PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) IN LIGHTING PRODUCTS - *White Paper*

GLOBAL LIGHTING ASSOCIATION

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Introduction

Lighting is integral to modern life, ensuring safety, visibility, and aesthetic appeal across various settings. In general, the electrical- and electronic industry utilises a variety of materials, including over 50 per- and polyfluoroalkyl substances (PFAS), for example in parts, housings and electronic components to achieve insulation, flame retardancy, mechanical strength, and resistance to water, dust, and chemicals. However, the lighting industry's contribution to PFAS emissions is primarily indirect, originating more from the manufacturing of PFAS containing materials themselves rather than the production or use of lighting products. As regulatory scrutiny of PFAS intensifies, the lighting industry faces challenges in identifying essential uses and we call on plastic and component suppliers for action to develop direct replacements, where feasible. We understand that this process could take a decade or more due to strict technical and safety considerations.

2. Lighting as an Essential Service

Lighting solutions are essential for numerous aspects of modern life, ensuring adequate visibility or spectrum, contributing to safety, and enhancing for instance, health, aesthetics and special purpose applications and treatments in both professional and consumer settings. A variety of components are employed in luminaires and control systems. PFAS are used in some of these components, often due to the durability gains which they bring or for fire and electrical safety reasons.

3. Challenges, Market Impact and Recertification

The restriction or outright ban of all PFAS related substances presents significant challenges, including supply chain disruption in the absence of suitable alternatives, possible rising R & D costs, delays and obstacles in product development. PFAS are essential for the functionality and durability of lighting products due to their unique properties and exceptional performance characteristics. The "repair as produced

principle" is crucial for servicing, remanufacturing and refurbishing existing lighting equipment, necessitating the continued availability of manufacturer-approved (original) spare parts. Recertification of all installed lighting products is not feasible, therefore, the use of PFAS in existing products already on the market, along with their manufacturer-approved replacement parts, should be permitted to enable servicing and reuse. An internal survey of our members revealed that suppliers utilise PFAS in components due to their unique characteristics, which are essential for ensuring the safety, reliability and durability of lighting solutions. These features are mandated by electrical and fire-safety standards issued by international standardisation bodies.

4. PFAS-Free Alternatives

Based on supply base information gathered during the survey, direct replacements for PFAS in the lighting industry are rare, necessitating material reformulation or product redesign. Furthermore, the use of Fluoropolymers is classified as 'low-concern' by the OECD and these polymers should be fully exempted from restrictions if alternatives do not exist. Limited knowledge about PFAS-free alternatives poses a risk that new materials may not meet the stringent safety, flammability and durability standards or may conflict with future regulatory restrictions, resulting in so-called "regrettable substitutions". The replacement process of the full range of PFAS substances is extremely challenging as sustainable alternatives are not yet feasible for many electrical and electronic applications. For example, other polymer classes often lack the ability to withstand high temperatures and aggressive environmental conditions, typically resulting in a loss of performance and a significant reduction in service life. To address these complexities, temporary exemptions are needed while more sustainable, longer-term solutions are developed.

5. Prevention and Reduction of PFAS Emissions and Exposure

The lighting industry's influence on PFAS emissions is indirect; the primary source is the manufacturing of PFAS substances themselves. Lighting manufacturers rely heavily on their suppliers and have limited influence over the inclusion of PFAS in the component provided. The degradation of lighting products at the end of their life cycle may lead to some PFAS release into the environment. To address this concern, many stakeholders actively participate in extended producer responsibility programs to minimise the environmental impact associated with the disposal of end-of-life lighting products.

6. Socio-Economic Impact of a Premature Phase-Out of PFAS

A premature ban on PFAS without viable alternatives or exemptions would have severe repercussions for the lighting industry, consumers, and societies. The non-availability of critical lighting components would lead to an inability to service, remanufacture or refurbish existing lighting installations nor manufacture new lighting products, resulting in widespread shortages of lighting products, job losses, business closures and decreased innovation. Reliance on older, less efficient lighting technologies would increase energy consumption and greenhouse gas emissions and negatively impact public health care, safety, economic activity and overall quality of life.

7. Required Transition Period and/or Derogations

Developing and implementing non-PFAS alternatives is complex and time-consuming, and may require a decade or more for full integration into the supply chain. An estimated transition period of at least 12 years would be required for the lighting sector if PFAS were to be banned. Specific derogations for essential PFAS without suitable alternatives should be considered, subject to regular review and linked to research of suitable alternatives. Additionally, for servicing, remanufacturing and refurbishment purposes, PFAS-containing components, spare parts and materials should be allowed to be placed on the market beyond the implementation of potential restrictions to prevent premature end of life products, avoidable waste and economic loss.

ABOUT THE GLA

The Global Lighting Association (GLA) is the leading voice for the lighting industry worldwide, representing over 5,000 lighting manufacturers and generating $75 billion in annual sales. Through its network of 27 national and regional lighting associations, the GLA advocates for policies and practices that promote sustainable lighting solutions, energy efficiency, and human well-being. The GLA is committed to fostering a collaborative environment that supports innovation, fair competition, and the growth of the lighting industry on a global scale.

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