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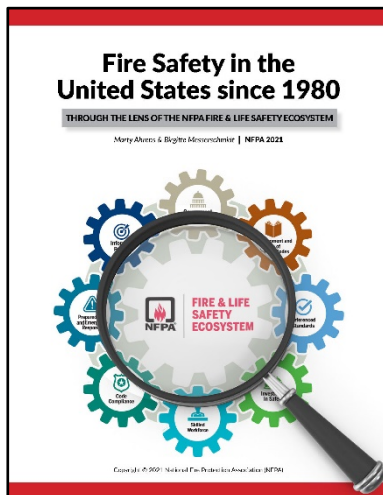
*US federal furniture fire safety enacted*

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## FIRE SAFETY



### NFPA report on fire in the US since 1980

**Analysis of 40 years' data concludes that the key to improving fire safety is implementation of codes and standards.** In buildings where fire safety is strictly regulated, such as hospitals, schools and hotels, catastrophic fires are now rare. In apartment buildings, the rate of deaths per fire has fallen, whereas in less regulated 1-2 family homes it has increased. Smoke alarms are the biggest success story in home fire safety, driven by a combination of regulation and public education. Smoking-related fire risk has been reduced by standards for cigarette lighters and candles, whereas the impact of Reduced Ignition Propensity Cigarettes is unclear. Cooking however remains a leading cause of home fires, resulting in more fires and more fire deaths in recent years than in the 1980's. Key challenges for the future identified are: the ageing population, increasing wildfires, fire risks of new technologies and the permanent challenge of ensuring implementation of fire safety codes and regulations.

*"Fire Safety in the United States since 1980 through the lens of the NFPA Fire & Life Safety Ecosystem", M. Ahrens & B. Messerschmidt, US NFPA (National Fire Protection Association) and Fire Protection Research Foundation, 63 pages, 2021 <https://go.nfpa.org/l/14662/2021-05-24/8hkgts>*

## NEW PINFA MEMBERS



### Nordmann

**International chemical distribution group with world expertise in PIN FRs and synergists, Nordmann has joined pinfa.**

Nordmann is a leading international chemical distribution company, marketing natural and chemical raw materials, additives and specialty chemicals worldwide through subsidiaries in Europe, Asia and North America. The company staffs 460 people worldwide and generated sales of 440 million euros in 2019. Nordmann has many years of experience and application know-how in the field of flame retardants with a special focus on innovative, halogen-free products and synergists. Our partners benefit from up-to-date information and knowledge sharing in our global network of producers, customers and Nordmann experts. As a pinfa member, Nordmann is particularly involved in the Transport Working Group and the Phosphorus Task Force.

[www.nordmann.global/flame-retardants](http://www.nordmann.global/flame-retardants)

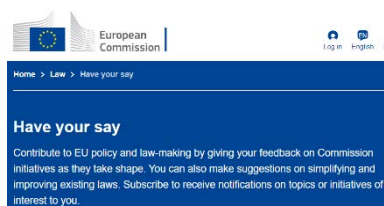
## AsahiKASEI Asahi Kasei

**A leading Japanese polymer manufacturers, Asahi Kasei has joined pinfa to take forward safe and sustainable FRs.**

Asahi Kasei is a global technology company with over 44 000 employees worldwide and operations in Materials, Homes, and Health Care. The Materials division encompasses fibers & textiles, petrochemicals, performance polymers, performance materials, consumables, battery separators, and electronic devices. The company has a broad portfolio of non-halogenated flame retardant polymers, including polyamide 6.6 and modified polyphenylene ether (mPPE). Asahi Kasei's mPPE-based particle beads foam is the first such material to be certified UL 94 V-0. These performance materials are especially suitable for automotive and E&E applications. Taku Ishida, General Manager of the Engineering Plastics Division of Asahi Kasei Europe: "Europe is the leading region in regard to safety and environmental regulations, so that joining pinfa will allow Asahi Kasei to observe and engage with the latest technological and regulatory developments in this field, and at the same time share our broad knowledge of flame-retardant engineering plastics and foams with other industry experts."

[www.asahi-kasei.eu](http://www.asahi-kasei.eu) and [www.automotive.asahi-kasei.eu](http://www.automotive.asahi-kasei.eu)

## CONSULTATIONS



### Smart phone Ecodesign consultation

An EU general public consultation on smart phone & tablet Ecodesign priorities is open to 23 August 2021. This consultation targets smart phone and tablet users (general public) and companies and organisations involved in manufacture, servicing, recycling or other sectors. Questions address the priorities in device choice between e.g. performance, design, battery endurance, upgradability / repairability, take-back, as well as questions about how long user's devices have lasted, which component caused failure, etc.

*European Commission public consultation to 23<sup>rd</sup> August 2021 "Designing mobile phones and tablets to be sustainable - ecodesign"*

[https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12797-Designing-mobile-phones-and-tablets-to-be-sustainable-ecodesign\\_en](https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12797-Designing-mobile-phones-and-tablets-to-be-sustainable-ecodesign_en)

## POLICY AND REGULATION



### H&M on Safe and Sustainable by Design

Clothing and interior company H&M calls the EU to require chemical assessment methodology and full disclosure. H&M's position on Safe-by-Design chemicals and circularity (published by ChemSec) states that chemical management is an essential part of H&M's vision to lead change to safe products and toxic-free fashion by 2030. H&M says that communication of chemical hazards to downstream users is today inadequate and calls for an EU harmonised hazard assessment methodology to future-proof circularity. H&M already applies the precautionary principle, phasing out chemicals before consensus is reached on specific hazard categories and applies a 'class approach' to restrictions. H&M calls for confidential full disclosure of all intentional ingredients at any concentration and of unintentional contaminants at > 100 ppm, using a cross-industry standard methodology (e.g. GreenScreen™) with independent third-party assessment, under confidentiality to ensure protection of Intellectual property of suppliers.

*"H&M wants EU safe and sustainable by design criteria to focus on hazard assessment, disclosure", in ChemicalWatch 25 March 2021*

<https://chemicalwatch.com/237405/hm-wants-eu-safe-and-sustainable-by-design-criteria-to-focus-on-hazard-assessment-disclosure>

*"H&M Group's position on safe-by-design chemicals definition to drive circular economy", posted by ChemSec, 15 April 2021*

<https://chemsec.org/hm-groups-position-on-safe-by-design-chemicals-definition-to-drive-circular-economy/>



## Chemical Ingredient Disclosure

**Over 100 companies and organisations have defined and endorsed six principles for access to information on chemicals.**

The principles have been developed by a stakeholder coalition, led by Clean Production Action (CPA), over the last 18 months, and other companies and organisations are now invited to sign up to endorse [here](#). The principles are: disclosure of all deliberately added chemicals (unless Confidential Business Information), disclosure of breakdown products etc. if of concern, supply chain engagement, facilitate communication of information, promote filling of chemical data gaps, support policies which advance these principles. Signatory companies to date are mainly in the consumer product, cosmetic and health sectors, as well as investment funds.

*"Principles for Chemical Ingredient Disclosure", BizNGO*  
<https://www.bizngo.org/public-policies/principles-for-chemical-ingredient-disclosure> Webinar on Chemical Ingredient Disclosure Principles 14 July, with CPA, Interstate Chemicals Clearing House (IC2), Reckitt Benckiser, California Dept. Toxic Substances Control and others  
<https://www.bizngo.org/resources/entry/webinar-principles-for-chemical-ingredient-disclosure>



## ChemSec on "Essential Use"

**NGO ChemSec says hazardous chemicals must disappear if their function, even if important, can be achieved otherwise.**

The environmental organisation proposes a five-question process to identify "Essential Use" of hazardous chemicals, suggesting that any use of hazardous chemicals in products such as toys, cosmetics, textiles, furniture, personal care is non-essential because the function can be achieved otherwise. The NGO considers that a hazardous chemical is "Essential Use" only if used in categories such as medical devices, transport or communication, and only if essential for the functioning of the product, and only if there are no alternative chemicals or non-chemical routes to achieve the required function. ChemSec considers that the analysis must start by assessing the use of the product in society, and not the chemical's function in the product.

*ChemSec position June 2021 "Let's not mix apples and oranges when it comes to essential use. When is it justified to use very hazardous chemicals?"* <https://chemsec.org/publication/chemical-strategy/when-is-it-justified-to-use-very-hazardous-chemicals/> Webinar, 24<sup>th</sup> June 2021  
<https://chemsec.org/webinar-when-is-it-justified-to-use-hazardous-chemicals/>



## Risk scientists criticise Chemicals Strategy

**Scientists of the German Federal Institute for Risk Assessment question the scientific basis of the new EU Chemicals Strategy, in particular the hazard-based approach.** The eight scientists suggest that the new Chemicals Strategy for Sustainability (CSS) was developed without consultation of risk assessment experts, and regret the absence of expert committees to accompany its implementation.

The scientists suggest that the CSS is not based on scientific evidence, belittles the effectiveness of current EU chemicals legislation and risks interpretational bias (e.g. the CSS does not define key terms used such as “zero-pollution” or “toxic-free”). They question the stated aim of accelerating time needed currently to regulate substances of concern, suggesting that this is due to lack of data and slow administrative procedures, which will not be resolved by the CSS.

They particularly question the validity of the proposed “hazard-based generic approach to risk management” and “Mixture Assessment Factor” (MAF), suggesting that there is today no evidence of increased risk to consumers from combinations of chemicals. Concerning “many years” it currently needed to restrict chemicals after risks are identified, the risk assessment scientists suggest that the “actual scientific risk assessment takes up only a minor fraction” of this time, blaming industry for not providing the full data required by REACH and the European Commission for “time-consuming bureaucratic procedures”.

Lastly, the risk assessment scientists reject the CSS proposed move from risk assessment to generic hazard-based regulation, underlining that this will fail to assess proportionality of measures and will likely result in restrictions of chemicals based on risks related to one specific application or to one particular chemical which are not relevant to other chemicals and applications which will nonetheless be restricted.

*“The “EU chemicals strategy for sustainability” questions regulatory toxicology as we know it: is it all rooted in sound scientific evidence?”, M. Herzler and al., German Federal Institute for Risk Assessment (BfR), Berlin, Archives of Toxicology (2021) 95:2589–2601  
<https://doi.org/10.1007/s00204-021-03091-3>*

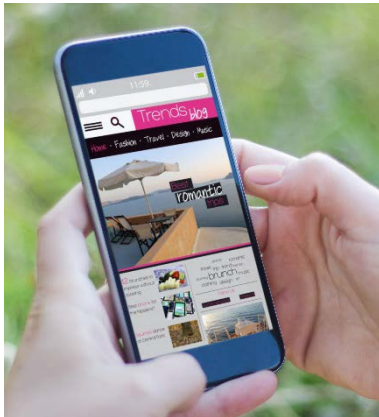


## US federal furniture fire safety enacted

The CPSC has issued a final federal rule to require for cigarette ignition resistance of all upholstered furniture, as passed in the [COVID-19 Regulatory Relief and Work From Home Safety Act](#) (see pinfa Newsletter n°122). The rule is based on California TB 117-2013 and defines the scope of upholstered furniture (any furniture with integrated or separate filling or cushion susceptible to be used indoors), defines labelling requirements and testing methods. This rule prevents States from implementing any stricter furniture fire safety requirements (presumably this is only for domestic furniture).

*US Consumer Product Safety Commission (CPSC) “Standard for the Flammability of Upholstered Furniture”, 16 CFR Part 1640, Docket No. CPSC-2021-0007, Federal Register vol. 86, n° 67, 9<sup>th</sup> April 2021  
<https://www.federalregister.gov/documents/2021/04/09/2021-06977/standard-for-the-flammability-of-upholstered-furniture>*

## INNOVATION

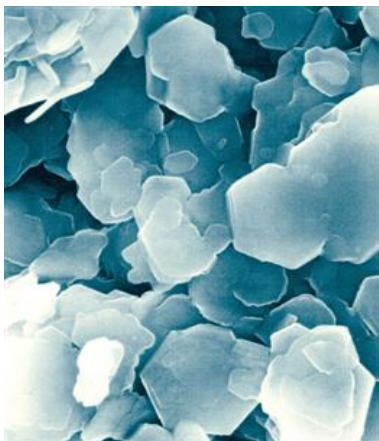


### Bio-based polycarbonate with PIN FR

**SABIC high-performance, bio-based polycarbonate, carbon fibre reinforced compound with PIN FR package.** The new compound offers reduced carbon footprint whilst meeting demanding technical and processability requirements for thin-wall injection moulding for applications such as electronics, electrical housings or healthcare, offering a drop-in replacement for incumbent materials. The compound uses 21% bio-based polymer (e.g. from vegetable oils) and over 50% post-consumer recycled resin, and pre-consumer recycled carbon fibres. The compound is halogen free and PIN flame retarded, achieving UL 94 V-0 @ 0.8 mm thickness.

*“SABIC Debuts A Novel Bio-Based LNP™ Compound That Can Help Reduce Carbon Emissions And Fossil Fuel Use”, 27 April 2021*

<https://www.sabic.com/en/news/29281-sabic-debuts-a-novel-bio-based-lnp-compound-that-can-help-reduce-carbon-emissions-and-fossil-fuel-use>



### Performance of kaolin with PIN synergists

**Quarzwerke HPF has developed an olefin compound for automotive using kaolin and non-halogenated synergists.** The project, for E&E and automotive applications, developed with an automobile manufacturer and a compounder (confidential), uses a specific flaky phyllosilicate kaolin with a high aspect ratio at > 10% loading. UL 94 V-0 (Vertical, 20 mm height, 50 W, 2 x 10 sec) was demonstrated, and GWT (Glow Wire Test IEC 60695-2-10/11) 1.75 mm penetration after 30” at 750°C. The PIN compound ensures no corrosive gases and low smoke. It offers long term heat stability at up to 150°C, good impact strength down to -20°C and resistance to chemicals and oils. Kaolin is also an effective FR synergist in other polymers such as polyamides or PBT, enabling cost-effective solutions.

*Quarzwerke “High performance fillers”*

<https://www.quarzwerke.com/en/products/high-performance-fillers/>

*Compounding World, December 2020*

<http://download.polympart.ir/polympart/EMag/CW-Dec-2020.pdf>



### Hexpol Group low-smoke low-toxicity range

**New wire & cable compound range from the polymers group centres on non-halogenated FRs to meet regulatory demands.** Hexpol’s new portfolio covers high performance materials such as VMQ (vinyl-methyl-silicone), advanced rubbers (e.g. EPDM ethylene propylene diene monomer) and thermoplastic elastomers, including cable bedding, insulation and sheathing materials, targeting expanding electrification and communications markets including telecoms and high- and low-voltage power supply, as well

as sensitive locations such as hospitals, transports, aviation and offshore. Use of PIN flame retardants in Hexpol LSHF/LSZH (low smoke halogen-free / zero halogen) enables achievement of international cable standards such as EN 50363 or IEC 60811 with low-smoke and low-toxicity.

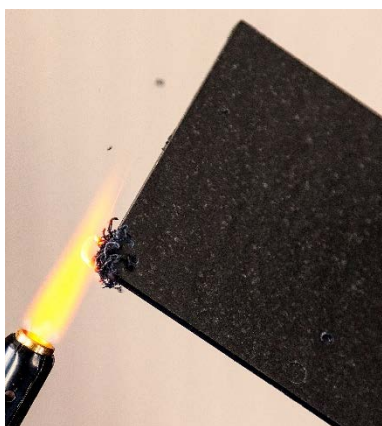
*"HEXPOL Launch Wire And Cable Compounds Portfolio", 15/9/2021*  
<https://www.hexpol.com/tpe/hexpol-launch-wire-and-cable-compounds-portfolio/>



## PIN FR glass-reinforced polyamides

**Teknor Apex expands portfolio of PIN FR polyamides for demanding applications including under-hood automotive.** The non-halogen, 15% - 30% glass-reinforced semi-aromatic PA66 compounds achieve UL94-V0 fire performance (0.5 or 0.8 mm) and offer high flow for injection molding of complex components, good surface finish and good retention of mechanical properties such as tensile strength and stiffness under exposure to moisture. These non-halogen formulations are adapted for sensitive electronic components where halide ion migration could lead to electrical failure. Applications include appliance and power tool housings, electronic devices, e-vehicle charging infrastructure and automotive under the hood, for example in an engine cover where OEM specifications require property retention after ageing at 170°C. Teknor Apex is a major international compounder and material science company with production in the USA, Asia and Europe.

*"Halogen-Free FR Polyamides Yield Parts With Superior Surface Finish and Excellent Property Retention Upon Aging", Teknor Apex, 29<sup>th</sup> March 2021* <https://www.teknorapex.com/halogen-free-fr-polyamides-yield-parts-with-superior-surface-finish>



## Wider applicability of expandable graphite

**Georg H. Luh has developed an expandable graphite with starting temperature over 270°C, targeting technical polymers.** Expandable graphite is an inorganic flame retardant which expands considerably in heat, generating a thermally stable residue in case of fire. A limiting factor of current expandable graphite grades is the low processing stability of typically less than 230°C. This limits application to polymers with low melt temperature such as PP, PE or EVA. Due to a higher onset temperature of over 270°C, the new product opens new possibilities for engineering polymers such as polyamides. Product quality and low contaminant levels are ensured. The thermal conductivity of expandable graphite also increases resistance to ignition and can improve heat dispersion in applications. Applications to date include housings for automotive and machinery. The company is also working to develop an expandable graphite grade with starting temperature >300°C.

*George H Luh "New generation expandable graphite"*  
<https://www.luh.de/en/news/new-generation-expandable-graphite>

See also Klaus Rathberger in pinfa Newsletter n°109



## Higher temperature expandable graphite

**NeoGraf Solutions's new expandable graphite offers onset temperature over 270°C enabling new applications.** The new grade, with particle size of 300 microns, plastics can be used as a PIN flame retardant in plastics including polypropylene, polystyrene, PET, polyamides and ABS for injection moulding and thermoforming, including composites. Applications include transportation, aviation, electronics, building and construction, seals and gaskets. A limitation is the black colour. Expandable graphite acts by forming in fire an intumescent char layer that protects the base polymer from the heat of the flames. NeoGraf recommends combination with magnesium hydroxide (MDH) which offers comparable processing temperatures.

NeoGraf Solutions <https://neograf.com/products/grafguard-expandable-graphite-flakes> and <https://www.plasticstoday.com/additivescolorants/new-fire-retardant-additive-formulated-thermoplastics>



## Organoboron smoke suppressing PIN FRs

**DTNW Germany has launched research into organoboron compounds as safer alternative smoke suppressant PIN FRs** for the automotive and construction sectors. Boric acid and its salts are very effective FRs in terms of fire resistance and smoke suppression, acting by facilitating charring and glass formation. However, boric acid is a substance of very high concern (SVHC) under REACH. In order to develop a safer alternative solution to provide boron's smoke suppressing effect, DTNW (Deutsches Textilforschungszentrum Nord-West GmbH) and Hochschule Bremen are developing non-halogenated boronate-based or boronate-PIN combined textile FRs for biobased composite materials, using organoboron compounds (not concerned by the SVHC designation). The chemical immobilisation of the organoboron FRs on the textile fibres and the implementation of finished textiles into composite materials (embedded in a polymer matrix), are expected to mean very low potential environmental exposure. Toxicity of combustion gases will be monitored and evaluated via gas phase analyses (TGA/MS, TGA/IR) and a beneficial effect on overall toxicity is anticipated.

*The project is financed within the AiF funding (IGF No. 21318 N) of the German government. It will pay special attention towards the applicability of the developed FR mixtures for small and medium-sized enterprises (SME) in textile finishing.*

<http://www.dtnw.de/forschungsvorhaben/aktuelle-forschungsvorhaben/borhaltige-flammschutzmittel/>

<https://igf.aif.de/innovationsfoerderung/industrielle-gemeinschaftsforschung/igf-steckbrief.php?id=24375&suchtext=21318%20N>





## HELUKABEL new LSOH data cables

The range of four new instrumentation and compensating cables are each available in Low Smoke Zero Halogen versions. The three instrumentation cable types are conformant to PLTC UL13, EN 50288-7 or IEC 60331-21, cable type dependant. They are flexible for use in minimal flexing and fixed applications and ensure minimum losses over long distances. Configurations include single or double shield, wire armoured and shielded. The compensating cables are for thermocouple connection for various metal combinations and conform to ANSI MC 96.1 / PLTC UL13. The four ranges of cables are each available in LSOH using PIN flame retardant XLPE for use in applications where corrosive or toxic combustible gases must be avoided. HELUKABEL is a German-based, global provider of performance cable solutions with 55 locations in 36 countries worldwide.

*“HELUKABEL Launches Four New Cable Product Groups. Instrumentation and Compensating Cables for Sophisticated Applications”, HELUKABEL 15 June 2021 [https://www.helukabel.de/de-en/Newsroom/Overview/?item=/de-en/Newsroom/Item/Item\\_2240.html](https://www.helukabel.de/de-en/Newsroom/Overview/?item=/de-en/Newsroom/Item/Item_2240.html)*



## Improving mineral PIN FR performance

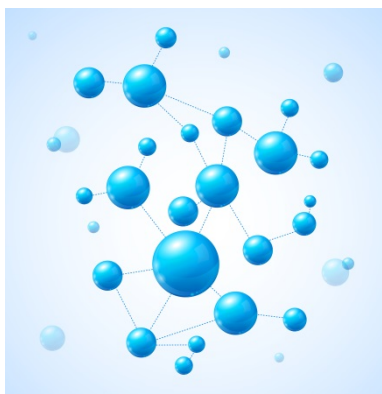
Innospec Leuna offers non-halogenated processing aids which improve processing of ATH and MDH PIN FR compounds. The polar organic additive is used at 1 – 2% to improve wetting and dispersion, and prevent re-agglomeration during processing, of mineral PIN FRs, such as ATH (aluminium hydroxide), MDH (magnesium hydroxide), calcium carbonate, kaolin, silicates. Its use improves processability, in particular by increasing MFI (melt flow index), without deteriorating mechanical or ageing properties, and can enhance fire performance by improving char formation and inhibiting dripping. This can enable reduction in dosages of coupling agents. Applications include in polyolefin elastomer resins, TPO (thermoplastic olefins) and EVA in cable sheathing compounds, cable bedding, roofing, insulation panels. Customer examples include enabling an increase in MDH content to 82% in TPO roofing membranes (+12%) so ensuring fire safety requirements

*Innospec Leuna <https://viscospeed.com/en/>*

*Compounding World October 2020 pp48-49*

*<https://content.yudu.com/web/1r19/0A1r2p/CWOct20/html/print/CW%20october%202020%20pdf%20for%20download.pdf>*

## RESEARCH



### Bio – mineral PIN FRs for wood

**Milk-derived casein protein reacted with magnesium hydroxide and showed to be an effective PIN FR coating for timber.** The reaction was carried out at 70°C with sodium hydroxide and the resulting compound was then spread on 20 mm scotch pine wood samples and dried at room temperature. The coating showed to have penetrated around 0.5 mm into the wood. Peak heat release was reduced by nearly 45%, time to ignition was more than doubled and smoke release was reduced by around 30% with c. 1 kg (dry weight) coating per m<sup>2</sup>. The authors conclude that the casein acts as an adhesive to between the magnesium hydroxide and the wood, contributes to an intumescent effect, and retains water released by the magnesium hydroxide in fire. The composite releases magnesium oxide layers with a high surface area which absorb smoke and gases. Information on the aesthetic impacts of the coating on the timber and on possible durability (resistance to moisture and weathering) are not assessed.

*“Casein-magnesium composite as an intumescent fire retardant coating for wood”, M. Uddin et al., Fire Safety Journal 112 (2020) 102943*  
<https://doi.org/10.1016/j.firesaf.2019.102943>



### Guanidine-based FR for cotton

**Guanidine, a biological molecule, was reacted with ammonium and phosphorus to produce a durable, reactive FR for cotton.** Guanidine is found in urine, and can be produced by the degradation of guanine (from DNA/RNA) or synthetically. Guanidine acetic acid was reacted with phosphorus acid, formaldehyde and then urea to produce a molecule with high P and N content (AGATMPA), which could be reacted with cotton fabric using dicyanamide as a catalyst by soaking in solution and curing at 180°C for 5 minutes, before rinsing and drying. This treatment showed to be effective in improving fire resistance: LOI of virgin cotton 19%, LOI with 15% wt. AGATMPA 40%, no after-flame nor after-glow. After 30 wash cycles, the LOI (15% wt. AGATMPA) was reduced to 29% and the FR treatment is considered durable. The FR action is considered to be due to generation of a carbonised char layer, release of ammonia which dilutes fire gases and cooling by release of water from carbonisation.

*“A novel guanidine ammonium phosphate for preparation of a reactive durable flame retardant for cotton fabric”, C. Wan et al. Cellulose volume 27, pages3469–3483 (2020) <https://doi.org/10.1007/s10570-020-03003-1>*



## Recycling boron from cellulose insulation

**Field trials show effectiveness of a fertiliser made by pyrolysis of cellulose fibre insulation containing boron flame retardant.** Boron is on the EU Critical Raw Materials list since 2014, with 70% being used in glass and ceramics, 12% in fertilisers (18% other). Borate is used as a PIN FR in bio-sourced insulation materials, with annual use in the application estimated by the authors as around a quarter of EU use in fertilisers. For this study, boric acid treated cellulose insulation material (produced from recycled paper, Isocell, Austria) was pyrolysed at 600°C to generate a biochar, tested in field trials with maize and sunflower. The pyrolysis partly converts the boron to low-solubility forms, which is important to avoid losses from soil or possible toxicity to plants, and to reflect plants' slow need and uptake over time. Plant uptake of boron using the insulation material biochar was double that of control (boron content in shoots) and similar to that with a soluble synthetic sodium tetraborate. Lysimeter tests were also carried out, showing that boron losses to ground water using the insulation material biochar did not exceed EU drinking water boron limits.

*"Field evaluation of a boron recycling fertiliser", O. Duboc et al., Plant Soil & Environment, 67, 2021 (2): 110–119 <https://doi.org/10.17221/567/2020-PSE> Photo Waldemar Brandt on Unsplash*

## OTHER NEWS



**New York State "Family and fire fighter protection act" bans intentionally added "halogenated, organophosphorus, organonitrogen or nanoscale chemical" flame retardants and FR synergists in upholstered furniture, mattresses, (enclosure and stand of) electronic displays.** The bill provides some limited exceptions and is applicable from 1/1/2024. Organophosphorus and organonitrogen are defined as containing one or more phosphorus/nitrogen elements and one or more carbon elements the term "element" is not here defined ... maybe the legislators meant "atoms"?). The bill has been passed by the State assembly and senate and is awaiting signature by the Governor.

*New York State Family and Fire Fighter Protection Act (S. 4630-B/A. 5418-B) <https://www.nysenate.gov/legislation/bills/2021/s4630>*

## 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](http://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](http://www.pinfa.org)

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