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pinfa input to the consultation on the Ireland Furniture Fire Regulations

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Who is pinfa?

pinfa is the Phosphorus, Inorganic and Nitrogen (PIN) Flame Retardants Association (a Sector Group within Cefic, the European Chemical Industry Council). www.pinfa.org

We bring together (with pinfa North America and pinfa China) nearly 40 companies who manufacture or use non-halogenated flame retardants. pinfa members include large companies and SMEs in different areas of PIN fire safety chemistry or application.

PIN flame retardants include all non-halogenated flame retardants, smoke suppressants and synergists, and are based on chemistries of one or more of phosphorus, nitrogen and inorganics (metals, sulphur, clays ...). PIN flame retardants include both organic and inorganic chemistries and hybrids; additive, reactive and polymeric molecules.

PIN flame retardants can act by different mechanisms, including gas phase flame inhibition, solid phase (protective carbon or ceramified char layer), cooling and water or inert gas release, catalytic smoke suppression, and intumescent barrier systems.

They are potential alternatives to halogenated flame retardants (organobromine and organochlorine chemicals) and antimony in plastics and foams, rubbers, natural and synthetic fibres and textiles, composites, insulation materials, cables and wiring, timber and wood productions, intumescent fire protection of structural elements (e.g. steel), etc.

pinfa's Mission Statement: *"Members of pinfa share the common vision of continuously improving the environmental and health profile of their flame retardant products. This vision is coupled with a commitment to maintain high fire safety standards across the world, standards which minimize the risk of fire to the general public."* <https://www.pinfa.eu/about-pinfa/mission>

What is pinfa's interest in this consultation?

pinfa can provide information on fire safety solutions for upholstered furniture materials, in particular on substitutes for certain halogenated flame retardants which have been widely used in the past in furniture and which are today banned and/or identified as posing health and environmental questions. These legacy halogenated flame retardants include: PBDEs in particular DecaBDE (textiles and back coatings, brominated, now on UN POP list), HBCD (textiles, brominated, now on UN POP list), chlorinated phosphorus esters (TCPP, TCEP, TDCP, foams, [ECHA restriction proposal](#) pending [data on carcinogenicity](#)).

Answers to consultation questions

\$A - Question 6:

“Sleeping bags and mattress protectors fall within a grey area of the current scope. As these items can be washed in a washing machine any flame-retardant chemicals will soon disappear – should these items be included in the scope?”

- Pinfa suggests that the statement in the question that flame retardants will “soon disappear” is not correct. A wide range of wash-durable flame retardants are available, particularly for both fillings and textiles for items such as sleeping bags which are not washed frequently and probably with a “delicates” wash programme. Examples include polymeric phosphonate flame retardants, a number of proprietary PIN flame retardants[§] but also water-soluble flame retardants if applied in wash-resistant systems.

§: further information available from the different pinfa member companies on request

Section B “Flame retardants” – introductory text

The introductory text to section B states “*Potentially harmful groups include brominated, chlorinated and organophosphorus flame retardants.*”

- pinfa suggests that this is misleading. Not all organophosphorus chemicals, and similarly not all organophosphorus flame retardants are potentially harmful. Our bodies contain many organophosphorus molecules which are essential for our health and are widely present in our food; DNA, cell membrane phospholipids, ADP/ATP, phytate, etc. Organophosphorus flame retardants with no identified health or environmental risks (not Classified with relevant “R” Phrases, or this property is lost after application¹) are today available and this is a core criteria in R&D towards new PIN flame retardants.

(1) E.g. some FR treatments may contain formaldehyde or solvents which are removed during application. This requires appropriate management in industrial installations during processing, but does not imply a risk for users of furniture.

The following organophosphorus flame retardants (see table below) are not Classified for health/environment (or lose the Classification on application) and are accepted for use under the [TCO](#) (the health, environment and worker protection label for office and home electronics) and/or [ÖkoTex](#) (the textile ecolabel):

\$B – introductory text: Organophosphorus-containing flame retardants not considered harmful (see above)				
	Health or environment Classifications	TCO* accepted	ÖkoTex** accepted	ZDHC *** approved
Bisphenol A diphosphate		YES		
Triphenyl Phosphate		YES		
Tetrakis (2,6-dimethylphenyl)-m-phenylene biphosphate		YES		
Siloxanes and silicones, di-Me, di-Ph, polymers with Ph silsesquioxanes		YES		
Phenoxyphosphazene / hexaphenoxycyclotriphosphazene (HPCP)		YES		
Polyphosphonates			YES	
Phosphonic acid, (3([hydroxymethyl]amino)-3-oxopropyl-dimethyl ester		YES		
Proprietary organosphorus-based flame retardants ^{\$}			YES	
* TCO the health, environment and worker protection label https://tcocertified.com/ ** ÖkoTex https://www.oeko-tex.com/en/our-standards/standard-100-by-oeko-tex *** ZDHC = Zero Discharge of Hazardous Chemicals coalition http://www.roadmaptozero.com/ \$: further information available from the different pinfa member companies on request				

The introductory text to section B states that “many” US states have banned flame retardants. In particular, it is stated that California banned the sale of furniture, mattresses, etc containing flame retardants.

- pinfa suggests that this is misleading. Some US states have banned certain categories of flame retardants in furniture. To our understanding, only Maine, Maryland and New Hampshire have banned all flame retardants in furniture. Most regulators recognise that a ban on all flame retardants is not appropriate, and that it is not justified to ban products which improve fire safety and are identified as not posing health or environment problems.
- California has not banned all flame retardants in furniture. To our understanding, the legislation passed in [2018](#) bans organic but not inorganic flame retardants. As indicated above, pinfa suggests that such legislation is not justified in that organic flame retardants are available which do not have health or environment Classifications.

The introductory text to section B also states “*there is always the potential for new products to emerge which are not covered by this Regulation*” (REACH).

- Pinfa does not understand what is intended by this statement: REACH covers all chemicals sold or used commercially in the EU (> 1 tonne/year). All flame retardants sold or used in Europe must be Registered under REACH with the appropriate information dossier, publicly consultable on the ECHA [website](#)
- We underline that most flame retardants on the market have no restriction or limitation under REACH.

\$B - Question 1

Do you agree with the use of flame retardants as the primary means of meeting the safety requirements of the Furniture Fire Regulations?

- pinfa suggests that the Regulations should not prescribe the use of flame retardants nor of other technologies, but should define demanding fire safety requirements, in order to protect lives. This would preferable limit:
 - time to ignition with a small flame (representative of e.g. a candle or an electrical malfunction such as an overheating extension lead)
 - peak heat release and time to peak heat release
 - smoke emission, density and corrosivity, which are the key aspects in inhibiting escape
- general chemical regulations (in particular REACH) should ensure that flame retardants used are safe for the environment and health, but the Furniture Regulations could possibly also consider specific additional requirements relevant to the specific use in furniture (e.g. contact with skin, repeated compression of foam and so dust and air emissions)

\$B - Question 2

If you agree with the use of flame retardants can you identify a group that may not have the potential to pose a risk to human health?

Answer: YES

- pinfa underlines that “*groups*” of chemicals should be defined appropriately, in order to ensure that chemicals in a “*group*” do effectively have similar properties and similar possible risks. See the US National Academy of Sciences [report](#) 2019 which concludes that (non PIN) organohalogen flame retardants cannot be treated as a single class, but as 14 sub-classes
- pinfa suggests that the following flame retardants (see table below) do not have identified risk to human health, but that evaluation must be made on a case-by-case basis, or by careful definition of sub-groups as indicated above:

\$B – Q2 – Flame retardants with no identified risk relevant to use in furniture	
<i>For all the groups indicated, different chemicals in a category may not have the same properties, and each flame retardant should be assessed case-by-case. Assessment should consider both the use life of the furniture and also effects in case of fire (including smoke emission).</i>	
Non-halogenated polymeric flame retardants	Halogens generate corrosive gases in case of fire
Non-halogenated flame retardants which are durably reacted into the material and no longer present at significant levels	
Advanced organophosphorus flame retardants	See table of examples above
Inorganic phosphorus compounds	e.g. Aluminum diethylphosphinate (AIPi) is on TCO Ecolabel accepted chemicals list
Melamine compounds	Some melamine salts [§] are ÖkoTex accepted and ZDHC eligible Possible toxicity of melamine (as such, not the compounds used as flame retardants in furniture) by oral uptake is related to deliberate criminal adulteration of animal or human food with significant doses of melamine, and is not relevant for use in furniture.
Other nitrogen-based compounds	E.g. non halogenated N-alkoxy-hindered amine [§] : ÖkoTex accepted and ZDHC eligible
Mineral flame retardants and smoke suppressants based on metals (magnesium, aluminium, iron, calcium ...)	
Non-halogen acrylic-based polymers	https://www.lubrizol.com/Coatings/Products/Hycar-NH3069
Clays / organoclays	Clays are generally considered as safe, and are used in a range of applications including animal feed, cosmetics and pharmaceuticals
Expandable graphite	ÖkoTex accepted and ZDHC eligible
A number of proprietary [§] PIN (non-halogenated phosphorus, inorganic, nitrogen) based flame retardants	ÖkoTex accepted or eligible ZDHC eligible
§: further information available from the different pinfa member companies on request	

\$B - Question 3

If you agree with the use of flame retardants can you also identify relevant changes which would protect against health risks identified internationally with the use of flame retardants?

- pinfa recommends rather to rely on objective assessments, such as
 - excluding all chemicals (including flame retardants) which are substances of very high concern (SVHC) under REACH or which have certain health or environment Classifications (unless they are durably reacted into the treated material and are no longer present at significant levels). This is the approach adopted by the EU Green Label and other ecolabels for a number of product categories.
 - limiting to chemicals which have achieved Benchmark 2 or higher under [GreenScreen](#). This is the approach adopted by TCO (see above).

\$C – Testing – Question 1

Do you think that I.S. 419:2011 is still relevant as a standard to show the presumption of conformity with the safety requirements of the Furniture Fire Regulations?

Answer: YES

- pinfa recognises that the prevalence of fires caused by cigarettes and smoking materials is decreasing. However, the 2018 data referenced in the consultation document shows that more than half of fires attended by fire services were of “unknown causes”.
- maintaining the overall principles of I.S. 419:2011 therefore seems an appropriate conservative approach to fire safety: small flame resistance is relevant not only for smoking materials but also for candles or accidental fires at the initial stages of development (the fire resistance of upholstered furniture can prevent a small fire starting in e.g. adjacent electrical equipment from developing rapidly into a major incident) and cigarette fire resistance can be relevant for other potential fire sources such as overheating wiring, projections from an open fire.
- the maintenance of the existing test I.S. 419:2011 enables data consistency and reliability. However, it could be allowed for industry to propose alternative test data justified to provide the same level of fire safety.

\$D – Labelling - Question 4

Should a label contain information on the types of flame retardants contained in furniture if such flame retardants are used?

- pinfa considers that information concerning flame retardants used at a significant level (e.g. > 1% in components with mass > 50g) represents valid transparency
- For reasons of commercial confidentiality, this should however require to specify the type of flame retardant, not the exact molecule (e.g. by referring to the ISO 1043 [codes](#) which specify 42 different families of flame retardant).
- The furniture label should be limited to important information, in particular consumer warnings about fire risks and product safety. Information on flame retardants should be available via a specified website and QR code, enabling more complete and legible information for consumers wishing to access it.