardship actions across the PIN flame retardant industry.

Below: outline of pinfa's Chemicals Strategy for Sustainability roadmap for FRs



FIRE SAFETY



1 000 London buildings are fire-unsafe

London Fire Brigade says 1 149 buildings in London need a 24-hour “waking watch” because of severe fire safety defects. These “waking watches” were put into place in fire-unsafe buildings in London following the Grenfell Tower fire, in which 72 people died. This concerns buildings where fire risk is such that residents should evacuate, not stay in their flat, in case of fire, because of flammable cladding or defective fire safety installations such as non-functioning or absent sprinklers or fire doors. Such waking watches cost an average of over 160 Euros per dwelling per month. National guidance says that waking watches should be a temporary measure only until fire safety defects are remedied. London Fire Brigade says that householders are “currently facing unacceptable burdens” with the cost of such watches and calls the situation, five years after the Grenfell fire, “appalling” and “unacceptable”.

“More than 1,000 buildings in London need 24-hour fire patrols”, BBC 7th February 2021 <https://www.bbc.com/news/uk-england-london-60291553>



Numerical modelling of Grenfell fire - bis

Modelling study, funded by Kingspan, concludes tenability inside Grenfell flats was independent of insulating material. Kingspan is the manufacturer of one of the insulation cladding products which burnt in the Grenfell Tower fire. The three-part modelling study now published (parts 4 - 6), totalling over 70 pages, follows on from parts 1 - 3 (see pinfa Newsletter n°121) which suggested that mineral wool spreads fire faster than polymer insulation. Parts 4 – 6 of the study model the fire spread across the building cladding, and model tenability (heat and toxic gases) in the flats and in the common spaces (lobbies and stairs) in the tower during fire. Models compare polyisocyanurate (PIR) insulation (as used on Grenfell) to mineral wool insulation, in both cases behind ACM-PE (aluminium composite material – polyethylene) cladding as used on Grenfell. The modelling assumes, based on data from Grenfell, that the window frames deform in fire heat, then the window glass shatters, allowing fire from the external cladding to enter flats. The modelling shows that once this has occurred, conditions inside the flat are driven by burning of furniture, not by the cladding fire. Non-tenable conditions are generally reached firstly because of heat, rather than gas toxicity. The main contribution to gas toxicity comes from furniture burning in the flats. Conditions in the lobbies and stairs were very variable and strongly influenced by opening of doors to burning flats.

E. Guillaume et al., Fire and Materials Fire and Materials, "Reconstruction of Grenfell Tower fire", parts 4, 5 and 6:

- *Part 4: Contribution to the understanding of fire propagation and behaviour during horizontal fire spread, 2020, 44, 1072–1098.,*

<https://doi.org/10.1002/fam.2911>

- *Part 5: Contribution to the understanding of the tenability conditions inside the apartments following the façade fire, 2022;1-28*

<https://doi.org/10.1002/fam.3054>

- *Part 6: Numerical simulation of the Grenfell tower disaster: Contribution to the understanding of the tenability conditions inside the common areas of the tower, 2022,1-19* <https://doi.org/10.1002/fam.3053>

WEBINAR

EUROPEAN

COATINGS

retardant coatings for wood and timber

European Coatings webforum showed how PIN FRs enable safe use of buildings of the renewable material, wood. The webinar, hosted by **Katrin Vogt, European Coatings Journal**, brought together nearly forty participants from leading companies across Europe.



Sebastian Moschel, Budenheim (pinfa member), underlined that use of wood in construction is growing at 3.2% per year, and is desirable both for environmental reasons (carbon sequestration) and for aesthetic qualities. PIN FR intumescent coatings can provide fire safety for wood, steel and other materials, and also as back-coatings for textiles. Over recent decades, building regulations are increasingly allowing the use of wood in buildings subject to demanding fire specifications, such as high-rise and public buildings, provided that the wood is fire safety treated. Fire-safety treatment is also required for wood used in varying applications such as storage crates, or transport vehicle interiors. PIN FR coatings can delay ignition of wood in fire, reduce smoke emission and prevent emission of sparks susceptible to spread fire. They are also used to protect steel and concrete from fire heat, so preventing structural failure. Budenheim offer various specific APP (ammonium polyphosphate) formulations, enabling coating transparency, use with water- or solvent-based binders, prolonged storage life, which generate stable intumescent foam protection in case of fire, and which have no organic or halogenated indoor air emissions.



Markus Wöhr, Sika Deutschland (soon to be a member of the Sherwin Williams group), explained that FR intumescent coatings combine a blowing agent, carbon source, catalyst, and a binder, and so generate a protective carbon char foam in case of fire. They can be complemented with surface sealers to ensure aesthetic qualities and durability against environmental impacts. He presented the main fire tests used for reaction to fire testing, applicable to wood and timber products for both load bearing timber and wood panels: EN 13823-SBI - EN 13501-1, BS 476 parts 6 & 7, ASTM E84-08a. Heat emission, sparks, smoke and toxic gases are all important. Essential are also indoor air quality specifications (including EU Directive 2004/42/CE), green building certification schemes (BREEAM, LEED, DGNB, etc.) and ecolabels. These particularly target low emission of VOCs, formaldehyde and ammonia, to name a few. He presented examples of public buildings extensively using treated timber with Sika's products to achieve required fire safety standards, including the Freiburg House of Farmers, Germany, Matamata – Piako Civic Centre, New Zealand, and Friedrichshafen Fair centre, Germany. The latter is now over 20 years old, demonstrating the durability of the PIN FR intumescent coating systems.

European Coatings webforum "Fire retardant coatings 8th February 2022
<https://www.european-coatings.com/events/2022/ec-webforum-fire-2022>

MARKET PERSPECTIVES



Demand for PIN FRs expected to grow

New market studies predict ongoing growth in global demand for flame retardants, especially PIN FRs, driven by fire safety, increased use of polymers and other flammable materials, and environmental and recycling requirements. Estimates for growth seem to be similar, or slightly higher than market studies appearing pre-Covid, but also show varying numbers between different studies, possibly resulting from different definitions of what is covered.

[FutureMarketInsights](#) (April 2022) expect 7.1% annual growth of the global FR market from 2022 to 2032, driven by fire safety regulation, especially in electrical and electronics, transport and construction.

[GrandviewResearch](#) (Nov. 2021) expect 8.0% growth of the world FR market, to reach 13 billion US\$ in 2028, with aluminium hydroxide (ATH) as the largest PIN FR by both volume and revenue.

[VerifiedMarketResearch](#) (Feb. 2022) expect the global FR market to grow 9.8% annually to 29 US\$ billion in 2028.

[MarketsAndResearch](#) (Jan. 2022) predict 6.5% annual growth for non-halogenated FRs worldwide, to reach 7.4 billion US\$ by 2028, with phosphorus FRs showing the highest value share.

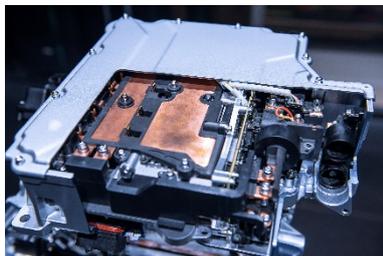
[TheMarketReports](#) (Dec. 2021) predicts 6.8% growth of the global non-halogenated FR market, to reach 6.9 billion US\$ by 2027.

[AxiomMRC](#) predict 6.4% annual growth for the PIN FR market worldwide 2021 – 2027, driven by increasing polymer use in electronics, construction, textiles and transport.

[DataBridge](#) (Jan. 2021) predict annual growth of 8.9% for non-halogenated FRs from 2021 to 2028, to reach 9.8 billion US\$ in 2028, driven by regulations against halogenated FRs, increasing use of polymers especially in automotive, growth of electronics, tightening of fire safety regulations and improved polymers.

See previous summaries of FR market studies in pinfa Newsletter n°113 (May 2020), n°108 (Nov. 2019), n°103 (July 2019)

INNOVATION



PIN FR performance PPA for EVs and E&E

Solvay's partially bio-based long-chain PPA achieves UL94 V-0 (at 0.4 mm) with processability, strength and stability. The non-halogenated flame retardant polyphthalamide formulations offer processing advantages of high glass transition temperature and melting point (Tg 135°C, Tm 315°C) adapted to non-blistering reflow soldered surface mount devices (SMD) and parts in cooling systems for power electronics or fluid connectors, and to production of miniaturised components. Electrical performance (CTI > 600V), limited moisture absorption, high dimensional stability, low risk of stress corrosion, heat resistance, impact strength, elongation, colourability and surface aesthetic quality are adapted to high-end electrical and electronic parts and e-mobility applications. The PPA is produced using partly non-food competing bio-feedstock and 100% renewable electricity, assessed by Verisk Maplecroft for ESG (environmental & social governance).

“Solvay launches new grades to support further sustainable innovation in e-mobility” 18/11/2021 <https://www.solvay.com/en/press-release/new-amodel-grades-to-further-sustainable-innovation-emobility>

“Solvay Introduces Sustainable Amodel® Bios PPA for E-Mobility Electrical and Electronic Applications », 19/5/2021 <https://www.solvay.com/en/press-release/solvay-introduces-sustainable-amodel-bios-ppa-e-mobility-electrical-and-electronic>

Product information web pages

<https://www.solvay.com/en/brands/amodel-ppa/amodel-bios>



Inovia Materials ionic liquid PIN FRs

Ionic liquids as PIN FRs for a range of polymers, offering fire resistance and low impact on performance and processing. The ionic liquids, based on salts in which one ion has delocalised charge and one component is organic and biodegradable, contain phosphorus, nitrogen and sulphur, and afford structure design flexibility enabling performance in different polymers. Inovia has developed the first and only flame retardant for PMMA that can achieve UL 94 V-0 at 0.8 mm while keeping transparency intact. Inovia flame retardant for PC can achieve V-0 from 0.06 mm with high transparency. Ionic liquids have solvating power towards other additives, and so synergistic effects when used together with traditional PIN FRs. Inovia products (2-3%) with MCA (4-5%) can reach V-0 at 0.8 mm in TPU. Inovia formulated FR products for PA can improve the mechanical, thermal, electrical properties and lower its moisture absorption rate. Inovia ionic liquid FRs can also be used as flow enhancers improving processability for extrusion, moulding, and composite materials. Additionally, low volatility and ionicity reduce leaching and off gassing.

Inovia Materials <http://inoviamaterials.com/English/Product/Players/>

US patent 2011 <https://patents.google.com/patent/US20110073331A1/en>



Bio-based FR is Dyson Awards finalist

A biopolymer extracted from seaweed wins University of Waterloo, Canada, place in James Dyson student Awards. The AlgoBio AlgoGel product consists of the natural biopolymer loaded with nanoparticles (not specified), producing a “non-toxic” liquid PIN FR for application to textiles. Work is currently underway to adapt the material as an additive for plastics.

“University of Waterloo students’ invention finalist in international competition”, 17 November 2021

<https://www.therecord.com/news/waterloo-region/2021/11/17/university-of-waterloo-students-invention-finalist-in-international-competition.html>



Reactive PIN FR for polyurethane foam

A reactive phosphorus – nitrogen PIN FR improved both fire performance and mechanical properties in flexible PUR foam. A complex dihydroxy P – N molecule 2- ((bis (2-hydroxyethyl) amino) methyl) -5,5-dimethyl -1,3,2-dioxaphosphinane 2-oxide (HAMPP) was synthesised in three reaction stages and tested in flexible polyurethane foam at 0 – 10% loading. The dihydroxy structure means the molecule can react into PUR or polymerise. Tests showed that at 10% loading, HAMPP-PUR showed LOI (Limiting Oxygen Index) increased from 19 to nearly 24, peak heat release rate decreased by around 25% and UL 94 V-0 pass. The foam mechanical properties were improved, in particular tensile strength and elongation at break. The reactive PIN FR showed to function both by generating a molten viscous protective char layer on the foam surface and by releasing water and nitrogen gases.

“Flame Retardancy Behaviors of Flexible Polyurethane Foam Based on Reactive Dihydroxy P-N-containing Flame Retardants”, Y. Ding et al., ACS Omega 2021, 6, 16410–16418

<https://doi.org/10.1021/acsomega.1c01267>



Polyphosphoramidate PIN FR for PLA

A polymeric phosphorus – nitrogen PIN FR was synthesised without using solvent achieving UL 94 V-0 in PLA at 2% loading. The polyphosphoramidate DM-H was synthesised in a two-step, one-pot controlled condensation reaction, without solvents or catalysts, using HAD (1,6-hexanediamine) and DMMP (dimethyl methylphosphonate), resulting in an oligomer $M_w = 6\ 800$ g/mol containing c. 7 -11 wt% N and 12 – 16 wt% P. Fire performance was tested for PLA (poly lactic acid) at 0 – 3% loading DM-H. At 2% DM-H, LOI of PLA was increased by 50%, peak heat release rate was reduced by 11% and UL 94 V-0 was achieved (3.2 mm). The mechanical performance characteristics of PLA were not significantly modified by 2% loading of DM-H.

“One-Pot, Solvent- and Catalyst-Free Synthesis of Polyphosphoramidate as an Eco-Benign and Effective Flame Retardant for Poly(lactic acid)”, J. Feng et al., ACS Sustainable Chem. Eng. 2020, 8, 16612–16623

<https://dx.doi.org/10.1021/acssuschemeng.0c05931>



Comparing PIN and halogenated FRs in PP

A novel PIN FR achieved fire and mechanical performance comparable to a brominated/antimony FR package. In polypropylene, a novel mono-constituent, intumescent PIN FR (PNP1D, combining phosphate ester, polyhydroxyl and melamine) was compared to DecaBDE or DecaBDE+HBCD (Br-FRs) with ATO (antimony trioxide). The BrFR systems could achieve UL 94 V-0 (thickness not specified, “standard strip”) at 30% Br-FR loading, and fire performance was improved with addition of an anti-drip agent (in this case nano-sheet kaolin (SK-80) at 6% loading). The PIN FR (PNP1D) achieved UL 94 V-0 at 23% loading. PNP1D did not significantly modify the polypropylene tensile strength at this loading, but reduced impact strength from 43.1 kJ/cm² (pure PP) to c. 11, similar to the 10 – 12 for the Br-FR systems which passed UL 94 V-0. Processing would also be impacted by the FRs: with maximum and balancing torques (Nm) for pure PP of 29 and 3 compared to 33 and 5 with PNP1D or 31 - 44 and 4.3 - 6 for the Br-FR packages (without or with SK-80).

“Flame Retardant Properties and Mechanical Properties of Polypropylene with Halogen and Halogen-Free Flame Retardant System”, X. Zhu et al., Journal of Physics: Conference Series 2160 (2022) 012031, <https://dx.doi.org/10.1088/1742-6596/2160/1/012031>



@Fraunhofer WKI

Intumescent PIN FRs for decorative wood

Fraunhofer WKI and DTNW Germany launch research into PIN FR intumescent coatings as safer alternative PIN FRs for wood surfaces in building construction. Wood is increasingly used, as a natural and sustainable construction material for buildings and because timber-based constructions can be erected in an energy-efficient and climate-friendly manner. The use of these materials in exterior applications poses a challenge for fire safety. In addition to fire resistance requirements, the decorative wood appearance must be maintained and the FRs must offer weather resistance. DTNW ([Deutsches Textilforschungszentrum Nord-West gGmbH](https://www.dtnw.de/)) and [Fraunhofer WKI](https://www.fraunhofer-wki.de/) (Institut für Holzforschung, Wilhelm Klauwitz Institut) are developing innovative non-halogenated PIN FRs for single-step fire retardant coatings in the field of decorative wood surfaces. The chemical immobilisation of the PIN FRs onto the surface of finished wood is expected to ensure very low environmental exposure.

The project is financed within the AiF funding (IGF No. 03182/21) of the German government. It will pay special attention towards the applicability of the developed FR varnish for small and medium-sized enterprises (SME) in wood finishing.

OTHER NEWS



US EPA concludes “unreasonable risks” to the environment and to workers from the brominated flame retardant HBCD. The updated and final Risk Assessment of hexabromocyclododecane and the cyclic aliphatic bromide cluster (HBCD), published by the US Environmental Protection Agency on 29th December 2021, supersedes the use-specific no unreasonable risk determinations of the previous version (September 2020). The final Risk Assessment concludes impacts on aquatic plants, fish embryos, survival of aquatic invertebrates, reproduction and survival of earthworms. The priority human health impact is on the thyroid hormone. Unreasonable risk was concluded for import, processing in formulations and in articles, recycling, installation of construction materials and demolition, but not for consumer use of final products.

“EPA Finds Unreasonable Risks for HBCD Flame Retardants”, 7 January 2022 <https://ehsdailyadvisor.blr.com/2022/01/epa-finds-unreasonable-risks-for-hbcd-flame-retardants/> and EPA “Risk Evaluation for Cyclic Aliphatic Bromide Cluster (HBCD)” December 2021 <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-evaluation-cyclic-aliphatic-bromide-cluster-hbcd>

Stockholm Convention confirms Dechlorane Plus as POP and moves on to risk management and control. The 17th meeting of the POPs Review Committee of the Stockholm Convention adopted the [Risk Profile](#) of the halogenated flame retardant Dechlorane Plus, concluding that there is evidence for persistence, bioaccumulation and adverse effects on organisms and widespread environmental occurrence including in remote regions leading “to significant adverse human health and/or environmental effects such that global action is warranted”. The meeting also decided to proceed to POP risk assessment of certain chlorinated paraffins, and agreed terms of references to assess certain fluorinated chemicals (PFOS and other).

“Seventeenth meeting of the Persistent Organic Pollutants Review Committee (POPRC.17)”, Stockholm Convention 24-28 January 2022 <http://www.pops.int/TheConvention/POPsReviewCommittee/Meetings/POPRC17/Overview/tabid/8900/Default.aspx>

Organophosphorus FR metabolites detected in urban air across the world. Metabolites of five OPFR (organophosphate ester flame retardants) TCEP, TCPP, TDCPP (chlorinated) and TBEP, TPhP (non-chlorinated) were analysed in samples of air from 18 megacities worldwide (Global Atmospheric Passive Sampling – Megacities programme). Nineteen metabolites were detected, of which ten metabolites (6 chlorinated, 4 non-chlorinated) were identified to specific molecules. Total concentrations were in all cases < 0.005 µg/m³. The authors suggest that the results show the need to consider atmospheric transformations when assessing chemical risks.

“Uncovering global-scale risks from commercial chemicals in air”, Q. Liu et al., Nature, vol. 600, 16 December 2021 <https://doi.org/10.1038/s41586-021-04134-6>

Limited correlations between organophosphate esters and blood pressure in children and adolescents. A study of 1 194 persons aged 6 – 18 in Liuzhou, China, compared urinary levels of TCEP, BCIPHIPP, BDCIPP (chlorinated), DPHP, BBOEP, DoCP & DpCP (non-chlorinated) to systolic and diastolic blood pressure. Only BDCIPP showed overall statistically significant to blood pressure, but BBOEP and BCIPHIPP showed correlations to subpopulations (adolescents only, obese subjects). The authors note that two other studies have shown associations between organophosphate esters and hypertension in adults ([Luo 2020](#), [Li 2020](#)).

“Association of exposure to organophosphate esters with increased blood pressure in children and adolescents”, L. Hu et al., Environmental Pollution 295 (2022) 118685 <https://doi.org/10.1016/j.envpol.2021.118685>

“Presence of organophosphate esters in plasma of patients with hypertension in Hubei Province, China”, Y. Li et al. Environmental Science and Pollution Research (2020) 27:24059–24069 <https://doi.org/10.1007/s11356-020-08563-0>

“Associations between organophosphate esters and sex hormones among 6–19-year old children and adolescents in NHANES 2013–2014”, K. Luo et al., Environment International 136 (2020) 105461 <https://doi.org/10.1016/j.envint.2020.105461>

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) www.pinfa.org. 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