



# Annual Report 2021

**pinfa**

Phosphorus, Inorganic & Nitrogen Flame Retardants Association

[www.pinfa.eu](http://www.pinfa.eu)

# Contents

- 4 About pinfa
- 5 The Executive Committee
- 5 The Board
- 6 The Advisory Board
- 8 New pinfa members 2021
  
- Policy & advocacy**
- 10 The new EU policy landscape: opportunities for more sustainable flame retardants
- 10 pinfa input to EU policy making
- 12 Swedish tax on chemicals in electronics - withdraw or amend is pinfa's advice
- 14 Sustainability Taskforce on Melamine
- 15 Sustainability Taskforce on Phosphorus-based Flame Retardants
  
- Conferences & webinars**
- 16 Sustainable Electrical Vehicle Design
- 17 Safe and Sustainable-by-Design
- 18 Webinar on transportation composites
- 18 Fire Retardant Polymeric Materials
- 19 The future for flame retardants
  
- Communications**
- 20 pinfa newsletter and social media
- 20 New tool to teach fire safety and FRs
- 21 pinfa-NA formulators' training
  
- pinfa worldwide**
- 22 pinfa North America
- 23 pinfa China
  
- 24 **Meet the pinfa EU team**
  
- 26 **pinfa EU membership**

**First of all, we owe a big thank you to all our members and supporters for bearing with us through another year with Covid-19, where meeting remotely was the “new normal”! Despite the pandemic, pinfa managed 2021 very well:**

**pinfa was steadfast in its commitment to maintain high fire safety standards** across the world, which minimise the risk of fire to the general public, by continuing to improve the environmental and health profile of our flame retardant products. This mission remains especially important to ensure the continuity of progress in fire safety awareness, safer design and fire resistance materials.

**We further grew our PIN FR family** and proudly welcome on board the new members Luna, Sibelco, Asahi Kasei and RioTinto!

**pinfa made an outline for a Chemicals Strategy for Sustainability roadmap for flame retardants.**

After its launch in late 2020, the European Commission has been working on further details of its Chemicals Strategy for Sustainability (CSS) as part of the EU Green Deal. pinfa addressed the topic early on and has now come up with some concrete ideas on how to respond to the challenges and chances of the CSS. Members of the pinfa Advisory Board – which brings together experts and scientists from varying fields of material sciences, fire safety, environmental sciences, and toxicology – provided valuable feedback on the roadmap we outlined for the CSS. This preparatory work allows us to kick-off 2022 with a dedicated project with defined milestones and deliverables on the CSS, in close collaboration with Cefic and our value chain stakeholders.

**pinfa contributed to discussions in the EU policy context.**

We got involved in regulatory discussions around melamine, a nitrogen-based constituent of a number of flame retardants, and dove deeper into the sustainability topics around phosphorus flame retardants. pinfa also contributed to

a number of EU stakeholder consultations, ranging from batteries and smartphones to photovoltaics and construction products. In these contexts, pinfa stresses the role of fire safety for protecting consumers and workers.

**pinfa stepped up its communications activities.**

In addition to launching a dedicated social media strategy for LinkedIn and Twitter – to complement the existing website and newsletter – pinfa (co-) organised a number of events on “Sustainable Electrical Vehicle Design”, “Transportation Composites” and “Safe and Sustainable-b-Design”. pinfa also chaired well received panel discussions at the AMI flame retardants conferences, on “The future for flame retardants” and as part of the European Fire Safety Week on “New Fire Challenges of Green Energy in Buildings”. The latter was our first experience with online streaming – like being live on TV.

**For 2022 we have an exciting programme lined up:**

In addition to the ongoing topics mentioned above, we will kick-off a review of recycling options and technologies for materials containing PIN FRs. We will be reaching out to our value chain partners, the fire safety community and European Commission to ensure that safer, greener flame retardants are seen as a role model for the EU Sustainable Chemicals Strategy.



A handwritten signature in blue ink that reads "Adrian Beard".

**Adrian Beard**  
pinfa Chairman



A handwritten signature in blue ink that reads "Esther Agyeman-Budu".

**Esther Agyeman-Budu**  
pinfa Sector Group Manager

## About pinfa

pinfa is the Phosphorus, Inorganic and Nitrogen Flame Retardants Association and is a Sector Group within Cefic, the European Chemical Industry Council. pinfa brings together companies manufacturing and using non-halogenated phosphorus, inorganic and nitrogen flame retardants (PIN FRs) and is open to other stakeholders. pinfa acts worldwide with its sister associations, pinfa North America and pinfa China.

The members of pinfa share the common vision of providing environmentally compatible fire safety solutions and continuously improving the environmental and health profile of their flame-

retardant products. This vision is coupled with a commitment to support high fire safety standards across the world, standards which minimise the risk of fire to the public.

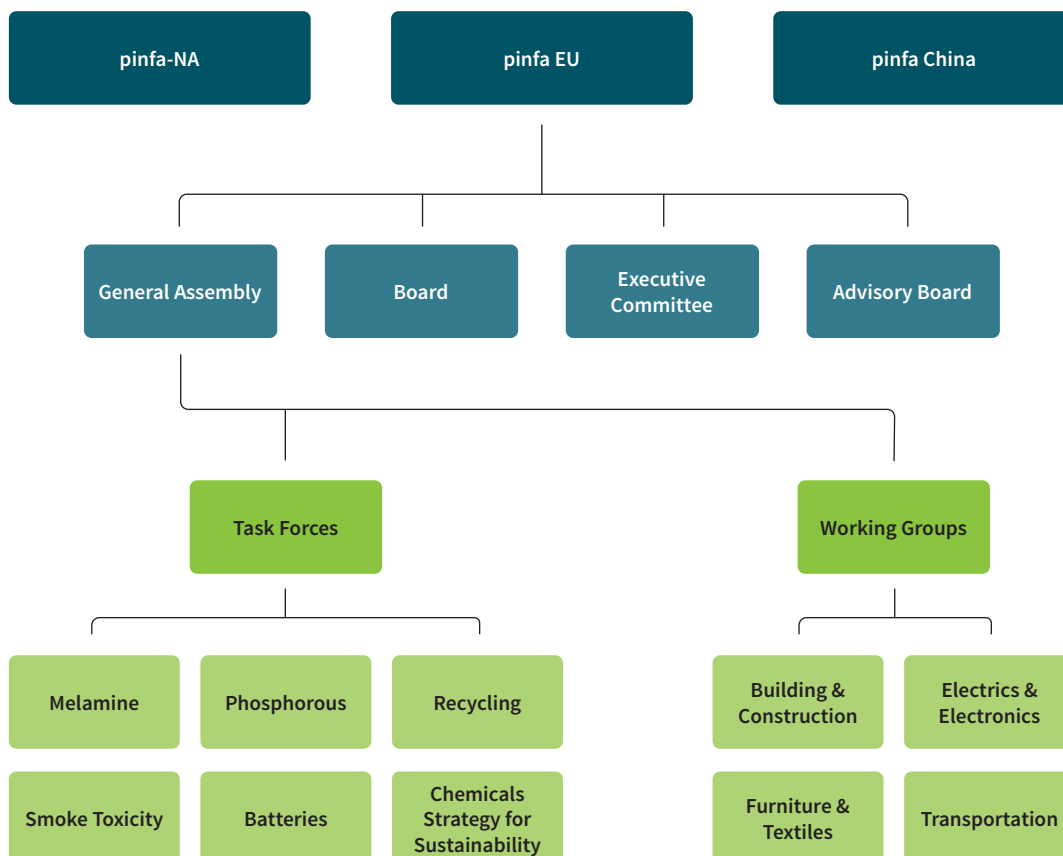
pinfa's main objectives are cooperation with the PIN FR industry value-chain, dialogue with institutions, development of scientific knowledge and provision of information and data on PIN FR properties and life cycle.

pinfa's vision is detailed in our Mission Statement and formalised in our Operating Rules, updated in 2021.



The members of pinfa at a general assembly meeting in 2019

© A Beard







## The Board

**Adrian Beard**  
*Clariant P&C (Deutschland) GmbH*

**Yann Bourgeois**  
*Huber Engineered Materials*

**Thomas Esche**  
*BASF Schweiz AG*

**Thomas Futterer**  
*Chemische Fabrik Budenheim*

**Richard Green**  
*ADEKA Polymer Additives  
Europe SAS*

**Adriana Jalba**  
*ICL Europe Cooperatief U.A.*

**Béatrice Hermann**  
*ICL Europe Cooperatief U.A.*

**Michael Klimes**  
*Nabaltec AG*

**Atsushi Sakai**  
*ADEKA Corporation*

**Reiner Sauerwein**  
*Nabaltec AG*

**Heiko Tebbe**  
*Lanxess Deutschland GmbH*

**Herman Vansteeger**  
*Huber Engineered Materials*

**Ulrich Wietschorke**  
*ADEKA Corporation*

**Yutaka Yonezawa**  
*ADEKA Corporation*

**Ugo Zucchelli**  
*Italmatch Chemicals S.p.A.*

## The Executive Committee

*New Executive committee (re-)elected on 30 November 2021*



**Adrian Beard**  
Chairman



**Thomas Futterer**  
Vice-Chairman



**Christian Panofen**  
Vice-Chairman



**Heiko Tebbe**  
Vice-Chairman



**Esther Agyeman-Budu**  
Secretary General

## The Advisory Board

In recent years, there has been increased public discussion about the safety and environmental impacts of flame retardants (FRs). Although largely focused on halogenated FRs, concerns have also been raised, to a lesser extent, about some non-halogenated FRs. Conversely, where FR use has decreased, concerns have been raised about fire safety. As a result, the appropriate use of FRs and whether alternatives to FRs provide sufficient fire safety protection have become important issues that policy makers are trying to address. pinfa set up an Advisory Board to ensure that it could create a platform to maintain a dialogue with all relevant stakeholders (see graphic).

In 2021, a key topic for the Advisory Board was the Chemicals Strategy for Sustainability (CSS), where we discussed what actions pinfa might pro-actively take to address the CSS policy targets (see pinfa roadmap below). Some feedback from the Advisory

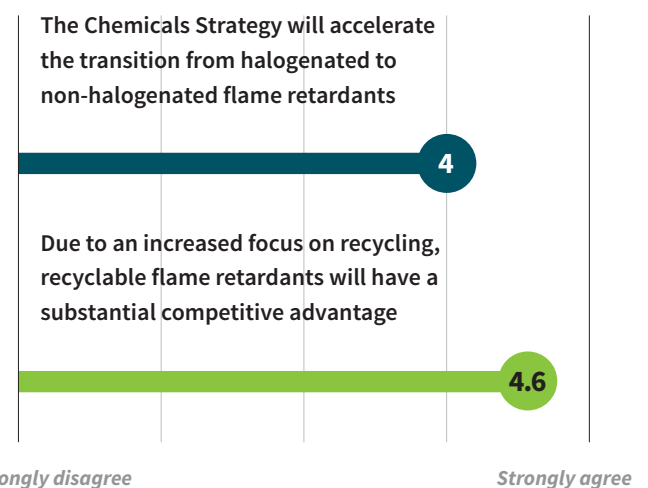
***“Staying in contact is important. Platforms such as [the pinfa Advisory Board meetings] did not exist in the 1980s or ‘90s. Back then, umbrella organisations did not give scientists a seat at the table. I think it is very important that we understand each other, and understand each other’s needs and challenges.”***

**Jacob de Boer**

Vrije Universiteit Amsterdam

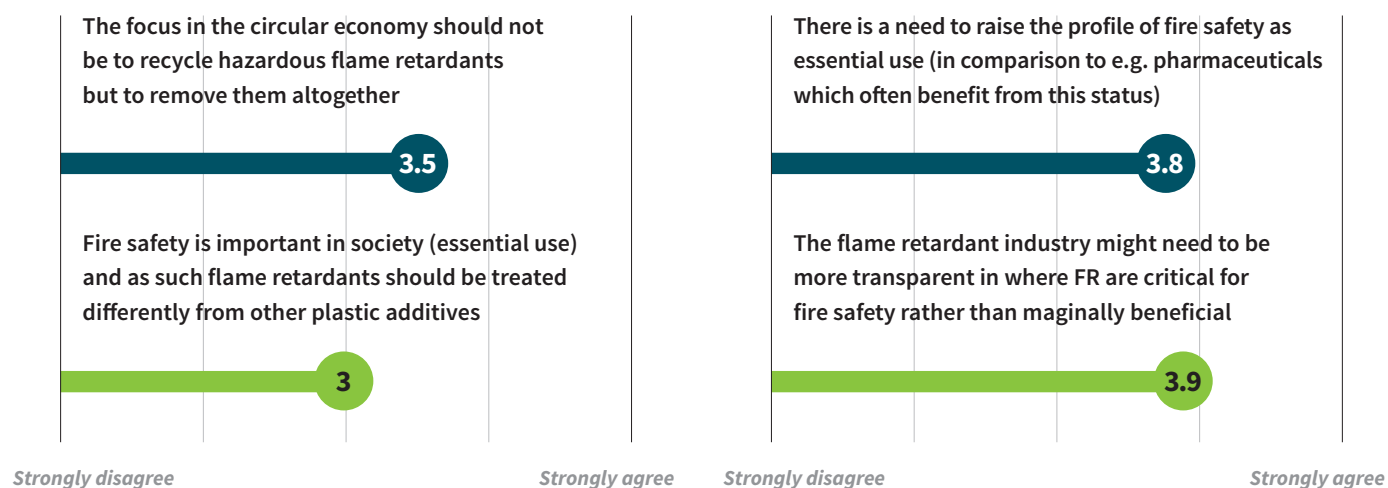
Board on key questions is shown in the graphic below. On the fire safety side, we discussed the initiated revision of the European Construction Products Regulation as well as research on a new European fire test for facades, which even began before the tragic Grenfell fire in 2017. The European Fire Safety Alliance presented their Action Plan and activities around the European Fire Safety Week.

### Results from a query amongst the Advisory Board on CSS related topics





The stakeholders of the pinfa Advisory Board – graphic courtesy of HLC Consulting



# New pinfa members 2021



New pinfa EU member, Nordmann is an international chemical distribution company with expertise and application know-how in PIN FRs. Nordmann especially focuses on innovative non-halogenated products and synergists.

***“Flame retardants are of strategic importance to Nordmann. We see great potential in this market. The pinfa membership allows us to closely monitor the latest technological and regulatory developments in this field. At the same time, we can share our broad knowledge with other industry experts.”***



**Ralf Meier**

European Business Manager Flame Retardants at Nordmann

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



New pinfa-NA member, Luna provides innovative fibre-optics and communication solutions, from R&D to products for defense, health care, energy etc. Luna’s applied R&D and product development work includes focused projects to develop novel flame retardant solutions for customers.

***“Luna has joined pinfa-NA to connect with and understand the FR industry, market and needs, to benefit our R&D and product development perspectives. We look forward to together promoting the flame retardant industry.”***



**Nikita Kevlich**

Luna Innovations Inc.

[www.lunainc.com](http://www.lunainc.com)

[www.lunainc.com/lunalabs](http://www.lunainc.com/lunalabs)





New pinfa EU member, Sibelco is a global materials solutions company, offering a range of specialist mineral PIN FRs for fire safety. In particular, engineered particle size distribution and surface treatment and new combination packages of existing PIN FRs and synergists can address materials performance challenges

[www.sibelco.com](http://www.sibelco.com)

## RioTinto

New pinfa-NA member 2021, U.S. Borax (part of Rio Tinto), is a global leader in the supply and science of borates: naturally occurring minerals containing boron and other elements which are a building-block for performance PIN FRs and synergists. In particular, zinc borates are multi-functional PIN FRs, combining the fire safety benefits of zinc and boron oxides.

***“By joining pinfa-NA, Borax will stay up to date on new flame retardant regulations and technological developments and be part of the dynamic non-halogenated FR community.”***



**Emmanuel Laval**

US Borax – Rio Tinto

[www.borax.com/firebrake](http://www.borax.com/firebrake)

## AsahiKASEI

New pinfa EU member, Asahi Kasei is a leading Japanese polymer manufacturer and a global technology company with over 44,000 employees worldwide and operations in Materials, Homes, and Health Care. The company has a broad portfolio of non-halogenated flame retardant polymers and intends to take forward safe and sustainable flame retardant solutions.

***“Joining pinfa will allow Asahi Kasei to observe and engage with the latest technological and regulatory developments in fire safety and environmental protection, and at the same time share our broad knowledge of flame-retardant engineering plastics and foams with other industry experts.”***



**Taku Ishida**

General Manager of the Engineering Plastics Division of Asahi Kasei Europe

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

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

## The new EU policy landscape: opportunities for more sustainable flame retardants

### The European Chemicals Strategy for Sustainability

The “Chemicals Strategy for Sustainability ... to ensure a toxic-free environment” promised in 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). REACH will be reinforced and extended. New policies are announced on “sustainable-by-design” chemicals (with environmental footprinting of chemicals), safe recycling, compliance enforcement of chemicals regulation and for information on chemicals in products. The “Chemicals Strategy” is part of the wider Green Deal “Zero Pollution Action Plan”, addressing legislation on air, water, soil and waste, and which will further impact chemicals.

These new policies will pose challenges to some flame retardants, with pressure on chemicals which show environmental toxicity, persistence, mobility, bioaccumulation or endocrine disruption. Conversely, pinfa sees important opportunities for PIN FRs and for the PIN FR business in Europe, as the Chemicals Strategy aims to “promote the EU’s resilience of supply and sustainability of chemicals used in essential applications for society through EU funding and investment mechanisms”. Other Green Deal initiatives on products and articles will also strongly impact chemicals, in particular the “Sustainable Products Initiative” (expected to particularly target electronics and telecommunications, furniture and textiles) and the extension of EcoDesign.

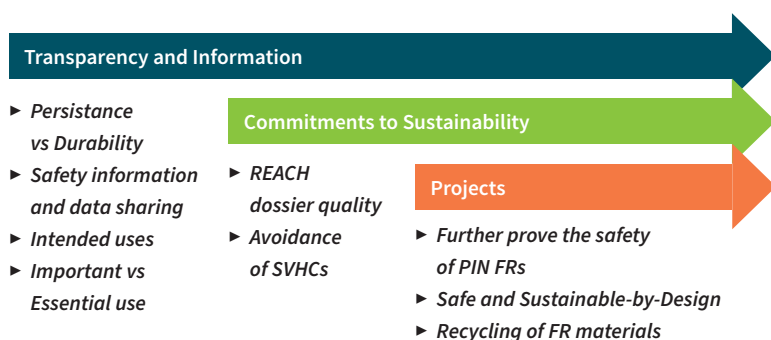
### Opportunities for PIN FRs within the new EU Chemicals Strategy

Flame retardants play an important role in the sectors cited for chemicals innovation and opportunities in the new EU Chemicals Strategy: construction materials, textiles, low-carbon mobility, batteries, wind turbines and renewable energy sources.

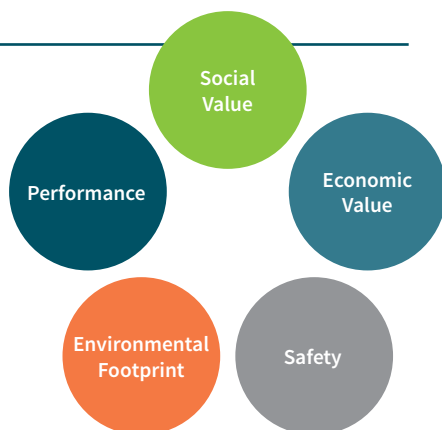
The Strategy announces regulatory challenges to all chemicals, including assessment of combinations of chemicals, new criteria for environmental toxicity, persistence, mobility, bioaccumulation, endocrine disruptors and nanomaterials.

**pinfa sees important opportunities for PIN FRs in objectives such as:**

- ▶ **Safe and Sustainable-by-Design chemicals**
- ▶ **REACH requirement for overall environmental footprint of chemicals**
- ▶ **emphasis on recycling and addressing “legacy substances” in waste streams**
- ▶ **identification of essential uses and applications of chemicals for society**



*The elements of the pinfa roadmap for the Chemicals Strategy for Sustainability, 2022 – 2024*



*The elements of Safe and Sustainable-by-Design*

***“pinfa welcomes the challenges of the new Chemicals Strategy and sees opportunities to further promote the development and use of sustainable flame retardants – addressing the “Safe and Sustainable-by-Design” concept. pinfa is developing a concrete roadmap on how we can contribute to this process together with our customers, environmental groups and regulators.”***

**Adrian Beard**  
pinfa Chairman, Clariant

## pinfa input to EU policy making

In coherence with Cefic, pinfa prepared and submitted input for a number of public or stakeholder consultations on EU or national policies.

### ► EU Construction Products

**Regulation (CPR)** (public consultation). pinfa considers that the CPR has brought benefits to building safety and quality, and in clarifying information for architects and construction materials users across Europe, and that further benefits can be expected over time. pinfa declared support for maintaining and reinforcing the CPR and for adapting to new fire and smoke challenges in modern buildings.

### ► Environmental impact of

**photovoltaics** (EU roadmap consultation). pinfa proposed that fire safety should be included in Ecolabel, Green Public Procurement and EcoDesign criteria for PVs, because of environmental impacts of fires and concerns for fire fighters.

### ► Smart phone EcoDesign

(stakeholder consultation). pinfa noted that smart phones, with battery runaway and plastics and composites, can start serious fires and that non-halogenated flame retardants can provide fire safety with preferable health and environmental profiles.

### ► EU Batteries Regulation (revision).

Currently in discussion in Council and Parliament (start 2022). pinfa proposed amendments to include minimising fire and smoke toxicity risks in battery design objectives, to include fire resistance and smoke toxicity in battery testing, and to extend the safety obligations to all batteries > 2 kWh (currently proposed only for stationary energy storage systems).

### ► ECHA flame retardant profiles

(stakeholder consultation). The scope for consultation was limited to non-textile floorings. pinfa underlined the need for flame retardants to achieve fire resistance, collected and provided information on PIN FRs used in different materials and underlined the trend towards low-smoke requirements, which are achieved by PIN FRs.

### ► RMO (Risk Management

**Options) for Melamine** (BAUA public consultation). Preparatory to possible limitations under REACH. For details of pinfa’s input see under Melamine Task Force.



## Swedish tax on chemicals in electronics – withdraw or amend is pinfa’s advice

**In April 2017, the Swedish Tax on Chemicals in Certain Electronics (Lag 2016:1067) entered into force**, putting a tax on electronic articles and white goods. The tax rate depends on whether (and which) halogenated (brominated, chlorinated) or phosphorus-based flame retardants are used. The aim of the tax is to promote substitution of “critical” flame retardants by posing an excise tax on them – in addition to the obvious target of raising money for the State. Since taxation is a national legal domain, the law does not need to be aligned within the European Union.

pinfa and many other stakeholders including Swedish ecolabel and environmental organisations have been criticising the tax since its early origins, because they believe that it does not achieve its original intention of promoting the substitution of critical flame retardants (FRs). In November 2019, the Swedish Government asked the Swedish Chemicals Inspectorate (KEMI) and the Tax Agency (Skatteverket) to investigate if the chemical tax meets its intended primary goal, i.e. to stimulate producers of the taxable products to select safer alternatives. In October 2020, the chemical tax evaluation report by the Swedish Chemical Inspectorate (KEMI) and the Tax Agency concluded:

- ▶ **the tax is not cost-effective**
- ▶ **the administrative burden for the companies is high**
- ▶ **the Annex to the legislation has a large number of errors**

The overall summary is that the chemical tax on Electric and Electronic (EE) products does not meet its intended goal, i.e. to stimulate the producers of the taxable products to use environmentally preferred substances. In the 2nd report by these agencies, published on May 17th 2021, several proposals to amend the tax legislation were presented, with the aim to make the legislation more effective. Among the suggested changes were:

- ▶ **only flame retardants should be taxed**
- ▶ **the tax should be based on the intrinsic hazard properties of the substances**
- ▶ **for substance hazard assessment, the GreenScreen™ methodology, since many years used by the IT Industry, is recognised.**



***“The Swedish Chemical tax is inefficient and misses its goals – for several years I have been advocating to fundamentally change it or abolish it altogether. It has been counter-productive to the sustainability efforts we did at HP and other electronics OEMs.”***

**Hans Wendschlag**

Consultant for pinfa and former employee of Hewlett Packard

Regarding the suggested changes, TechSverige (former IT&Telekomföretagen) has voiced its concerns to the Government Offices of Sweden and politicians in Parliament (Riksdag), especially with regard to the following:

- ▶ **there is still no zero tax alternative**
- ▶ **compliance control is not possible as standard test methods for many of the taxable substances are not available**
- ▶ **in contradiction to the principles of circular economy, used products are not exempt from taxation**
- ▶ **the amended taxation methodology is very complex and will require the development of two new appendices which are not available and will take a long time to develop**

Industry also does not support the list of possible future new taxable EE products. These two reports from the authorities have been delivered to the Swedish Government, but as per December 2021, we have seen or heard no position on how they intend to handle the issue.

In September 2021, a joint statement was developed and signed by six affected Swedish industry associations, including TechSverige, which has been shared with the Swedish political parties. In brief, all of the signatories of the document agree that the tax should be abolished. However, if it is kept, major changes are necessary. Among these, a zero tax alternative is needed, the differentiation between additive and reactive flame retardants needs to be

removed, only flame retardants containing bromine and chlorine should be taxed and the major flaws of the tax need to be corrected before any new EE products are added in the future.

Of special interest is that the Swedish Government has chosen not to proceed with a proposal to introduce a chemical tax on clothes and shoes in 2022, mainly because its implementation was seen to be too complex and burdensome for the affected industries.

There will be elections to the Swedish parliament in September 2022. Therefore, 2022 will be an interesting year where industry will need to intensify the work to either have chemical tax withdrawn or, if it is kept, ensure that it is amended to ensure it meets its intended goal.



***“Dressing fiscal taxes in environmental arguments risks undermining confidence in both the tax instrument and policy, nor does it benefit the environment. I really wish that the Swedish government would be open to the fundamental criticism from almost all stakeholders, including environmental groups.”***

**Frida Faxborn**

Public Affairs Expert at TechSverige (former IT & Telekomföretagen), the Swedish IT Industry organization



## Sustainability Taskforce on Melamine

**Due to the increasing regulatory scrutiny on melamine**, pinfa's Product Sustainability Taskforce on melamine continues to monitor developments in order to safeguard the interest of melamine-based flame retardants.

In general, the use of melamine as flame retardants (FRs) is estimated to be <5% of total melamine use. Due to the high nitrogen content of melamine, melamine-based substances are used in a wide range of flame-resistant materials, to achieve the necessary international fire safety standards. These include mainly electric and electronic applications (e.g., switches, connectors, charging cables) where UL 94 and IEC 60695 are relevant standards. They are also used in building and construction applications with EN 13501 defining the fire performance and test standards. Applications also include coatings for fire resistance for steel structures regulated in EN 13381-8.

This year the Melamine Product Sustainability Taskforce was busy monitoring the progression of the harmonised classification (CLH) and responding to a new consultation on a Regulatory Management Option Analysis for melamine.

### **Harmonised classification (CLH) of melamine**

In March 2021, the European Chemicals Agency (ECHA) published the opinion of the 55th Risk Assessment Committee (RAC) meeting in December 2020, where the CLH classification of melamine was discussed.

The RAC, composed of independent experts from EU Member States, recommended a harmonised classification of melamine as follows:

- ▶ *Suspected carcinogen (category 2)*  
[Carc. 2; H351, "Suspected of causing cancer"]
- ▶ *Presumed to have a specific target organ toxicity via repeated exposure to the urinary tract [STOT RE 2; H373 (urinary tract) "May cause damage to the urinary tract through prolonged or repeated exposure"]*
- ▶ *A GCL of 1,0% for the classification of mixtures containing melamine is applied, as a direct consequence of Carcinogenicity Category 2.*

**Next steps:** The European Commission is now expected to adopt the 18th ATP (Adaptation to Technical Progress), a legislative proposal including substances, such as melamine, recommended for classification. This proposal will be sent to the European Parliament (EP) and the Council of the European Union for final approval. We expect the proposal to be published without undue delay in the Official Journal of the EU during the first half of 2022. Considering the transition period (usually 18 months), the harmonised classification of melamine as Carc. Cat. 2 and STOT RE 2 is expected to be legally in place at the earliest in the second half of 2023.

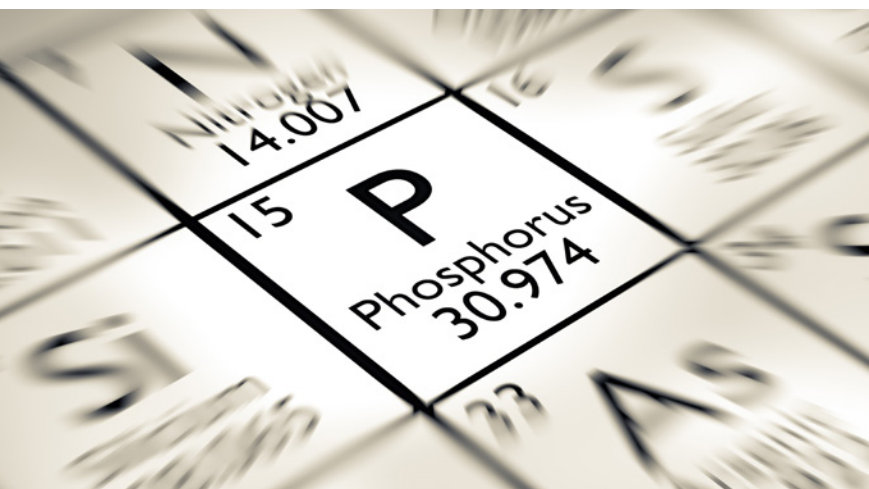
### **Regulatory Management Option Analysis (RMOA) for Melamine**

Following the publication of the RAC opinion, the German Federal Institute for Occupational Safety and Health (BAuA) launched a public consultation for the preparation of a Regulatory Management Option Analysis (RMOA) for Melamine. The purpose

of a RMOA is to help authorities clarify whether regulatory action is necessary for a given substance and to identify the most appropriate measures to address a concern. pinfa contributed to this public consultation and will continue to follow this process closely as well as engaging with BAuA to safeguard the interest of melamine-based flame retardants.

---

## Sustainability Taskforce on Phosphorus-based Flame Retardants



Phosphorus is an extremely versatile element and the diversity of its chemical compounds is reflected in a large span from benign and biogenic chemicals like the phosphates that are part of our DNA (this time not an awkward analogy, but the exact truth) to intentionally toxic pesticides and nerve gasses. Flame retardants are of course meant to be non-toxic and harmless in the environment, nevertheless some phosphorus flame retardants have hazardous properties as neat chemical substances. This should not translate into significant risk for commercial users or end consumers. Phosphate esters are the

largest group of phosphorus-based flame retardants in commercial use and even they span a variety from alkyl- to arylphosphates, small to large molecules to oligomers, as well as chlorinated versus non-halogenated types.

In 2021, pinfa's sustainability taskforce on phosphorus-based flame retardants finalised a position on organo-phosphate ester flame retardants' environmental and health impacts. pinfa wants to make more industry data available to scientists and support them in consulting the extensive database existing from the REACH registration process and available on the ECHA website – see also pinfa's activities on the European Chemicals Strategy for Sustainability above.

pinfa has also started addressing the topic of grouping chemicals for evaluation, risk assessments and consequently regulatory purposes. While it is understandable to see grouping as a way to simplify and speed up substance assessments, there can be substantial differences in chemicals, which are structurally similar. Therefore, this kind of simplification bears a high risk for excluding sound alternatives for substitution. Phosphorus flame retardants or the sub-group of organo-phosphate flame retardants (OPFRs) include a broad range of substances with differing characteristics, formulations and intended uses, so it is difficult to group all these substances together or make broad conclusions on a wide range of substances. The June 2021 meeting of the Competent Authorities for REACH and CLP (CARACAL) discussed a proposal for a Restrictions Roadmap under the Chemicals Strategy for Sustainability, which includes the group OPFRs. pinfa is preparing scientific input for the further discussion.

# Conferences & webinars

*pinfa participated in a number of events on fire safety worldwide in 2021, presenting PIN flame retardants and engaging dialogue with stakeholders and industry.*

---

## Sustainable Electrical Vehicle Design

*pinfa panel at the Kisaco virtual summit 20-21 September 2021*

As part of the virtual summit on “Sustainable E-Vehicle Design” organised by Kisaco, pinfa held a panel on “Sustainable Flame Retardants for E-Mobility”. PIN-FR-producers (Sebastian Herold from Clariant, Reiner Sauerwein from Nabaltec), users and Tier-1 suppliers (Laurent Tribut from Schneider Electric, Antonio Nerone from Radici), all representing pinfa, Rudolf Pfaendner, Division Director Plastics of Fraunhofer LBF and Ann Dierckx, Director of Sustainability from Cefic, discussed specific challenges for flame retardants in e-mobility applications.

It was stressed, that even though there is a trend to adopt FR requirements from the electric and electronics industry in e-vehicles, there are still many technical standards to be defined and harmonised. With the EV power train, fire safety of cars has become a key topic, which needs to be fulfilled by the best available FR technology, addressing the needs of circular economy in the design phase.

The panel members pointed to flame retardant tests of increasing severity, e.g. the ongoing developments for housings to guarantee passenger safety in case of battery thermal runaway. While such requirements need materials of complex compositions, recyclability and CSS goals are by tendency easier to be fulfilled with polymer compounds having a limited number of polymers, additives and FRs. Concluding, all panellists agreed that the safety of passengers must have the highest priority and emphasised the role of PIN-FRs as key enabling raw materials.



## Safe and Sustainable-by-Design

pinfa webinar, 7 July 2021

Summary in pinfa Newsletter n°130

140 participants dialogued with experienced panellists in chemicals advocacy, fire safety science, environmental science and in flame retardant user industries (Daimler AG, Plastics Europe, Schneider Electric, Radici). Discussions concluded that the EU Green Deal concept of Safe and Sustainable-by-Design will considerably impact flame retardant chemical portfolios. Industry needs to work with scientists, NGOs and regulators to develop standardised sustainability assessment metrics, to improve transparency of data (both on chemical hazard and on wider sustainability criteria, in particular recycling) and to find new ways to ensure communication to the value chain and the consumer.

***“The most important environment and health development for chemicals today remains “no halogens”, that is to phase out halogenated chemicals as a whole group.”***



**Jacob de Boer**

Professor of Environmental Chemistry and Toxicology, Vrije Universiteit Amsterdam

***“Fire safety is linked to societal challenges such as climate change, information technology, ageing population, urbanisation. Linking fire safety and sustainability is essential.”***



**Margaret McNamee**

Professor of Fire Safety Engineering at Lund University, Sweden and International Association for Fire Safety Science (IAFSS)

***“The EU Green Deal’s Chemicals Strategy for Sustainability means a step-change for chemicals, with a new legislation system. Key concepts are “Essential Use”, which aims to ban the most hazardous chemicals and families of chemicals except in specifically identified applications, and “Safe and Sustainable-by-Design” (SSbD), which will be required for all chemicals.”***



**Sylvie Lemoine**

Executive Director, Cefic Product Stewardship

***“Plastics additives, including flame retardants, should offer low toxicity exposure and be compatible with plastics recycling.”***



**Michel Cassart**

Director Strategic Council Sustainable Use of Plastics, Plastics Europe

***“Flame retardant hazard assessment needs better transparency, updating and agreement on conclusions, open to challenge by scientists. The challenge is how to integrate such data bases into supply chains and market tools.”***



**Lauren Heine**

ChemFORWARD

# Conferences & webinars

## Webinar on transportation composites

*SAMPE - pinfa-NA event, 28 April 2021*

Summary in pinfa Newsletter n°126. Speakers included the US Federal Aviation Authority, SAMPE (Society for the Advancement of Material and Process Engineering), Boeing, UL, Saran Cabin, SwRL. The speakers identified important challenges for tomorrow's fire safety in transportation and in particular in aviation: 3D-printed materials, flexible testing at different scales to follow the speed of materials innovation, fire risks related to batteries, ageing of flame retarded materials and bringing high production rates from the automotive industry to the rail and aircraft sectors. SAMPE emphasized the high and accelerating rate of innovation in materials in transport applications, with non-halogen flame retardants playing a key role in enabling new materials. Watch the recording of the webinar on the SAMPE YouTube channel.



## Fire Retardant Polymeric Materials

*Summary in pinfa Newsletter n°129.*

Christian Battenberg (Clariant), for pinfa, gave the conference dinner speech at the 18th FRPM, Budapest, 29 Aug – 1 September 2021. He underlined the exciting opportunities offered by the juncture of today's challenges: the increasing need for fire safety, with societal drivers, such as ageing population and urbanisation, new technologies such as batteries and connectedness of things, and sustainability demands for safe chemicals and recycling.



## The future for flame retardants

pinfa panel at AMI Fire Resistance in Plastics, online, 4-5 May 2021

Summary in pinfa Newsletter n°124.

140 participants, of whom more than one third compounders

***“The toxicological and environmental science is behind today’s market and is still working on the brominated flame retardants used in the past because they are very persistent in the environment whereas there is a need for more environmental research into new flame retardants.”***



**Lisa Melymuk**  
Masaryk University,  
Czech Republic

***“Key questions for the future of flame retardants are end-of-life and recycling, the demand for fire safety in the global energy transition and the need to develop efficient fire testing which is representative of reality.”***



**Sophie Duquesne**  
ENSCL Lille, France

***“ Fire safety is a real issue requiring solutions, but we need to find solutions which do not create future problems, for health, the environment and the economy.”***



**Samy Porteron**  
ECOS (European Environmental  
Citizens Organisation on  
Standardisation)

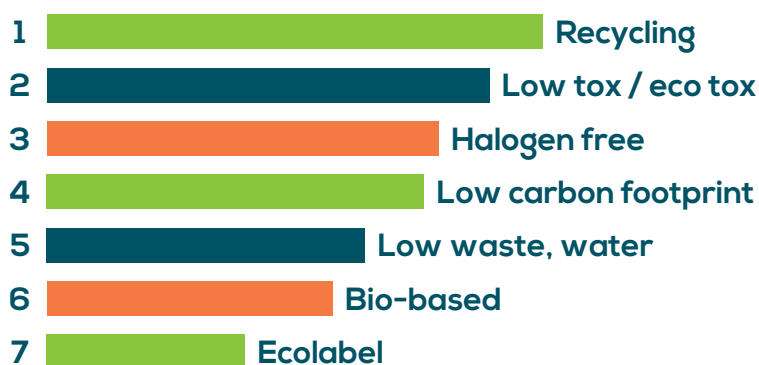
***“The development of flame retardant solutions integrated into the polymer matrix can improve environment and health safety, but can be an obstacle to recycling.”***



**Franck Poutch**  
Crepim, France

Mentimeter input from Conference delegates during the pinfa panel discussion

Which needs or trends do you see for flame retardants?



## pinfa newsletter and social media

The pinfa monthly Newsletter continues to be a recognised information source on innovation in PIN flame retardants and on fire safety, with twelve issues published in 2021 (n°s 120-131)

The pinfa Newsletter covers developments worldwide, providing an update on developments such as fire safety and chemicals policies, publications and studies, new PIN FR chemistries and applications. Back issues of the Newsletter are available on the pinfa website, constituting a reference library for information on PIN FR developments (use the 'search' function on the pinfa website). The Newsletter is emailed to nearly 1,000 subscribers across the world. You can sign up to receive the Newsletter summary directly when it is published on the pinfa website home page.

The pinfa website brings together information on PIN flame retardants, fire safety, events, documents and links. The website recorded over 50,000 page visits in 2021, more than four times the number of visits in 2020.

pinfa is also active on social media:

LinkedIn (150 followers and growing) and Twitter (nearly 100 followers), enabling more rapid circulation of information ahead of the monthly publication of the Newsletter.

**pinfa website and Newsletters: [www.pinfa.eu](http://www.pinfa.eu)**

*The pinfa Newsletter welcomes input from companies and other stakeholders worldwide on fire safety and FR developments. Please send any news or information of interest to pinfa.*



## New tool to teach fire safety and FRs

pinfa has created an 80+ slide toolkit, with information and graphics to explain materials fire safety, flame retardants, fire tests, standards, environment and health. The slide set is available online in PDF, and is provided in PowerPoint on request to pinfa for use for teaching, professional training and industry. The slides have been developed with expertise from the nearly forty member companies of pinfa in Europe and worldwide (with pinfa North America and pinfa China) as well as external experts. Sections of the slide set cover materials fire safety, how flame retardants work to prevent, extinguish or slow fire development, fire tests and standards, regulations, environment & health questions, flame retardants markets and applications (including to date: wire & cable, building - construction, transport). pinfa intends to periodically update the existing slides, and to progressively extend to cover further themes (such as textile fire testing, recycling, bio-based FRs) and other applications (electrical and electronics, textiles, wood/timber, e-mobility, 3D printing).

**Day-to-day Materials and Fire**


Plastics have a high 'calorific value' (energy comparable to conventional fuels).

Crude oil	43 MJ/kg
Coal	23-26 MJ/kg
Plastics & polymers	18-31 MJ/kg

Natural materials also represent a significant fuel potential in homes and offices.

Wood	14 MJ/kg
Cotton	16 MJ/kg

The heat emitted in a fire depends on oxygen, so foams (which contain air bubbles) or thin plastic components will burn faster and more fiercely.



18 July 2012: Energy and economic value of our recycled plastics (REP) summary (en)@PinfaInCanada  
http://bit.ly/2wv3v3v  
18 July 2012: Energy and economic value of our recycled plastics (REP) summary (en)@PinfaInCanada  
http://bit.ly/2wv3v3v  
18 July 2012: Energy and economic value of our recycled plastics (REP) summary (en)@PinfaInCanada  
http://bit.ly/2wv3v3v

pinfa.org

## pinfa-NA formulators' training

The pinfa-NA - SPE formulators' online training engaged around 90 participants, with strong interest in PIN FR developments. Led by plastics and compounding expert Roger Avakian, the four online sessions (4 x 2 hours), co-organised by pinfa North America and SPE (Society of Plastics Engineers) in June 2021, addressed in depth fire behaviour of materials and fire safety tests, non-halogenated flame retardant chemistry, flame retardant selection for different polymers, (in particular formulation of elastomers, thermosets, textiles, coatings), new developments and sustainability. Participants from companies formulating polymer compounds were able to ask detailed questions concerning PIN FR solutions for specific materials to achieve different fire safety test standards, as well as questions about industry trends and technical developments.



**Dr. James Zhou**, Avient presented an overview of fire tests at the pinfa formulators' training

The participant survey concluded that this training series is seen as a valuable and unique opportunity to find, in one place, full, objective technical information on different FR formulations, including case studies and examples. Participants showed particular interest in: low-smoke solutions and PIN smoke suppressant synergists gas-phase PIN FRs; thermally stable PIN FRs for high temperature processing; polymeric/oligomeric or reactive PIN FRs; specific PIN FR solutions for polyolefins; and sustainability information on PIN FRs, in particular Life Cycle Analysis (LCA) and recycling. Overall, this first session of formulator trainings showed to be a success, with demand to now develop the workshops for Europe and Asia, by including case studies and information on relevant standards and tests. SPE (Society of Plastics Engineers) view the webinar series as an outstanding success and are using it as a template for other webinars on specific polymer subjects.



## pinfa North America

pinfa North America welcomed new members U.S. Borax and Luna during 2021 (see above) and now has fourteen members.

The Technical Program Committee of pinfa-NA developed and produced four virtual half-day sessions during June 2021 on formulating with non-halogen flame retardants (see dedicated section below). Our organization also collaborated with the Society for the Advancement of Material and Process Engineering (SAMPE) on a virtual program entitled “Meeting Fire, Smoke & Toxicity Requirements for Transportation Composites” during 2021. Over one hundred participants from across the globe gained knowledge from speakers representing U.S. FAA, Boeing, UL, Southwest Research Institute, Safran Cabin and others.

pinfa-NA collaborated with Case Western Reserve University (Cleveland, Ohio) on different projects during 2021 including drip suppressants and the contribution of FR-containing materials to fire safety. To encourage and support the work of academia related to material fire safety, pinfa-NA has pledged a \$2,500 annual fire safety merit scholarship for a CWRU student conducting research on this topic. The 2021 CWRU student recipient will be announced shortly.



*pinfa North America's Maggie Baumann being interviewed at the 2021 Compounding World Expo, Cleveland, Ohio, USA*

The Outreach Committee had an active year. pinfa-NA sponsored and participated in several events (SPE ANTEC and Plastics for Aerospace, AMI sponsored conferences involving FRs and compounding, the Foam Expo North America 2021 and CAMX 2021 focused on composites). During CAMX October 19-21 in Dallas, Outreach submitted an on-demand presentation on “Fire safety and E-Mobility”. At the November 2021 Compounding World Expo North America (Cleveland, Ohio), pinfa-NA Vice-Chair Maggie Baumann presented a paper entitled “Working toward more Sustainable Fire Safety Solutions”. Industry trends, regulatory considerations, new PIN FR chemistry and sustainable FR material solutions were some of the topics covered.

Looking ahead to 2022, pinfa-NA intends to be present at numerous industry and stakeholder events. Planned events are listed on the pinfa NA website, [www.pinfa-na.org](http://www.pinfa-na.org).



*pinfa China  
2021 Q3 General  
Assembly Meeting,  
Hangzhou,  
28th Sept. 2021*



## pinfa China

As the outbreak rebounded in many regions, including China, COVID-19 continued to negatively impact the global economy in 2021. In China, repeated regional outbreaks made work challenging. Through our close partnership with pinfa China members, we continue to grow our influence within China's halogen-free flame retardant industry.

In June 2021, pinfa China sponsored the 2021 Chinese National Flame Retardant Annual Conference which was hosted by the local government (Xuchang) and organised by the National Flame Retardant Association of the CPCIF (China Petroleum and Chemical Industry Federation).

pinfa China was highly visible at the conference, including with a newly-produced Chinese version of pinfa's electric and electronic brochure.

pinfa China is continuously active in digital communications. Thus, two part-time secretaries, Vivian Wang and Lisa Liu joined us in the third quarter to support with new media promotion and technical initiatives.

By the end of 2021, three articles had been posted on pinfa China's official WeChat account (748 followers) covering HFFR technology and its application to cables, as well as carbon neutrality and sustainability. In addition, an online seminar titled "FR Solutions and Mechanism for Typical Polymers" by Professor Qian Lijun from Beijing Technology and Business University was organized. Meanwhile, for intellectual property protection, pinfa China has registered the trademark related to flame retardant products. CPCIF and BIT (Beijing Institute of Technology) FR testing centers have been contacted for future cooperation. In 2022, pinfa China plans to hold another 10 online seminars regarding Sustainability and Carbon Neutrality.

The organisation of pinfa China has changed in 2021: due to her changing responsibilities within the company, Ms. Cindy Liu handed over the chairmanship to Mr. Wayne Zhou. With the unanimous approval of the founding members of pinfa China, Ms. Cindy Liu was nominated as the Honorary Chairman of pinfa China for a term of 3 years, effective since 1st Oct. 2021.



*To follow pinfa China's WeChat account, click the QR code*



# Meet the pinfa EU team



**Dr Adrian Beard** Chairman of pinfa

Adrian Beard works for Clariant Corporation, Hurth near Cologne in Germany, as Head of Marketing and Advocacy for the Flame Retardants Business Line of the Business Unit Additives. On top of his Clariant position, Adrian has been the Chairman of pinfa since November 2016. He is also a senior expert in fire safety and environmental properties of phosphorus based flame retardants. From 1991 to 1999, before joining Clariant, he was head of the environmental analytical laboratory at the Fraunhofer-Institute for Environmental, Safety, and Energy Technology in Oberhausen, Germany. He holds a doctorate in analytical chemistry from the University of Waterloo, Ontario, Canada and a diploma in geoecology from the University of Bayreuth, Germany



**Esther Agyeman-Budu** Sector Group Manager

Esther Agyeman-Budu, has been working for the European Chemical Industry Council (Cefic) since April 2013 in the Innovation Policy unit as Communication and Emerging Science and Policy Issues Manager. In April 2019 she changed roles to become Sector Group Manager in the Specialty Chemicals unit of Cefic and is responsible for several sectors groups, including pinfa, the Phosphorus, Inorganic and Nitrogen Flame Retardants Association. Before joining Cefic, Esther was an undergraduate Communication Instructor at Kent State University. Previous experiences: Corporate Social Responsibility fellow at Johnson and Johnson and Marketing Specialist for Microsoft Business Solutions. Esther's background is in science and political communication, corporate social responsibility and information science



**Francesca Filippini** Sector Group Manager

Francesca Filippini has been working for the European Chemical Industry Council (Cefic) from January 2021 in the Product Stewardship department managing regulatory and institutional affairs. In January 2022 she changed her role to become Sector Group Manager in the Specialty Chemicals unit of Cefic and she is responsible for several sector groups, including pinfa. Prior to joining Cefic, Francesca worked as legal support for a biomedical company and, before that, in a law firm. Francesca is Italian and she is a brilliant law graduate with a focus on criminal law.



**Hannane Haddouch** Assistant of pinfa

Hannane Haddouch is a sector group assistant for the Specialty Chemicals department of Cefic. Since 2011, she provides excellent administrative support to the Secretary General and the pinfa members.



**Vincent Mans** Technical Advisor

Vincent Mans coordinates with the European Commission and other stakeholders regarding issues on fire safety in building and construction, in particular for passive fire protection. He is a previous President of EAPFP (European Association for Passive Fire Protection) and of TECNIFUEGO (Fire Safety Association in Spain) and is an active member of UNE/CTN23, mirror committee of CEN/TC127 dealing with standards on reaction and resistance to fire of building elements. His degree is chemical engineer from the University of Barcelona, where he is based, and he has been working in research and technical applications of Phosphorous and Nitrogen based FRs for 40 years as Business Leader in Chemische Fabrik Budenheim.



**Chris Thornton** Consultant to pinfa for communications

Chris Thornton writes the pinfa Newsletter, which provides monthly information on PIN flame retardants and fire safety. He has been working with the flame retardants industry in Europe since 2001 on information and communications, fire safety, life cycle analysis, eco-labels, smoke toxicity and other flame retardant environment and health challenges. He is British born, now living in France. His other activities include sustainable management and recycling of phosphorus.



**Ellen Mulder** Cefic Communication

Ellen Mulder is a Communications Manager within the Public Affairs team of the European Chemical Industry Council (Cefic). Her current portfolio includes running Cefic's reputation campaign (ChemistryCan), and providing communications advice to Specialty Chemicals Sector Groups, the Programme Council Innovation and the Sustainability Forum. More specifically, since 2021 Ellen has supported pinfa with content and visuals for the Twitter and LinkedIn channels. As a Dutch national, she is also fluent in English and has a good working knowledge of French, German, and Spanish.

# pinfa EU membership

## Full members

Any producer of Phosphorus, Inorganic or Nitrogen flame retardant chemicals is eligible for membership.  
The membership includes a company's subsidiaries and joint ventures.



In 2021, pinfa EU welcomed new members



## Associate members

Associate membership is open to other related technologies, e.g. FR synergists, and to companies using Phosphorus, Inorganic and Nitrogen flame retardant chemicals (i.e. formulators, blenders, distributors, agents, end users).



*For pinfa-NA and pinfa China members, see their websites*

---

## Mutual memberships



# pinfa

Phosphorus, Inorganic & Nitrogen Flame Retardants Association

A sector group of Cefic 

European Chemical Industry Council - Cefic aisbl

EU Transparency Register n° 64879142323-90

pinfa Secretariat  
Cefic  
40 rue Belliard  
B-1000 Brussels

[pinfa@cefic.be](mailto:pinfa@cefic.be)  
[www.pinfa.eu](http://www.pinfa.eu)