pinfa
Phosphorus, Inorganic & Nitrogen Flame Retardants Association

Your newsletter for non-halogen fire safety solutions n° 177 December 2025

FOR A SAFE AND MERRY CHRISTMAS

Don't take fire safety risks for Christmas

pinfa wishes you a joyful Christmas, the best for the New Year, … and keep safe!

US statistics show that fire services are called to around one thousand structural home fires each year starting with Christmas trees or Christmas decorations. These fires led to an average of over 50 reported deaths or injuries and over 30 million US$ property loss. Around one third of these were caused by candles and nearly half by electrical installations (lights, electrical distribution). The US National Fire Protection Association reminds that Christmas tree fires can turn devastating within seconds. The US Fire Administration (FEMA) recommends to keep candles away from flammable materials and prefer battery flameless candles, to inspect holiday lights before putting them up, to keep Christmas trees well away from heat sources and to water them every day.

In a separate Fire Prevention Week campaign, NFPA concentrates on lithium-ion batteries, emphasising purchase of listed batteries, safe charging and responsible disposal.

"Charge into Fire Safety", NFPA (US National Fire Protection Association) "Fire Prevention Week, October 5-11, 2025, to Address Lithium-Ion Battery Risks and Ways to Minimize Them", 3rd October 2025
https://www.nfpa.org/about-nfpa/press-room/news-releases/2025/fire-prevention-week-october-5-11-2025-to-address-lithium-ion-battery-risks

NFPA (US National Fire Protection Association) Holiday Fire Safety Tips "Deck the Halls with Fire Safety" https://www.nfpa.org/education-and-research/home-fire-safety/winter-holidays

FEMA (US Fire Administration) Holiday Fire Safety
https://www.usfa.fema.gov/prevention/home-fires/prevent-fires/holiday/

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RESPONSIBLE CARE™
Driving Safety & Sustainability

A sector group of Cefic

PINFA IN ACTION

pinfa-NA video explains plastics additives

Short video explains why plastic additives, including flame retardants, are essential in modern society. Different categories of plastics additives are explained: stabilisers, which provide durability to plastics by protecting from weathering, heat and UV; processing aids which make production of technical plastics articles possible, and reduce energy consumption and production wastes; and property enhancers, which provide strength, flexibility, colours, antimicrobial resistance and fire safety. Plastics are today everywhere in our lives, essential for everything from electronics to hospitals, but to enable plastics to perform the different functions we need, with strength, resilience and safety, additives are essential.

"Plastic additives: essential ingredients for our modern world", In 3 ½ minutes video, pinfa-NA home page https://www.pinfa-na.org/

Save the date: pinfa-NA 21st L&L webinar

Wed. 25th February 2026, 11:30 - 12:30 EST (USA) = 17h30-18h30 CET (Brussels). Fire Protection of Materials for EV Batteries (to be confirmed)

https://www.pinfa-na.org/

PUBLIC CONSULTATIONS

Proposed EU restriction of MCCPs

EU consultation on restrictions for Medium Chain Chlorinated Paraffins (MCCPs) open to 19th December 2025. MCCPs (chloroalkanes C_{14-17}) are a class of halogenated flame retardant, already on the EU REACH Candidate List since 2021 (see pinfa Newsletter n°129). MCCPs were added to the global Stockholm Convention Annex A "POPs" list (persistent organic pollutant) at the 12th Conference of the Parties, April-May 2025, joining halogenated flame retardants already on the Stockholm Convention POP list (Dechlorane Plus, Tetra-, Penta-, Hexa-, Hepta- and DecaBDE, HBCDD, LCCPs, SCCPs). The public consultation proposes, coherent with the Stockholm Convention POP list, to modify the EU POP Regulation 2019/2021, to add MCCPs with time-limited exceptions allowing a few specific uses (medical devices, replacement spare parts …) and with a limit of 0.1% MCCP content.

EU public consultation open to 19th December 2025 "Persistent organic pollutants – medium-chain chlorinated paraffins" https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14835-Persistent-organic-pollutants-medium-chain-chlorinated-paraffins_en

Canada proposed actions on THTP, TBOEP

Public comment open on human health assessment and risk reduction proposals for TPHP and TBOEP, to 21st January 2026, TPHP and TBOEP are part of the group of 13 PIN organophosphorus flame retardants (OPFRs) under ongoing assessment by the Canada government since publication of a screening assessment and regulatory action proposals for TEP and IPP in foams (see pinfa Newsletter n°132). The 2021 assessment concluded possible human health risks for 8 of the OPFRs and possible environmental risk from all of the aryl OPFRs.

The Canada government indicates that additional information on health impacts of TPHP and TBOEP has become available since the 2021 report and is proposing that:

- IPPP and TEP may be harmful to health at current levels of exposure,
- BPDP and IDDP are neither persistent nor bioaccumulative, TPHP and TEP are considered persistent but not bioaccumulative, BDMEPPP and IPPP are bioaccumulative but not persistent,
- TPHP, BPDP, BDMEPPP, IDDP and IPPP may enter the environment at potentially harmful concentrations.

Regulatory actions are proposed for TPHP and TBOEP because of risk of developmental effects of TPHP and of liver effects (in males) of TBOEP, with the aim of reducing skin exposure to foams containing either of these FRs, or for TPHP exposure from use in lubricants and greases or in nail care products.

Environment & Climate Change Canada, public comment open to 21st January 2026:

November 2021: "Draft Screening Assessment Flame Retardants Group", https://www.canada.ca/content/dam/eccc/documents/pdf/pded/tphp-bpdp-bdmeppp-iddp-ippp-tep/Draft-screening-assessment-flame-retardants-group.pdf

November 2021: "Risk Management Scope for Phosphoric acid, triphenyl ester [TPHP], Phosphoric acid, (1,1-dimethylethyl)phenyl diphenyl ester [BPDP], Phosphoric acid, bis[(1,1-dimethylethyl)phenyl] phenyl ester [BDMEPPP], Phosphoric acid, isodecyl diphenyl ester [IDDP], Phenol, isopropylated, phosphate (3:1) [IPPP], and Phosphoric acid, triethyl ester [TEP] "https://www.canada.ca/en/environment-climate-change/services/evaluating-existing-substances/risk-management-scope-tphp-bpdp-bdmeppp-iddp-ippp-tep.html

November 2025 "Human health risk characterization document for the assessment of triphenyl phosphate (TPHP) and tris(2-butoxyethyl) phosphate (TBOEP)", https://www.canada.ca/en/environment-climate-change/services/evaluating-existing-substances/human-health-risk-characterization-document-assessment-tphp-tboep.html and November 2025: "Risk management scope for triphenyl phosphate (TPHP) and tris(2-butoxethyl) phosphate (TBOEP)" https://www.canada.ca/en/environment-climate-change/services/evaluating-existing-substances/risk-management-scope-triphenyl-phosphate-tris-2-butoxethyl-phosphate.html

Brominated FR blooming test standard

Discussion of possible extension of the test standard for 'blooming' of brominated FRs (loss to material surface). The existing ASTM D8280 provides a standardised method for assessing how much of brominated flame retardants in a plastic have migrated to the surface. The test uses ion chromatography to compare brominated FRs on the surface after aging for 14 or 35 days at 70°C with initial condition (before ageing). Current discussions may extend this method to assess brominated flame retardants in dust.

Information from Marcelo Hirschler's editorial in Fire Safety & Technology Bulletin (FS&TB) November 2025 (vol. 18, n°11) https://www.gbhint.com/firesafety-and-technology-bulletin/

ASTM D8280-20a "Standard Test Method for Determination of the Blooming of Brominated Flame Retardants onto the Surface of Plastic Materials by Ion Chromatography" https://store.astm.org/d8280-20a.html

EUROPEAN FIRE SAFETY WEEK 2025

Fire safety in a changing world

The European Commission, consumers and industry outlined fire safety challenges and solutions for tomorrow's society.

Heikki Väänänen, European Commission (DG GROW) underlined that fire risks are both increasing and changing, including with climate change, demographic changes, denser urbanisation and different urban uses, new materials and technologies. We need to act now to address these new challenges and for this exchange of knowledge and experience between different professionals and stakeholders is essential.

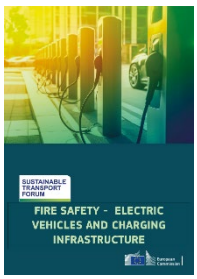
Michela Vuerich, ANEC (European association for consumer representation in standardisation) underlined the need for harmonised and reliable fire and safety data, and the importance of public awareness in addressing fire risks. ANEC supports EFSA (European Fire Safety Alliance) call for an EU fire safety strategy, addressing in particular new fire risks, the needs of vulnerable populations and carbon monoxide risks. ANEC highlighted the need to address emerging risks from electrification and to promote research into safer, energy-efficient homes, while avoiding any trade-off between safety and energy performance. ANEC also calls for fire safety labelling of products and to improve systems for reporting dangerous products.

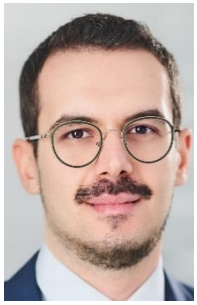
Paul van der Zanden, General Director Euralarm, underlined that innovation without fire safety would lead to societal blockages. Lithium-ion batteries are now ubiquitous in homes, offices, transport, bring specific new fire risks. Solar panels on roofs, with DC current, sometimes installed close to flammable insulation materials, pose specific challenges. Regulations and standards are not keeping up with innovation despite awareness of the fire risks. These new risks add to the long-standing fire dangers in our homes, which continue to cause losses and deaths: cooking, heating, electrical failures. Fire safety in an electrifying world can be improved by promoting a holistic approach to fire safety, raise awareness and invest in education. As far as batteries are concerned, there should be quality requirements, supported by regulation on battery fire safety.

Thorsten Teichert, Euralarm, noted that 4 – 5 000 people continue to die in fires every year in Europe, mostly in homes, with smoke being the main cause of death. Yet the public continues to believe that "it won't happen to me". Home fire risks have changed considerably over recent decades, with much more synthetic materials present, which burns hotter and faster, with more toxic fumes. Although construction products are regulated at the EU level (Construction Products Regulation), building and electrical safety regulations are not. Euralarm calls for alignment of regulations and investing in enforcement, combined with continued community education. Residents should test alarms regularly and stay informed while installers should follow standards, get trained and verify installations.

In other webinars in European Fire Safety Week, the European Commission actions on for fire safety were presented:

Petar Parushev, European Commission Directorate-General for Justice and Consumers (DG JUST) explained how Safety Gate, the EU Rapid Alert System, helps protect consumers from dangerous non-food products across the European Single Market. The presentation outlined how Safety Gate alerts are created and shared among Member States' national authorities, and how citizens can access information on unsafe products through the Safety Gate portal. Specific focus was given to the fire risk trends identified in recent years, and particularly to issues linked to lithium-ion batteries in motor vehicles, e-bikes, scooters and power banks, as well as faulty chargers, household appliances and extension leads. Finally, he presented the Coordinated Activities on the Safety of Products (CASP), which bring together national authorities to test products, exchange good practices and raise awareness, including several projects focused specifically on fire-risk products such as batteries, heaters and electrical toys.





Görkem Türer, E-Mobility Europe, presented the "Guidance on fire safety for electric vehicles parked and charging infrastructure in covered parking spaces", developed by the EU Expert Group Sustainable Transport Forum (STF) and published by the European Commission DG Mobility and Transport. This 86-page report summarises policies in place in different European countries, fire risks related to electric vehicles in garages fire detection, prevention and protection measures and recommendations for firefighters and for authorities. The report notes that cable systems should respect non-fire propagation fire standards, charging installations should be certified, parking structures should be fireproof and doors should be fire resistant (E60C) and that flame retardants are one element which can reduce or slow battery fire risks (in batteries, in components such as battery enclosures). One of the four recommendations to authorities is to "better regulate and enforce the fire safety requirements for enclosures, plugs, and sockets used in BEV recharging infrastructure by raising the minimum fire safety / flammability standards as well as should introduce fire safety requirements and tests for addressing new fire safety challenges for electric powertrains and Li-ion batteries".

EUROPEAN FIRE SAFETY ALLIANCE

https://www.europeanfiresafetyalliance.org/european-fire-safety-week/edition-2025

pinfa webinar: affordable safe housing

pinfa webinar, European Fire Safety Week, discussed the intersects of affordable housing, sustainability and fire safety,

The webinar was opened by **Esther Agyeman-Budu, Manager of pinfa at Cefic,** and brought together over 120 participants.

Thomas Futterer, pinfa Chairman (Budenheim), summarised the challenges to fire safety posed by climate change, new technologies and materials in buildings (including renewable energy and energy storage), use of sustainable materials in construction (bio-based materials, such as wood, recycled materials, such as end-of-life textile insulation …), urbanisation (densification, renovation) and societal changes (ageing population). Fire safety should be a core criterion in EU housing and renovation, because fire safety contributes to durability and long-term affordability, by reducing fire risks and losses. Flame retardants are key to limiting fire risks, by preventing fires starting. Overheating or shorting in electrical equipment in houses, because of ageing, misuse, dust accumulation or electrical failure, must not lead to a fire in the polymers used in electrical components, wiring, housings and insulation. Flame-retardants also slow fire spread, enabling more time to escape or to extinguish the fire.

Guillermo Rein, Imperial College London, Professor Guillermo Rein, from Imperial College London, spoke about the urgent fire safety challenges emerging from modern societal priorities such as sustainable buildings, climate change, new energy technologies and innovation in construction. He warned that fire safety engineering and standards are often failing to keep pace with these rapid developments. An example is the failure to ensure fire safety of building facades, where evolving construction methods, novel materials, and thermal insulation have resulted in improved performance, but also in an increasing number of façade fires, some with catastrophic consequences. Timber construction offers sustainability advantages but comes with specific and complex fire safety challenges. Climate change, with increasing winds and temperatures, increases fire risks in areas where wildland meets the built environment. Renewable energies, such as PV panels and batteries, also result in new fire risks. These developments demand updated knowledge, revised fire standards, and renewed attention to fire safety engineering. They require reinforcing all layers of fire protection, from prevention and detection to evacuation, compartmentation, suppression, and resilience.

Nick Haughton, Sapphire Balconies Ltd. The company is an innovation leader in balconies worldwide, today proposing all its products as modular, prefabricated units, often in combination with modular façade systems or fully modular construction. Balcony fires have become more common, often related to inappropriate use of the balcony by residents (barbecues, smoking, storage of flammable materials). The Grenfell fire tragedy has led to significant tightening of fire safety regulations for high-rise buildings, in particular A2-s1, d0 requirement for facades above 11m (3 floors including ground).

Tighter obligations for traceability of fire performance of products and installations are implemented ("golden thread"). Modular construction providers need to interface with other products, engage with fire standards development and ensure full testing, compliance and documentation, communicated fully to property managers, architects and construction contractors. The use of precast wall panels combined with clip-on balconies can enhance fire safety.

John Fingleton, Irish Green Building Council, noted that nearly 30 000 homes are registered under Ireland's Home Performance Index, for sustainable and healthy homes, including over 4,000 homes certified. The Index is aligned with EU Taxonomy criteria. Fire safety is required by building regulations in Ireland, and is not an indicator within the Home Performance Index, but it is relevant to indicator requirements on lifecycle cost, lifecycle global warming potential, circular design, VOC emissions, climate risk and consumer information and aftercare.

EUROPEAN FIRE SAFETY ALLIANCE

https://www.europeanfiresafetyalliance.org/european-fire-safety-week/edition-2025/4-11/#session-2b

See pinfa presentation, Thomas Futterer, pinfa Chairman (Budenheim) "Why fire safety is essential in affordable and sustainable housing?" https://www.pinfa.eu/wp-content/uploads/2025/11/pinfa_EFSW_20251104_presentation_final.pdf

RESEARCH AND INNOVATION

mare mag

Making PIN FRs from salt production waste

EU LIFE project MareMag plans to produce magnesium hydroxide (MDH) from bittern waste liquor, from salt works. MDH is a widely used inorganic PIN flame retardant, which protects from fire by absorbing heat (decomposition energy) and releasing water and is compliant with LSZH requirements (Low Smoke Zero Halogen). Because table salt production works remove calcium from seawater, magnesium recovery from bittern generates a purer magnesium hydroxide than production from seawater, as well as valorising the bittern waste stream.

"How the MAREMAG LIFE project plans to bring green magnesium to our lives with LIFE close-to-market support", EU CINEA 11_11_2025 https://cinea.ec.europa.eu/news-events/news/how-maremag-life-project-plans-bring-green-magnesium-our-lives-life-close-market-support-2025-11-11_en

LIFA MareMag project website (in Italian) "Sustainable and circular marine magnesium" https://www.maremag.it/

New PIN FR solutions for e-mobility PBT

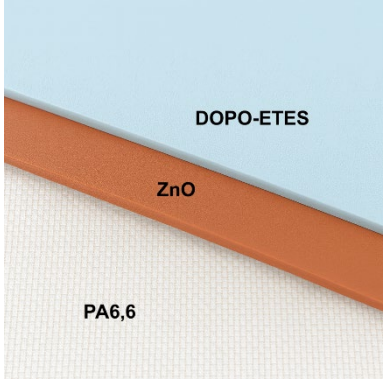
Clariant (pinfa member) has launched two new phosphinate PIN FRs for performance PBT in e-mobility. The new organophosphorus PIN FRs can both achieve UL 94 V-0 @ 0.4 mm with 15-20% loading in polybutylene terephthalate (PBT), without ATO (antimony trioxide), and offer respectively exceptional hydrolysis stability or CTI (comparative tracking index) of 600V even after prolonged storage, as well as colorability, physical and electrical properties. They are also adapted for use in polyesters, PET (polyethylene terephthalate) and other technical polymers, with or without glass fibre reinforcement. They respond to increasingly demanding requirements for electric vehicles, including non-halogenated fire safety and electrical insulation and stability under demanding conditions. Both PIN FRs are not Classified as Hazardous and are not considered endocrine disruptors, not PBT, not vPvB (persistent, bioaccumulative and toxic, very persistent and very bioaccumulative).

"Clariant increases capacity in Daya Bay facility and expands Exolit™ OP portfolio for e-mobility", 14th October 2025
https://www.clariant.com/en/corporate/news/2025/10/clariant-increases-capacity-in-daya-bay-facility-and-expands-exolittrade-op-portfolio-for-emobility

Reactive phosphorus PIN FR for foams

LANXESS (pinfa Member) new reactive, non-halogenated FR offers minimised VOC for performance insulation foams. The PIN FR is specifically designed for rigid polyurethane (PUR) and polyisocyanurate (PIR) insulation foams and can be used in various types of rigid PU foam applications including insulation boards, metal sandwich panels, and spray foam. It is low viscosity, has low plasticising effect, and because it is reactive, shows minimal migration, low VOC and high durability. The FR has 18.4% phosphorus content, acid value <2 and colour (Hazen) <100.

"Levagard® 2100", Lanxess, 30th October 2025
https://www.specialchem.com/polymer-additives/product/lanxess-levagard-2100 and "LANXESS at K 2025: Focus on additives, colorants and pigments" 25th September 2025 https://lanxess.com/en/media/press-releases/2025/09/lanxess-at-k-2025-focus-on-additives-colorants-and-pigments



ZnO/DOPO-Silane PIN Systems for FR PA6,6

Research shows that precision coating of PA6,6 fibres with ZnO and DOPO-silane exhibits catalytic flame-retardant effect. A commercial woven nylon textile (polyamide 6,6), 75 g/m2, was coated with atomic layer deposition (ALD) of zinc oxide (ZnO) at three different layer thicknesses (50, 84, or 199 nm), followed by a synergistic DOPO-silane phosphorus-silicon PIN flame retardant (DOPO-ETES from abcr GmbH) applied via sol-gel processing. Thermal analysis (TGA) and microscale combustion calorimetry (MCC) showed that the zinc oxide catalytically altered polyamide

degradation and generated a physical fire-protective barrier, while the P-silane mainly promoted protective char formation. Together, the two coatings reduced the maximum TGA decomposition temperature by approximately 5%. Self-extinguishing was not achieved due to the melting behaviour of PA; however, a smoke-suppression effect was observed when ZnO was used. The authors note that the synergy between the two PIN compounds likely depends on the coating sequence.

"Thermal Behavior and Smoke Suppression of Polyamide 6,6 Fabric Treated with ALD-ZnO and DOPO-Based Silane", W. Ali et al., DTNW, Materials 2025, 18, 3195. https://doi.org/10.3390/ma18133195

PIN flame retardant construction facer

Ahlstrom, launches non-halogenated FR facer paper for environmentally friendly fire safety in construction. Based in Finland, Ahlstrom is a global leader in combining fibres with sustainable materials. The facer paper uses patented PIN FR technology to ensure charring and self-extinguishing, meeting TAPPI T 461 (Technical Association of the Pulp and Paper Industry, flame resistance of paper and paperboard <1.6 mm thickness). Applied to insulation boards, it brings fire safety, mechanical strength and water resistance (reduced water absorption prevents delamination with weathering). It can be applied to aluminium foils, rigid insulation foams, stone- and glass-wool insulation panels and panels (OSB, MDF, HDF, particle boards). It can also be used in paint spray booths, filter systems, honeycomb structures, duct wrap, decorative papers, wall coverings and other applications requiring fire safe materials. It is suited for processing by e.g. adhesive lamination, phenolic saturation, foil lamination, printing, slitting, sheeting, and is available in a range of colours and formats.

"Ahlstrom launches flame-resistant facer to enhance fire protection in building and construction", 14 August 2025, https://www.ahlstrom.com/Media/releases/press-releases2/2025/ahlstrom-launches-flame-resistant-facer-to-enhance-fire-protection-in-building-and-construction/

PUBLISHER INFORMATION

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