**General comments and answers to specific information requests**

**Specific information requests:**

1. **Sectors and (sub-)uses**: Please specify the sectors and (sub-)uses to which your comment applies according to the sectors and (sub-)uses identified in the Annex XV restriction report (Table 9). If your comment applies to several sectors and (sub-)uses, please make sure to specify all of them.
2. **Emissions in the end-of-life phase**: The environmental impact assessment does not cover emissions resulting from the end-of-life phase. To get a better understanding of the extent of the resulting underestimation, (sub-)use-specific information is requested on emissions across the different stages of the lifecycle of products, i.e. the manufacture phase, the use phase and the end-of-life phase. Please provide justifications for the representativeness of the provided information. In particular:
3. Please provide, at the (sub-)use level, an indication of the share of emissions (as percentages) attributable to these three different stages. An indication of annual emission volumes in the end-of-life phase at sector or sub-sector level would also be appreciated.
4. If possible, please provide for each (sub-)use what share of the waste (as percentages) is treated through incineration, landfilling and recycling. Please provide information to justify the estimates as well as information on the form of recycling referred to.
5. **Emissions in the end-of-life phase**: With respect to waste management options, additional information is requested on the effectiveness of incineration under normal operational conditions (for different waste types, e.g. hazardous, municipal) with respect to the destruction of PFAS and the prevention of PFAS emissions.
6. **Impacts on the recycling industry**: To get an understanding of the impacts of the proposed restriction on the recycling industry, information is requested on:
7. The impacts that the concentration limits proposed in paragraph 2 of the proposed restriction entry text (see table starting on page 4 of the summary of the Annex XV restriction report) have on the technical and economic feasibility of recycling processes (together with a clear indication on the waste streams to which the described impacts relate).
8. The measures that recyclers would need to take to achieve the proposed concentration limits.
9. The costs associated with these measures.
10. **Proposed derogations – Tonnage and emissions**: Paragraphs 5 and 6 of the proposed restriction entry text (see table starting on page 4 of the summary of the Annex XV restriction report) include several proposed derogations. For these proposed derogations, information is requested on the tonnage of PFAS used per year and the resulting emissions to the environment for the relevant use. Please provide justifications for the representativeness of the provided information.
11. **Missing uses – Analysis of alternatives and socio-economic analysis**: Several PFAS uses have not been covered in detail in the Annex XV restriction report (see uses highlighted in blue and orange in Table A.1 of Annex A of the Annex XV restriction report). In addition, some relevant uses may not have been identified yet. For such uses, specific information is requested on alternatives and socio-economic impacts, covering the following elements:
12. The annual tonnage and emissions (at sub-sector level) and type of PFAS associated with the relevant use.
13. The key functionalities provided by PFAS for the relevant use.
14. The number of companies in the sector estimated to be affected by the restriction.
15. The availability, technical and economic feasibility, hazards and risks of alternatives for the relevant use, including information on the extent (in terms of market shares) to which alternative-based products are already offered on the EU market and whether any shortages in the supply of relevant alternatives are expected.
16. For cases in which **alternatives are not yet available**, information on the status of R&D processes for finding suitable alternatives, including the extent of R&D initiatives in terms of time and/or financial investments, the likelihood of successful completion, the time expected to be required for substitution (including any relevant certification or regulatory approvals) and the major challenges encountered with alternatives which were considered but subsequently disregarded.
17. For cases in which **substitution is technically and economically feasible** but more time is required to substitute:
    1. the type and magnitude of costs (at company level and, if available, at sector level) associated with substitution (e.g. costs for new equipment or changes in operating costs);
    2. the time required for completing the substitution process (including any relevant certification or regulatory approvals);
    3. information on possible differences in functionality and the consequences for downstream users and consumers (e.g. estimations of expected early replacement needs or expected additional energy consumption);
    4. information on the benefits for alternative providers.
18. For cases in which **substitution is not technically or economically feasible**, information on what the socio-economic impacts would be for companies, consumers, and other affected actors. If available, please provide the annual value of EU sales and profits of the relevant sector, and employment numbers for the sector.
19. **Potential derogations marked for reconsideration – Analysis of alternatives and socio-economic analysis**: Paragraphs 5 and 6 of the proposed restriction entry text (see table starting on page 4 of the summary of the Annex XV restriction report) include several potential derogations for reconsideration after the consultation (in [square brackets]). These are uses of PFAS where the evidence underlying the assessment of the substitution potential was weak. The substitution potential is determined on the basis of i) whether technically and economically feasible alternatives have already been identified or alternative-based products are available on the market at the assumed entry into force of the proposed restriction, ii) whether known alternatives can be implemented before the transition period ends (taking into account time requirements for substitution and certification or regulatory approval), and iii) whether known alternatives are available in sufficient quantities on the market at the assumed entry into force to allow affected companies to substitute.

A summary of the available evidence as well as the key aspects based on which a derogation is potentially warranted are presented in Table 8 in the Annex XV restriction report, with further details being provided in the respective sections in Annex E.

To strengthen the justifications for a derogation for these uses, additional specific information is requested on alternatives and socio-economic impacts covering the elements described in points a) to g) in question 6 above.

1. **Other identified uses – Analysis of alternatives and socio-economic analysis**: Table 8 in the Annex XV restriction report provides a summary of the identified sectors and (sub-)uses of PFAS, their alternatives and the costs expected from a ban of PFAS. More details on the available evidence are provided in the respective sections in Annex E.

For many of the (sub-)uses, the information on alternatives and socio-economic impacts was generic and mainly qualitative. In particular, evidence on alternatives was inconclusive for some applications falling under the following (sub-)uses: technical textiles, electronics, the energy sector, PTFE thread sealing tape, non-polymeric PFAS processing aids for production of acrylic foam tape, window film manufacturing, and lubricants not used under harsh conditions.

More information is needed on alternatives and socio-economic impacts to conclude on substitution potential, proportionality, and the need for specific time-limited derogations. Therefore, specific information (if not already included in the Annex XV restriction report or covered in the questions above) is requested on alternatives and socio-economic impacts covering the elements listed in points a) to g) in question 6 above.

1. **Degradation potential of specific PFAS sub-groups**: A few specific PFAS sub-groups are excluded from the scope of the restriction proposal because of a combination of key structural elements for which it can be expected that they will ultimately mineralize in the environment. RAC would appreciate to receive any further information that may be available regarding the potential degradation pathways, kinetics or produced metabolites in relevant environmental conditions and compartments for trifluoromethoxy, trifluoromethylamino- and difluoromethanedioxy-derivatives.
2. **Analytical methods**: Annex E of the Annex XV restriction report contains an assessment of the availability of analytical methods for PFAS. Analytical methods are rapidly evolving. Please provide any new or additional information on new developments in analytics not yet considered in the Annex XV restriction report.

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| 6515 | Date:  2023/08/04 13:37  Content:  Scope or restriction option analysis  Environmental emissions  Information on alternatives  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Sennheiser electronic GmbH & Co. KG  Org. country:  Germany  Attachment:    <redacted>  Privacy statement:  internal research report | General Comments:  Sennheiser develops and produces regulatory compliant and safe products for our customers. We support protecting the environment and avoiding release of environmental hazardous substances. We strive to improve our processes to get sustainable products and decrease the environmental impact of our production and products. In our products we only use very limited amounts of polymeric PFAS, where no alternative materials exist. The polymeric PFAS are classified by OECD [1] as polymers of low concern safe for human health and the environment. They are non-toxic, bio-compatible, non-soluble and immobile. Therefore, the polymeric PFAS should not be part of the restriction. We suggest a risk-based and substance-based approach according to article 68 (1) and article 69 of the REACH process. [1] OECD, 2006. OECD definition of polymer. OECD Environment, Health and Safety Publications. Available at: https://www.oecd.org/env/ehs/oecddefinitionofpolymer.htm |
| Answer to specific info request 3:  End of life The PFAS fraction of our products can be incinerated at above 850 °C so that no PFAS will be emitted. See attached research dossiers : uploaded document: Overview PFAS incineration studies.docx To ensure a safe recycling process, it is necessary to claim PFAS as Substance of very high concern (SVHC). This would ensure a) information along the supply chain on PFAS and b) a report of PFAS in the SCIP database and provision of any information needed for the recycling and safe use. The intention of the SCIP database is to enable recyclers to recycle the products without emitting SVHC. |
| Answer to specific info request 6:  Which PFAS are used by Sennheiser PTFE, FEP, FKM, PVDF, … Applications in which PFAS are added Electret foil in microphones; Isolators in Cables, Antennas and HF applications; micro electromechanical systems, sealings, batteries … What is the function of the PFAS in the application? An electret material possesses a permanent electrical dipole moment. When used in a condenser microphone, it provides the polarization voltage between the membrane and backplate in place of the external supply voltage. Electret materials are generally high-resistivity polymers, a prime example being PTFE. They are fabricated by heating a film of the material almost to its melting point and subjecting it to an intense electric field. The net dipole moment results from either rotation of permanent dipoles in polar materials or from migration of free charge carriers. In either case, when the material is cooled to room temperature the net dipole moment is “frozen-in.” The elimination of the external polarization voltage supply, however, has a significant advantage. The generation of a high-dc voltage and the extensive filtering needed to obtain a low noise floor, ripple, and hum require bulky components (except for battery-operated equipment). The absence of this requirement greatly enhances the miniaturization potential of electret-based instrumentation. Cables with PTFE have an outstanding chemical performance and due to the low friction of the material a much better mechanical stability against bending and mechanical stress, which is therefore very sustainable in comparison to other materials. Why is PTFE superior to alternative electret materials. PTFE as electret material possesses excellent chemical stability and dielectric properties. In the manufacturing process of PTFE electrets, the material is electrically charged. The long-term stability of the charge is undisputed and maintains for decades, even under harsh environmental conditions. It is this long-term stability of the PTFE electret that prolongs the lifetime of the microphone. No alternative electret material is known to possess such long-term charge stability. The high temperature stability of PTFE is of particular importance for this application, because the electret undergoes a soldering process at 250 °C. At this high temperature, the material must maintain its properties. No commercially available alternative electret material is stable above 200 °C [Electret Kapsel Entwicklungsreport.pptx]. Substitute materials that were tested by the internal research and development department are different poly(p-xylylene) polymers (Parylene N, Parylene C, Parylene D and Parylene HT). The most promising of these four materials was Parylene HT, which is unfortunately also considered a PFAS. [Forschungsbericht Parylene als Alternative zu PFAS bei Sennheiser.docx] Substitution of electret microphone capsules by other microphone types would be a technological step backwards. Other microphone types, for example dynamic microphones, require an external power supply to function. This requirement restricts the miniaturization potential of the devices. For energy consumption purposes, the electrically powered polarization needs more battery capacity and has less energy efficiency. |
| Answer to specific info request 8:  Electronics and semiconductors (Annex E.2.11.) elctonics The evaluation report describes only a weak evidence for this sector. Our evaluation for our company shows: High producer surplus losses as a result of business closures [very high evidence] due to not being able to manufacture electronic devices [very high evidence] High socio-economic costs to customers due to the unavailability of electronic devices [high evidence] Employment losses as a result of high share of business closures [very high evidence] |

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| 6516 | Date:  2023/08/04 13:59  Content:  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Regional or local authority  Org. name:  IngBOlz GmbH  Org. country:  Switzerland  Attachment: | General Comments:  Fluorine plastics and elastomers must be exempted. They do not pollute the environment, but protect it. No other materials have this good advanteges. This are expensive, high performance marerials for specific applications in most of the industry. In the moment there are no alternative materials available to substitute this florine materials. They have there existence eligibility in the many markets. Have a very long live time of decades. Nothing is going out of this products in the nature. We have to look for a disassembling and good recycling after use. |
| Answer to specific info request 1:  I am a plastic engineer with long experience in the automotive and other industries. On high temperature and |
| Answer to specific info request 2:  There some pilot plant to pyroyse them to there reactants. We have to look forward to optimice this process and use them all over the world. |
| Answer to specific info request 3:  See above. |
| Answer to specific info request 4:  I am interrested on this process, but no specialist. We have to disassemple the pruducts and recycle all parts. |
| Answer to specific info request 6:  The industry is working on alternatives. Thrrough the short connection of fluorine on the carbon, it is not easy to find a suitable alternative. |
| Answer to specific info request 9:  No degradation is possible during use. Nothing goes in the nature. The fluorin carbon connection of the material is very high. |

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| 6517 | Date:  2023/08/04 15:09  Content:  Hazard or exposure  Environmental emissions  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Germany  Company name confidential:  Yes | General Comments:  Subject: Statement on the planned exemption of PVDF, PTFE, ETFE, ECTFE, FPM and FFKM from a comprehensive ban on fluoroplastics in the chemical industry  Dear Sir or Madam  As a manufacturer of ventilation systems and equipment for the chemical industry, we would like to express our concern about the planned comprehensive ban on fluoroplastics. We recognise and support the need to limit the use of harmful substances to minimize negative impacts on people and the environment. However, we would like to point out the essential role of fluoroplastics such as PVDF, PTFE, ETFE, ECTFE, FPM and FFKM in our industry and call for an exemption of these substances from the planned ban. Fluoroplastics have proven to be indispensable in numerous applications, especially in chemically aggressive environments. These materials offer unparalleled chemical resistance, which is critical to the safety and efficiency of our products and applications. As a manufacturer of air handling equipment, we must demand the highest levels of reliability, durability and resistance from our products to prevent potential leaks and ensure the long-term safety of people and the environment. Implementing the ban on fluoroplastics in our industry would inevitably lead to significant problems. For one thing, alternatives with comparable chemical resistance would not be available, which could lead to a weakening of safety standards. Greater leakage and a shortened life span of our products would be unavoidable consequences, which would significantly increase the danger to people and the environment. We would like to emphasise that as a responsible company, we always strive to promote sustainable and environmentally friendly solutions. We support the research and development of environmentally friendly alternatives to fluoroplastics and are willing to help shape a long-term, gradual transition. However, we must remain realistic and consider the current situation. Until reliable, safe and proven alternatives are available, we urge that PVDF, PTFE, ETFE, ECTFE, FPM and FFKM be exempted from the planned ban. This would allow us to continue to manufacture our products in compliance with the highest safety standards while providing time and space for research and implementation of more sustainable solutions.  We are open to a constructive dialogue and are at your disposal to find the best possible solutions for people and the environment together. Thank you for your understanding and consideration of our concerns. |

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| 6518 | Date:  2023/08/04 15:24  Content:  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Daikin Chemical Europe GmbH  Org. country:  Germany  Attachment:  <redacted>  Privacy statement:  Protection of commercial interests | General Comments:  The assessment of alternatives (Table 8) in the restriction proposal came to the result that for propellants used in MDIs, there is sufficiently strong evidence pointing to the existence of technically and economically feasible alternatives at EiF. However, we cannot confirm this for our product. Detailed information including an assessment of alternatives is included in our confidential submission paper. |
| Answer to specific info request 1:  This submission relates to the main application “medical devices”, sub-use “Metered Dose Inhalers (MDIs), e.g. as coating and propellant” (Annex XV restriction report, Table 2), and in particular to the pharma propellant HFC-227ea. |
| Answer to specific info request 2:  Manufacturing phase: Detailed information on emissions during the manufacturing phase is contained in our submission paper. We would like to highlight here that we are the only manufacturer of pharma propellant HFC-227ea in the EU and therefore, we can clearly state that the production quantities mentioned in Annex A, Table A.104. (and under A.3.10.2.2.) and as a consequence, the calculated emissions during production are far too high. More information is provided in our Our correct production volumes, which are confidential, are mentioned in our submission paper. Use phase: Pharma propellant in a pMDI is intended to be fully emitted because its function is to generate an aerosol. However, since the production volumes for our product indicated in the restriction proposal are far too high, we assume that if the emissions on the use phase are calculated on these figures, the emissions for the use phase are also too high. |
| Answer to specific info request 6:  Our submission paper includes detailed information on points a) – g). |
| Answer to specific info request 8:  Our submission paper includes detailed information on potential alternatives. |

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| 6519 | Date:  2023/08/04 15:32  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Type:  BehalfOfAnOrganisation  Org. type:  International NGO  Org. name:  European Environmental Bureau  Org. country:  Belgium  Attachment: | General Comments:  Find our contribution on the scope, hazards and the EoL in the attached non-confidential text file. |

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| 6520 | Date:  2023/08/04 15:58  Content:  Environmental emissions  Baseline  Information on alternatives  Other socio economic analysis (SEA) issues  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Sida Fluoroplastic Co., Limited, Zhejiang  Org. country:  China  Attachment:    <redacted>  Privacy statement:  None of the attached information is confidential | General Comments:  - |
| Answer to specific info request 1:  Overview on Co. SIDA Fluoroplastics: Established in 2009, Sida Fluoroplastic Co., Limited,located in Zhejiang, China, is a comprehensive fluorine materials service provider with R&D, design, manufacture, installation and technical service in one company, such as fluorine plastic profiles, fluorine plastic lining devices, fluorine plastic heat exchanging devices, fluorine plastic molding devices, and so on. The company has accumulated a wide range of international and domestic fluorine materials technology, talents, management and other resource advantages. The company has widely accumulated international and domestic fluorine materials technology, talents, management and other resource advantages, adhering to the business philosophy of pioneering and innovation, integrity and pragmatism, cooperation and win-win situation, scientific and efficient enterprise operation mechanism, relying on strong scientific and technological strength and solid management foundation, through several years of rapid development, has become a well-known domestic and foreign fluorine materials comprehensive service provider. Currently the company has a employee number of nearly 400, and also the company has first-class technical force. We employ have dozens of researchers with Ph.D. and Masters title, and has a advanced experiment lab for various testing and evaluation of fluoropolymers. It has built a provincial R&D centre and a provincial engineering technology centre, exclusively drafted a number of industry standards, has 77 patents of independent intellectual property rights, including 13 invention patents, and is a national high-tech enterprise. The purpose of the business: By working on the fluoropolymer processing for more than a decades, Sida wishes by providing the leading fluoropolymer processed equipment to various industry, Sida could help to create a better world. Products: Fluoropolymer lined tank, molded fluoropolymer equipment, fluoropolymer tubes, fluoropolymer sheets, fluoropolymer heat ex-changer Market fields: Solar Panel, Lithium battery material, Semiconductor material, Power Plant, Steel manufacturing, Chemicals Position within the value chain of Fluoropolymers: The supply chain is from the fluoropolymer raw material (such as PFA,FEP,PTFE), then fluoropolymer semi-finished products( such as sheet, film, tube), then fluoropolymer contained equipments( such as tank, heat ex-changer, distillation tower), then end-users( such as power plant, solar panel manufacturer, chemical plant) |
| Answer to specific info request 2:  1 Use Phase: Sida fluoropolymer lined products are used under ambient temperatures and slight enhanced temperatures, such as heat-exchangers, these temperatures are far below of beginning of decomposition. Therefore no emission is generated during the use phase. Fluoropolymers are safe in these applications. End-of-Life phase: In the past up to the present, the used fluoropolymer are removed from the steel equipment and stored safely by landfill. Currently, Sida is working with a supplier in Germany to build up an Upcycling plant, this plant will convert the end-of -life products into the monomers again. After the purification of monomers, they can be used for polymerization again. Then the products start their second cycle. That means -, no toxic emissions are generated by Sida's fluoropolymer products after reaching its end of life. This is will be a concept in near future. |
| Answer to specific info request 3:  2 Sida is using two kinds of end-of-life products handling: In the past up to the present, landfill, landfill is not generating any toxic emission, neither to the air, to the atmospher, nor to the soil or the water. In the future, Sida will use the upcycling technology. The upcycling plant will be controlled exactly for avoiding the toxic emssion. Therefore, the upcycling product, which will be TFE and HFP mainly, will not generate emissions, they will be used for the polymerization of products. |
| Answer to specific info request 4:  First the impact on recycling industry: Sida will use the upcoming concentration on toxic emission for implementation of circular economy as a replacement of linear economy for the handling of end-of-life fluoropolymer products. Second the measures of recycling: Sida will set the guidelines in China to build up a system for collecting end-of-life products,end-of-life products will generated the feedstock for upcycling technology, they will be collected during the maintanance of the plants in semiconductor, power plant or other chemical plants, these end-of-life products will be prepared for recycling by the company who is collecting the products, under the preparing of the products it is understood that they need to separated from the contamination and then grinding into particle of defined sizes. the costs associated with these measures : both together, collecting and preparing the end-of-life products and upcycling process itself, can be considered as a very well competitive process compared to the regular process of manufacturing of fluoro-monomers. Significant cost saving are guaranteed. Furthermore, no consumption of raw materials, such as fluorospar, oil, or sodium chloride is needed when the monomer is being used following the upcycling route. This means the upcycling route is highly profitable compared to the standard of way of producing monomers. |
| Answer to specific info request 5:  We rejected all kinds of derogations in the PFAS restriction proposal. The special position of fluoropolymers within all plastics, is caused by three facts: the strong CF bond, the perfect shielding of the carbon chain by fluorine atoms and by high molecular weight keeps number of end groups in negligible level. No other polymer except fluoropolymer fullfilled this requirements. Sida has checked alternative material and their properties by applying OECD criteria and further Sida internal criteria and found out that alternative material are existing, but they do not fullfill the requirements of Sida's fluoropolymer products. Further description is made and collected in the documents attached(230725\_Alternative materials valuation). |
| Answer to specific info request 6:  a. annual tonnage and emissions: 100 tons is an approximated consumption of polymer process by Sida. Sida is following the recommendation of fluoropolymer manufacturing , during the processing, no mentionable emissions are generated. b.key functionalities of fluoropolymers in Sida's application anti-corrosion performance, overall chemical resistance, high purity for semi-conductor production. approved for contact with drinking water and food stuff, high temperature stability, smooth surface, easy to clean, possibility for sterilization. c. number of companies affected: further information you can find in this social-economic analysis, attachment( 230725\_Socio-economic impact company SIDA) d. technical and economic feasibility, hazard and risks of alternative. The alternatives being analyzed according to the document alternative material in the attachment, none of the alternative material do fullfill all the requirements which are necessary for Sida high demanding application. The first what we would lose when switching to the alternative material would be a safe performance of the materials in the application. Safety is the first we would lose. In semi-conductor applications, only fluoropolymers are possible. e. alternative materials, not yet available. we do not expect that alternative material can be identified during the proposed time for derugations, as the special performance profile of fluoropolymers is based on a three chemcial factors mainly as mentioned above. These factors can not be fullfilled by alternative materials. f. more time requirements the experts of sida fluoropolymer plastic are convinced that even longer time for the derugation will not provide alternative solutions. g. reference is made to the attached document socio-economic analysis (230725\_Socio-economic impact company SIDA) |
| Answer to specific info request 7:  based on the current technology, we considered that there are no alternative materials for fluoropolymers for use in these applications. We do not exclude that possibily new technologies will be developed in the future. If this is the case, the situation can be taken under re-consideration. |
| Answer to specific info request 8:  For more details, please see the attachment(230725\_Socio-economic impact company SIDA). |

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| 6521 | Date:  2023/08/04 16:51  Content:  Hazard or exposure  Information on benefits  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  HUGO PETERSEN GmbH  Org. country:  Germany | General Comments:  The comment refers to the PFAS Compounds. HUGO PETERSEN is an engineering copmpany in the field of Chemical Plants and Environmetal protection plants. The use of PFAS like PTFE, PFA, PVDEF etc is necessary as not adiquate material in respect to high corrosive/acidic and varying media is available in the market. The dissapearance of PFAS would reduce the quality and lifetime of chemical plants. |
| Answer to specific info request 3:  The incineration would produce acidic compunds that would eliminated in the gas cleaning plants of industrial hazardous waste incineration plants. |

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| 6522 | Date:  2023/08/04 17:16  Content:  Scope or restriction option analysis  Environmental emissions  Baseline  Description of analytical methods  Information on alternatives  Information on benefits  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Lechler GmbH  Org. country:  Germany | General Comments:  Nozzles and atomizers made of PFAS polymers (PTFE and PVDF) have a broad scope of application across diverse industries and processes, including petrochemicals, chemical manufacturing, power generation, electronics, agriculture and more. These polymers are preferred for their temperature resistance, chemical inertness, and ability to withstand harsh environments. Alternative materials lack the same combination of advantageous properties as PFAS polymers.  Lechler GmbH, based in Metzingen, Germany, is a family-owned business that specializes in developing and producing precision nozzles, nozzle systems, and droplet separators made from a wide range of materials. The company is a market leader in Germany and Europe and is considered one of the most important players in the global atomization technology market. As of the year 2021, the Lechler Group of Companies employs approximately 785 people worldwide, with around 380 at Lechler GmbH's headquarters in Metzingen. The Lechler group's annual turnover amounts to 130 million euros. The company's atomization technology products find applications in a broad scope of application across diverse industries and processes, in various industries, including petrochemicals, power generation, agriculture, metallurgy, chemical industry, pharmaceuticals, electronics, food and beverage, and more. Since many of these applications involve the use of chemicals, these nozzles must be made from chemically resistant and thermally tolerant materials. Lechler uses the fluorpolymers PTFE and PVDF, depending on the customer's requirements and specific application.  If fluoropolymers could no longer be used as nozzle material, it would significantly impact a large number of industries and applications where nozzles are a core process component. |
| Answer to specific info request 1:  The assignment to one of the listed sectors is not possible because nozzles and atomizers of any kind and shape are not included. The mentioned sectors do not fit to the business sector of Lechler GmbH. Nozzles and atomizers cannot be assigned to any of the existing categories. In our opinion, the list of predefined categories is incomplete and insufficient. The main application markets for nozzles and atomizers include, but are not limited to, the following areas. : - Petrochemicals and Refineries: In the processing of crude oil and petroleum products, spray nozzles are used for applications such as cooling towers, desulfurization, and chemical injection. - Chemical Manufacturing: Spray nozzles are used in chemical processing for mixing, coating, and reacting chemicals. They are also employed in spray drying processes. - Steel and Metal Manufacturing: Spray nozzles are used for cooling, quenching, and lubrication in steel mills and metal manufacturing facilities. - Power Generation: In power plants, spray nozzles are used for cooling processes, such as in cooling towers and gas turbine inlet air cooling. - Aerospace and Aviation: In aerospace industries, spray nozzles are used for coating, cleaning, and surface treatment applications. - Electronics: as in aerospace and aviation, spray nozzles are used for coating, cleaning and surface treatment in crucial processes. - Glass Manufacturing: Spray nozzles are employed in glassmaking processes, including cooling and tempering glass products. - Food Processing and beverages: In food manufacturing, spray nozzles are used for applications like coating, cleaning, and flavoring. - Environmental Control: Spray nozzles are used in environmental control processes such as air pollution control systems and gas scrubbing. - Automotive and Transportation: Spray nozzles are used in car washes, surface treatment, and painting processes in the automotive industry. - Pharmaceutical and Biotechnology: Spray nozzles are used for coating tablets, encapsulation, and spray drying in pharmaceutical manufacturing. - Agriculure: Spray nozzles are used to apply plant protective chemicals and pesticides. In all of the above sectors (and even more) we can find applications where spray nozzles must perform in high-temperature and/or chemical aggressive environments, making PTFE and PVDF the main choice. The key advantages of PTFE are temperature resistance, chemical inertness, non-stick properties, low friction coefficient, electrical insulation, UV and weather resistance, biocompatibility making it suitable for medical and pharmaceutical applications, dimensional stability over a wide temperature range as well as easy fabrication. Due to these advantageous properties and their unique combination, Fluorpolymers (PVDF and PTFE) are commonly used in nozzles that need to be capable of withstanding high temperatures and harsh chemical environments. |
| Answer to specific info request 5:  Raw material usage for spray nozzle production PTFE: 2.300 kg in 2022 for machining PVDF: 19.000 kg in 2022 for machining and moulding In order to provide data on what proportion by weight remains in the actual end product, further internal investigations are necessary. |
| Answer to specific info request 6:  Raw material usage for spray nozzle production PTFE: 2.300 kg in 2022 for machining PVDF: 19.000 kg in 2022 for machining and moulding In order to provide data on what proportion by weight remains in the actual end product, further internal investigations are necessary. Nozzles play a crucial role in various chemical processes and are commonly used for fluid handling and dispersion. These devices are designed to control the flow and direction of liquids, gases, or mixtures within the chemical processing industry. The use of nozzles can significantly impact process efficiency, reaction rates, and product quality. Here are some common applications of nozzles in chemical processes: Mixing and Blending: Nozzles are used to introduce reactants or chemicals into a reaction vessel, ensuring thorough mixing and blending. They can create turbulent flow or introduce jets to enhance the contact between different substances, promoting faster and more efficient reactions. Spray Drying: In spray drying processes, liquid materials are atomized into fine droplets using nozzles. These droplets are then exposed to hot air, allowing rapid evaporation of the solvent and converting the liquid into dry particles. Spray drying is widely used to produce powdered products such as detergents, food additives, and pharmaceuticals. Gas Scrubbing and Absorption: Nozzles are used in gas scrubbing systems to spray liquid solutions or solvents into gas streams. This allows the absorption of gaseous pollutants or contaminants by the liquid phase, resulting in cleaner emissions and safer air quality. Coating and Surface Treatment: Nozzles are employed in coating processes to apply thin films of liquids onto surfaces. Whether it's painting, electroplating, or applying protective coatings, the controlled spray pattern of nozzles ensures even distribution and minimizes wastage. Cooling and Quenching: Nozzles are employed to spray cooling liquids, such as water or coolant, to control the temperature of chemical reactions or to quench hot materials, preventing damage or thermal shock. Foam Generation: Nozzles can be designed to generate foam, which is utilized in various chemical applications, including fire suppression, flotation processes, and as a medium for separation techniques. The choice of nozzle type, size, and material depends on the specific application, the properties of the fluids involved, and the desired process outcomes. Proper selection and maintenance of nozzles are essential to ensure efficient and safe chemical processes. Additionally, advancements in nozzle technology continue to offer innovative solutions for improved performance and reduced environmental impact in chemical processing industries. Nozzles are widely used in electronic manufacturing processes, particularly in the assembly of printed circuit boards (PCBs) and electronic components. The precise and controlled dispensing of materials is critical in electronics manufacturing to ensure high-quality and reliable electronic products. Here are some common applications of nozzles in electronic manufacturing: Solder Paste Dispensing: Solder paste is a crucial material used to attach electronic components to PCBs during the surface mount technology (SMT) assembly process. Nozzles are used in solder paste dispensing machines to accurately and uniformly deposit the solder paste onto the designated pads on the PCB. Proper solder paste deposition is essential to achieving good solder joints and reliable connections between components and the board. Adhesive Dispensing: Various adhesives, such as epoxy or UV-curable adhesives, are used in electronic assembly to bond components or seal sensitive areas. Nozzles are employed in adhesive dispensing equipment to apply precise amounts of adhesive onto specific locations with consistent accuracy. Component Placement: Nozzles are used in pick-and-place machines to handle and accurately position electronic components onto PCBs. These machines utilize specialized nozzles designed to grip and hold components of different shapes and sizes, ensuring precise placement on the board. Flux Application: Flux is used to clean metal surfaces and facilitate soldering during the reflow process. Nozzles are used to apply flux selectively to specific areas, ensuring proper solder wetting and minimizing soldering defects. Underfill Dispensing: Underfill is a specialized adhesive used to reinforce the mechanical integrity of semiconductor packages by filling the gap between the chip and the substrate. Nozzles are used to dispense underfill material with high precision, preventing voids and ensuring optimal performance of the electronic component. Conformal Coating: In some applications, electronic components and PCBs require a protective conformal coating to guard against moisture, dust, and other environmental factors. Nozzles are used in conformal coating machines to apply a uniform and controlled layer of the coating material. Cleaning and Rinsing: Nozzles are employed in cleaning processes to spray cleaning agents or rinse fluids onto PCBs or electronic components to remove residues, contaminants, or flux residues after soldering. The use of nozzles in electronic manufacturing is essential to achieving consistent and high-quality results in mass production. The automation and precision provided by nozzle-based dispensing systems contribute to increased efficiency, reduced waste, and improved product reliability in the electronics industry. Continuous advancements in nozzle technology further enhance manufacturing processes, allowing for greater flexibility and adaptability in response to evolving electronic designs and requirements. Nozzles play a crucial role in modern agriculture by facilitating the precise application of pesticides, herbicides, and fertilizers, which, in turn, optimizes crop management, enhances efficiency, and reduces environmental impact. Two important technologies that have revolutionized nozzle performance in agriculture are Pulse Width Modulation (PWM) and the use of PFAS polymer materials. Pulse Width Modulation (PWM) technology allows for more precise control of nozzle flow rates by pulsing the flow instead of relying solely on pressure changes. This method enables more accurate application rates, particularly when operating at varying speeds or in irregularly shaped fields. By using PWM, farmers can apply chemicals more efficiently and target specific areas, reducing waste and potential environmental harm. PFAS Polymer Materials: Nozzles used in modern agriculture are often made of durable materials such as PFAS (Per- and Polyfluoroalkyl Substances) polymer materials, including PTFE (Polytetrafluoroethylene) and PVDF (Polyvinylidene Fluoride). These materials are designed to withstand the harsh chemicals used in agricultural operations and maintain consistent performance over time. The chemical inertness of PFAS polymers ensures that the nozzles remain unaffected by the substances they deliver, thus preventing degradation and prolonging their lifespan. By using nozzles made of PFAS polymer materials, farmers can maintain efficient and accurate application of chemicals, ultimately reducing the overall environmental impact of agricultural practices. Precise application allows for the right amount of chemicals to be delivered in the right places, minimizing chemical runoff and leaching. This preservation of soil health and water quality is crucial for sustainable agriculture and environmental protection. 2.400 customers have ordered nozzles or parts containing PFAS in 2022. We expect all of them affected, but the number of processes oder end-customers affected can only be guessed. At first glance, PEEK could be considered as an alternative to PVDF and PTFE. But at a closer look, PEEK has many disadvantages. Thermal Conductivity: PEEK has higher thermal conductivity compared to PTFE. While this can be an advantage in certain applications, it can also be a disadvantage in situations where low thermal conductivity is required. Wear Resistance: PEEK has good wear resistance but may not be as superior in this regard as PTFE, which has excellent low-friction and anti-wear properties. In some high-wear applications, PTFE might be a more suitable choice. Chemical Resistance: While PEEK has good chemical resistance, it may not be as chemically inert as PTFE. PTFE is known for its exceptional resistance to a broader range of chemicals and solvents. PTFE is also suitable for use with strong mineral acids such as concentrated sulphuric acid, concentrated nitric acid and hydrofluoric acid. Molding Complexity: PEEK can be more challenging to process and mold compared to PTFE. The molding of PEEK parts requires more precise control of temperature and pressure, which can add to manufacturing complexity. Water Absorption: PEEK has a higher water absorption rate than PTFE. This can be a concern in certain applications where moisture absorption can affect the material's properties. Surface Finish: Achieving a smooth and high-quality surface finish on PEEK parts can be more difficult compared to PTFE, which has excellent release properties and non-stick characteristics. Electrical Insulation: While both PEEK and PTFE are good electrical insulators, PTFE has slightly better electrical properties, making it more suitable for certain electrical and electronic applications. FDA Approval: PEEK may not have as widespread approval from regulatory bodies like the U.S. Food and Drug Administration (FDA) for use in food contact applications compared to PTFE. Wear Resistance: While PEEK has good wear resistance, PVDF is known for its excellent wear and abrasion resistance. In high-wear applications, PVDF might be a more suitable choice. Chemical Resistance: PVDF offers excellent chemical resistance, but PEEK may not be as chemically inert as PVDF. PVDF is highly resistant to a wide range of aggressive chemicals and solvents. Water Absorption: PEEK has a higher water absorption rate than PVDF. In applications where moisture absorption can affect the material's properties which is always the case with spray nozzles, PVDF is preferred. Electrical Properties: PVDF is known for its excellent electrical properties, including high dielectric strength and low dielectric constant. It is widely used in electrical and electronic applications. Other alternatives, such as UHMWPE, are not feasible simply because of their low temperature resistance. Alternatives to the PFAS polymer materials are currently not known due to the required properties as well as their combination. Many applications in the food sector, where materials actually come into contact with food, require special approvals, such as those provided by the U.S. Food and Drug Administration (FDA). Lechler GmbH currently makes a good part of its total turnover with nozzles made of PFAS polymers, calculated across all the markets and sectors described above. For other materials to be used in the future, adjustments to all injection moulds used would be necessary due to different shrinkage properties. In total, going to other materials would mean adjustment and redesign of injection moulds and cores. This alone would result in costs of approx. 9 million €. This does not take into account any internal expenses (design, adjustments, re-sampling, drawing changes, documentation, production testing and test samples, adjustment of test plans, injection moulding parameters, etc.). In addition, the revision, redesign and new procurement of moulds and cores would take an rough estimate of more than 10 years. All in all, the entrepreneurial sense of this effort must be seriously questioned. Loss of annual value of sales, profit, and increased effort endangeres approx. 30 jobs. Loss in efficiency leads to lower nozzle performance and therefore lower product quality in customers processes. The absence of nozzles made of appropriate material would have devastating effects. Many processes would simply not run properly without nozzles made of PFAS. Consequently, we request exemption for the product group of spray nozzles made from PTFE and PVDF. |

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| 6523 | Date:  2023/08/04 18:23  Content:  Information on alternatives  Information on benefits  Other socio economic analysis (SEA) issues  Request for exemption  Type:  Individual  Country:  Germany  Attachment: | General Comments:  - |

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| 6524 | Date:  2023/08/04 19:26  Content:  Hazard or exposure  Transitional period  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  China  Company name confidential:  Yes | General Comments:  - |
| Answer to specific info request 1:  PLease see attachment |

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| 6525 | Date:  2023/08/04 19:58  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Baseline  Information on alternatives  Information on benefits  Other socio economic analysis (SEA) issues  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  W. L. Gore & Associates GmbH  Org. country:  Germany  Attachment:    <redacted>  Privacy statement:  As disclosure would undermine the protection of commercial interests of a natural or legal person, including intellectual property (Article 4(2) of Regulation (EC) No. 1049/2001 | General Comments:  We provide information in the attachments |
| Answer to specific info request 1:  Packaging vents used in transport of storage of decomposing chemicals. |
| Answer to specific info request 6:  Packaging vents used in transport of storage of decomposing chemicals. |

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| 6526 | Date:  2023/08/04 22:06  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Baseline  Information on alternatives  Information on benefits  Other socio economic analysis (SEA) issues  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  W. L. Gore & Associates GmbH  Org. country:  Germany  Attachment:    <redacted>  Privacy statement:  As disclosure would undermine the protection of commercial interests of a natural or legal person, including intellectual property (Article 4(2) of Regulation (EC) No 1049/2001 | General Comments:  See attachments |
| Answer to specific info request 1:  Petroleum and Mining Applications of Fluoropolymers |

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| 6527 | Date:  2023/08/05 05:36  Content:  Scope or restriction option analysis  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  SHANDONG MICFLON TECHNOLOGY CO.,LTD  Org. country:  China  Attachment: | General Comments:  Shandong Micflon Technology Co.,Ltd. is a Chinese company specialized in fluoropolymers of PTFE, PFA and PCTFE. Main products includes PTFE compounded Free Flow powder, semi-finished products of PTFE/PFA/PCTFE and their machined finished parts.  As we have been in the field of fluoropolymers for more than 15 years, we know that the impact of PFAS and related substances restriction would be dramatic for our company, as there is no alternative to the conversion of the machinery to produce other materials currently.  Micflon has learned a lot information on the potential danger of some substances classified as PFAS, but at the same time it is also convinced that an exemption for fluoropolymers should be adopted, please check the reasons below:  • They do not exhibit the toxicological and environmental profiles associated with non-polymeric PFASs that could be considered of concern. • They have unique physical-chemical properties, which let them very different from non-polymer PFAS and therefore should have a distinct class within them. • They meet the OECD criteria of Polymer of Low Concern (PLC) and are non-toxic, bio-compatible, insoluble and immobile molecules, which are deemed to have insignificant environmental and human health impact.  Fluoropolymers produced in Micflon is used in many different fields including several important fields in our life, which can’t be replaced by other materials.  Main implications for downstream users:  • No alternative allows a complete replacement with performances of equivalent quality; there are some possible alternatives for some properties but there’s no one material that present all the specific and unique properties of Fluoropolymers (no 1:1 alternatives are available) • Costs will arise due to necessary amendments of machinery and equipment when switching to alternative substances. The industrial application process on products using non-fluoropolymers material is much more complicated. • Due to the greater quantity of product necessary for this application and the reduced service life of the treated articles, a significant environmental impact must be considered in terms of nanoforms (microplastic) and CO2 emissions.  Meanwhile, we agree and support the opinion of Conference of Fluoro-Chemical Product Japan (FCJ). Please check the detailed information from Annex. |

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| 6528 | Date:  2023/08/05 05:52  Content:  Scope or restriction option analysis  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Thailand  Company name confidential:  Yes  Attachment:    <redacted> | General Comments:  ThreeBond Manufacturing Thailand Co.,Ltd. supports th satement made by FCJ on the issues of proposed restriction, as per attached in Section IV. |
| Answer to specific info request 1:  PTFE thread sealing for screws and bolts threads(Proposal for a Restriction, Table 9, P136) The following are uses not listed in the proposed restrictions. ・Other sealants and adhesives ・ Lubricants |
| Answer to specific info request 2:  a 214.6kg b Incineration 50%, landfill 50%, recycling 0%. |
| Answer to specific info request 5:  The annual emissions of PFAS components contained in the application concerned are approximately 214.6kg. |
| Answer to specific info request 6:  a 1. Use : PTFE sealing tape for screws and bolts threads, other sealants and adhesives Annual emissions: 190.7kg 2. Use: Lubricants Annual emissions: 23.9kg b It exhibits high heat resistance, high chemical resistance, high lubricity. c It is estimated that 99 companies in the automotive, electrical and construction sectors will be affected by the unavailability of our products. d There are no heat- or chemical-resistant components that can replace PFAS, so it is not possible to develop alternatives. e There is no technical solution. f At present, there is no prospect of a technically or economically viable alternative. g It is clear that the economic losses and number of jobs caused by the restricted use of PFAS are enormous throughout the industry. We use products containing PFAS components in 99 of our customers. We alone estimate that losses of maximum EUR 226231 and approximately 500 jobs will be affected. In view of the above, we consider that PFAS substitutes should be exempted from the proposed restriction, rather than a 12-year grace period, as they are very likely not to be a complete replacement and are for all practical purposes. |

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| 6529 | Date:  2023/08/05 09:58  Content:  Hazard or exposure  Environmental emissions  Information on alternatives  Information on benefits  Other socio economic analysis (SEA) issues  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  WELSPRING UNIVERSAL  Org. country:  India  Privacy statement:  openly mentioned. | General Comments:  Good initiative , we are also part of this chain. |
| Answer to specific info request 1:  Annex xv under standing more deeply. |
| Answer to specific info request 2:  our product does not contain PFAS. |
| Answer to specific info request 3:  Effective & Safe disposal hazardous waste. |
| Answer to specific info request 4:  Understood impacts & effects. |
| Answer to specific info request 5:  anual consumption data recording if in use. |
| Answer to specific info request 6:  PFAS compliance requirements are understood. |
| Answer to specific info request 7:  PFAS EFFECTS . |
| Answer to specific info request 9:  Thermoplastics having PFAS. |

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| 6530 | Date:  2023/08/05 21:52  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Information on benefits  Other socio economic analysis (SEA) issues  Transitional period  Type:  Individual  Country:  Sweden | General Comments:  I as a consumer gladly take that the products I buy in the future has a lower quality than today if that is the outcome of restricting PFASs. I agree wholeheartedly with the proposition to restrict manufacture, placing on the market and use of PFASs. I think that it is very important that we stop emitting these harmful, high persistence chemicals into our environment that will remain there for such a long time. |

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| 6531 | Date:  2023/08/06 02:07  Content:  Information on alternatives  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  A・K・K　CORPORATION  Org. country:  Japan  Attachment: | General Comments:  There is no substitute for PFA, ETFE and PVDF for electric heater applications, from the viewpoint of heat resistance and durability |
| Answer to specific info request 1:  There is no substitute for PFA, ETFE and PVDF for electric heater applications, from the viewpoint of heat resistance and durability |
| Answer to specific info request 6:  There is no substitute for PFA, ETFE and PVDF for electric heater applications, from the viewpoint of heat resistance and durability |
| Answer to specific info request 7:  There is no substitute for PFA, ETFE and PVDF for electric heater applications, from the viewpoint of heat resistance and durability |
| Answer to specific info request 8:  There is no substitute for PFA, ETFE and PVDF for electric heater applications, from the viewpoint of heat resistance and durability |

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| 6532 | Date:  2023/08/06 15:39  Content:  Environmental emissions  Baseline  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  Japan Grease Institute (JGI)  Org. country:  Japan  Attachment: | General Comments:  We will submit a brief document on environmental emissions of fluorinated grease. JGI member company will also submit comment for fluorinated grease. Please refer to 1st comment from us. |
| Answer to specific info request 2:  Please see attached document. |
| Answer to specific info request 3:  Please see attached document. |

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| 6533 | Date:  2023/08/06 16:03  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Other socio economic analysis (SEA) issues  Type:  Individual  Country:  Sweden | General Comments:  Extremt viktigt att utsläpp av kemikalier som finns kvar i naturen länge utan att brytas ner stoppas så att våra barn får möjlighet att växa upp utan att exponeras för dessa kemikalier. Ökade priser eller att varor blir sämre spelar ingen roll i jämförelse med vikten av människors hälsa och välbefinnande. |

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| 6534 | Date:  2023/08/06 17:17  Content:  Scope or restriction option analysis  Baseline  Information on alternatives  Information on benefits  Other socio economic analysis (SEA) issues  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Germany  Company name confidential:  Yes | General Comments:  Industrial Plastic Piping Systems made from Fluoropolymers (FPs) are used for conveyance of critical media (e.g. high purity water and/or harsh chemicals) from high-tech industries (related to Green Deal, digitalization etc.) to wide-spread basic chemical industry uses. Other piping materials (such as Polypropylene or PVC) are being used for water treatment in general. All these piping systems do need Sensors (such as measurement of flow, temperature and pressure, pH/ORP, dissolved oxygen, conductivity) for (quality) control and efficiency. Sensors for the upper tier and higher measurements quality levels depending on the specific use contain many different PVDF, PTFE mechanical components as well as FKM gaskets. We can prove on selected practical use cases with our research, that there are currently no technical alternatives (polymeric/non-polymeric) in the upper tier of our specific uses. It is to be considered that the product range contains 1000+ different products and the use is heavily regulated by customers (e.g. Semicon), standards and use-specific audited certification schemes. |
| Answer to specific info request 1:  Sensors in Plastic Piping System with mechanical PTFE/PVDF components with using FKM gaskets • Semicon Use – conveying (ultra) high-purity water and harsh chemicals • Chemical (Processing) Industry – in general, conveying a defined set of very harsh chemicals. Many more uncounted sub-uses in e.g. metal pickling, various manufacturing facilities, distribution companies etc. however, technical reasoning is linked to the same harsh chemicals as we will show • Further uses/sub-uses are in Water treatment in general, Food production, Life science applications, Energy etc. |
| Answer to specific info request 7:  Semicon: Fluoropolymer piping (high-purity water/harsh chemicals) are an essential piece of any upper level Semicon Manufacturing Plant. The demanded extreme high quality of the media conveyed is directly related to the microchip yield rates; even more so with next generation of micro-chips (e.g. nm bandwidth, energy consumption) This is specifically to raise awareness for Sensor products, please refer to our attachments with regard to technical alternatives (confidential/non-confidential) already made in our ECHA response #4039. The socio-economic impact on our side is rather small relative to all our high tech/-quality customers with huge impact on their industrial processes. |
| Answer to specific info request 8:  Many sectors/uses are mentioned in the matrix (Table A.1 of Annex A) however, piping systems in these sectors/uses are rarely mentioned in the restriction dossier or missing completely. Chemical Industry: The missing sub use is conveyance of certain harsh chemicals. However, these chemicals are used in uncounted widespread sub-uses (e.g. see our sample on metal pickling). Although they do not belong directly to the sector "Chemical Industry", we list them there as new sub-uses, because the driving force with our specific chemicals is the same. Water treatment in general, Life Science, Food production: Above certain customer requirements, levels the named Sensors are needed to ensure quality and efficiency of the respective processes This is specifically to raise awareness for Sensor products, please refer to our attachments with regard to technical alternatives (confidential/non-confidential) already made in our ECHA response #4039. The socio-economic impact on our side is rather small relative to all our high tech/-quality customers with huge impact on their industrial processes. |

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| 6535 | Date:  2023/08/06 17:33  Content:  Scope or restriction option analysis  Baseline  Information on alternatives  Information on benefits  Other socio economic analysis (SEA) issues  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Germany  Company name confidential:  Yes  Attachment:  <redacted>  Privacy statement:  The confidential attachment is needed to provide requested data and research protecting our internal know-how and commercial market interest. Plus our financial interests with regard to used FP tonnages and general company/financial information. | General Comments:  The proposal does not cover uses of PFAS containing lubricants for the installation of Piping Systems for example in manufacturing plants (e.g. painting equipment in automotive production) or repair couplings (e.g. water lines). These lubricants are used in our manufacturing of piping products for specific uses or during installation on the construction side. |
| Answer to specific info request 1:  Our comments are related to many use/sub-uses of Lubricants which have not specifically identified • Painting equipment (e.g. automotive industry) – specific lubricants are specified for piping products which shall not disturb high quality painting processes. • Repair of water lines (e.g. water utilities) – specific lubricants are specified for installation of repair couplings, obviously drinking water complaint but existing alternatives (e.g. silicones) are not allowed as they may cross-contaminate the PE welding procedures These are just to samples of many customer uses which have not been identified; there might be many more because piping systems are used everywhere. |
| Answer to specific info request 8:  Many sectors/uses are mentioned in the matrix (Table A.1 of Annex A) however, piping systems in these sectors/uses are rarely mentioned or the respective uses are missing completely. Lubricants based on Silicone are often used for the installation of piping system however, Silicone is extremely resilient on surfaces (which is good) but is as well a no-go for specific uses. There are currently no know technical alternatives. 1) Industrial Painting Equipment (e.g. for automotive industry): Any Silicone contact for plastic piping products and needed lubricants for valves) is strongly forbidden as it jeopardizes class A painting of automobiles 2) Water Utilities (repair couplings for water leakages): Any Silicone lubricant on products or during installation is strongly forbidden as it contaminates the welding area of PE piping too easily leading to (long-term) leakages. Please refer to our attachment for our argumentation on benefits, discussion of alternate solution and socio-economic impact. |

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| 6536 | Date:  2023/08/07 01:01  Content:  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  JOB GmbH  Org. country:  Germany  Attachment: | General Comments:  See attached comprehensive presentation (Request for exemption for E-Bulb - "The world's smallest fire extinguisher") |
| Answer to specific info request 1:  See attached comprehensive presentation (Request for exemption for E-Bulb - "The world's smallest fire extinguisher") |
| Answer to specific info request 2:  See attached comprehensive presentation (Request for exemption for E-Bulb - "The world's smallest fire extinguisher") |
| Answer to specific info request 5:  See attached comprehensive presentation (Request for exemption for E-Bulb - "The world's smallest fire extinguisher") |
| Answer to specific info request 6:  See attached comprehensive presentation (Request for exemption for E-Bulb - "The world's smallest fire extinguisher") |

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| 6537 | Date:  2023/08/07 02:55  Content:  Scope or restriction option analysis  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Japan  Company name confidential:  Yes  Attachment: | General Comments:  Supports the statement made by JVMA on the issues of proposed restriction, as per attached in Section IV. |

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| 6538 | Date:  2023/08/07 09:27  Content:  Environmental emissions  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Brugg Pipes  Org. country:  Switzerland | General Comments:  Referring to the use of HFOs as a blowing agent for the production of insulated pipes, most notably for the manufacturing of the insulation material of such insulated pipes: Insulated pipes for the use of district heating and cooling (DHC) are composed of so called medium pipes which are surrounded by a thermal insulation material (most typically polyurethane foam) which is covered by a jacket of typically polyethylene. The medium pipes consist of steel or are of a polmeric nature. Those insulated pipes are at the heart of any district heating (or cooling) network. The pipes are laid underground and remain in service for 30 - 50 years. During operation hot water (the energy transporting medium) is transported from the centrally located heating station towards the consumers (typically residential buildings to be heated). In this use case HFO can be used as a blowing agent for the insulating foam. It is important to understand that the HFO remains inside the foam for the entire life-time of the insulated pipe and is not emitted to the environment. The HFO is a functional part within the insulated pipe and serves the specific purpose to reduce the energy losses during operation, and it performs that task better than any known technical alternative available today. The energy savings over the life-time of the products are significant, especially when looking not only at one specific network which is already in operation but when taking into acount the increase which is planned for DHC solutions in the coming years in order to save reach the EU climate targets. |
| Answer to specific info request 1:  Application of fluorinated gases, sub section "foam blowing agents". |
| Answer to specific info request 2:  a) Sub use "foam blowing agents". b) The HFO is used as a blowing agent for the production of the insulating foam around the medium pipes. During production itself only minor amounts are being leeased to the exhaust, a few percent. When the insulated pipe becomes part of a district heating (or cooling) network is is buried underground and remains there for its entire lifetime. That is typically more than 30 years, often even 50 years. The insulated pipes aty in the ground undamaged. When this network is being dismanteled the insulated pipes are disposed off. The steel pipes can be recycled, also the polyethylene jacket can be reused. According to the state of the art the insulating foam is being incinerated. During incineration the HFO will be decomposed, the final decomposition products being carbon dioxide and hydrofluoric acid (like with any fluorine containg organic compound). All acidic gases (as the hydrofluoric acid) are being retained by acid scrubbers. In the end no further HFO is released to the environment. |
| Answer to specific info request 3:  The HFO is used as a blowing agent for the production of the insulating foam around the medium pipes. During production itself only minor amounts are being leeased to the exhaust, a few percent. When the insulated pipe becomes part of a district heating (or cooling) network is is buried underground and remains there for its entire lifetime. That is typically more than 30 years, often even 50 years. The insulated pipes aty in the ground undamaged. When this network is being dismanteled the insulated pipes are disposed off. The steel pipes can be recycled, also the polyethylene jacket can be reused. According to the state of the art the insulating foam is being incinerated. During incineration the HFO will be decomposed, the final decomposition products being carbon dioxide and hydrofluoric acid (like with any fluorine containg organic compound). All acidic gases (as the hydrofluoric acid) are being retained by acid scrubbers. In the end no further HFO is released to the environment. |

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| 6539 | Date:  2023/08/07 09:43  Content:  Hazard or exposure  Baseline  Information on alternatives  Information on benefits  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Germany  Company name confidential:  Yes  Attachment:  <redacted>  Privacy statement:  confidential business information and protection of know how | General Comments:  additional information to our already uploaded contribution |
| Answer to specific info request 1:  Lubricants |
| Answer to specific info request 2:  information provided in main document |
| Answer to specific info request 3:  information provided in main document |
| Answer to specific info request 5:  information provided in main document |
| Answer to specific info request 6:  information provided in main document |
| Answer to specific info request 8:  information provided in main document |

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| 6540 | Date:  2023/08/07 09:45  Content:  Baseline  Type:  Individual  Country:  Germany  Privacy statement:  we and all the products we deliver to magna are reach conform | General Comments:  we a |

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| 6541 | Date:  2023/08/07 09:57  Type:  Individual  Country:  Korea, Republic of  Attachment:    <redacted> | General Comments:  - |

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| 6542 | Date:  2023/08/07 10:05  Content:  Scope or restriction option analysis  Hazard or exposure  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  Verband der Mineralfarbenindustrie e.V.  Org. country:  Germany  Attachment:    <redacted> | General Comments:  Siehe hochgeladene Datei, Eingabe VdMi, in Sektor IV and V |

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| 6543 | Date:  2023/08/07 10:11  Content:  Scope or restriction option analysis  Hazard or exposure  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  Eurocolour e. V.  Org. country:  Germany  Attachment:    <redacted> | General Comments:  See uploaded file, input Eurocolour, in sector IV and V |

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| 6544 | Date:  2023/08/07 10:39  Content:  Scope or restriction option analysis  Other socio economic analysis (SEA) issues  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Japan  Company name confidential:  Yes  Attachment:    <redacted>  Privacy statement:  The sliding test result data attached to Section 5 is our company's own method of evaluation and shall be treated confidentially to prevent disclosure of information to competitors. Also, PDF "Public Consultation-Sec. V\_Supplementary Doc. " is classified as confidential because it lists the name of the company that has business with our company. | General Comments:  Daido Metal Co. Ltd. supports the statement made by FCJ on the issues of proposed restriction, as per attached in Section IV. |
| Answer to specific info request 1:  Plain bearings are manufactured as final products containing PFAS. Plain bearings are widely used in sliding mechanical devices such as automobiles, construction machines, hydraulics, air conditioning, aviation, and wind turbines. The Plain bearing field is not described in ECHA: The Annex 15 Restriction Report (Table9). |
| Answer to specific info request 2:  PTFE, PFA, and FEP are used in the final product, and because they are chemically stable, they are not released into the air, exposed to employees, or discharged into water during the manufacturing process. There is no information on disposal after shipment as a product because it covers a wide range of fields. |
| Answer to specific info request 6:  Topic for "a": There is no information on PFAS for Plain bearing applications in the proposed restrictions. PTFE, PFA and FEP are used in the plain bearing field. The below amount was recent year used. PTFE (Polytetrafluoroethylene) used is 2.7 tons per year. PFA used is 0.1 tons per year. FEP used is 0.1 ton per year. Emission is Zero for above three substances. Topic for "b": PTFE is the material with the lowest friction coefficient among the solids that exist to date and is the most suitable material for plain bearings. Since it is inert to chemicals, PTFE does not react even if an additive is added to a lubricating oil and etc, used with a plain bearing in a sliding part of a machine, and thus can function as a sliding material of a plain bearing. It has a melting point of 327°C, and It can be used for sliding in a dry environment without lubricating oil and heat generation up to 260°C. Therefore, it has heat resistance that can withstand even rotating parts of machines. PFA is a melt type resin with the same performance as PTFE, and is mixed with PTFE. As described in Patent No. JPB-1986052322(refer Sec. IV), the effect of PFA is to improve the resistance to cavitation erosion by strengthening the matrix resin (PTFE), so that the abrasion resistance of the sliding material can be achieved without impairing the friction characteristics of the PTFE. The strengthening of the matrix is possible because it is made of the same fluororesin as PTFE. FEP has the same effect as PFA. Topic for "c": Refer Sec. V attached documents. (PDF: Public Consultation-Sec. V\_Supplementary Doc.) Topic for "d": PTFE has the lowest coefficient of friction of any material that exists to date, so there is currently no substitute. Topic for "e": We have examined alternatives to resin materials, which are generally said to have low friction coefficients. Sliding test results are attached to Section 5. Compared with PTFE, the friction coefficient is more than three times higher than PTFE, and it is confirmed that it cannot be simply replaced as a sliding material for sliding bearings. Topic for "f": Unknown, since no replacement exists. Topic for "g": Refer Sec. V attached documents. (PDF: Public Consultation-Sec. V\_Supplementary Doc.) |

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| 6545 | Date:  2023/08/07 11:20  Content:  Information on alternatives  Information on benefits  Other socio economic analysis (SEA) issues  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Academic institution  Org. name:  Oulu University Hospital  Org. country:  Finland  Attachment: | General Comments:  - |

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| 6546 | Date:  2023/08/07 12:07  Content:  Baseline  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Austria  Company name confidential:  Yes | General Comments:  Hello all, we use components from material Vespen in our space craft applications and they do not exist on the earth |
| Answer to specific info request 1:  Components from material Vespel are used in space applications and final product will not physically exist on earth |