**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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| 8579 | Date:  2023/09/22 12:31  Content:  Scope or restriction option analysis  Hazard or exposure  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:  Wir sind ein Hersteller von Kunststofffahrzeugscheiben aus Polycarbonat für spezielle Anwendungen in Polizei-, Forst-, Erdbau- und Straßenbaumaschinen, die eine Schutzwirkung der Insassen gegen potentiell gefährliche äußere mechanische Einwirkungen bieten. Zusätzlich stellen wir funktionsbeschichtete transparente Kunststoffplatten für eine Vielzahl von Anwendungen her wie z.B. Lärmschutzwände. Die Lacke für die Funktionsbeschichtungen des Polycarbonats entwickeln und produzieren wir selbst.  Wir betreiben zur Herstellung unserer Lacke eine größere Glasapparatur, deren einzelne Elemente über TEFLON-Dichtungen verbunden sind. Wir können derzeit nicht einschätzen, ob es Dichtungsalternativen ohne TEFLON geben würde, aber da alle unsere Lacke von den chemischen Notwendigkeiten her lösemittelbasiert sind, haben wir erhebliche Zweifel, dass dieselbe Dichtungswirkung durch Alternativstoffe erreicht werden. Jedes Auseinanderbauen der Anlage, z.B. bei einem dann häufiger werdenden Dichtungswechsel im Falle von weniger langlebigen Dichtungsmaterialen, birgt das Risiko, dass die Glasapparatur einen irreparablen Schaden erleidet. Eine unkontrollierte Abgabe von TEFLON-Dichtungen in die Umwelt erscheint uns für diese Anwendung wenig wahrscheinlich.  Eine unserer Beschichtungen, die für transparente Kunststoffe Schutz vor Graffiti-Verunreinigungen bietet, enthält in dem entsprechenden Lack ein Funktionsadditiv, welches als Perfluorsilan unter ein potentielles PFAS-Verbot fallen würde. Die Folge wäre, dass wir diesen Lack nicht mehr produzieren und die daraus hergestellten beschichteten Produkte nicht mehr anbieten könnten. In einem Entwicklungsprojekt werden aktuell Lackadditive zur gezielten Modifikation der beschichteten Oberfläche untersucht. Hier zeigten PFAS vielversprechende Eigenschaften, welche von in der Regulierung nicht betroffenen Alternativen bisher nicht in ähnlicher Form erreicht werden konnten. Eine Substitution der PFAS, insbesondere in Hinblick auf deren Anti-Haft- und wasserabweisenden Oberflächeneigenschaften bei gleichzeitig hoher chemischer Stabilität erweist sich nach unseren bisherigen Erfahrungen als schwierig und wird, wenn überhaupt, nur mit Abstrichen in den Eigenschaften möglich sein. Insgesamt ergibt sich, dass durch ein mögliches PFAS-Verbot die Gefahr besteht, den weiteren Fortschritt und interessante Neuentwicklungen zu verhindern. |
| Answer to specific info request 1:  1.) PFAS-Polymere, die für anspruchsvolle technische Anwendungen wie Dichtungen verwendet werden. 2.) PFAS-Funktionsadditive in Beschichtungen, deren Oberflächeneigenschaften ohne die PFAS-Stoffe nicht realisierbar sind. |
| Answer to specific info request 6:  Unserer Meinung nach sollten PFAS-Polymere, die für anspruchsvolle technische Anwendungen wie Dichtungen derzeit unersetzbar erscheinen, von der geplanten Regelung ausgenommen werden. Ebenso sollten PFAS-Stoffe, die in kleinen Konzentrationen eingesetzt werden aber hochinteressante und hochspezifische Eigenschaften erzeugen, im Sinne des weiteren technischen Fortschritts weiterhin verwendbar bleiben. |

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| 8580 | Date:  2023/09/22 12:30  Content:  Information on alternatives  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Germany  Company name confidential:  Yes  Attachment:  <redacted> | General Comments:  In our company that builds special machinery for the food and beverage industry, PFAS substances have been banned from use for years and are only permitted if there is absolutely no technical alternative. However, the components supplied represent a big problem for us, as PFAS substances are often used here. This particularly applies to O-rings, radial shaft seals and gaskets. |
| Answer to specific info request 1:  1) Identification of sectors that use PFASs special machine construction in the food and beverage industry -> Suppliers of pumps, motors, pneumatics, switching devices |
| Answer to specific info request 6:  b) High temperature and chemical resistance, which are required in O-rings, radial shaft seals and gaskets. and conveyor belts. f) i - Due to the high proportion of standard and commercial parts, around 850 assemblies are affected in our company and need to be checked and redesigned. As a first rough estimate, we assume the following costs per assembly: €4,480 Construction: 14 hours -> 120€/h -> 1680€ Technical draftsman: 14 hours -> 80€/h ->1120€ Documentation manual: 14 hours -> 120€ -> 1680€ Due to similarities in assemblies and uses, the scope of the overall construction will probably be reduced to 350 assemblies, resulting in a total cost of approximately €1.5 million. ii - If the basic conditions are assumed, this would result in a lead time of 1.5 years with 6 employees. |

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| 8581 | Date:  2023/09/22 12:32  Content:  Scope or restriction option analysis  Information on alternatives  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Spain  Company name confidential:  Yes  Attachment:    <redacted> | General Comments:  1,1,1,2-Tetrafluoroethane CAS-Nr.: 811-97-2 Request for transitional period: 12 years transition period for refrigerants used in material handling products. |
| Answer to specific info request 6:  see attachments |

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| 8582 | Date:  2023/09/22 12:33  Content:  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  NTN Corporation  Org. country:  Japan  Attachment:  <redacted>  Privacy statement:  The attached file includes internal information of our company. | General Comments:  Please refer to the attached file in section V. |
| Answer to specific info request 1:  Sector Transport (sub-)use Use of PFASs in applications affecting the proper functioning related to the safety of vehicles, and affecting the safety of operators, passengers or goods, to the extent not addressed under other parts of this proposed restriction |
| Answer to specific info request 2:  Please refer to the attached file in section V. |
| Answer to specific info request 7:  Please refer to the attached file in section V. |
| Answer to specific info request 8:  Please refer to the attached file in section V. |

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| 8583 | Date:  2023/09/22 12:34  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> | General Comments:  TAISEI KAKO 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:  Applications of fluorinated gases(Annex E.2.8.),Solvents |
| Answer to specific info request 6:  Attached in Section V |
| Answer to specific info request 7:  Attached in Section V |

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| 8584 | Date:  2023/09/22 12:35  Content:  Scope or restriction option analysis  Information on alternatives  Information on benefits  Other socio economic analysis (SEA) issues  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  ABB  Org. country:  Switzerland  Attachment: | General Comments:  Epoxy resin is a very important material for electrical equipment, especially for products over 1000 V. As thermoset material it is very robust, can fill large volumes without voids (which is not possible for thermoplastics), is very durable and has very good dielectric and mechanical performance. For this, it became a central construction material in electrical equipment decades ago in a huge number of applications. It has replaced porcelain which was used in the beginning of electrification, which had some severe disadvantages and limitations. Epoxy resin is actually the most important insulating material in electrical equipment over 1000 V and is used by every manufacturer of electrical equipment. Even if for specific applications thermoplastic material is introduced, electrical switchgear over 1000 V fully without epoxy resin is not possible today. A very wide range of components for the high voltage section are manufactured using different casting processes. Production volumes can reach very high quantities of several thousand units per year. The investment in manufacturing tools is very high, with several ten thousand of Euros per mold. Epoxy resin itself is no PFAS, but actually used brands contain PFAS in the production process which is planned to be prohibited. The product itself might contain at least traces above 25 ppb, in case the PFAS is part of the chemical reaction in the curing of the epoxy from the components. ABB is already working on the identification of PFAS in epoxy resin and has identified first materials from suppliers not containing PFAS, covering at the time only a part of the applications. As the requirements for the epoxy resin depend on the applications, e.g. indoor or outdoor, the same epoxy resin cannot be used for every application. As the PFAS used for the curing process also has a significant impact on the quality, e.g. the generation of voids, not all alternatives working in principle and other applications can cover the high-quality needs of epoxy resin used as insulation material.  The process of substitution in products is about to start, but it will take significant time to identify the acceptable material and afterwards to transfer all components and production sites to new epoxy resin materials. As epoxy resin components are vital for electrical equipment, a multiple supplier requirement as per company rules has to be considered. It is not possible to install single sources for such important materials as it would create an unacceptable supply risk. For the final products it needs to be considered where type tests or long-term aging tests need to be completed before the products can be launched to the market.  For this, ABB ELDS asks for an extended transition time of an additional 5 years to complete the transition to PFAS-free solutions. |
| Answer to specific info request 1:  The comment does no apply to a specific sector listed in the Annex XV restriction report (Table 9) but will be an additional one. |
| Answer to specific info request 2:  Epoxy resin itself can not be fully recycled. In addition it contains a high amount of filler materials as quartz flour. Embedded in the epoxy resin are very often aluminum or copper in significant amounts, which makes it interesting to get these materials back, mainly by mechanical separation. The epoxy resin itself can only be used for thermal recycling or as filler material. The PFAS containing materials will normally be part of the thermal recycling process. With temperatures >900 °C for sufficient time PFAS are destroyed to non-PFAS. |
| Answer to specific info request 4:  As the epoxy resin itself can not be recycled, the contamination issue is on the contained materials such as aluminium, copper and steel. After mechanical separation fragments of epoxy resin on this material will easily lead to contamination levels of >25 ppb. There might be chemical processes removing these traces, but the overall environmental impact of this process will most likely be higher than the contamination of the traces of epoxy resin containing PFAS. In the melting process of the metals this will anyhow disappear due to the high melting points of the metals. |
| Answer to specific info request 6:  Epoxy resin is a very important material for the energy sector, which is marked green in table A.1 of Annex A of the Annex XV restriction report, but this material is not listed sufficiently as a user of PFAS. a) The annual tonnage of epoxy resin is high, precise figures are not available. As the PFAS is only a part of the chemistry it is significantly lower. Due to the chemical processes during curing, most of the PFAs is a reaction partner in the curing process and will not be in the product after the curing has completed, but remaining concentrations >25 ppb can be expected. But as the PFAS regulation would also prohibit manufacturing, the quantity before curing is relevant. b) The final epoxy resin quality is influenced by many parameters. One important parameter is the curing process, which has to run in parallel, homogenous and complete. Epoxy resin for electrical equipment is very sensitive regarding inhomogeneity and voids, due to high dielectric stress and high mechanical stress. For this, not all epoxy resin recipes on the market can be used for this specific application. c) Epoxy resin is the main material used by all manufacturers of electric equipment. It is globally widely used. Epoxy resin is used in indoor and outdoor applications in medium voltage (MV) and high voltage (HV, >52 kV). d) Some first epoxy resin recipes without PFAS have been tested. The results indicate that also for epoxy resin most likely there will be no drop-in solution and the substitute could only cover specific applications. As the production sites are using centralized mixing systems for the epoxy resin components, the request for different mixtures for different applications would add complexity to the manufacturing. e) The process is ongoing and not finished yet. For this, we ask for an additional 5 years to search for recipes covering a wide range and keeping the technical requirements. f) Electrical equipment is mandatory for safe and reliable energy supply. Reduction of performance or lifetime is not acceptable. Substitutes must be able to have the same performance. As epoxy resin is used for the main components in electrical equipment, a change of material would require re-testing of complete product portfolios with a huge investment in time (3-5 years) and money (several million euros). g) For electrical equipment the question is not how big companies' losses are if they can no longer produce the equipment. If it is not possible to serve the market, the energy supply is endangered, the transformation to green energy is slowed down and the extension of the electrical networks is stopped, with a negative impact on industry and society. |
| Answer to specific info request 8:  A group covering epoxy resin is missing and needs to be created. A derogation of 5 years is estimated to be sufficient to replace actually used PFAS in epoxy resin by PFAS-free solutions. At the time it can not be excluded that for some few applications no alternative can be developed. |

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| 8585 | Date:  2023/09/22 12:34  Content:  Baseline  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  ACIMGA - Italian manufacturers associantion of machinery an pater industry  Org. country:  Italy  Attachment: | General Comments:  Acimga is the association of Italian manufacturers of machinery for the graphic, paper and converting industry. Established in 1947, it plays a key role in the industry both in Italy and internationally representing “Made by Italy” production – that is, not just machinery produced in Italy, but the wealth of competence and expertise unique to the country, which is the trademark of these technologies, regardless of where they are manufactured. The association carries out lobbying activities, oversees institutional and parliamentary activities in support of the supply chain, monitors legislative actions in the interests of the industry. Italy is among the top three exporters in the world with a market share of nearly 10%. Acimga’s shareholders – currently just less than 70 – represent over 60% of the total industry turnover in the sector and 70% of export turnover. The Italian industry closed 2022 with positive revenues (+7,3%) over the previous year, with a value of €2.945 million. We, ACIMGA, represent about 70 companies from that 20 in the field of the rotogravure industry, such as printing for packaging, decorative printing, printing for publication and embossing (Italian Rotogravure Group by ACIMGA) in Italy. ACIMGA is therefore an important factor in the European supply chain in this sector. Companies represented by us depend on the continued availability of PFAS-based wetting agents for their processes. Application of PFAS-containing wetting agents is mainly conducted in closed plating units limiting the potential for exposure of the environment and the workplace. The largest manufacturer of closed plating units used for rotogravure and embossing is “Maschinenfabrik Kaspar Walter GmbH & Co. KG” (K.Walter), and these units are also widely used by our member companies. K.Walter has submitted detailed comments regarding the PFAS restriction during the consultation period. We would like to express that we fully support the comments submitted by K.Walter concerning the non-availability of alternatives, impacts and the approach to align the restriction with the substitution timelines of CrO3 used in electroplating units. We kindly ask you to take this information into consideration when evaluating the restriction proposal of PFAS for hard-chrome plating. |
| Answer to specific info request 1:  The comment applies to the use “Metal plating and manufacture of metal products (Annex E.2.4.)” and the sub-use “Hard chrome plating”. |

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| 8586 | Date:  2023/09/22 12:36  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Information on alternatives  Information on benefits  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Academic institution  Org. name:  Fraunhofer Heinrich - Hertz - Institut  Org. country:  Germany  Attachment: | General Comments:  In research, we thrive on innovation and would always be willing to research substitutes. But in many areas there is not even an idea for a substitute. Semiconductors used in telecommunications for fast optical data transmission are subject to long certification procedures. Even where it is possible to replace PFAS, the transition times are far from sufficient. From an idea to a product and certification, no one can guarantee that it will be possible in 20 years. Our lasers and detectors, for example, are buried in gas fibre cables in the sea between continents and have to last 40 years. No customer will wait for Europe. We work on new passive optical polymer components containing PFAS. All other products themselves do normally not contain PFAS and can easily be imported from China. All the semiconductor companies in our research environment that have dealt with PFAS in their production are in naked existential fear. It seems urgent not to equate the semiconductor sector with a pizza box. Regulators have failed across the board in the past when it comes to making PFAS visible in the supply chain. There is no documentation requirement at all! This is the only reason why many believe they are not affected. |
| Answer to specific info request 1:  Semiconductors |
| Answer to specific info request 2:  manufacturing: Fluorpolymers, mostly PTFE, are present in production Equipment (sealings, Vacuumoil, etching tanks) They do not react with wafers. The emission at industrial stage is zero. In the use phase there is no emission. In the-end-of life phase the industry knows how to deal with special waste and it is possible to protect the environment from any contamination as we do with all other critical substances. |
| Answer to specific info request 3:  end-of-life-phase: During maintenance and repair PTFE may be replaces ore removed. According legal requirements recycling will be done by special accredited special waste companies. There is no emission to the environment. |
| Answer to specific info request 5:  In our research Institute we are running a semiconductor fab but we are not producing like a company. During maintenance and in we estimate to use less than 100 kg/year. |
| Answer to specific info request 7:  It should be noted that PFAS are so stable because fluorine is the most reactive element with the greatest electronegativity in the periodic table and therefore the compound is so stable. It is precisely this property that is required if semiconductors are to be manufactured reproducibly to atomic layer accuracy. An incorrect seal can outgas molecules that contaminate the entire system or simply make the required ultra-high vacuum impossible. Further explanations can be found in the attached position papers. |
| Answer to specific info request 8:  please see attached Papers from IMAT e.V. and Polyphotonics Berlin e.V. |

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| 8587 | Date:  2023/09/22 12:37  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Information on alternatives  Other socio economic analysis (SEA) issues  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  COCIR  Org. country:  Belgium  Attachment: | General Comments:  This is PART II of the COCIR submission tot he consulttion on Annex XV dossier, that complements PART I submitted in on 2 June 2023. This second part includes: - Expanded analysisi of uses in medical imaging, radiotharapy and associated medical devices - More refined assessment of the quatities of PFAS used yearly by the sector - Analysis of alternative - Case studies about substitution of critical applications - Extension of the socio-economic impact assessment to all imaging and radiotherapy devices in terms of reduced access to healthcare (number of exams that will be missed) - Impact analysis on industry, jobs and competitiveness  Part II of the COCIR submission report is attached to this form |
| Answer to specific info request 1:  See the attached report |
| Answer to specific info request 2:  See the attached report |
| Answer to specific info request 3:  See the attached report |
| Answer to specific info request 5:  See the attached report |
| Answer to specific info request 6:  See the attached report |
| Answer to specific info request 8:  See the attached report |

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| 8588 | Date:  2023/09/22 12:38  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:  <redacted>  Org. country:  Belgium  Company name confidential:  Yes  Attachment:  <redacted>  Privacy statement:  We consider that the document attached in this section, as well as the name of the company for which we are submitting these comments, should be treated as confidential (and as such, should not be disclosed), on the basis of two grounds: (i) the protection of the company’s commercial interests, pursuant to Article 4(2), first indent of Regulation (EC) No 1049/2001; and (ii) the protection of legal advice, pursuant to Article 4(2), second indent of Regulation (EC) No 1049/2001. First, the first indent of Article 4(2) of Regulation (EC) No 1049/2001 provides that “[t]he institutions shall refuse access to a document where disclosure would undermine the protection of: commercial interests of a natural or legal person, including intellectual property […] unless there is an overriding public interest in disclosure”. In this respect, it should be noted that Regulation (EC) No 1049/2001 does not define the concept of commercial interests, except in so far as it specifies that such interests may cover the intellectual property of a particular natural or legal person. The EU Courts nevertheless stress that information withheld under the exception relating to the protection of commercial interests is information which is not generally known to persons belonging to the circles dealing with the type of information in question, within the meaning of that provision. The Court held that it is in principle appropriate for an EU institution to rely on general presumptions applying to certain categories of documents, similar general considerations being likely to apply to requests for disclosure of documents of the same nature (Joined Cases C‑39/05 P and C‑52/05 P, Sweden and Turco v Council, EU:C:2008:374, paragraph 50). In this respect, the General Court has for example confirmed that information on company methods and expertise, specific prices, details of budgets and timetables involved, and elements of business strategies were covered by a general presumption that their disclosure would in principle undermine the protection of commercial interests of the company and that the EU institution therefore did not have to put forward any concrete evidence to justify the non-disclosure of each document, in its entirety (Case T-651/21, Hans-Wilhelm Saure v Commission, EU:T:2022:526, paragraphs 106 and 107). In this case, the document attached in this section contains numerous business secrets and proprietary data of the company submitting it, that are not available in the public domain. It contains knowledge about the specific use of polymerisation aids in the production of polymeric PFASs in medical devices. This expertise and this know-how are not publicly available and their disclosure would cause significant harm to the competitive position of the company, as it would undermine their commercial interests, including intellectual property. Moreover, the document contains and details numerical data as well as R&D work conducted by the company in respect to these particular uses. Knowledge of such information could allow third parties such as an applicant for access to document to access such information, that they could possibly use for their own benefit, which could ultimately undermine the commercial interests of the company submitting these comments. Lastly, it shows the commercial relationship between the company and its suppliers, that also constitutes sensitive information. Moreover, there is no overriding public interest in the present case that would impose the disclosure of the name of the client. According to the case-law of the EU Courts (see, for example, Case C-127/13, Strack v Commission, EU:C:2014:455, paragraph 128), the burden falls on the applicant for access to documents, first, to demonstrate the existence of a public interest likely to prevail over the reasons justifying the refusal of the documents concerned and, second, to demonstrate precisely in what way disclosure of the documents would contribute to assuring protection of that public interest to the extent that the principle of transparency takes precedence over the protection of the interests which motivated the absence of disclosure (Case T-634/17, Anikó Pint v European Commission, EU:T:2018:662, paragraph 48). As such, it is only where the particular circumstances of the case substantiate a finding that the principle of transparency is especially pressing that that principle can constitute an overriding public interest capable of prevailing over the need for protection of the information (Joined Cases C-514/07 P, C-528/07 P and C-532/07 P, Sweden and Others v API and Commission, EU:C:2010:541, paragraphs 156 to 159). In this case, there is no such overriding public interest nor has one been claimed. Second, the second indent of Article 4(2) of Regulation (EC) No 1049/2001 provides that “[t]he institutions shall refuse access to a document where disclosure would undermine the protection of: […] legal advice […] unless there is an overriding public interest in disclosure”. In respect of that exception, as highlighted by the EU Courts (see, for example, Joined Cases C 39/05 P and C 52/05 P, Sweden and Turco v Council, EU:C:2008:374, paragraph 37), the examination to be undertaken by the institution concerned when it is asked to disclose a document must necessarily be carried out in three stages. First, it must satisfy itself that the document which it is asked to disclose indeed relates to legal advice and, if so, it must decide which parts of it are actually concerned and may, therefore, be covered by that exception. Secondly, it must examine whether disclosure of the parts of the document in question which have been identified as relating to legal advice, would undermine the protection of that advice. Thirdly, if it takes the view that disclosure of a document would undermine the protection of legal advice, it should ascertain whether there is any overriding public interest nevertheless justifying disclosure (See Case C-408/21 P, Council v Pech, EU:C:2023:461, paragraphs 37 to 39). In the present case, we submit that the identity of the client (client-attorney relationships are privileged under ethical rules) as well as the content of the document should be considered confidential under the protection of legal advice. It is, firstly, undisputed that the document constitutes legal advice as it is submitted by the law firm relating to their engagement by their client to advise them in submitting comments in the context of the public consultation on the PFAS Restriction Proposal. Secondly, the law firm’s identity being linked to the present comments in a public manner, disclosing the name of their client would lead to the disclosure of the privileged and confidential nature of the client’s relation with its attorneys. Thirdly, as demonstrated above concerning the protection of commercial interests, there is no overriding public interest in the present case that would impose the disclosure of the confidential information. The name of the company on whose behalf these comments are submitted as well as the document attached in Section V should as such be entirely confidential and their disclosure prevented, in application of the exceptions to disclosure contained in Article 4(2), first and second indents of Regulation (EC) No 1049/2001. | General Comments:  Please see confidential attachment in Section V. |
| Answer to specific info request 1:  Please see confidential attachment in Section V. |
| Answer to specific info request 2:  Please see confidential attachment in Section V. |
| Answer to specific info request 5:  Please see confidential attachment in Section V. |
| Answer to specific info request 6:  Please see confidential attachment in Section V. |
| Answer to specific info request 8:  Please see confidential attachment in Section V. |

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| 8589 | Date:  2023/09/22 12:43  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Information on alternatives  Other socio economic analysis (SEA) issues  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Italy  Company name confidential:  Yes  Attachment: | General Comments:  See attachment |
| Answer to specific info request 1:  See attachment |
| Answer to specific info request 2:  See attachment |
| Answer to specific info request 3:  See attachment |
| Answer to specific info request 4:  See attachment |
| Answer to specific info request 5:  See attachment |
| Answer to specific info request 6:  See attachment |
| Answer to specific info request 7:  See attachment |
| Answer to specific info request 8:  See attachment |

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| 8590 | Date:  2023/09/22 12:42  Content:  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Germany  Company name confidential:  Yes  Attachment:  <redacted> | General Comments:  - |
| Answer to specific info request 6:  See SECTION V. Confidential Attachment. |

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| 8591 | Date:  2023/09/22 12:44  Content:  Scope or restriction option analysis  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Germany  Company name confidential:  Yes | General Comments:  Dear Ladies and Gentlemen, I would like to express my concern about the planned regulation of per- and polyfluorinated alkyl substances (PFAS) under the REACH Regulation. While I support the need for strict regulation of hazardous chemicals, I would like to highlight some important concerns related to the proposed measure. 1. Differentiation of PFAS: PFAS are a diverse group of chemicals with different properties and effects on health and the environment. It is important that regulation is not lumped together, but that specific characteristics and risks are taken into account. 2. Alternatives and substitutes: The regulation of PFAS should also take into account the promotion of environmentally friendly alternatives and substitutes. Hasty regulation without sufficient alternatives could have an undesirable impact on our industry. 3. Impact assessment: A comprehensive impact assessment of the proposed regulation is crucial to fully understand potential economic, social and environmental impacts. Regulation should be based on scientific evidence and take into account both short- and long-term effects. 4. Research and development: The regulation of PFAS should take into account ongoing research and development to ensure that innovative solutions are promoted to mitigate risks and address environmental problems. 5. International cooperation: PFAS is a global problem, and coordinated international cooperation in regulation and research is crucial to finding effective solutions. I call on ECHA to take a balanced approach to developing the regulation of PFAS, taking into account the above points. Informed and prudent regulation will ensure that the risks of PFAS are adequately addressed without causing undesirable consequences for industry, innovation and economic growth. Thank you for your attention and commitment to the safety of people and the environment. |
| Answer to specific info request 1:  We may be affected because PFAS is present in the following substances by: Material Full name Common areas of application PTFE polytetrafluoroethylene seals, plain bearings, non-stick coatings FKM Fluoroelastomer Chemical Processing, Oil & Gas Industry, Automotive FPM Fluororubber Chemical Processing, Oil & Gas Industry FFKM Perfluoroelastomer Chemical Processing, Oil & Gas Industry, Semiconductors FVMQ Fluorosilicon Medical Devices, Food Industry PVDF Polyvinylidene Fluoride Chemical Processing, Semiconductor, Wire Insulation FEP Fluoroethylene-Propylene Cable sheathing, hoses, coatings ETFE Ethylene Tetrafluoroethylene Wire Insulation, Architectural Materials PFA Perfluoroalkoxy Chemical Processing, Semiconductors, Medical Technology PFPE Perfluoropolopolyether High Vacuum Technology, Lubricants HFC hydrofluorocarbons Refrigerants in air conditioning systems, solvents HFO Hydrofluoroolefin Environmentally friendly refrigerant, aerosols Teflon brand name for PTFE seals, plain bearings, non-stick coatings Viton Brand Name for FKM Chemical Processing, Automotive, Aerospace |
| Answer to specific info request 5:  Dear Ladies and Gentleman, I demand from you that none. PFAS substance is prohibited unless an alternative material is available. The impact on the supply of food to mankind on the health care of mankind or the entire industry, which otherwise can no longer produce, depends on the use of these substances. If you simply ban substances with no alternative, this can lead to a collapse of the economy, to even more environment, waste and pollution |

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| 8592 | Date:  2023/09/22 12:44  Content:  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  <redacted>  Org. country:  Germany  Company name confidential:  Yes  Privacy statement:  -- | General Comments:  This contribution to the public consultation aims to obtain an exemption from a restriction or ban of the use of Perfluoralkoxy-Polymere (PFA), utilized in industrial applications and as aids and resources in the industrial production of goods (e.g., fused silica, glass products, electronics, optical fibers, ceramics, …). These applications are for example, shelfs, pads, seals, gaskets, tapes, tools and tool parts, hoses, pressure hoses, hoses for corrosive chemicals, pump components, housings and cases, bumpers, guide rails, grippers, cones, clamping devices, tapers, membranes, furnace components, coatings, containers, bottles, internal coatings of tubes, technical (e.g., etch resistant) coatings of devices, surfaces and machine components to mention only a few of them. |
| Answer to specific info request 1:  This contribution to the public consultation aims to obtain an exemption from a restriction or ban of the use of Perfluoralkoxy-Polymere (PFA), utilized in industrial applications and as aids and resources in the industrial production of goods (e.g., fused silica, glass products, electronics, optical fibers, ceramics, …). These applications are for example, shelfs, pads, seals, gaskets, tapes, tools and tool parts, hoses, pressure hoses, hoses for corrosive chemicals, pump components, housings and cases, bumpers, guide rails, grippers, cones, clamping devices, tapers, membranes, furnace components, coatings, containers, bottles, internal coatings of tubes, technical (e.g., etch resistant) coatings of devices, surfaces and machine components to mention only a few of them. Substance used: Name of substance: Perfluoralkoxy-Polymere, PFA EC: 1272/2008 CAS: 26655-00-5 State / form: solid, thermoplast Contributing activity / technique for the environment: Environmental release category (ERC): ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles ERC6A: Use as intermediate. ERC 11A: Wide dispersive indoor use of long-life articles and materials with low release ERC 12C: use of articles at industrial sites with low release Contributing activity / technique for workers: Process Category (PROC): PROC 1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 26: Handling of solid inorganic substances at ambient temperature (no corresponding TRA entry) Technical function: Other: Shelfs, pads, seals, gaskets, tapes, tools and tool parts, hoses, pressure hoses, hoses for corrosive chemicals, pump components, housings and cases, bumpers, guide rails, grippers, cones, clamping devices, tapers, membranes, furnace components, coatings, containers, bottles, internal coatings of tubes, technical (e.g., etch resistant) coatings of devices, surfaces and machine components, … Sector of end use: SU16: Manufacture of computer, electronic and optical products, electrical equipment, medical equipment: industrial equipment, automotive industry, optical spectroscopy, research and science Subsequent service life relevant for this use: unlimited Substance supplied to that use in form of: as such The comment also applies according to sectors and (sub-)uses identified in the Annex XV restriction report (Table 9): Manufacture (Annex E.2.1.) Construction products (Annex E.2.13.) Side-chain fluorinated polymers used for surface protection/ sealants Non-polymeric PFASs as processing aids Electronics and semiconductors (Annex E.2.11.) |
| Answer to specific info request 2:  PFA is a further development of PTFE and has unique features combined in one product (see section 6b) and are thus irreplaceable in many areas of technology due to their exceptional properties. PFA has similar chemical properties than PTFE, but a higher resistance to changes of bend loads. Due to its excellent mechanical and thermal stability as well as inertness, PFA is usually not released into the environment during its life cycle. At the end of usage cycle, PFA is usually disposed of properly. This means that these high-quality materials are currently often deposited or thermally recycled. |
| Answer to specific info request 6:  To 6a.: Due to missing insights, the worldwide demand of PFA is hard to estimate, but it must be high, because it is often used in the industry if plastics with excellent chemical resistance to acids, halogens, hydrocarbons and oxidizing agents are required. To 6b.: PFA has unique features (see Wikipedia): PFA has similar chemical properties than PTFE, but a higher resistance to changes of bend loads. Also the high transparency of PFA is an important factor. Compared to PTFE, PFA is more translucent and have improved flow and creep resistance, with thermal stability close to or exceeding PTFE. PFA is preferred when extended service is required in hostile environments involving chemical, thermal, and mechanical stress. PFA offers high melt strength, stability at high processing temperatures, excellent crack and stress resistance and a low coefficient of friction. PFA is commonly used as a material for piping and as fittings for aggressive chemicals, housings, chemically resistive gaskets, as well as the corrosion-resistant lining of vessels in the chemical-processing industry. Typical applications include the construction of gas scrubbers, reactors, containment vessels and piping. Due to its unique properties, PFA used for a lot of products, utilized in industrial applications. These applications are for example, shelfs, pads, seals, gaskets, tapes, tools and tool parts, hoses, pressure hoses, hoses for corrosive chemicals, pump components, housings and cases, bumpers, guide rails, grippers, cones, clamping devices, tapers, membranes, furnace components, coatings, containers, bottles, internal coatings of tubes, technical (e.g., etch resistant) coatings of devices, surfaces and machine components to mention only a few of them. To 6c.: PFA is widely used in the industry due to its unique properties such as excellent chemical resistance to acids, halogens, hydrocarbons and oxidizing agents, even at high temperatures. Therefore, the number of companies affected by the restrictions must be huge. To 6d.: Depending on the application of PFA there are presumably some alternatives available. These alternatives are for example ceramics, special metals, graphite, plastics such as polymethylene urea (PMU), PP, Nylon, etc., but depending on the alternative they have also drawbacks such as higher weight, lower chemical resistivity, shorter lifetime, lower durability, higher impurities and contamination risks, poor recyclability, etc. or the alternatives are also belonging to the group of PFAS such as Teflon (PTFE) or PVDF. Therefore, the alternatives are not always suitable for all applications, especially if many of the positive PFA properties are required in one product. For example, PP is no longer allowed as vessels or tanks for hydrofluoric acid due to the poor chemical resistivity. To 6e.: As mentioned in section 6d. There are alternatives available, but for countless applications, PFA is indispensable and required, because PFA combines a lot of unique properties mentioned in section 6b in one product. There are presumably several companies having presumably large R&D teams working on alternatives, but insights to those activities are unknown so far. To 6f.: Substitutions are technically and economically presumably only feasible, if other drawbacks are accepted for the respective application. To 6g.: Nowadays, PFA is indispensable for many industrial and medical processes due to its unique properties combined in one product at the same time. PFA is commonly used as a material for piping and as fittings for aggressive chemicals, as well as the corrosion-resistant lining of vessels in the chemical-processing industry. Typical applications include the construction of gas scrubbers, reactors, containment vessels and piping. (see Wikipedia). There is a high risk that product properties change if PFA has to be replaced. In the field of industrial applications and production processes as well as medical applications restrictions or a ban would have a strong impact. In the worst case, some of the applications would be no longer possible, which would have a strong socio-economic impact and damage for the involved industry and the end-users. Important products would have to be stopped, even if they are not directly related to PFA or if PFA is only used in the production process e.g., as a protection layer in devices. In the worst case, jobs will be lost, and industrial sectors have to be closed. |

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| 8593 | Date:  2023/09/22 12:45  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  GlobalFoundries  Org. country:  Germany  Attachment:  <redacted>  Privacy statement:  Protection of our commercial interests, including intellectual property. | General Comments:  - |
| Answer to specific info request 1:  Please refer to our attachment. |
| Answer to specific info request 5:  Please refer to our attachment. |
| Answer to specific info request 7:  Please refer to our attachment. |

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| 8594 | Date:  2023/09/22 12:45  Content:  Scope or restriction option analysis  Hazard or exposure  Environmental emissions  Description of analytical methods  Information on alternatives  Other socio economic analysis (SEA) issues  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  Japan Electronics and Information Technology Industries Association（JEITA)  Org. country:  Japan  Attachment: | General Comments:  We, Japanese four electric and electronic equipment industry (JP4EE, that is: JEITA (Japan Electronics and Information Technology Industries Association), CIAJ (Communications and Information Network Association of Japan), JBMIA (Japan Business Machine and Information System Industries Association) and JEMA (Japan Electrical Manufacturers’ Association)) have been vigorously committed complying with chemical regulations set by many countries. We have consistently supported the ambitious attempt of EU to reduce the risk caused from the hazardous substances and sincerely and diligently taken actual measures to meet the requirements under the EU chemical regulations such as REACH. The electrical and electronic equipment (EEE) are manufactured via supply-chain extending over the world, and chemical legislations in the EU, one of the big markets in the world, would have big influence over the world. Under such situation, we believe it essential that proposed requirements would not hamper the smooth international circulation of the products including EEE and would be implementable as a law reasonably. From the point of view above, we would be very happy if you consider the following opinions carefully. Our general comments are attached to this input as JP4EE Annex\_1-2\_Japan 4EE Comments on restriction dossier on PFAS Part 2. We summarise our input here, but please see our JP4EE Annex\_1-2 and other Annexes relating to each topic.  (1) The restriction should be considered based on the risk evaluation. Especially, it would be appropriate for ECHA to reconsider the proposed restriction for fluoropolymers, if ECHA cannot provide scientific justification for such measures. We have consistently supported the ambitious attempt of EU to reduce the risk caused from the hazardous substances and sincerely and diligently taken actual measures to meet the requirements. However, it is unfeasible to legislate the PFAS restrictions in this dossier as they stand, and we are deeply concerned that, if enforced, they will not only hollow out EU industry, but also make existing infrastructure unsustainable.  (a) About the risk assessment of the substances themselves. PFAS are a huge group of substances that include many different substances with varying levels of risk. However, we believe that a blanket restriction on all PFAS may lack a risk-benefit balance and is not scientifically or socio-economically sound. As PFAS are not even SVHCs, it is impossible to provide accurate information on their use in articles within the input deadlines for dossiers, so we have to guess based on speculation (See (6) below for Explanation of Difficulties in Obtaining Information on Chemical Substances Contained in EEE.). Risk assessments based on such guesses may lack credibility. Highly hazardous PFAS such as PFOS and PFOA are already restricted under REACH. If other PFAS for which a hazard classification has not yet been identified are to be restricted, a proper risk assessment should be conducted and the regulation should focus on applications with high exposure potential and well-established alternative technologies.　 Especially for the risk of fluoropolymers, Chemical industry explains as follows: Fluoropolymers do not pose a risk to human health or the environment as they are non-toxic, not bioavailable, non-water soluble, non-mobile and do not bio accumulate. If ECHA cannot provide more reasonable justification, it would be appropriate for ECHA to reconsider the proposed measures for fluoropolymers.  (b) About the assessment of the risk caused by the substances in the articles. During the use of articles like EEE, it is presumed that an exposure amount of PFAS is generally negligibly low compared with the exposure of the PFAS as chemicals own. The blanket restriction on PFAS will affect many industries. We hope that you will consider our recommendations and information in the following sections and make a scientific and technical decision about the need for and feasibility of regulation.  (2) The possible risk caused from the articles should be properly considered, and convincing justification should be provided to show why the uniform restriction of PFAS in the articles is the most appropriate Union-wide measure to address the identified risks. In the course of risk assessment, the fact that the end-of-life stage of EEE is managed according to WEEE Directive should be well-recognised and evaluated. We would like to ask the researchers and law-makers to evaluate the industry’s effort and diligence to meet the sector-specific EPR legislation properly. We believe that emissions relating to EEE are quite well managed and are quite limited. If there are any concerns on the EOL stage of EEE, requirements for separate treatment under the recycling legislation such as Article 8 of WEEE or occupational safety regulations would be more effective ways to manage them with better cost-benefit than reflecting them to the threshold of PFAS under REACH which does not cover waste in principle.  (3) The regulation for the substances which are currently and widely used in the global supply-chain should be gradually introduced. If the uniform restriction of PFAS in the articles is really planned by ECHA after the proper risk assessment, all the issues described in our following comments should be carefully considered for establishing the feasible and enforceable measures. For complex articles such as electrical and electronic equipment (EEE), even a single substance survey will not work unless the entire global supply-chain responds appropriately to the survey. In such context, the collection of SVHC information is a well-established tool for understanding the presence of substances of concern, and through SVHC surveys, end-product manufacturers can make concrete estimates of the amount of the substance used and the potential impact if the substance is regulated.  However, as the restriction of PFAS is proposed not via the route via SVHC and authorization, end-product manufacturers are unable to estimate the exact amount of use or potential impact. Forcefully requesting information on the proposed restrictions in this situation would have little chance of gathering reliable data.  In addition, even if we had been able to gather more data, we consider that the separate date of the restriction of the articles should be set as a date later than that for chemicals. For EEE, complex articles, necessary transition period would be at least 5 years or more after the feasible substitutes are available as substances or mixtures. For EEE for industrial and social infrastructures would need longer time. From this perspective, it makes practical sense to establish an "Authorisation" step before restricting a substance. Please also see our Comment (5) below.  (4) About the appropriate thresholds and denominator for the articles: The management at the level of 1,000 ppm in the article would be practical and feasible. We consider that the feasible denominator for the restriction of substances in the articles should be “article” and not be “homogeneous material”, especially for the proposed thresholds is at ppb order. What can be surely managed by the article manufacturers are threshold value on the order of 1,000 ppm. Please see our Comment 4 in JP4EE Annex\_1-2 attached to this input for the details.  (5) Necessity of sufficient time until the enforcement of the restriction. In the case of restricting substances contained in articles according to the REACH, we would like the Dossier Submitter to set sufficient time until the enforcement of the restriction. For the very small amount of PFAS in complicated EEE, it would take 48 months only to complete the investigation of containment. We are continuously investigating and reviewing the PFAS applications in EEE after the submission of our 1st input, and we consider that most of the applications found out would need applicable derogations. The reasons why are that many of substitutable applications of PFAS have already been replaced in response to the recent trend of regulating fluoro-substances and PFAS materials with high-performance are relatively expensive.  However, it takes very long time to investigate the substances which have not become even SVHCs through the whole supply-chain and to check whether there are any other unknown applications using PFAS than those currently known or not. Based on the experience of compliance with the RoHS Directive, even in the case when replacement exists, a period of at least 4 years is necessary to implement substitution in the article, even if the restricted substances are clearly identifiable and the threshold value is on the order of 1,000 ppm. PFAS is very huge group of substances, we cannot even assume the necessary transitory period, but we estimate that at least 4 years would be needed only to complete the investigation of containment. Please see our Comment (6) for the difficulties in the investigation of such products.  In considering the above, the first four years had better to be set as a kind of “checking point” for the complex articles. If any application becomes known during this period and no feasible substitutions are found out at present, a mechanism to set a new derogation for such application should be established.  (6) Explanation of Difficulties in Obtaining Information on Chemical Substances Contained in EEE. We would like to explain again about the difficulties in obtaining information on chemical substances contained in EEE, as the reason why that it takes long time to investigate very small amount of substance(s) in the complex articles, as described in the comment 5 above. This is because we feel it would be difficult to have the law-makers, who have mainly covered chemicals, understand truly how the material investigation in the complex article is difficult. Please see our Comment 5 in JP4EE Annex\_1-2 attached to this input for the details.  (7) The period and the way of setting and maintaining a “derogation” should be further considered and established. The criteria for setting a derogation for the essential use for the complex articles should be similar to those of RoHS, and the date set for a derogation should not be an expiry date of the derogation but be a date for reviewing it.  (a) About the criteria for setting a derogation for the essential use for the complex articles. As PFAS is the huge group of the industrial chemicals taking indispensable uses on complex articles at present, the conditions set in the Article 5(1)(a) of RoHS DIRECTIVE 2011/65/EU should be considered in determining appropriate derogations for the PFAS in the complex articles as follows: (a) inclusion of materials and components of EEE for specific applications in the lists in Annexes III and IV (note: exempted applications from the restriction under RoHS), … where any of the following conditions is fulfilled: ‑ their elimination or substitution via design changes or materials and components which do not require any of the materials or substances listed in Annex II (note: restricted substances) is scientifically or technically impracticable, ‑ the reliability of substitutes is not ensured, ‑ the total negative environmental, health and consumer safety impacts caused by substitution are likely to outweigh the total environmental, health and consumer safety benefits thereof.  (b) About the procedures relating to applying, setting and reviewing a derogation. Current PFAS dossier proposes three types of the duration, that is, five years, twelve years, and without limitation, for the listed derogations. However, we feel uncertain whether the duration of five years plus transitory period would be feasible for the substitution. Such duration would be feasible when there are practical substitutes which can be used in the actual products with a certain reliability, but we have experienced many cases where some non-substitutable applications are inevitably found out in pushing forward the actual substitution. In addition, we also feel concern about the duration of twelve years plus transitory period, because there is no guarantee that some alternative technology is developed and that the substitution becomes practically feasible within such duration for PFAS applications relating to semi-conductors, for example. The complex article manufacturers consider that the date set for a derogation should not be an expiry date of the derogation but be a date for reviewing it. For your reference, under current RoHS Directive, all the exemptions (derogations) are checked by the industry every five years. Then, for the applications which have not become substitutable yet, the Commission technically reviews them in response to the requests for renewal of the exemption from the industry. However, the review and renewal of many exemptions at five years’ interval would not be practical, because the burden for such actions is so heavy not only for the industry but also for the authority. We consider twelve years’ interval would be practical and feasible to review the derogations, in considering the broad coverage of PFAS group, the time for the chemical industry to develop the new materials and wide-variety of the final applications in EEE.  (8) Necessary PFAS derogations in EEE. (Relating to the Questionnaire 6 to 8). There are currently no feasible substitutes for PFAS which can attain the performance needed for EEE for the applications listed in Column E of our revised JP4EE Annex 3. We would like to request ECHA to set the derogations for them, as the feasibility in EEE becomes assessable only after the viable substitute materials are established. Please see our previous Annex 2 “The unfeasibility of “possible substitutes” in the dossier in the actual EEE” and new JP4EE Annex 9 “Unfeasibility of other “possible substitutes” in actual EEE”, for the explanation of reasons why the candidate substitutions are not feasible in the actual EEE. Please see the JP4EE Annexes 3 to 6 for the applications needing derogations and reasons. The essential applications of PFAS needed for EEE are also listed in our answers to the Questions 6 -8 of this Questionnaire. Please also see them.  Please refer to the following Annexes to our input: ‑ JP4EE Annex 3 rev List A of PFAS essential uses in EEE: Updated Essential Application list A: Explanation starting from PFAS as chemical materials. ‑ JP4EE Annex 4 rev List B of EEE Functions needing PFAS: Slightly-updated Essential Application list B: List of the functions and properties necessary to electrical and electronic equipment (EEE), which need PFAS materials to attain required performances. ‑ JP4EE Annex 6 Explanation on EEE Functions in Annex 4 (List B)：Supplementary Explanation on the functions of EEE needing PFAS shown in our List B of EEE Functions needing PFAS. ‑ Annex 5. Supplementary Explanation in Relation to Japan 4EEIA Input on PFAS Dossier. (Attached to our 1st input) In addition, following Annexes should be referred to, these cover also following Comment 7. ‑ Annex 2. The unfeasibility of “possible substitutes” in the dossier in the actual EEE. (Attached to our 1st input) ‑ JP4EE Annex 9 Unfeasibility of other “possible substitutes” in actual EEE  (9) Necessary PFAS derogations in manufacturing processes of EEE and its parts. (Relating to Questionnaire 8). There are currently no feasible substitutes for PFAS which can attain the performance needed to produce the parts needed for EEE for the applications listed in JP4EE Annex 7. We would like to request ECHA to set the derogations for them, as the feasibility in EEE becomes assessable only after the viable substitute materials are established. Please see our previous Annex 2 “The unfeasibility of “possible substitutes” in the dossier in the actual EEE” and new JP4EE Annex 9 “Unfeasibility of other “possible substitutes” in actual EEE”, for the explanation of reasons why the candidate substitutions are not feasible in the actual EEE.  The items considered necessary for derogation in the manufacturing process of EEE and its components are as follows (Column C of JP4EE Annex 7): 1. Immersion process. 2. Electrode formation process with safety function for film capacitors. 3. Electrode formation process of Electric Double Layer Capacitor (EDLC). 4. Coating process of optical film for electronic displays.  Please refer to the following Annexes to our input: ‑ JP4EE Annex 7 List C of PFAS essential uses in EEE manufacturing: Non-Exhaustive PFAS Essential Application list C: Explanation of applications in the manufacturing process of electrical and electronic equipment and its components. ‑ JP4EE Annex 8 Explanation on PFAS essential uses in EEE manufacturing in Annex 7 (List C): Supplementary Explanation on the manufacturing processes of EEE and its parts which need PFAS and listed in our Essential Application list C (Annex 7).  (10) A derogation for articles already placed on the market before implementing the restriction should be provided like other restriction covering articles under Annex XVII to REACH. Proposed derogation: Paragraph 2 shall not apply to articles already placed on the EU market before the date referred to in paragraph 3. Please note that the draft Regulation on PFHxA, published in 13 June 2023, includes this derogation. We consider that a similar derogation should be set also for the PFAS restriction. Please see our Comment 10 in JP4EE Annex 1-2 to this input for the detailed justification.  (11) A General exemption of spare parts without expiry date would be indispensable for complicated articles to extend their useful life, if their original products are placed on EU market before the requirement comes into force. After submitting our previous input, DIGITAL EUROPE, the leading trade association representing digitally transforming industries in Europe, inputted their comments about this issue (Please see Ref. No.5927 listed in “rest\_pfas\_rcom\_part25\_36502\_en”. We, Japan 4EE industrial associations endorsed the comments along with other stakeholders in Japan. Please recognise and understand that this is the common and important issue for the industry relating to the complex articles. Please see our Comment 11 in JP4EE Annex 1-2 to this input for the details.  (12) About the reporting requirements on each PFAS contents：The articles should be excluded from the scope of reporting. We consider that it is impractical for article manufacturers to carry out thorough investigation, record and report on thousands of PFAS compounds that would be covered by the proposed rule. Information that article manufacturers at the downstream in a supply chain can obtain depends on the information received from component suppliers at upstream in the same supply chain. Since PFAS compounds as a class have not been restricted in any other jurisdictions, it would not be able to obtain accurate information such as the identity of each substance and each volume used in a part or product via broad, long and complex supply chain. As the result, the information ECHA would receive would be incomplete and of uncertain reliability, and it likely would not be of much value to ECHA in achieving its regulatory objectives. Taking into account the above, we would like to propose excluding PFAS-containing articles from the scope of reporting. At least, we consider it unfeasible and excessive to require manufacturers, importers of PFASs and PFAS containing articles to provide information on "the identity and quantity of the substances placed on the market in the previous year." Please see our Comment 12 in JP4EE Annex 1-2 to this input for the details.  (13) Preceding evaluations should be respected, especially for RAC/SEAC Opinion on PFHxA. If proposed PFAS restriction covers also PFHxA, all the derogations proposed in the final “RAC and SEAC Opinion on an Annex XV dossier proposing restrictions on undecafluorohexanoic acid (PFHxA), its salts and related substances”, published in May 2022, should be incorporated, because they are resulted from the full socio-economic impact assessment. Especially, following conditions and derogations are indispensable for the EEE industry. We listed such derogations in Comment 13 in JP4EE Annex 1-2 to this input. Please refer to it for the details.  (14) Others: About the following comments in our 1st input (listed as No. 4543 in "rest pfas rcom part21 36501 en"), we don’t resubmit them here because they do not include any items to be updated. However, the issues are still to be solved, and please refer to them as necessary: 1-9. Possible negative impact to the occupational safety in production process from the restriction of PFAS 1-10. There are no analytical methods for complex articles at ppb order. (Please see our 1st input to Question 10 in the questionnaire (Ref. No. 4543 in "rest pfas rcom part21 36501 en".)   The above are our second comments updated and added. We would like to ask ECHA to consider our first and second input along with our all other attachments carefully. We expect that ECHA would examine the dossier in a balanced way in considering the risk/benefit of the proposed measures.  Chemical regulations of EU have been a model of the global legislations in this area for many years. In such situation, we sincerely hope that ECHA and the European Commission would be able to contribute to the effective protection of human health and environment via reasonable and appropriate management of chemical substances based on regulatory science and accountability, by considering our comments above. |
| Answer to specific info request 1:  Please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501 en"). Our input mainly covers “Electronics and semiconductor (Annex E.2.11.)”. However, please see the input from other industrial associations covering semiconductors, especially the technical papers from SIA (Semiconductor Industry Association). “Electronics” includes both electrical and electronic equipment and its components themselves and manufacturing processes. In particular, applications whose main purpose is to perform functions in the manufacturing process have been listed and added to Annex 7 and 8. Please see these Annex. In addition, “battery” is indispensable for EEE industry, which would be covered under “Energy (Annex E.2.12.)”, though currently there is no independent sub-category for it. The essential applications that we listed would be applicable also to the batteries. However, please see the input from other industrial associations covering batteries for the details on special PFAS usage in the batteries. “Semiconductor” and “battery” are indispensable to EEE as parts for EEE manufacturers. However, other sectors are also relating to EEE and some of our input cover them as follows. EEE is a complex article comprising various components such as semiconductors or batteries and of many materials including lubricants, and many industrial sectors engage in its production in the long and complicated supply chain. Accordingly, regulations on other related sectors than EEE would have effect on EEE manufacturing as the results. Please also see Annex 5 of our input. “Material” for EEE manufacturers are “product” for chemical/raw material manufacturers, and thus “lubricant” sector are also related to EEE sector. (1) Sectors relating the manufacturing stage of EEE: (1) (i) “Metal plating and manufacture of metal products (Annex E.2.4.)”, especially for “Hard chrome plating”. Our input (Annexes 3 and 4) does not cover it directly because we do not plate metal materials by ourselves. However, because EEE makes use of the resulted metal, it is important also for EEE manufacturers that the derogations needed for the metal industry are adequately allowed. (1) (ii) “Applications of fluorinated gases (Annex E.2.8.)”, especially for “Refrigeration”, “Solvents”, “Insulating gas in electrical equipment”. Please also refer to other detailed-comments from fluorinated gas industry on these applications, for example, from Japan Refrigeration and Air Conditioning Industry Association (JRAIA). For the fluorinated gases used in the semiconductor industry, please also see our previous answer to Question 7 in 13 June 2023 (listed as No. 4543 in "rest\_pfas\_rcom\_part21\_36501\_en"). (1)(iii) “Lubricants (Annex E.2.14)”. (1)(iv) “Plastics (other than packaging) and rubber/elastomer production (including flame retardant)”. These are not listed in Table 9, but shown as “uses not researched in detail” in Table A1 of Annex A. Our input covers flame retardant as safety issue of electronics, our finished products, but the manufacturing stage of materials including flame retardants would be covered under this sector which is not researched. (2) Sectors relating the parts contained in EEE: (2)(i) Semiconductor, as a subsector of “Electronics and semiconductor (Annex E.2.11.)”. (2)(ii) Batteries. These would be covered under “Energy (Annex E.2.12.)”, though currently there is no independent sub-category for them. (2)(iii) “Applications of fluorinated gases (Annex E.2.8.)”, especially for “Refrigeration”, “Air conditioning and heat pumps”, “Solvents”, “Insulating gas in electrical equipment”. Please also refer to other detailed-comments from fluorinated gas industry on these applications, for example, from Japan Refrigeration and Air Conditioning Industry Association (JRAIA). (2)(iv) “Technical Textile” under “TULAC (Annex E.2.2.)”. (2)(v) “Lubricants (Annex E.2.14)”. (2)(vi) “Printing ink” and/or toner. These are not listed in Table 9, but “printing inks” are shown as “uses not researched in detail” in Table A1 of Annex A. These are non-substitutable applications relating to the imaging equipment (such as printers and copiers), one of the EEE, therefore we list them on our Annex 3. However, please refer to other detailed-comments from related industrial association on these applications. On the other hand, please note that almost all the industrial sectors would be affected by regulation on EEE as they make use of electric and electronic parts as their components. (3) Sectors making use of electric and electronic technology: (3)(i) Medical devices (Annex E.2.9.), if they make use of electric power. (3)(ii) Transport (Annex E.2.10.), if they have electronic parts. EEE covers so many various product categories, but the technologies and materials and parts used in EEE are basically common. Furthermore, EEE is covered under WEEE Directive 2012/19/EU at its end of life stage. Therefore, we believe that EEE should be treated as one category under REACH Annex XVII in most cases. However, some product categories under RoHS such as medical or measurement equipment may need additional applications in addition to those for the other EEE. |
| Answer to specific info request 2:  Please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501 en"). This is very important, and there are so many comments, we will re-input it here. In the course of risk assessment, the fact that the end-of-life stage of EEE is managed according to WEEE Directive should be well-recognised and evaluated. We would like to ask the researchers and law-makers to evaluate the industry’s effort and diligence to meet the sector-specific EPR legislation properly. For product groups such as automobiles and EEE, waste regulations and occupational safety standards have already been established. The end-of-life stage of EEE is strictly and properly managed according to WEEE Directive. No e-wastes are dumped into environment without necessary care. Other complicated products such as vehicles are also managed under their sector-specific waste legislations. Such legislations apply extended producer responsibility (EPR) to the manufacturers, and the industry has taken big effort to meet the requirement with spending huge cost and resources. We would like to ask the researchers and law-makers to evaluate such effort and diligence properly. If there are concerns on the risk of substances and mixtures, it may be more effective to cover them by occupational safety standards or the like. We consider that the methods of management should be flexible if there are other effective options to be considered. We believe that emissions relating to EEE are quite well managed and are quite limited. In the first place, at design and manufacturing stages, the use of PFAS in EEE is limited to the places where the functions of PFAS are really necessary, because PFAS materials are more expensive in exchange for high-performance than non-PFAS low-performance ones. In addition, in use phase, EEE must keep their quality and performance in their durable life. The PFASs used in products have a very low vapour pressure and therefore do not volatilise at room temperature, and are designed to remain where they are applied to in order to provide the required function during the product life time, and to perform well under more severe conditions than the rated operating conditions. We therefore believe that it is unlikely that PFASs will be released into the atmosphere from the products during the use phase. EEE will enter into end-of-life stage with keeping the above conditions, and the emission at EOL stage has been adequately and legally controlled because waste EEE is covered under EU recycling legislations such as WEEE Directive 2012/19/EU or Battery Directive 2006/66/EC. Therefore, we consider that PFAS contained in the products from the volume of PFAS use, 4,860t, for EEE (Electronics and semiconductor), as described in the baseline, would not be discarded to the environment. If there are any concerns on the EOL stage of EEE, requirements for separate treatment under the recycling legislation such as Article 8 of WEEE or occupational safety regulations would be more effective ways to manage them with better cost-benefit than reflecting them to the threshold of PFAS under REACH which does not cover waste in principle. |
| Answer to specific info request 3:  Please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501 en"). This is very important, and there are so many comments, we will re-input it here. Please see our input to Question2. For the articles such as EEE for which the special EU waste legislations are enacted based on the finished products, we believe that the end-of-life issues should be covered by the existing corresponding waste legislations, not by REACH. All the EEE have been separated from the general municipal waste stream, and WEEE treatment industry treat them, therefore no municipalities do any treatment of WEEE such as incineration. Any additional requirements to collect WEEE containing PFAS separately would be redundant and unnecessary, because all the EEE has been already collected and treated separately. Annex VII to WEEE Directive 2012/19/EU sets the separate treatment criteria for the specified materials and components according to the Article 8(2). The way of treating PFAS in EEE should be considered under the framework of WEEE Directive, as necessary. The Stockholm Convention on Persistent Organic Pollutants indicates PFOS waste should be thermally destroyed at a minimum 850°C and for PFOA waste, at 1,000°C, preferably at 1,100 °C. If such treatment is needed, for example, the information on the parts containing PFAS can be considered as an additional item for providing information to the treatment facilities under the Articles 8 (Proper treatment) and 15 (Information for treatment facilities) of WEEE Directive 2012/19/EU. |
| Answer to specific info request 4:  Please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501 en") and our Comments 9 and 10 in attached “JP4EE Annex\_1-2\_Japan 4EE Comments on restriction dossier on PFAS Part 2”. There are two ways of recycling the articles: one is the chemical recycling by returning the articles to the chemical materials, and the other is the recycling the products themselves or its parts/components. For the former, please consult to the chemical industry because chemical recycling is covered by the chemical companies. Our input covers the latter. (1) For recycling of the articles, derogation for articles already placed on the market before implementing the restriction should be provided like other restriction covering articles under Annex XVII to REACH. With such derogation, used, repaired or refurbished products would be able to be used after the restriction without problems. Proposed derogation: Paragraph 2 shall not apply to articles already placed on the EU market before the date referred to in paragraph 3. Please note that the draft Regulation on PFHxA, published in 13 June 2023, includes this derogation as follows: 6. By way of derogation from paragraph 1, that paragraph shall not apply to articles placed on the market before [PO: please insert the date = 24 months from the date of entry into force of this Regulation]. 7. By way of derogation from paragraph 2, that paragraph shall not apply to articles placed on the market before [PO: please insert the date = 36 months from the date of entry into force of this Regulation]. We consider that a similar derogation should be set also for the PFAS restriction. For detailed Justification, please also see our Comments 9 in attached JP4EE Annex\_1-2. (2) A General exemption of spare parts without expiry date would be indispensable for complicated articles to extend their useful life, if their original products are placed on EU market before the requirement comes into force. Please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501 en") and our Comments 10 in attached JP4EE Annex\_1-2. After submitting our previous input, DIGITAL EUROPE, the leading trade association representing digitally transforming industries in Europe, inputted their comments about this issue (Please see Ref. No.5927 listed in “rest\_pfas\_rcom\_part25\_36502\_en”. We, Japan 4EE industrial associations endorsed the comments along with other stakeholders in Japan. Please recognise and understand that this is the common and important issue for the industry relating to the complex articles. In relation to this matter, a study for the possible policies in future RoHS covering EEE has been published recently, and many measures are proposed for EEE to contribute further to the circular economy. Study to support the assessment of impacts associated with the general review of Directive 2011/65/EU (RoHS Directive) Final report https://op.europa.eu/en/publication-detail/-/publication/b9188764-f465-11ed-a05c-01aa75ed71a1/language-en/format-PDF/source-286516984 The report includes following recommendation: “Ensuring that RoHS contributes to increased use of recovered spare parts Reuse of products or parts of products is an important part of circular economy as it can contribute to reduce the material footprint and increase resource efficiency. The current wording of Article 4(5) of the RoHS Directive only allows the reuse of spare parts from EEE which have been placed on the EU market within certain temporal conditions. This wording therefore restricts the recovery of spare parts which limits the potential of the Directive to strengthen circular economy objectives. The objective is that RoHS should not disproportionally hinder the use of recovered spare parts, while simultaneously alleviating administrative burden on economic operators and regulatory bodies. For this, one possibility could be opening the temporal and geographical scope of Article 4(5). Stakeholders would have legal certainty that the reuse of recovered spare parts from any device is possible. Alternatively, only the geographical scope could be opened, but the temporal limitations kept. This would mean that certain time-limited exemptions for the medical industry are not necessary anymore, however some legal complexity would still remain due to the remaining temporal limitations.” However, current PFAS dossier does not include these two fundamental derogations above and may hamper the contribution of EEE to the circular economy. |
| Answer to specific info request 5:  Please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501\_en"), and our answers to the Questions 2 and 3 above. |
| Answer to specific info request 6:  Please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501 en"). There are currently no feasible substitutes for PFAS which can attain the performance needed for EEE for the applications listed in Column E of our revised JP4EE Annex 3. We describe the essential applications of PFAS needed in EEE in our revised list in more concrete way than those in our previous input. We would very appreciate it if ECHA carefully reviews our revised input. We would like to request ECHA to set the derogations for them, as the feasibility in EEE becomes assessable only after the viable substitute materials are established. For the detailed reasons of needing derogations and possible socio-economic impact, please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501\_en) and the following Annexes attached to our input： ‑ JP4EE Annex 3 rev List A of PFAS essential uses in EEE: Updated Essential Application list A: Explanation starting from PFAS as chemical materials. (Updated cells are shown in yellow.) EEE inevitably needs derogations for the essential applications listed in Column E of this list A from the proposed PFAS restriction. ‑ JP4EE Annex 4 rev List B of EEE Functions needing PFAS: Slightly-updated Essential Application list B: List of the functions and properties necessary to electrical and electronic equipment (EEE), which need PFAS materials to attain required performances. ‑ JP4EE Annex 6 Explanation on EEE Functions in Annex 4 (List B)：Supplementary Explanation on the functions of EEE needing PFAS shown in our List B of EEE Functions needing PFAS (Annex 4) Among the above listed applications, “missing uses” relating to EEE industry are as follows: (1) Printing inks/Toner. This does not appear in Table 9 in the Dossier, but an application, “printing inks”, is shown as “Uses not researched in detail” in Table A.1 in Annex A to the Dossier. We list an essential application, “functional material used in printing process” including “printing inks and toners” in our revised Annex 3 as follows, because it is relating to the imaging equipment (printers, copiers, etc.), one of the EE products categories. However, for the details on chemicals used in printing process, please refer to the input from the related industries, such as Japan Business Machine and Information System Industries Association (JBMIA), for the concrete details of “Functional materials used in printing process”. Essential uses listed in our JP4EE Annex 3 relating to this use: < Necessary derogations relating to Fluoropolymers > 15. Functional material used in printing process (Please refer to the input from the related industries, such as Japan Business Machine and Information System Industries Association (JBMIA), for the concrete details.) < Necessary derogations relating to Fluoroalkyl compounds with functional groups (such as -OH, -COOH, N-R, etc.) and Side-chain fluorinated polymers > 19. Functional material used in printing process (Same as 15 above.) < Necessary derogations relating to Other fluorinated compounds > 28. Functional materials used in printing process (Same as 15 above.) (2) Plastic (Other than packaging) and rubber/elastomer production (including flame retardants). These are not listed in Table 9, but shown as “uses not researched in detail” in Table A1 of Annex A. Our input (JP4EE Annexes 3 and 4) covers flame retardant as safety issue of electronics, our finished products, as follows: “Anti-dripping agent used for safety and to enhance flame retardancy”. However, the manufacturing stage of materials including flame retardants would be covered under this sector which is not researched. Essential uses listed in our JP4EE Annex 4 relating to this use: < Necessary derogations relating to Fluoropolymers > 4. Insulating material requiring flame-retardancy and/or heat-resistant, where the use is needed for safe functioning and safety of equipment. 7. Anti-dripping agent used for safety and to enhance flame retardancy. |
| Answer to specific info request 7:  Please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501 en"). There are currently no feasible substitutes for PFAS which can attain the performance needed for EEE for the applications listed in Column E of our revised JP4EE Annex 3. We describe the essential applications of PFAS needed in EEE in our revised list in more concrete way than those in our previous input. We would very appreciate it if ECHA carefully reviews our revised input. We would like to request ECHA to set the derogations for them, as the feasibility in EEE becomes assessable only after the viable substitute materials are established. Among the listed applications, “potential derogations marked for reconsideration” relating to EEE industry are as follows: (1) 5.ee "semiconductor manufacturing process" Please note that we explain about “thin-film devices manufacturing process" here with semiconductors because they use almost identical manufacturing processes to those of semiconductors such as MEMS, SAW filters, etc., though currently it is not listed as a potential derogation. Essential uses listed in our JP4EE Annex 3 relating to this use: < Necessary derogations relating to Fluoropolymers > 13. PFAS used for semiconductor manufacturing process, semiconductor manufacturing equipment, and semiconductor 14. PFAS used for thin-film device (Micro Electro Mechanical System/MEMS, SAW device, Capacitor, etc) manufacturing process, thin-film device manufacturing equipment, and thin-film device < Necessary derogations relating to Fluoroalkyl compounds with functional groups (such as -OH, -COOH, N-R, etc.) and Side-chain fluorinated polymers > 17. Semiconductor manufacturing process 18.Thin-film device (Micro Electro Mechanical Systems/MEMS, SAW, Capacitor etc) manufacturing process < Necessary derogations relating to Fluoroalkanes and fluoroalkenes, and Fluoroethers and fluoro-ketones > 21. Refrigerant, coolant, cleaning agent and solvent used for semiconductor process 22. Refrigerant, coolant, cleaning agent and solvent used for thin-film device (Micro Electro Mechanical Systems/MEMS, SAW etc) process 23. Chemicals for ultra-fine processing applications, as typified by semiconductor and MEMS manufacturing processes \*HFC-23 (CHF 3), HFC-32 (CH 2 F 2), HFC-152 a (CHF 2-CH 3) , HCFC-141 b (CCl 2 F-CH 3), HFO-1132 a (CH 2=CF 2) are outside the scope definition of this regulation (from Annex A Appendix A .3 .9 Applications of Fluorinated Gases). Minor uses; In the electronics and semiconductor industries, fluorinated gases are used in etching and chamber cleaning processes to form nano-level fine semiconductor integrated circuits, etc., including CHF 3, CF 4, perfluoroethane, perfluoroalkane, and cycloalkane (Annex A A.3.9.1.7) < Necessary derogations relating to all the PFAS > 29. Functional coatings\* (\* "Functional coating" is a coating applied to an article in order to give it the required functions, such as low dielectric properties, low dielectric loss tangent, electrical insulation, heat resistance, UV resistance, chemical resistance, corrosion resistance, weather resistance, water repellency, oil repellency, slipperiness, low refractive index and so on. "Functional coating" includes, but not limited to, "conformal coating" used to protect electronic materials. In our input, we use the term "functional coating" because the required functions are not only to protect the objects.) For the detailed reasons of needing derogations and possible socio-economic impact, please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501\_en) and the following Annexes attached to our input： ‑ JP4EE Annex 3 rev List A of PFAS essential uses in EEE: Updated Essential Application list A: Explanation starting from PFAS as chemical materials. (Updated cells are shown in yellow.) EEE inevitably needs derogations for the essential applications listed in Column E of this list A from the proposed PFAS restriction. ‑ JP4EE Annex 4 rev List B of EEE Functions needing PFAS: Slightly-updated Essential Application list B: List of the functions and properties necessary to electrical and electronic equipment (EEE), which need PFAS materials to attain required performances. ‑ JP4EE Annex 6 Explanation on EEE Functions in Annex 4 (List B)：Supplementary Explanation on the functions of EEE needing PFAS shown in our List B of EEE Functions needing PFAS (Annex 4) In addition to the above, please see the paper published by SIA (Semiconductor Industry Association): These can be downloaded. Please read these papers for details. “The Impact of a Potential PFAS Restriction on the Semiconductor Sector” 13th April 2023 (2) 5.v. Hard chrome plating. Current PFAS dossier sets “9. Paragraphs 1 and 2 shall apply without prejudice to the application of any restrictions set out in this Annex or to other applicable Union legislation.”, but how to treat the restrictions under consideration is unclear. If proposed PFAS restriction covers also PFHxA, at least following derogation proposed in the final SEAC Opinion on PFHxA should be incorporated into PFAS regulation, because it is resulted from the full socio-economic impact assessment. “5. Paragraphs 1 and 2 shall not apply until XX XX XXXX [five years after the entry into force] to: (a) hard chrome plating.”“5. Paragraphs 1 and 2 shall not apply until XX XX XXXX [five years after the entry into force] to: (a) hard chrome plating.” (3) 5. cc. membranes used for venting of medical devices. Likewise, following derogations proposed in the final SEAC Opinion on PFHxA should be incorporated. (Other applications may be relating to these PFHxA derogations.) “8. (e) impregnation agents for re-impregnating of articles referred to in paragraph 8(b), (c), (d), (h); (h) medical devices as specified in Regulation (EU) 2017/745 of the European Parliament and of the Council; woven, knitted and nonwoven medical textiles as specified in Regulation (EU) 2017/745 of the European Parliament and of the Council with a minimum performance requirement of >20 cm hydrostatic head according to EN 13795; in vitro diagnostic medical devices as specified in Regulation (EU) 2017/746 of the European Parliament and of the Council as well as parts thereof; and (i) filtration and separation media used in high performance air and liquid applications that require a combination of water- and oil-repellency for filters used in industrial settings or by professionals.” For the explanation of reasons why the candidate substitutions are not feasible in the actual EEE, please see the following attachments to our input: ‑ Annex 2. The unfeasibility of “possible substitutes” in the dossier in the actual EEE. (Attached to our previous input in 13 June 2023 listed as No. 4543 in "rest pfas rcom part21 36501 en".); ‑ JP4EE Annex 9 Unfeasibility of other “possible substitutes” in actual EEE. |
| Answer to specific info request 8:  Please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501 en") and following annexes to this input. There are currently no feasible substitutes for PFAS which can attain the performance needed for EEE for the applications listed in Column E of our revised JP4EE Annex 3. We describe the essential applications of PFAS needed in EEE in our revised list in more concrete way than those in our previous input. We would very appreciate it if ECHA carefully reviews our revised input. We would like to request ECHA to set the derogations for them, as the feasibility in EEE becomes assessable only after the viable substitute materials are established. Among the listed applications, “other identified uses” relating to EEE industry are as follows. The number shown below is linked to the reference number in our Application list A (revised JP4EE Annex 3). Please see our JP4EE Annex 4 and 6 for more details of each use, such as non-exhaustive examples of uses and reasons why PFASs are un-replaceable. < Necessary derogations relating to Fluoropolymers > 1. Sliding elements in mechanical section. 2. Optical elements. 3. Piezoelectric elements. 4. Insulating material requiring flame-retardancy and/or heat-resistant, where the use is needed for safe functioning and safety of equipment. 5. Optical elements for LCD panels 6. Electronic circuit boards for high-frequency applications. 7. Anti-dripping agent used for safety and to enhance flame retardancy. 8. High performance materials for mold release and protection purposes used in the article molding process. 9. Batteries. (Please refer to the input from the battery industries, such as those from RECHARGE (Ref.No. 3925 in RCOM Part.2) or from Battery Association of Japan (BAJ) (Ref.No.4331 in RCOM part 14), for the concrete details.) 10. Film, sheet or membrane requiring surface performance which ensures multiple functions such as electrical insulation property, chemical resistance, heat resistance, flame resistance, flex resistance and excellent elongation followability at the same time. 11. Hermetic sealant requiring low percentage of the compression set as well as simultaneously other functions such as excellent elongation followability, durability, flame resistance, heat and hot water resistance, low water absorption, low moisture permeability, chemical resistance and/or low outgassing. 12. Fluid tubes and containers requiring chemical resistance, high cleanliness. 15. Functional material used in printing process. (Please refer to the input from the related industries, such as Japan Business Machine and Information System Industries Association (JBMIA), for the concrete details.) < Necessary derogations relating to Fluoroalkyl compounds with functional groups (such as -OH, -COOH, N-R, etc.) and Side-chain fluorinated polymers > 16. High performance materials for mold release and protection purposes, which ensures multiple functions electrical insulation, heat resistance, chemical resistance or flame resistance, etc. at the same time. 19. Functional material used in printing process. (Same as 15 above.) < Necessary derogations relating to other PFAS > 25. Transparent electronic circuit board and circuit. 26. Liquid crystal display (LCD) elements. 27. Optical elements. 28. Functional material used in printing process. (Same as 15 above.) < Necessary derogations relating to all the PFAS (flupropolymers and others) > 29. Functional coatings\*. (\* "Functional coating" is a coating applied to an article in order to give it the required functions, such as low dielectric properties, low dielectric loss tangent, electrical insulation, heat resistance, UV resistance, chemical resistance, corrosion resistance, weather resistance, water repellency, oil repellency, slipperiness, low refractive index and so on. "Functional coating" includes, but not limited to, "conformal coating" used to protect electronic materials. In our input, we use the term "functional coating" because the required functions are not only to protect the objects.) 30. Lubricants where the use takes place under harsh conditions or the use is needed for safe and intended functioning and/or safety of equipment. For the detailed reasons of needing derogations and possible socio-economic impact, please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501\_en) and the following Annexes attached to our input： ‑ JP4EE Annex 3 rev List A of PFAS essential uses in EEE: Updated Essential Application list A: Explanation starting from PFAS as chemical materials. (Updated cells are shown in yellow.) EEE inevitably needs derogations for the essential applications listed in Column E of this list A from the proposed PFAS restriction. ‑ JP4EE Annex 4 rev List B of EEE Functions needing PFAS: Slightly-updated Essential Application list B: List of the functions and properties necessary to electrical and electronic equipment (EEE), which need PFAS materials to attain required performances. ‑ JP4EE Annex 6 Explanation on EEE Functions in Annex 4 (List B)：Supplementary Explanation on the functions of EEE needing PFAS shown in our List B of EEE Functions needing PFAS (Annex 4) The list attached as Annex 7 also includes PFAS essential applications used in EEE and their components manufacturing processes. These PFAS are essential there as they are primarily intended to function in the manufacturing process. Therefore, we would like to request to set the derogations for them. Without the derogation, production of high-value-added EEE would have to be evacuated outside the EU. In addition, please see the following material attached to this input: ‑ Annex 8 Additional explanation for List C: PFAS essential applications in EEE manufacturing processes 1. Immersion process. 2. Electrode formation process with safety function for film capacitors. 3. Electrode formation process of Electric Double Layer Capacitor (EDLC). 4. Coating process of optical film for electronic displays. For the explanation of reasons why the candidate substitutions are not feasible in the actual EEE, please see the following attachments to our input: ‑ Annex 2. The unfeasibility of “possible substitutes” in the dossier in the actual EEE. (Attached to our previous input in 13 June 2023 listed as No. 4543 in "rest pfas rcom part21 36501 en".); ‑ JP4EE Annex 9 Unfeasibility of other “possible substitutes” in actual EEE. |
| Answer to specific info request 10:  Please see our previous input in 13 June 2023 (listed as No. 4543 in "rest pfas rcom part21 36501 en"). |

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| 8595 | Date:  2023/09/22 12:45  Content:  Scope or restriction option analysis  Information on alternatives  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Mtech Access Ltd.  Org. country:  United Kingdom  Attachment: | General Comments:  A group of industry stakeholders has collaborated to conduct an independent targeted literature review and primary research study in response to the European Chemicals Agency (ECHA) restriction proposal on the manufacture, placing on the market and use of per- and polyfluoroalkyl substances (PFASs). Mtech Access is an independent and impartial healthcare consultancy commissioned to conduct the research. The industry stakeholders comprise of Alchimia S.r.L, Bausch & Lomb, BVI, Carl Zeiss Meditec, D.O.R.C. Dutch Ophthalmic Research Centre (International) B.V. and Pharmpur GmbH. Please refer to the non-confidential attachment for more information. |
| Answer to specific info request 1:  Use sector: Medical devices |
| Answer to specific info request 6:  Please refer to the non-confidential attachment "Industry stakeholder group response to ECHA\_22.09.23" |
| Answer to specific info request 8:  Please refer to the non-confidential attachment "Industry stakeholder group response to ECHA\_22.09.23" |

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| 8596 | Date:  2023/09/22 12:46  Content:  Scope or restriction option analysis  Other socio economic analysis (SEA) issues  Transitional period  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  SMS Group  Org. country:  Germany  Attachment:  <redacted>  Privacy statement:  Sensitive content and information regarding the company's products is contained in the attached document. | General Comments:  The SMS Group, with over 14,500 employees in more than 30 countries, is a leading in plant construction and mechanical engineering company playing a key role in the transformation towards a green metals industry. SMS Group shares and recognizes the importance of the proposal and ECHA’s efforts to protect human health and the environment. However, the proposed restriction does not differentiate between the types of PFAS, although fluoropolymers such as PTFE and fluoroelastomers including FKM are classified as polymers of low concern. In the attached comment we express our concerns regarding the potential socio-economic impact on our industry and our development of new technologies to mitigate climate change and request that fluoropolymers and fluoroelastomers be excluded from the scope of the Restriction. |
| Answer to specific info request 1:  Metal plating and manufacture of metal products (Annex E.2.4.)sub-uses: Hard chrome plating - Manufacture of metal products not addressed elsewhere; Applications of fluorinated gases (Annex E.2.8.)sub-uses: Air conditioning and heat pumps - Solvents; Transport (Annex E.2.10.)sub-uses: Hydraulic fluids; Electronics and semiconductor (Annex E.2.11.)sub-uses: Electronics – Semiconductors; Energy sector (Annex E.2.12.)sub-uses: Sector as a whole; Construction products (Annex E.2.13.)sub-uses: Bridge and building bearings - PTFE thread sealing tape; Lubricants (Annex E.2.14.)sub-uses: Sector as a whole |
| Answer to specific info request 6:  Please see document in attachment. |
| Answer to specific info request 7:  Please see document in attachment. |
| Answer to specific info request 8:  Please see document in attachment. |

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| 8597 | Date:  2023/09/22 12:46  Content:  Environmental emissions  Baseline  Transitional period  Type:  BehalfOfAnOrganisation  Org. type:  Company  Org. name:  Mercer Rosenthal GmbH  Org. country:  Germany  Attachment:  <redacted> | General Comments:  Mercer Rosenthal, as a company that produces pulp, electrical energy and pulp by-products such as tall oil and lignin, sees itself purely as a user of industrial PFAS products. These occur in all main and secondary processes, as well as the infrastructure and system peripherals (e.g. as seals, slide rails, refrigerants, coatings, etc.). PFAS can also be found in the required protective work clothing. The innovative strength of the suppliers will offer alternatives in the short, medium and long term, which will gradually find their way into the chemical processing industry. An abrupt change of all materials in the production and support process is impossible for economic reasons and therefore threatens the existence of the company. Mercer Rosenthal is not opposed to a general ban on environmentally harmful plastics containing fluoride, but this should be scientifically proven and the market should provide alternatives. It will take approximately 10 to 20 years to replace all PFAS from the production process equipment.   A ban would cause problems that cannot be overlooked, as many technical systems in chemical parks, pharmaceutical production and food production rely on the use of PTFE products. For example, since seals made of this material are 10 - 20 times more expensive than conventional sealing materials, an alternative could have been used long ago if this were possible. Without such materials, environmental protection and occupational safety with aggressive chemicals would not be guaranteed. |
| Answer to specific info request 1:  - Users of air conditioning and heat pumps - Users of fire extinguishing suppressants - Users of hydraulic units and fluids - Users of grease and other lubrication materials - Users of high performance sealings for aggressive liquor and acid (TA-Luft) |
| Answer to specific info request 2:  Mercer Rosenthal, as a company that produces pulp, electrical energy and pulp by-products such as tall oil and lignin, sees itself purely as a user of industrial PFAS products. These occur in all main and secondary processes, as well as the infrastructure and system peripherals (e.g. as seals, slide rails, refrigerants, coatings, etc.). PFAS can also be found in the required protective work clothing. The level of environmental pollution by our company with PFAS is under review. In general, we are certified as a company according to EN14001:2015 and audited cyclically. The handling of waste materials after use is strictly monitored and controlled. Disposal takes place via certified disposal companies. |
| Answer to specific info request 6:  A fundamental ban on the PFAS group of substances would have far-reaching consequences for us as downstream users (within the meaning of the REACH Regulation) in the chemical industry. We use the PFAS group of substances in all of our fittings, valves and seals, which must have basic chemical resistance to acids and bases under high temperatures and pressures (chemical and physical). A general ban on the substance group PFAS without a transition period for the chemical industry would mean that the production of pulp as a basis for the further production of paper would have to be stopped. This would also involve the production of bioelectricity (388,232 MWh/a in 2022), tall oil and lignin, as a C-based raw material alternative to petroleum. These economically important products would also not be made available to the market if PFAS were fundamentally banned. The suppliers of the fittings/valves/seals we use must be given sufficient time so that they can provide alternatives of the same quality, with the same properties (durability and service life) and in sufficient quantities. Current product alternatives have not yet been tested and therefore cannot be assessed conclusively. It is currently unknown whether the currently available alternatives are suitable alternatives and must be tested. Given our dependence as a downstream user, a transition period of at least 20 years is required for adequate testing due to our presence in the production process (at least 90%). Since it is currently not known whether the use in fittings/valves/seals results in PFAS being released into the environment with the product pulp or with wastewater or other by-products and waste materials, there is interest in participating in a research project on this has already been stated. The results are not yet available. It has been analytically proven that the amount of PFAS released from our use via our pulp product is insignificant or undetectable (see appendix laboratory analysis). For this reason, substitution of fittings/valves/seals with PFAS appears to be sufficient in connection with progressive/regular maintenance and service work. In this respect, it is proposed to specify the exchange of PFAS-based equipment without a deadline. At the same time, foregoing a specific time limit would correspond to the approach of giving suppliers enough time to provide alternatives of equivalent quality in the required quantities. Flat gaskets made of pure PTFE or reinforced PTFE are part of our factory standard for aggressive acids and alkalis, and are also temperature-resistant up to 250°C. The same applies to the sealing of fittings and safety devices, which are intended to prevent the uncontrolled escape of these substances. Furthermore, the materials FKM, FFKM, ECTFE, PFA, PVDF are used in various production steps when it comes to consistent and reliable sealing and performance of the system. Ensuring the production of kraft pulp, bioenergy, tall oil and lignin, as C-based raw material alternatives to petroleum, is fundamentally of macroeconomic importance. If production comes to a standstill due to the ban on the PFAS group of substances without an appropriate transition period for the chemical industry, the securing of the building blocks that are important for the European energy and climate transition will be at risk. |
| Answer to specific info request 7:  Mercer Rosenthal as users of PFAS products depend on the flexibility and innovative strength of our manufacturer. Units are also operated that are 50 years old and special spare parts can only be supplied by the OEM, which is not always based in the EU. Appropriate alternatives must be examined and, if necessary, tried-and-tested systems must be replaced. The specialties that the chemical industry brings with it are not, or only very inadequately, discussed in Tables 8 and 9. |

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| 8598 | Date:  2023/09/22 12:46  Content:  Scope or restriction option analysis  Baseline  Request for exemption  Type:  BehalfOfAnOrganisation  Org. type:  Industry or trade association  Org. name:  WirtschaftsVereinigung Metalle. e.V.  Org. country:  Germany  Attachment: | General Comments:  WirtschaftsVereinigung Metalle e.V. (WVMetalle) fundamentally rejects the group restriction procedure for PFAS.  The restriction proposal must do justice to this group of substances' critical economic and social role. PFAS are crucial in countless critical modern applications such as semiconductor production, (alternative) energy, climate or medical technology and biotechnology. Non-ferrous metals play an essential role in enabling these products. Therefore, exemptions from the restriction for using PFAS in the non-ferrous metals industry should be granted, particularly for critical and strategic raw materials, as defined by the Critical Raw Materials Act (CRMA).  According to the REACH Regulation, a differentiated assessment of the risks to humans and the environment associated with these substances (hazards + exposures), including already established protective measures/use, occurs. Instead of a general restriction under REACH, targeted regulations, e.g., occupational health and safety, could be more practical.  A distinction between industrial uses and consumer products would be necessary. Where PFAS do not enter the product, and safe use is already proven, their use should be allowed indefinitely. Safe PFAS substances, which are used as process chemicals and have no exposure, should be exempted indefinitely from the REACH restriction.  The transition periods must be set appropriately and industry-related. A generic regulation cannot consider the specifics of the industry, e.g. for the semiconductors industry, such as development periods, qualification and certification phases at customers.  Even though we cannot provide quantitative information and data (we would need more time), by submitting our position, we would like to address the importance and the challenges of using PFAS in the non-ferrous metals sector. |
| Answer to specific info request 1:  Construction products (Annex E.2.13.) - Side-chain fluorinated polymers used for surface protection/sealants - Non-polymeric PFASs as processing aids Metal plating and manufacture of metal products (Annex E.2.4.) - Manufacture of metal products not addressed elsewhere Electronics and semiconductor (Annex E.2.11.) - Electronics - Semiconductors |
| Answer to specific info request 6:  Coolant - Two-phase immersion cooling (2-PIC) is currently the most energy-efficient technology for cooling data centres. Given the rapid deployment of data centres, this technology is essential for achieving the European climate targets. 2-PIC has not been identified and evaluated as a PFAS application in the Annex XV dossier or its annexes. |
| Answer to specific info request 7:  The following are examples of PFAS use in the metals industry. These applications should be exempted from the restriction if no real alternatives are available. - e.g., in the form of pipe linings and reliable sealings - For surface treatment/metal coatings to protect against corrosion, staining & weathering - In the semiconductor and battery industry & measurement technology o Production process (front end) - e.g. in the form of photoresists, etching and cleaning gases, solvents, refrigerants (e.g. two-phase immersion cooling technology or 2-PIC technology) o Production equipment, e.g. as linings for etching basins, in valves, sealings or pipe linings o Backend, e.g. in housings, adhesives or in the carrier material - infrastructure: o Plant technology o Operating fluids (e.g. process gases, release agents) o Sealings (e.g. hazardous goods transport containers and radiation protection booths) o Pipeline linings o Electronics o Fire-fighting foams (own restriction proposal) o cable sheathing o Sensors - PFAS contribute to the safe and efficient operation, maintenance and repair of industrial plants. They are widely used there in seals, valves, coatings, diaphragms, lubricants, electrical insulators, safety clothing, etc. - Piping: Valves, seals, ball valves, etc., are equipped or lined with PTFE. Thus, PFAS are processed in the complete piping periphery. - In the plant structure, components such as motors are designed with PTFE (coating/sealing) in relation to coupling/gearbox. - PTFE seals are installed throughout plant parks, in most of the process plants, especially in primary plants, for example, in furnaces - Filter systems coated with PTFE, which thus have a high cleaning effect, to be able to comply with tight limit values permanently. - Teflon plates (PTFE) are installed as electrical insulation on busbars. - Coolant - Two-phase immersion cooling (2-PIC) is currently the most energy-efficient technology for cooling data centres. Given the rapid data centres, this is essential for achieving the European climate targets. It was not and has not been identified and evaluated as a PFAS application in the Annex XV dossier or its annexes. |