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PFAS Use-mapping

Annex to the Guidance for respondents to the consultation on the SEAC draft opinion on restricting per- and polyfluoroalkyl substances (PFAS)

Disclaimer: As the SEAC opinion making is still ongoing, there could be some minor changes to this use mapping when the consultation begins.

Table 1. Descriptions for the sectors containing uses of PFAS as identified in the draft Background Document. Note that the eight additional sectors listed in the updated Annex XV restriction report, which were not specifically evaluated by SEAC, have their sector name in the first column in italics.

Sector	Description
Consumer mixtures and miscellaneous articles	The assessment of the Consumer mixtures and miscellaneous consumer articles sector covers the uses of PFAS in various mixtures and articles intended specifically for consumer use. Examples include cleaners and cleaning products, waxes and polishes, automotive windscreen care products, anti-fogging agents for eyewear, fishing lines, synthetic turf as well as lubricants and string materials used in musical instruments. PFAS uses related to Consumer mixtures and miscellaneous consumer articles but NOT considered as part of this sector: - Cosmetics (considered as part of the Cosmetics sector) - Ski waxes (considered as part of the Ski Wax sector) - Home fabric treatments e.g. sprays used for stain repellence purposes (considered as part of the Textiles, upholstery, leather, apparel and carpets (TULAC) sector) - Consumer uses of lubricants, except for piano keys and strings of musical instruments (considered as part of the Lubricants sector) - Razor blade coatings (considered as part of the Metal plating and manufacture of metal products sector) - Electrical components for musical instruments (considered as part of the Electronics and semiconductors sector) - Spare parts are assessed as an overarching issue (please see Annex E, Section 3.3)
Cosmetics	The assessment of the Cosmetics sector covers the uses of PFAS in cosmetic products and the use of TFA in the synthesis of peptides as cosmetic ingredients. PFAS uses related to Cosmetics but NOT considered as part of this sector: - Applications in manufacturing equipment used for the manufacture of cosmetics (depending on the application, these may be considered as part of e.g., the Sealing applications or Machinery applications sectors) - Packaging of cosmetics products (considered as part of the Food Contact Materials and Packaging sector) - Analytical instruments and equipment parts used in the cosmetics sector e.g., valves, tubing and connectors (considered as part of the Sealing applications sector. Analytical equipment in general is assessed as an overarching issue, please see the explanatory notes of the main report of the Background Document and in particular the sub-heading '*Scientific research and development*'). - Uses of PFAS in excipients, immediate packaging and drug delivery devices (considered as part of Other Medical Applications) - Active substances in human and veterinary medicinal products are exempted from the restriction proposal (please see in particular Section 2.2.3 of the main report of the Background Document)
Ski wax	The assessment of the Ski wax sector covers the uses of PFAS in ski wax that can be applied to traditional skis, snowboards and skin skis across different kinds of snow sports. Examples include blocks of wax, liquid wax, paste wax, powder wax, spray wax or mixtures for cleaning and impregnation. PFAS uses related to Ski wax but NOT considered as part of this sector: - Shoes and textiles for skiing (considered as part of the Textiles, upholstery, leather, apparel and carpets (TULAC) sector)
Metal plating and manufacture of metal products	The assessment of the Metal plating and manufacture of metal products sector covers the uses of PFAS in metal plating processes as well as in the manufacture of other metal products. Examples include wetting agents, mist/fume suppressing agents and processing aids in metal plating baths, coating of metal products and solvents in metal manufacturing. PFAS uses related to the manufacture of metal products but NOT considered as part of this sector: - Production of parts for engines and other applications in technical components (considered as part of the Transport sector) - Production of parts in machinery, as well as other industrial applications, such as sealings (considered as part of the Sealing applications or Machinery applications sectors) - Production of parts for military equipment (considered as part of the Military Applications sector) - Coatings and paints for metal components specifically used in construction and machinery (considered as part of the Construction Products and Machinery applications sectors) - Cover gases for use in magnesium casting (considered as part of the Applications of fluorinated gases sector)
Petroleum and mining	The assessment of the Petroleum and mining sector covers the uses of PFAS in petroleum extraction, mining operations, and downstream industries such as refineries, petrochemical plants, carbon capture and storage, and geothermal applications. Note that only non-polymeric PFAS are in the scope of this sector, while polymeric PFAS used in these industries are addressed cross-sectorially. PFAS uses related to Petroleum and mining, but NOT considered as part of this sector: - Piping, tubing, tanks etc. used in the production and transportation of oil and gas (considered as part of the Sealing applications sector) - Sealing devices in petroleum and mining applications e.g., sealants in O-rings, V-rings, gaskets, fittings, and seals (considered as part of the Sealing applications sector) - Anti-corrosive coatings of equipment and infrastructure (considered as part of the Construction products sector and the Machinery applications sector) - Cables, specialised uses in petroleum and mining (considered as part of the Electronics and semiconductors sector) - Membranes, diaphragms, filters etc. in petroleum and mining applications (considered as part of the Technical textiles sector) - Machinery, valves, pumps etc. in petroleum and mining applications (considered as part of the Sealing applications and Machinery applications sectors) - Bearings, skidways etc. in petroleum and mining applications (considered as part of the Machinery applications sector) - Lubrication of equipment (considered as part of the Lubricants sector) - Personal protective equipment (PPE) (considered as part of the TULAC sector) - Explosives in mining (considered as part of the Explosives sector)
Textiles, upholstery, leather, apparel and carpets (TULAC)	The assessment of the TULAC sector covers the uses of PFAS in home textiles, consumer apparel, professional apparel and Personal Protective Equipment, leather and home fabric treatment sprays. PFAS uses related to TULAC but NOT considered as part of this sector: - Packaging (considered as part of the Food contact materials and packaging sector) - Optical fibre weaving (considered as part of the Electronics and semiconductors sector) - Inks for printing on textile (considered as part of the Printing applications sector)

	- Components related to textile industry e.g., conveyor belts (considered as part of the Broader industrial uses sector) - Outdoor technical textiles, architectural membranes, other tensile fabrics and other construction applications, filtration and separation media, removable covers for industrial process equipment, medical applications, technical textiles in transport vehicles (considered as part of the Technical textiles sector)
Food contact materials (FCM) and packaging	The assessment of the Food contact materials and packaging sector covers the uses of PFAS in food and non-food packaging applications, non-stick coatings in consumer cookware and domestic appliances, and non-stick coatings in industrial bakeware. PFAS uses related to Food contact materials and packaging but NOT considered as part of this sector: - Packaging of medical devices (considered as part of the Medical devices sector) - Immediate/primary packaging of medicinal and pharmaceutical products for human and veterinary uses (considered as part of the Other medical applications sector) - Inks, lacquers and waxes used in non-FCM applications (considered as part of the Printing applications sector) - Non-intentionally added substances in (recycled) packaging materials (considered and discussed in the Impacts on Recycling and Circular Economy section, please see e.g. section E.3.4. of Annex E) - Advanced semiconductor packaging (considered as part of the Electronics and semiconductors sector) - Sealings, gaskets, piping and linings used in food and feed production (considered as part of the Sealing applications sector) - Conveyor belts, production/assembly line equipment, bearings and rollers used in food and feed production (considered as part of the Machinery applications sector) - Lubricants in industrial settings (considered as part of the Lubricants sector) - Membranes and filtration materials used in drinking water treatment (considered as part of the Technical textiles sector)
Construction products	The assessment of the Construction products sector covers the uses of PFAS in building materials and construction products. Examples include roofing materials, paints and coatings, impregnations, sealants, and adhesives. PFAS uses related to Construction products but NOT considered as part of the Construction products sector: - Architectural membranes and weatherproofing membranes, including vapour barriers, coated fabric and fiberglass coating (considered as part of the Technical textiles sector) - Sealings, PTFE thread sealing tape, valves and pipes (considered as part of the Sealing applications sector) - Flexible solar panels, renewable energy systems and film/coating of wind turbines/solar panels (considered as part of the Energy sector) - Foam blowing agents in roofing and fluorinated gases in foam insulation (considered as part of the Applications of fluorinated gases) - Wires and cables (incl. insulation) and electrochromic functionalities in e.g. glazing (considered as part of the Electronics and semiconductors sector) - Coil coating of metal products (considered as part of the Metal plating and manufacture of metal products sector) - Lubricants in manufacturing PEX-pipes and compression sleeves for underfloor heating (considered as part of the Lubricants sector) - Plain bearings for non-building applications (e.g. energy systems, cranes, lifts or elevators) in machinery/equipment, pumps, valves, gas installations and coil coating in manufacturing process (considered as part of the Machinery applications sector) - Explosives used in the construction applications (considered as part of the Explosives sector)
Applications of fluorinated gases	The assessment of the Applications of fluorinated gases sector covers uses of PFAS gases in various applications and uses. Examples include refrigeration, air conditioning and heat pumps, foam blowing agents, propellants, cover gases, clean fire suppressants, preservation of cultural paper-based materials and insulating gases. PFAS uses related to Applications of fluorinated gases but NOT considered as part of this sector: - Mobile air conditioning (MAC) (considered as part of the Transport sector) - Transport refrigeration (considered as part of the Transport sector) - Heat transfer fluids (i.e. fluids that guide heat/cold away from an application but do not actively cool the application) for immersion cooling and indirect cooling of electronics and semiconductors (considered as part of the Electronics and semiconductors sector) - Heat transfer fluids for non-electronic applications (considered as part of the Broader industrial uses sector) - Semiconductor manufacture (considered as part of the Electronics and semiconductors sector) - Solvents for cleaning and carrier solvents for lubricants (considered as part of the Broader industrial uses, Electronics and semiconductors and Lubricants sectors) - Metered dose inhalers (MD) (considered as part of the Other medical applications sector) - Use of fluoropolymers in equipment e.g. O-rings, gaskets, or similar components (considered as part of the Sealing applications and Machinery applications sectors) - Use of fluorinated gases in various military both mobile and stationary applications (considered as part of the Military applications sector)
Medical devices	The assessment of the Medical devices sector covers uses of PFAS in various instruments, appliances and other articles intended for medical purposes in humans. Examples include implantable medical devices, invasive medical devices, non-implantable/non-invasive medical devices and packaging of medical devices. PFAS uses related to Medical devices but NOT considered as part of this sector: - Electronic equipment for medical imaging, MRI, X-ray, etc. (considered as part of the Electronic and semiconductors sector) - Medical electronics (considered as part of the Electronic and semiconductors sector) - Diagnostic laboratory testing (considered as an overarching issue, please see the explanatory notes of the Main report of the Background Document and in particular the sub-heading *Scientific research and development*) - Excipients in pharmaceutical products (considered as part of the Other medical applications sector) - Drug delivery devices where the device is part of a drug-device combination product, e.g. pressurized metered-dose inhalers (pMDIs), pre-filled syringes, pre-filled injection pens, autoinjectors and pre-filled on-body delivery system, transdermal patches (considered as part of the Other medical applications sector) - Immediate packaging for medicines (considered as part of the Other medical applications sector) - Engineered fluids for diagnostic laboratory (considered as part of the Broader industrial uses sector) - Fluorinated gases used in industrial processes related to medical applications e.g. medical lasers (considered as part of the Broader industrial uses sector) - Medical textiles and membranes for venting (considered as part of the Technical textiles sector) - Personal protective equipment e.g., clothing and drapes (considered as part of the TULAC sector) - Construction applications in hospitals (considered as part of the Construction products sector) - Parts of analytical and medical equipment e.g. valves, tubing, connectors (considered as part of the Sealing applications sector) - Packaging other than for medical devices and medicines (considered as part of the Food contact materials and packaging sector)

Transport	The assessment of the Transport sector covers the uses of PFAS in transport vehicles, mobile machinery, and associated infrastructure. Examples are automotive vehicles, aerospace vehicles, watercraft vehicles, rail vehicles, agricultural and forestry vehicles, construction and industrial vehicles, and transport-related infrastructure. PFAS uses related to Transport but NOT considered as part of this sector: - Sealing applications e.g., gaskets, O-rings, pipe/tank linings (considered as part of the Sealing applications sector, except for hoses in combustion engines and hose linings in aerospace applications which are considered part of the Transport sector) - Machinery and equipment e.g., robotic arms, presses (considered as part of the Machinery applications sector) - Lubricants e.g., lubricants in engines and self-lubricating parts (considered as part of the Lubricants and Machinery applications sectors) - Metal plating e.g., mist suppressants (considered as part of the Metal plating and manufacture of metal products sector) - Electronical and electronic equipment in transport vehicles, excluding cable linings and coatings in transport vehicles (considered as part of the Electronics and semiconductors sector) - Batteries and fuel cells (considered as part of the Energy sector) - Immersion cooling (considered as part of the Electronics and semiconductors sector) - Optical fibres (considered as part of the Electronics and semiconductors sector) - Membrane textiles for mould-injection (considered as part of the Technical textiles sector) - Textiles in engine bays (considered as part of the Technical textiles sector) - Textile cover sheets e.g., convertible tops, vehicle protection covers (considered as part of the Technical textiles sector) - Filters e.g., for air conditioning systems (considered as part of the Technical textiles sector) - Interior textile treatments e.g., seats, carpets, roof linings (considered as part of the TULAC sector) - Anti-drip additives in polymers (considered as part of the Electronics and semiconductors sector) - Acrylic foam tape (considered as part of the Sealing applications sector) - Fire extinguishers for aircraft e.g., 2-BTP (considered as part of the Applications of fluorinated gases sector) - Propellants for spray biocides in aircraft (considered as part of the Applications of fluorinated gases sector) -
Energy	The assessment of the Energy sector covers the uses of PFAS in renewable energy generation, hydrogen technology, manufacturing of chemicals via electrolysis, batteries and electrical grids. PFAS uses related to Energy but NOT considered as part of this sector: - Sealing applications e.g., pipe linings, tubing, tanks, O-rings, gaskets etc. (considered as part of the Sealing applications sector. Note that, in relation to sealing applications, PFAS used in the 'core' of membrane electrode assemblies (MEA) in fuel cells and electrolysers in energy applications are assessed in the Energy sector as part of hydrogen technology and manufacture of chemicals via electrolysis) - Machinery applications and equipment e.g., robotic arms, production and assembly line equipment (considered as part of the Machinery applications sector) - Lubricants in relation to energy applications (considered as part of the Lubricants sector) - Hydropower applications (considered as part of the Sealing applications and Machinery applications sectors) - Anti-drip additives in polymers (considered as part of the Electronics and semiconductors sector) - Power plants, including fossil fuel power plants, nuclear power plants, waste-to-energy plants and engine power plants (considered cross-sectorally as part of sectors such as Sealing applications, Machinery applications, and Electronics and semiconductors) - Oil and gas applications (considered cross-sectorally as part of sectors such as the Sealing applications, Machinery applications, Electronics and semiconductors, and Lubricants sectors) - Membranes e.g., HEPA-filter, H2 and zinc-air battery membranes, excluding membranes for fuel cells and electrolysers (considered as part of the Technical textiles sector) - Solid oxide electrolyser cell (SOEC) and Solid oxide fuel cell (SOFC) (considered as part of the Sealing applications sector) - Storage, refuelling and transport of hydrogen (considered as part of the Sealing applications and Machinery applications sectors) - Solvents for cleaning (considered as part of the Electronics and semiconductors and Broader industrial uses sectors) - Electrical grids, excluding PFAS uses in switchgear and circuit breakers, such as PTFE nozzles for arc quenching (considered as part of the Sealing applications, Machinery applications, Electronics and semiconductors, and Applications of fluorinated gases sectors) - Electronics e.g., wires and cables (considered as part of the Electronics and semiconductors sector) - Industrial automation monitoring and control (IAMC) (considered as part of the Sealing applications, Machinery applications and Electronics and semiconductors sectors) - Spare parts are assessed as an overarching issue (please see Annex E, Section 3.3)
Lubricants	The assessment of the Lubricants sector covers the uses of PFAS in liquid or semi-fluid lubricant mixtures designed to remain viscous throughout their lifecycle, as well as PFAS additives in coatings that provide low-friction properties once cured or solidified. Examples include low-viscosity lubricants (base oils, mineral or synthetic, sometimes with additives), greases (base oil combined with a thickening agent and additives), solid/dry films (lubricant mixed with alcohol, water, or other volatile solvents), and release agents (such as dry films used in manufacturing thermoplastics and elastomers). PFAS uses related to Lubricants but NOT considered as part of this sector: - Lubricants for piano keys or the strings of musical instruments e.g., guitars, harps, ukuleles, violins, violas, lutes, and other old stringed instruments (considered as part of the Consumer mixtures and miscellaneous consumer articles sector) - Articles and complex objects e.g., bearings, bearing liners, pumps (considered as part of the Machinery applications sector) - Low friction sealings (considered as part of the Sealing applications sector) - Solvents e.g., for cleaning and dissolving purposes (considered as part of the Applications of fluorinated gases, Electronics and semiconductors, and Metal plating and manufacture of metal products sectors) - General industrial precision cleaning fluids (considered as part of the Broader Industrial Uses sector) - EEE (Electrical and Electronic Equipment) specialist equipment (considered as part of the Electronics and semiconductors sector) - Hydraulic oils (considered as part of the Transport or Broader industrial uses sectors)
Electronics and semiconductors (Electronics)	The assessment of electronics covers the uses of PFAS uses in electronic components and assemblies including wires and cables, circuit boards, connectors, sensors, electrical insulation, coatings of electrical components, photonics, etc. Plastic additives, heat transfer fluids for immersion cooling, cold plate cooling and vapor phase soldering in relation to electronics are also in scope. PFAS uses related to electronics but NOT considered as part of this sector: - Sealing applications e.g., gaskets, O-rings, pipe lining (considered as part of the Sealing applications sector) - Machinery applications e.g., conveyor systems, robotic arms (considered as part of the Machinery applications sector) - Technical textiles e.g., membranes, vents and filters (considered as part of the Technical textiles sector) - Lubricants e.g., for use in magnetic recording media (considered as part of the Lubricants sector) - Non-electronic industrial automation monitoring and control (IAMC) parts (considered as part of the Sealing applications or Machinery applications sectors) - All electrical parts (including wires) which are part of a medical device (considered as part of the Medical devices sector) - Refrigerants (chillers) for cooling in electronics and semiconductor sector (considered as part of the Applications for fluorinated gases sector)

	- Electrical insulation gases (considered as part of the Applications for fluorinated gases sector) - Heat transfer fluids other than those used for immersion cooling or vapor phase soldering (considered as part of the Broader industrial uses sector) - Industrial precision cleaning other than specific uses related to chemical vapor deposition and etch cleaning in electronics and semiconductors (considered as part of the Broader industrial uses sector) - Non-electronic parts of sensors e.g. liners, filters, membranes and gaskets (considered as part of the Sealing applications, Machinery applications and Technical textiles sectors)
Electronics and semiconductors (Semiconductors)	The assessment of semiconductors covers the uses of PFAS in semiconductor manufacturing processes, including etching, chamber cleaning, wafer processing, photolithography and Micro-electromechanical systems (MEMS). PFAS in semiconductor inspection equipment and semiconductor packaging are also in scope. PFAS uses related to semiconductors but NOT considered as part of this sector: - Sealing applications e.g., gaskets, O-rings, pipe linings (considered as part of the Sealing applications sector) - Machinery applications e.g., conveyor systems, robotic arms (considered as part of the Machinery applications sector) - Technical textiles e.g., membranes, vents and filters (considered as part of the Technical textiles sector) - Lubricants e.g., for use in magnetic recording media (considered as part of the Lubricants sector) - Non-electronic industrial automation monitoring and control (IAMC) parts (considered as part of the Sealing applications or Machinery applications sectors) - All electrical parts (including wires) which are part of a medical device (considered as part of the Medical devices sector) - Refrigerants (chillers) for cooling in electronics and semiconductor sector (considered as part of the Applications for fluorinated gases sector) - Electrical insulation gases (considered as part of the Applications for fluorinated gases sector) - Heat transfer fluids other than those used for immersion cooling or vapor phase soldering (considered as part of the Broader industrial uses sector) - Industrial precision cleaning other than specific uses related to chemical vapor deposition and etch cleaning in electronics and semiconductors (considered as part of the Broader industrial uses sector) - Non-electronic parts of sensors e.g. liners, filters, membranes and gaskets (considered as part of the Sealing applications, Machinery applications and Technical textiles sectors)
PFAS manufacturing	The assessment of the PFAS manufacturing sector covers all process steps in the manufacture of PFAS compounds at the manufacture site, including the processing of PFAS at the manufacturing site. This category also covers the use of PFAS as polymerisation aids in the manufacture of fluoropolymers. Note that processing PFAS into articles or mixtures offsite (e.g., foam moulding or fluoropolymer extrusion) is excluded and considered as part of other relevant sectors (e.g., Transport or Food contact materials and packaging).
Printing applications	The assessment of the Printing applications sector covers the uses of PFAS in various specific applications within printing, which are further organised in two use categories: consumables (e.g. toners, latex printing inks, PTFE wax, pigments and colourants, PTFE powders, photosensitive materials, surfactants used in printing equipment) and permanent parts (e.g. electrophotographic press units, kinetic printing components, printing plates (offset and letterpress printing), rollers). It should be noted that 'permanent parts' refer to components that are not consumed during use. However, while they are not used at the rate of consumables, they may still require replacement multiple times throughout the printer's lifespan - in some cases several times per year. PFAS uses related to Printing applications but NOT considered as part of this sector: - PFAS in printing inks, lacquers and coatings that are used for food contact materials (considered as part of the Food contact materials and packaging sector) - Solvents for 3D-printing (considered as part of the Broader industrial uses sector) - Lubricants (considered as part of the Lubricants sector) - Printed circuit boards and sensors (considered as part of the Electronics and semiconductors sector) - Components that are used in printing machinery, but are not directly associated with the actual printing process (considered as part of other sectors, e.g. sealing applications are considered in the Sealing applications sector)
Sealing applications	The assessment of the Sealing applications sector covers the uses of fluoropolymers (FPs) and perfluoropolyethers (PFPEs) in applications designed to (i) prevent unintended substance migration, (ii) contain pressure, and (iii) avoid contamination. Sealing applications are used across multiple sectors and may entail the use of FPs and PFPEs as substances/mixtures, in the manufacturing of FP/PFPE-containing sealing articles and during their service life as components in complex objects. Examples of sealing applications include seals, gaskets, piping, linings, valve parts, and packing. PFAS uses related to Sealing applications but NOT considered as part of this sector: - Hoses in combustion engines and hose linings in aerospace applications (considered as part of the Transport sector) - Cable linings (considered as part of the Electronics and semiconductors sector) - Vents for electronic components (considered as part of the Technical textiles sector) - PFAS used in the ‘core’ of fuel cells and electrolysers i.e., membrane electrode assemblies (MEA) or similar assemblies (considered as part of the Energy sector) - Sealants and adhesive products for specific construction purposes (considered as part of the Construction Products sector) - Lubrication of dynamic seals related to use cases where PFAS-based lubricants are applied, not the seals themselves (considered as part of the Lubricants sector) - Spare Parts (considered as an overarching issue in Annex E.3.3.)
Machinery applications	The assessment of the Machinery applications sector covers uses of fluoropolymers (FPs) and perfluoropolyethers (PFPEs) in industrial process equipment across various sectors, as well as in machinery applied for both professional and consumer uses, when such uses are not covered elsewhere in the Background Document. It includes the use of FPs and PFPEs as substances/mixtures, in the manufacture of FP/PFPE-containing machinery parts, and during their service life as components in complex objects. Examples include self-lubricating/low-friction elements, structural parts, machinery components and parts (e.g. bearings, belts, rollers, etc.) and protective/durable coatings in stationary and portable machinery not covered in the Transport sector. PFAS uses related to Machinery applications but NOT considered as part of this sector: - FP/PFPE coatings e.g., on needles, surgical equipment, tubes (such as implantable probes and stents), endoscopes and medical devices (considered as part of the Medical devices sector) - Wind turbine-blade protection coatings and PTFE nozzles for the quenching of electrical arcs in switchgear (considered as part of the Energy sector) - FP/PFPE used in bridge and building bearings, coatings for metal components, skidways for specific construction purposes (considered as part of the Construction products sector) - PFAS-based lubricant mixtures used for specialised ‘external’ coatings of the contact surfaces of articles where the primary function is to provide low-friction (considered as part of the Lubricants sector) - FP/PFPE used in diaphragms and membranes (considered as part of the Technical textiles sector) - Spare Parts (considered as an overarching issue in Annex E.3.3.)
Other medical applications	The assessment of the Other medical applications sector covers the uses of PFAS in excipients, immediate packaging and drug delivery devices. Examples include propellants in pressurized metered dose inhalers (pMDIs), excipients in medicinal products for ophthalmic and dermatological therapies, coatings in release liners and backing films for transdermal patches, PFOB as a processing aid in the manufacture of porous particles (excipients in pMDIs), blisters for solid oral dose formulations, coated rubber stoppers for vials/flasks for injectable medicinal products, coated packaging for transdermal patches, fluorinated HDPE packaging (FHDPE) used for some veterinary medicinal products, coated canisters in pMDIs, coated plungers in prefilled syringes, and pre-filled injection pens, and autoinjectors. PFAS uses related to Other medical applications but NOT considered as part of this sector: - Fluoropolymer-coated electronics in pre-filled on-body delivery systems (considered as part of the Electronic and semiconductors sector)

	- Lubricants in drug delivery devices (considered as part of the Lubricants sector) - Process chemicals (considered as part of the Broader industrial uses sector)
Military applications	The assessment of the Military applications sector covers the uses of PFAS (including fluoropolymers and fluorinated gases) in articles intended for military personnel. Examples include fluorinated gases used as refrigerants in military applications, fluorinated gases used in fire extinguishing systems for military vessels, vehicles, and aircraft, as well as other military uses. PFAS uses related to Military applications but NOT considered as part of this sector: - Military electrical systems e.g. coatings and cabling of electronics (considered as part of the Electronic and semiconductors sector) - Military applications of sealing materials (considered as part of the Sealing applications sector) - Military explosives e.g. munitions, flares and explosive charges (considered as part of the Explosives sector) - Military textiles e.g. tents, parachutes, filtration and separation media, medical textiles and textiles used in military vehicles (considered as part of the Technical textiles sector) - Military protective garments, uniforms and personal protective equipment (considered as part of the TULAC sector)
Explosives	The assessment of the Explosives sector covers the uses of PFAS in products or compositions designed to provide a useful liberation of energy, typically causing a release of heat, light, gas/smoke or a combination of the above. Civil products with uses of explosives include professional/consumer uses (e.g. ammunition for hunting and sport shooting, fireworks, flares) and transport (e.g. safety pyro mechanisms). Additionally, explosives can be used independently in industrial processes such as mining and blasting or in military applications (e.g. large calibre ammunition). PFAS uses related to Explosives but NOT considered as part of this sector: - Related uses of PFAS in petroleum and mining applications (considered as part of the Petroleum and mining sector) - Related uses of PFAS in military applications (considered as part of the Military applications sector) - Related uses of PFAS in transport applications (considered as part of the Transport sector)
Technical Textiles	The assessment of the Technical textiles sector covers the uses of PFAS in textile materials (such as woven fabrics, knitted fabrics, non-wovens and felts) and textile manufactured products that are used primarily for their technical and functional properties and not for their aesthetic and decorative character. The assessment covers the uses of PFAS in outdoor technical textiles, architectural membranes, other tensile fabrics and other construction applications, filtration and separation media, removable covers for industrial process equipment, technical textiles in medical applications, and technical textiles for transport vehicles. PFAS uses related to Technical textiles but NOT considered as part of this sector: - Home textiles, including comparable uses in vehicles (such as carpets and seat covers) and public settings, e.g. hospital settings and public transport (considered as part of the TULAC sector) - Consumer apparel (considered as part of the TULAC sector) - Professional apparel and personal protective equipment (considered as part of the TULAC sector) - Leather (considered as part of the TULAC sector) - Home fabric treatments (considered as part of the TULAC sector) - Packaging (considered as part of the Food contact materials and packaging sector) - Optical fibre weaving solutions for lighting applications in health, costumes, automotive, safety, environment, communication, architecture and industrial applications (considered as part of the Electronics and semiconductors sector) - Latex printing inks, including applications for printing on textiles (considered as part of the Printing applications sector) - Solvents for dry-cleaning of textiles (considered as part of the Applications of fluorinated gases sector) - Uses of PFAS in electrical components, sealing applications or machinery applications related to the manufacture of textiles or textile products (considered as part of the Electronics and semiconductors, Sealing applications and Machinery applications sectors respectively) - Conveyor belts (considered as part of the Machinery applications sector) - PTFE fibres/yarns used for the manufacture of braided packings for sealing applications (considered as part of the Sealing applications sector) - Use of PTFE in chemically inert fabrics used by the chemical and petrochemical industry for flange protection (considered as part of the Sealing applications sector) - Coating of fabric expansion joints (considered as part of the Sealing applications sector) - Uses of PFAS in relation to textiles used for self-lubricating /low-friction purposes (considered as part of the Machinery applications sector) - Uses of PFAS for textiles used for anti-adhesive/release purposes (considered as part of the Machinery applications sector) - Fuel-cell membranes and ion-exchange membranes for the manufacture of chemicals via electrolysis (considered as part of the Energy sector)
Broader industrial uses	The assessment of the Broader industrial uses sector covers the uses of PFAS in hydraulic fluids (if not covered under the Transport sector), solvents (solvents and reaction media for precision cleaning, extraction solvents and 3D printing), and catalysts and processing aids (catalytic reaction media and processing aids, including ionic liquids). These uses apply across different use sectors involving different actors (producers and users) along the supply/value chain. PFAS uses related to Broader industrial uses but NOT considered as part of this sector: - Precision cleaning in electronics and semiconductor manufacturing (considered as part of the Electronics and semiconductors sector) - Hydraulic fluids in transport (considered as part of the Transport sector, mainly for aviation) - Analytical and laboratory applications (considered as an overarching issue, please see the explanatory notes of the main report of the Background Document and in particular the sub-heading '*Scientific research and development*') - Engineered fluids: Fluids used for lubrication (considered as part of the Lubricants sector), cooling applications (considered as part of the Electronics and semiconductors sector), or precision cleaning agents (partly considered as part of the Broader industrial uses sector, partly considered as part of the Electronics and semiconductors sector) - Heat transfer fluids, including immersion cooling and cooling in (medical) lasers (considered as part of the Applications of fluorinated gases sector and the Electronics and semiconductors sector) - Engineered fluids for diagnostic laboratory applications (considered as an overarching issue, please see the explanatory notes of the main report of the Background Document and in particular the sub-heading 'Scientific research and development') - Coatings for metals (considered as part of several different sectors, e.g. anti-acid coatings for metals are considered as part of the Metal plating and manufacture of metal products sector)

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Table 2. Descriptions for the use categories, sub-uses and applications within the sectors specifically evaluated by SEAC as identified in the draft Background Document. Note that this use-mapping structure ends with the SEAC evaluation level (highlighted in tangerine yellow).

Sector	Use category	Description	Sub-use	Description	Application	Description
Consumer mixtures and miscellaneous articles	**Consumer mixtures**	Consumer mixtures covers the uses of PFAS in mixtures intended specifically for consumer applications. Examples include cleaners for various surfaces, waxes and polishes, dishwashing products, automotive windscreen care products, anti-fogging agents for eyewear, and lubricants for piano keys and strings of musical instruments.	**Cleaners for glass, metal, ceramic, carpet and upholstery**	Cleaners for glass, metal, ceramic, carpet and upholstery covers the uses of PFAS in consumer cleaning products to provide functions such as water repellence and to minimise re-soiling. Examples include cleaners for glass, metal, ceramic, carpet and upholstery, as well as dry-cleaning products and floor polish removers.		
			Waxes and polishes (for e.g. furniture, floors and cars)	Waxes and polishes (for e.g. furniture, floors and cars) covers the uses of PFAS as wetting agents to provide functions such as gloss and levelling, surface protection, and water repellence across various applications including furniture, floors, and automotive surfaces.		
			Dishwashing products	Dishwashing products covers the uses of PFAS as rinse aids for dishwashers.		
			Windscreen treatments for automobiles and windscreen wiper fluids	Windscreen treatments for automobiles and windscreen wiper fluids covers the uses of PFAS to provide functions such as water and stain repellence in automotive windscreen care products.		
			Anti-fogging agents for spectacles and goggles	Anti-fogging agents for spectacles and goggles covers the uses of PFAS to provide functions such as water repellence, helping prevent fog formation on eyewear lenses.		
			Lubricants for piano keys	Lubricants for piano keys covers the uses of PFAS as lubricants used for the (re-)coating of piano keys.		
			Lubricants for strings for musical instruments	Lubricants for strings for musical instruments covers the uses of PFAS as a lubricant for musical instrument strings (e.g. guitars).		
	Miscellaneous consumer articles	Miscellaneous consumer articles covers the uses of PFAS in articles intended for consumer applications. Examples include strings for musical instruments, fishing lines, and synthetic turf.	**Strings for musical instruments**	Strings for musical instruments covers the uses of PFAS in solid strings and as a coating on strings for musical instruments (e.g. harps) to provide functions such as durability, strength, wear resistance and to produce a specific sound.		
			Fishing lines	Fishing lines covers the uses of PFAS in the fabrication of fishing lines, mostly leader lines (also known as shock lines), to provide functions such as high specific gravity and a specific refractive index.		
			Synthetic turf	Synthetic turf covers the uses of PFAS as processing aids in the production of synthetic turf carpets. Synthetic turf carpets are a surface of synthetic fibres that look like natural grass and are used in sport arenas, residential lawns and commercial applications that traditionally use grass.		
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
Cosmetics	**Cosmetic products containing PFAS**	Cosmetic products containing PFAS covers the uses of PFAS in cosmetic formulations or products. Examples include skin care (e.g., fluorinated gases used for the treatment of acne lesions, scars and burns and as an anti-aging agent), toiletries, hair care, perfumes and fragrances, and decorative cosmetics (e.g. make-up, nail varnish and remover, lipstick and lip balm).				
	Use of TFA in the synthesis of peptides as cosmetic ingredients	For the use of TFA in the synthesis of peptides as cosmetic ingredients, most commonly TFA is used in solid phase peptide synthesis, and it may also be used in liquid phase peptide synthesis. Synthetic peptides are primarily used in leave-on face and body care applications for purposes such as anti-aging, anti-wrinkle, cell rejuvenation, and skin barrier recovery.				
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
Ski wax	**Ski wax**	Ski wax covers the uses of PFAS in ski wax applications. Examples include blocks of wax, liquid wax, paste wax, powder wax, spray wax or mixtures for cleaning and impregnation.				
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
Metal plating and manufacture of metal products	**Chrome plating**	Chrome plating covers the uses of PFAS in hard chrome plating, decorative chrome plating and the pretreatment of plastic before chrome plating (plating on plastic).	**Hard chrome plating**	Hard chrome plating (also referred to as 'Functional chrome plating) covers the uses of PFAS as wetting agents, mist/fume suppressing agents and processing aids in chrome plating solutions for hard chrome plating.		
			Decorative chrome plating	Decorative chrome plating covers the uses of PFAS as wetting agents, mist/fume suppressing agents and processing aids in chrome plating solutions for decorative applications.		
			Plating on plastic	Plating on plastic covers the uses of PFAS in the pretreatment (etching) of plastic followed by electroplating (e.g. chrome plating).		
	Plating with other metals	Plating with other metals covers the uses of PFAS in plating processes other than chrome plating. Examples include nickel plating, aluminium anodising and plating processes involving other metals.	**Nickel plating**	Nickel plating covers the uses of PFAS in nickel-based plating processes. Examples include electroless nickel(-phosphorous) PTFE plating or nickel plating.		
			Aluminium anodising	Aluminium anodising covers the uses of PFAS in anodic oxidation processes for aluminium applications.		
			Other metals	Other metals cover the uses of PFAS in plating processes other than Chrome plating, Nickel plating, and Aluminium anodising applications. Examples include copper plating/electroless copper plating, zinc flake coating, precious metals electroplating.		
	Manufacture of metal products	Manufacture of metal products covers the uses of PFAS in the production of a wide range of metal products, from mechanical components for vehicles and machinery to construction materials. PFAS may be applied both as process chemicals and in article production. This category includes solvents for metal cleaning, razor blades coating, and other metal coating.	**Metal coating**	Metal coating includes related polymeric PFAS applications that provide functions such as as chemical resistance, thermal stability, and protection.		
			Razor blades coating	Razor blades coating include related PTFE applications that provide functions such as inertness, durability, or low friction.		
			Solvents for metal cleaning	Solvents for metal cleaning covers the uses of PFAS-based solvents to remove PFAS-based oils and lubricants from metallic parts.		
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				

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Sector	Use category	Description	Sub-use	Description	Application	Description
Petroleum and mining	**Tracers**	Tracers refers to PFAS-based tracers that can be used for monitoring fluid/gas movement and monitor reservoir performance in water, oil and gas operations, geothermal systems, and carbon capture processes.	**Oil and gas tracers**	Oil and gas tracers can be used to track fluid/gas pathways and monitor reservoir performance.		
			Water tracers	Water tracers can be used to track fluid pathways and monitor reservoir performance.		
	Anti-foaming agents	Antifoaming agents are used to aid the separation of water and oil during production or refining processes in the petroleum industry to improve process efficiency.				
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
Textiles, upholstery, leather, apparel and carpets (TULAC)	**Home textiles**	Home textiles covers uses of PFAS in carpets, rugs, curtains, blinds, and textile-based coverings. Note that uses of PFAS in textiles used in vehicles (e.g. carpets and seat covers) and public settings (e.g. hospital settings and public transport) are also covered by this category.				
	Consumer apparel	Consumer apparel covers uses of PFAS in outdoor wear, indoor wear, sportswear, footwear, and accessories (e.g., bags, umbrellas, wallets).				
	Professional apparel and Personal Protective equipment (PPE)	Professional apparel and Personal Protective Equipment (PPE) covers PFAS used in professional apparel (including professional sports- and /footwear and uniforms), and personal protective equipment (PPE) for industrial and professional use.	**Professional apparel (including professional sports-/footwear and uniforms)**	Professional apparel (including professional sports/footwear and uniforms) covers related PFAS applications with the function of e.g. water and oil repellence.		
			Personal Protective Equipment (PPE)	Personal Protective Equipment (PPE) covers PFAS-treated protective equipment and tools for risks as defined in Regulation (EU) 2016/425, including military and emergency response gear, and agents for re-impregnation. Examples include safety helmets, gloves, eye protection, and hazmat suits.	**PPE intended to protect users against risks as specified in Regulation (EU) 2016/425, Annex I, risk categories I and II**	PFAS-treated PPE for minimal and intermediate risks, such as superficial mechanical injury or contact with cleaning materials
					PPE intended to protect users against risks as specified in Regulation (EU) 2016/425, Annex I, risk categories III(a) and III(c)	PFAS-treated PPE for very serious risks, including chemical attack and extreme temperatures
					PPE intended to protect users against risks as specified in Regulation (EU) 2016/425, Annex I, risk categories III(b) and III(d-m)	PFAS-treated PPE for life-threatening or irreversible harm, covering hazardous substances, biological agents, electrical risks, drowning, falls, and other severe hazards
					PPE specifically designed for armed forces, the maintenance of law and order and other emergency response workers	PFAS-treated specialized PPE for military, law enforcement, and emergency services, designed for extreme operational conditions.
					Impregnation agents for re-impregnation of PPE	Agents for re-impregnation of protective clothing, restoring water and oil repellence.
	Leather	Leather applications include related PFAS applications that provide functions such water and oil repellence. Examples include indoor and outdoor wear, footwear, professional sportswear and footwear, and seat covering.				
	Home fabric treatment (sprays)	Home fabric treatment (sprays include related PFAS applications that provide functions such as water, oil, and stain repellence on household textiles like upholstery, carpets, and curtains				
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
	Packaging (FCM and non-	Packaging applications cover the	**Paper-board packaging**	Paper-board packaging include related PFAS applications that provide functions such as providing moisture barriers, oil and grease repellence,		

Sector	Use category	Description	Sub-use	Description	Application	Description
Food contact materials (FCM) and packaging	**FCM applications)**	uses of PFAS in food and non-food packaging. These uses include related PFAS applications that provide functions such as to confer oil/grease resistance and water repellence.		and prevent sticking or leakage. Examples include food packaging (e.g., baking paper, grease-proof paper, pizza boxes, plates, trays), feed packaging (e.g., pet food, agricultural feed), and standard packaging.		
			Polymer processing aids used in flexible plastic film extrusion	Polymer processing aids used in flexible plastic films extrusion covers uses of PFAS as processing aids in the extrusion of plastic films and sheets for packaging applications.	**Applications where the structural integrity of the packaging is critical for human health and safety**	Applications where the structural integrity of the packaging is critical for human health and safety refer e.g. to vacuum food packaging or food packaged under inert atmosphere
					Other applications	Other applications refer to applications where the structural integrity of the packaging is not critical for human health and safety
			Packaging uses of f-HDPE	F-HDPE (fluorinated high-density polyethylene) packaging covers uses of PFAS in f-HDPE containers for the safe transport of hazardous chemicals, biocides and plant protection products.		
			Inks, lacquers and waxes in FCM packaging	Inks, lacquers and waxes cover uses of PFAS in packaging applications for printed surfaces in relation to food contact materials packaging. Inks can be used to apply printed information (e.g., branding, safety data, ingredient list, etc), while waxes and lacquers protect printed surfaces.		
			Other packaging applications	Other packaging applications cover uses of PFAS in packaging-related materials. Examples include car wrapping sheets and coatings of beverage and food cans.		
	Non-stick coatings in consumer cookware and domestic appliances	Non-stick coatings in consumer cookware and domestic appliances cover the uses of PFAS in consumer cookware and domestic appliances for both consumer and professional uses (e.g. catering and restaurant establishments).				
	Non-stick coatings in industrial bakeware	Non-stick coatings in industrial bakeware cover the uses of PFAS in industrial bakeware, including in the re-coating of industrial bakeware.				
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
Construction products	**Architectural coatings and paints**	Architectural coatings and paints covers PFAS-based films and additives. Examples include coatings for bridges, exterior walls (incl. photocatalyst paints), glass and window profiles, metal components (e.g., elevators, sanitary fixtures), doors and fittings, and consumer paints.				
	Coil coating	Coil coating covers the uses of polymeric PFAS-based coatings on steel and aluminium coils during industrial processing. These coated coils are later shaped into building components such as exterior panels, roofing sheets, and façade elements.				
	Polymer additives used for fire safety purposes	Polymer additives used for fire safety purposes covers the uses of PFAS in construction polymers. Note that his use refers specifically to construction products. Examples include flame retardants (e.g. PFBS as additive to polycarbonate resins), high-MW PTFE additive as drip suppression of burning plastics, PFHxS-Li+ as antistatic.				
	Film/foil for greenhouses	Film/foil for greenhouses covers the use of pure ETFE film used for greenhouse covers.				
	Polymeric PFAS – processing aids for the production of non-PFAS polymers/plastics	Polymeric PFAS - processing aids for the production of non-PFAS polymers covers the uses of PFAS-based processing aids in plastics and elastomers for construction applications. Examples include processing aids in thermoplastics (e.g. PE and PP), thermosetting plastics and elastomers used as building materials or construction products and PTFE used as processing aid in the manufacturing process of e.g. PEX-pipes and compression sleeves in underfloor heating				
	Bridge and building bearings	Bridge and building bearings covers the uses of polymeric PFAS in plain and slide bearings used in bridges and buildings. Examples include seismic isolators used in bridges and buildings.				
	Window frames	Window frames covers the uses of polymeric PFAS as surface protection films for laminating PVC and high-pressure laminate HPL window frames.				
	Plumbing applications (wetted pipes and fittings)	Plumbing applications (wetted pipes fittings) covers the uses of polymeric PFAS in systems such as drinking water, sprinkler, gas and hot water heating systems, including fittings. Note that this category does not include sealing of plumbing applications of connections using thread sealing tape.				
	Polymeric PFAS – surface protection	Polymeric PFAS - surface protection covers the uses of PFAS polymers in surface treatments for construction applications. Examples include surface treatments of absorbing and non-absorbing construction materials for interior and exterior surfaces (e.g., glass, enamel, wood, ceramics, metal, stone, concrete).				
	Side-chain fluorinated polymers – surface protection	Side-chain fluorinated polymers - surface protection covers the uses of PFAS in the form of side-chain fluorinated polymers in surface treatments for construction applications. Examples include surface treatments of absorbing and non-absorbing construction materials for interior and exterior surfaces (e.g., glass, enamel, wood, ceramics, metal, stone, concrete).				
	Wetting/levelling agents in e.g. coatings, paints and adhesives	Wetting/levelling agents in e.g. coatings, paints, adhesives covers the uses of non-polymeric PFAS used in coatings, paints, lacquers, and adhesives. Examples include wood finishes, tile adhesives, and surface treatments for glass and construction materials.				
	Non-polymeric PFAS used as processing aids to produce construction articles	Non-polymeric PFAS used as processing aids for the production of construction articles covers PFAS used as processing aids in manufacturing certain construction products, the PFAS do not remain in or function within the final article. Examples include aids for architectural membranes and acrylic foam tape.				
	Window film manufacturing	Window film manufacturing covers the uses of non-polymeric PFAS as coating additives and dispersants in window film manufacturing.				
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
Applications of fluorinated gases	**Refrigeration**	Refrigeration covers uses of fluorinated gases as refrigerants in the coolant circuits of refrigeration	**Domestic refrigerators and freezers**	Domestic refrigerators and freezers covers uses of fluorinated gases as refrigerants in domestic refrigerators and freezers in residential settings.		

Sector	Use category	Description	Sub-use	Description	Application	Description
		equipment as part of the Applications of fluorinated gases sector. This category consists of domestic, commercial, and industrial refrigeration as well as refrigerants used for maintenance and refilling of existing HVACR equipment.	**Commercial refrigeration**	Commercial refrigeration covers uses of fluorinated gases as refrigerants in retail and food services. This category consists of self-contained refrigerators and freezers for commercial use, multipack centralised refrigeration systems for commercial use and primary refrigerant circuit of cascade systems.	**Refrigerators and freezers for commercial use (self-contained equipment)**	Refrigerators and freezers for commercial use (self-contained equipment) covers uses of fluorinated gases as refrigerants in complete factory-made commercial refrigerators and freezers used for the storage, display or dispensing of products, for sale to end users, in retail and food services.
					Multipack centralised refrigeration systems for commercial use	Multipack centralised refrigeration systems for commercial use covers uses of fluorinated gases as refrigerants in systems with two or more compressors operated in parallel, which are connected to one or more common condensers and to a number of cooling devices such as display cases, cabinets and freezers, or to chilled store rooms, as part of commercial applications.
					Primary refrigerant circuit of cascade systems	Primary refrigerant circuit of cascade systems covers uses of fluorinated gases as refrigerants in primary circuits in indirect medium temperature systems where a combination of two or more separate refrigeration circuits are connected in series such that the primary circuit absorbs the condenser heat from a secondary circuit for the medium temperature, as part of commercial applications.
			Industrial refrigeration	Industrial refrigeration covers uses of fluorinated gases as refrigerants in large-scale cooling systems in industrial settings. This category consists of refrigeration equipment, self-contained refrigeration equipment, and chillers.	**Refrigeration equipment, except chillers and self-contained refrigeration equipment**	Refrigeration equipment (except chillers and self-contained refrigeration equipment) covers uses of fluorinated gases as refrigerants in all industrial refrigeration equipment, except in chillers and self-contained refrigeration equipment.
					Self-contained refrigeration equipment, except chillers	Self-contained refrigeration equipment (except chillers) covers uses of fluorinated gases as refrigerants in all industrial self-contained refrigeration equipment, except in chillers.
					Chillers up to and including a rated capacity of 12 kW	Chillers up to and including a rated capacity of 12 kW covers uses of fluorinated gases as refrigerants in chillers with rated capacity up to and including 12 kW. A chiller is a single system, whose primary function is to cool a heat transfer fluid (such as water, glycol, brine or CO2) for refrigeration, process, preservation or comfort purposes.
					Chillers above 12 kW	Chillers above 12 kW covers uses of fluorinated gases as refrigerants in chillers with rated capacity above 12 kW. A chiller is a single system whose primary function is to cool a heat transfer fluid (such as water, glycol, brine or CO2) for refrigeration, process, preservation or comfort purposes.
			Refrigerants for maintenance and refilling of existing HVACR equipment	Refrigerants for maintenance and refilling of existing HVACR equipment covers uses of fluorinated gases as refrigerants used for maintenance and refilling of HVACR equipment put on the market before 18 months after EiF (or placed on the market after 18 months after EiF based on an applicable derogation).		
	Air conditioning and heat pumps	Air conditioning and heat pumps covers uses of fluorinated gases as refrigerants in air conditioning systems and heat pumps within the Applications of fluorinated gases sector. This category consists of self-contained air-conditioning equipment and heat pumps, split air-conditioning equipment and heat pumps, and refrigerants used for maintenance and refilling of existing HVACR equipment.	**Self-contained air-conditioning equipment and heat pumps**	Self-contained air-conditioning equipment and heat pumps covers uses of fluorinated gases as refrigerants in complete factory-made systems which are in a suitable frame or casing. These systems are fabricated and transported as complete units or in two or more sections, and can contain isolation valves, but no gas-containing parts are connected on site. Examples include plug-in room air-conditioning equipment, monoblock air-conditioning equipment and self-contained air-conditioning equipment and heat pumps.	**Plug-in room air-conditioning equipment, monoblock air-conditioning equipment, other self-contained air-conditioning equipment and self-contained heat pumps, with a maximum rated capacity of up to and including 12 kW**	Plug-in room air-conditioning equipment, monoblock air-conditioning equipment, other self-contained air-conditioning equipment and self-contained heat pumps, with a maximum rated capacity of up to and including 12 kW.
					Monoblock air-conditioning equipment and heat pumps, with a maximum rated capacity of more than 12 kW but not exceeding 50 kW	Monoblock and other self-contained air-conditioning equipment and heat pumps, with a maximum rated capacity of more than 12 kW but not exceeding 50 kW.
					Other self-contained air-conditioning equipment and heat pumps (regardless of maximum rated capacity, but above 12 kW), except industrial uses	Other self-contained air-conditioning equipment and heat pumps (regardless of maximum rated capacity, but above 12 kW), except industrial uses.
					Industrial uses of self-contained heat pumps with a maximum rated capacity above 12 kW.	Industrial uses of self-contained heat pumps with a maximum rated capacity above 12 kW.
			Split air-conditioning equipment and heat pumps	Split air-conditioning equipment and heat pumps covers uses of fluorinated gases in systems consisting of a number of refrigerant piped units that form an interconnected unit, requiring the installation and connection of refrigerant circuit components at the point of use. This category consists of different types of split systems that vary in rated capacities.	**Split systems of a rated capacity up to and including 12 kW**	Split systems of a rated capacity up to and including 12 kW.
					Split systems of a rated capacity of more than 12 kW, except industrial uses	Split systems of a rated capacity of more than 12 kW, except industrial uses.
					Industrial uses of split	Industrial uses of split systems with a maximum rated capacity

Sector	Use category	Description	Sub-use	Description	Application	Description
					systems with a maximum rated capacity above 12 kW	above 12 kW.
			Refrigerants for maintenance and refilling of existing HVACR equipment	Refrigerants for maintenance and refilling of existing HVACR equipment covers uses of fluorinated gases as refrigerants used for maintenance and refilling of HVACR equipment put on the market before 18 months after EiF (or placed on the market after 18 months after EiF based on an applicable derogation).		
	Foam blowing agents in thermal insulation foam	Foam blowing agents in thermal insulation foam covers uses of fluorinated gases as blowing agents for applications that require non-flammability or high-efficiency insulation foam in thin layers. These agents create high efficiency thermal insulation foams and remain within the material to enhance the insulating performance of the foam itself. Examples include closed-cell foams, typically rigid and used as building insulation, and open-cell foams, generally soft and used in products such as mattresses, sofas, or car seats.				
	Propellants for technical aerosols (where non-flammability and high technical performance of spray quality are required)	Propellants for technical aerosols covers uses of fluorinated gases as propellants in technical aerosols for applications requiring non-flammability and high spray performance within the Applications of fluorinated gases sector. Propellants expel aerosol contents through a nozzle in products such as adhesive dispensers, cleaners, safety horns, cold sprays, and paints. Note that this category does not include products intended for entertainment and decorative purposes for the general public.				
	Cover gases	Cover gases involves uses of fluorinated gases as a protective "film" over molten metal surfaces during metal casting processes. The cover gas prevents the rapid oxidation and combustion of the metal surface. Examples include magnesium diecasting and sand-casting processes.	**Cover gases in magnesium diecasting**	Fluorinated gases may be used as cover gases in magnesium die casting to prevent the rapid oxidation and combustion of molten metal surface.		
			Cover gases in sand casting	Fluorinated gases may be used as cover gases in sand casting to prevent the rapid oxidation and combustion of molten metal surface.		
	Clean fire suppressants	Clean fire suppressants involve fluorinated gases used for fire suppression. Clean fire suppressants are used in situations where electrically non-conductive, non-corrosive and residue-free substances are required to protect people and assets.	**Applications where current alternatives damage the assets to be protected or pose a risk to human health (e.g. in aviation, certain data centres, historical archives and museums)**	Applications where current alternatives damage the assets to be protected or pose a risk to human health (e.g., in aviation, certain data centres, historical archives, museums) covers fluorinated gases used as clean fire suppressants as fire protection in this context. Examples include F-K-1-12 for protecting critical or culturally significant infrastructure, 2-BTP used in hand-held extinguishers on aircraft, and other clean fire suppressants applications.	**FK-5-1-12 used to protect critical or culturally significant infrastructure**	FK-5-1-12 used to protect critical or culturally significant infrastructure covers uses of FK-5-1-12 (mixed with HF(C)O-1233zd(E)) as a clean fire suppressant to protect critical or culturally significant sites. Examples include IT rooms, data centres, hospital and bank data storage, energy production/distribution facilities, telecom hubs, control rooms (e.g., airport towers, power plants, naval vessels), chemical storage areas, military and aerospace vehicles/ships, oil rigs, document vaults, historical archives, and museums.
					2-BTP used in hand-held extinguishers on-board aircraft	2-BTP used in hand-held extinguishers onboard aircraft.
					Applications of clean fire suppressants, except FK-5-1-12 used to protect critical or culturally significant infrastructure and 2-BTP used in hand-held extinguishers onboard aircraft	Applications of clean fire suppressants, except FK-5-1-12 used to protect critical or culturally significant infrastructure and 2-BTP used in hand-held extinguishers onboard aircraft.
			Clean fire-suppressing agents used for maintenance and refilling of existing fire-suppressing equipment	Clean fire-suppressing agents for maintenance and refilling of existing fire-suppressing equipment involves fluorinated gases used for maintenance and refilling of fire-suppressing equipment put on the market before 18 months after EiF (or placed on the market after 18 months after EiF based on an applicable derogation)		
	Preservation of cultural paper-based materials	Preservation of cultural paper-based materials involves fluorinated gases used as solvents, dispersants, or carrier fluids for Magnesium Oxide (MgO), which acts as an acid corrosion inhibitor to preserve cultural paper-based materials. This ensures long-term preservation of culturally or historically significant materials without damaging ink, bindings, adhesives, or causing paper discoloration.				
	Insulating gases in electrical equipment	Insulating gases in electrical equipment covers the use of fluorinated insulating gases in electrical equipment to ensure reliable power supply and distribution by interrupting current flow when required. Examples include electrical switchgear rated up to and including 145 kV, switchgear above 145 kV. This category further includes insulating gases used for maintenance and refilling of existing switchgear.	**Electrical switchgear up to and including 145 kV**	Electrical switchgear up to and including 145 kV.		
			Electrical switchgear above 145 kV	Electrical switchgear above 145 kV. This category includes C5-FK, HFO-1234yf, and other insulating gases used in electrical switchgear above 145 kV.	**C5-FK used in electrical switchgear above 145 kV**	C5-FK used in electrical switchgear above 145 kV.
					HFO-1234yf used in electrical switchgear above 145 kV	HFO-1234yf used in electrical switchgear above 145 kV.
					Insulating gases used in electrical switchgear above 145 kV, except C5-FK and HFO-1234yf	Insulating gases used in electrical switchgear above 145 kV, excluding uses of C5-FK and HFO-1234yf.
			Insulating gases for maintenance and refilling of existing switchgear equipment	Insulating gases for maintenance and refilling of existing switchgear equipment covers uses of fluorinated gases used for maintenance and refilling of switchgear equipment put on the market before 18 months after EiF (or placed on the market after 18 months after EiF based on an applicable derogation)		
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
Medical devices	**Implantable medical devices**	Implantable medical devices covers the uses of PFAS in medical devices and their components (e.g. electronic parts) that are introduced	**Fluorinated meshes**	Fluorinated meshes covers the uses of PFAS in implantable surgical meshes that serve as either permanent or temporary structural support for organs and other tissues. Examples include meshes used for hernia and pelvic floor surgery.		

Sector	Use category	Description	Sub-use	Description	Application	Description
		into the human body by clinical intervention and are intended to remain in place for a long period of time (or even permanently) after the procedure. Examples include medical implants (e.g., ear implants, scleral implants, heart valves and stents) and fluorinated meshes (e.g. hernia meshes, pelvic meshes).	**Other medical implants**	Medical implants covers the use of PFAS in implantable medical devices. Examples include scleral implants, heart valves, stents, and ear implants.		
	Invasive medical devices	Invasive medical devices covers uses of PFAS in medical devices and their components (e.g. electronic parts) that penetrate inside the body either through a body orifice or through the surface of the body and are in contact with the human body for a significant, although shorter time than the implantable devices. Examples include tubes, catheters and invasive vision applications.	**Tubes and catheters**	Tubes and catheters covers the uses of PFAS in the inner lining or outer coating in tubes, catheters, guidewires as well as in the insulation of reusable electrodes in endoscopy equipment in invasive applications.		
			Vision applications	Vision applications covers the uses of PFAS in invasive vision applications. Examples include Rigid Gas Permeable (RGP) lenses, invasive applications and tamponade agents used in ophthalmic surgery (including ocular tamponade gases), and eye drops (without active ingredients).		
			Other invasive medical devices, except tubes and catheters and vision applications	This category covers any other invasive medical devices, except tubes and catheters and vision applications		
	Non-implantable non-invasive medical devices	Non-implantable non-invasive medical devices covers uses of PFAS in medical devices that are neither implantable nor invasive. Examples include sterilisation gases, wound treatment products (e.g. bandages, medical adhesive tapes, etc.), and coatings.	**Sterilisation gases**	Sterilisation gases covers the uses of PFAS gases in hospitals as sterilisers either on their own or in dilution with other gases.		
			Wound treatment products	Wound treatment products covers the uses of PFAS in wound treatment and wound care products. Examples include bandages, medical adhesive tapes and products used for treating burns.		
			Coatings	Coatings covers the uses of PFAS in surface treatments applied to non-implantable and non-invasive medical devices to enhance durability, lubricity and biocompatibility. Examples include coatings used in ophthalmic lenses and sunglasses, surgical magnifying loupe lenses and hearing aids. Note that coatings applied to implantable or invasive medical devices are considered under the respective use categories.		
	Packaging of medical devices	Packaging of medical devices covers uses of PFAS in packaging materials specifically designed for medical devices. Examples include PCTFE in terminally sterilised and non-sterilised packaging of medical devices, polymer processing aids used in flexible plastic film extrusion for packaging of terminally sterilised and non-sterilised medical devices and waxes for inks and lacquers used on packaging of medical devices. Note that immediate packaging for medicinal products is not part of this category.	**PCTFE in packaging of terminally sterilised and non-sterilised medical devices**	PCTFE in packaging of terminally sterilised and non-sterilised medical devices include related PFAS applications (e.g. multilayer films) that provide functions such as to provide high barrier to moisture and chemicals, transparency, thermoformability, chemical stability and inertness, cryogenic stability, non-sticking and non-aging properties, and sterilizability.		
			Polymer processing aids used in flexible plastic film extrusion for packaging of terminally sterilised and non-sterilised medical devices	Polymer processing aids used in flexible plastic film extrusion for packaging of terminally sterilised and non-sterilised medical devices include related PFAS applications (e.g., polymer processing aids used in flexible plastic film extrusion for packaging of terminally sterilised and non-sterilised medical devices) that provide functions such as , to provide smoother extrusion flow, improve hydrophobic qualities, and strengthen packaging for both terminally sterilized and non-sterilized devices.		
			Waxes for inks and lacquers used on packaging of medical devices	Waxes for inks and lacquers used on packaging of medical devices include related PFAS applications (e.g., waxes in inks and coatings in flexible plastic packaging) that provide functions such as to improve scratch resistance, gloss, surface friction and water repellence.		
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
Transport	**Body, hull and fuselage construction**	Body, hull and fuselage construction covers uses of PFAS in structural and interior components of transport	**Foam mouldings**	Foam mouldings are used in the body, hull and fuselage construction of transport vehicles. Specific uses where PFAS may be included in foam mouldings are PVDF foam for aircraft interiors, and urethane foam for sound and heat insulation in cars.		

Sector	Use category	Description	Sub-use	Description	Application	Description
		vehicles and mobile machinery within the scope of the Transport sector. Examples include foam mouldings and fluoropolymers in rubber goods.	**Body, hull and fuselage construction uses, except foam mouldings**	Other uses that may contain PFAS that fall within the category of Body, hull and fuselage construction but do not belong under foam mouldings include for example fluoropolymers in rubber goods.		
	Tubes and hoses in combustion engine systems	Tubes and hoses in combustion engine systems include related PFAS materials used in tubes and hoses applied as fuel system components, turbo chargers, exhaust gas recirculation, etc. within combustion engine systems				
	Coatings, liners and finishes	Coatings, liners and finishes covers uses of PFAS in surface treatments or layers applied to materials or products to provide protection or functionality of transport vehicles, mobile machinery and associated infrastructure. Examples include protective coatings and paints, functional coatings (including anti-fouling), cable liners and coatings, and reflective coatings for traffic signage.	**Protective coatings and paints**	Protective coatings and paints include related PFAS applications that provide functions such as enhancing corrosion resistance, fire resistance, anti-crack resistance, abrasion resistance, chemical protection, UV stability, and durability for transport vehicles and mobile machinery.		
			Hydrophobic coatings for windshields	Hydrophobic coatings for windshields include related PFAS applications that provide functions such as to create water-repellent surfaces that improve visibility and safety. Examples include glass coatings in the automotive, ships and aerospace sectors.		
			Cable liners and coatings for transport vehicles, including high voltage insulators	Cable liners and coatings for transport vehicles, including high voltage insulators covers the uses of PFAS -containing materials that can be applied as protective liners or coatings on cables and insulators used in transport vehicles, mobile machinery and associated infrastructure. Examples include rail and airplane wire insulations.		
			FEP based heat shrink sleeving	FEP-based heat shrink sleeving include related PFAS applications that provide functions such as to provide heat or chemical resistance in transport vehicles		
			Other uses of PFAS in coatings, liners and finishes	Other uses of PFAS in coatings, liners and finishes covers uses of PFAS in various applications within the scope of coatings, liners and finishes as part of the Transport sector. Examples are anti-fouling coatings on ship hulls, surface coatings for exterior sensors, anti-icing coatings for helicopter rotors, trim materials for vehicle interiors, reflective coatings for traffic signs, coating of insulation materials, coatings to reduce fuel consumption and emissions, braking hoses, hoses for hydraulic fluids and fuel for aircrafts, PTFE lined hoses, interior coating systems for public transport vehicles, glass protective coatings, fluoropolymer coatings for aerospace industry, and PFAS as anti-stat in polycarbonate for use in automotive headlamp lenses.		
	Aerospace-specific applications	Aerospace-specific applications covers specific PFAS uses within aerospace systems not assessed as part of the other use categories.	**Aerospace hoses**	Aerospace hoses include related PFAS applications that provide functions such as enhancing chemical resistance, thermal stability, and mechanical durability under extreme operating conditions. Examples include liners of aerospace hose assemblies and PTFE-lined flexible high-pressure hoses.		
			Wraps for aluminium fan cases for jet engines	Wraps for aluminium fan cases for jet engines include related PFAS applications that provide functions such as enhancing thermal protection, flame resistance, and structural integrity under extreme aerospace operating conditions.		
	Additives in hydraulic fluids	Hydraulic fluids may contain PFAS e.g. for their include related PFAS applications that provide functions such as anti-corrosion, thermal stability, low compressibility, and chemical resistance, and other properties, ensuring safe and reliable operation in high-pressure systems like landing gear, flight controls and other hydraulic systems in transport vehicles and mobile machinery.	**Air- and spacecraft**	PFAS as additives in hydraulic fluids of air- and spacecrafts.		
			Non-road equipment	PFAS as additives in hydraulic fluids of non-road equipment.		
			Other transport vehicles	PFAS as additives in hydraulic fluids of transport vehicles other than air- and spacecrafts and non-road equipment.		
	Mobile air conditioning (MAC) and heat pump systems	Mobile air conditioning (MAC) and heat pump systems refers specifically to PFAS that may be used as refrigerants in air conditioning and heat pump systems in transport vehicles. It does not include PFAS in other MAC components such as hoses, seals, or coatings, which are addressed under other sub-uses/sectors.	**Light duty electrical vehicles**	Light duty electrical vehicles covers uses of PFAS in mobile air conditioning (MAC) and heat pump systems in electrical passenger cars and electrical vans of vehicle category M and N.		
			All other vehicles	Any application of Mobile air conditioning (MAC) and heat pump systems except in light duty electrical vehicles. Examples are heavy duty electrical vehicles, hybrid cars and combustion engine vehicles with mechanical compressors.		
			Maintenance/repair, including refilling, of existing equipment that was originally designed to use PFAS	This use refers to PFAS used in the maintenance or repair (including refilling) of existing equipment in the scope of Mobile air conditioning (MAC) and heat pump systems.		
	Transport refrigeration	Transport refrigeration refers to PFAS used in refrigerants for systems that maintain temperature control during the transportation of goods (e.g. cooled or frozen products). The scope is limited to PFAS in refrigerant substances; PFAS in other components like seals or insulation are addressed under separate sub-uses/sectors	**Automotive applications**	Automotive applications of transport refrigeration refer to European vehicle categories L, M, N and O.		
			Marine applications	Marine applications of transport refrigeration refers e.g. to reefer containers in marine transportation.		
			Other applications	Any application of Transport refrigeration except automotive applications, marine applications and maintenance/repair.		
			Maintenance/repair, including refilling, of existing equipment that was originally designed to use PFAS	This use refers to PFAS used in the maintenance or repair (including refilling) of existing equipment in the scope of Transport refrigeration.		
	Other transport uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above. Examples are devices for motion control solutions (e.g., flotation fluids in gyroscopes).				
Energy	**Renewable energy generation (i.e. wind and solar energy)**	Renewable energy generation covers uses of PFAS in solar collectors, photovoltaic cells and wind energy applications.	**Solar collectors**	Solar collectors covers the uses of PFAS applied in applications that absorb solar radiation and convert it into thermal energy.		
			Photovoltaic cells (solar panels)	Photovoltaic cells covers the uses of PFAS applied in applications that convert light energy from sunlight directly into electricity. Examples include PFAS in films, sheets and coatings in relation to various solar modules and cells		
			Wind energy	Wind energy covers the uses of PFAS applied in applications that convert wind energy into electricity. Examples include paints and coatings of wind turbines.		

Sector	Use category	Description	Sub-use	Description	Application	Description
	Hydrogen technology	Hydrogen technology covers uses of PFAS in components of the proton exchange membrane (PEM), alkaline water electrolysers (AWEs), direct-methanol fuel cells (DMFC), anion exchange membrane (AEM) electrolysis in relation to hydrogen technology applications.	**PEM fuel cells**	PEM fuel cells covers the uses of PFAS in membrane electrode assemblies (MEA) and its components such as catalyst coated membrane (CCM) (including reinforcing material), gas diffusion layer (GDL), microporous layes (MPL), electrodes, sealing materials and gaskets (specifically in relation to MEA) and bipolar plates	**PEM fuel cells applications, except bipolar plates**	All other PFAS applications in FEM fuel cells besides bipolar plates
					Bipolar plates	Bipolar plates in PEM fuel cells conduct electricity between cells while distributing gases and managing water and heat within the stack.
			PEM water electrolyser	PEM water electrolysers covers the uses of PFAS in critical components such as membranes, bipolar plates, and seals designed for high-performance operation as part of hydrogen technology under the energy sector.		
			PEM hydrogen compression, purification and extraction	PEM hydrogen compression, purification and extraction covers the uses of PFAS-based materials in membrane electrode assemblies used for durability under high pressure and corrosive conditions.		
			Alkaline water electrolyzers (AWEs)	Alkaline water electrolysers covers the uses of FAS in membranes that provide chemical stability and ion conductivity under highly alkaline conditions.		
			Direct-methanol fuel cells (DMFC)	Direct-methanol fuel cells covers the uses of PFAS in membrane components that ensure chemical resistance and proton conductivity when operating with methanol as fuel.		
			Anion exchange membrane electrolysis (AEM)	Anion exchange membrane electrolysis covers the uses of contain PFAS in membranes and auxiliary parts that require durability and chemical stability under alkaline conditions.		
	Manufacturing of chemicals via electrolysis	Manufacturing of chemicals via electrolysis covers uses of PFAS applications in chlor-alkali electrolysis, HCl electrolysis and PEM electrolysis for ozone production.	**Chlor-alkali electrolysis**	Chlor-alkali electrolysis covers the uses of PFAS in the oxygen-depolarized cathode and gas diffusion electrodes (ODC) providing functionalities of barrier, high conductivity, hydrophobicity, and chemical resistance.		
			HCl electrolysis	Manufacturing of HCl by electrolysis covers the uses of PFAS in the oxygen-depolarized cathode and gas diffusion electrodes (ODC) providing functionalities of chemical and thermal resistance, and hydrophobicity.		
			PEM electrolysis (ozone production)	PEM electrolysis for ozone production covers the uses of PFAS in, for example, the ionomeric membrane or in the reinforcement material, with the function of electric isolation, chemical resistance, mechanical stability and high resistance to radical species.		
	Batteries	Batteries covers the uses of PFAS in battery components such as binders, separator coatings or electrolytes in various types of batteries.	**Batteries in general (primary/secondary)**	Primary and secondary batteries include uses of PFAS in separator coatings, electrolytes, and binders within active material layers to ensure chemical resistance, thermal stability, and reliable performance under demanding electrochemical conditions. This sub-use is to provide generic information applicable to several battery types on binders, electrolytes and separator coatings. Information relevant only for specific battery types can be provided under battery specific use categories.	**Binders**	Polymeric binders are used in the electrode to make the active material (electrochemically active components, e.g. lithium metal oxide) adhere to the current collector. The polymeric binder is considered essential for battery efficiency as it provides the electrodes with the necessary structure and robustness for effective electron movement and ion transition during the process of charging and discharging
					Electrolytes	Non polymeric PFAS are used as electrolytes to provide functions such as capturing water and avoid hydrogen fluoride emissions as to increase electrolyte stability.
					Separator coatings	PVDF is used as a coating on a separator, which ensure separation of negative and positive electrode to avoid short-circuiting.
			Lithium-ion batteries (prismatic, cylindrical and pouch) (secondary)	*This use category is available for stakeholders to provide information specific for secondary lithium-ion batteries. Generic information on binders, electrolytes and separator coatings should be provided under the category batteries in general (primary/secondary).* Lithium-ion batteries (prismatic, cylindrical and pouch secondary) can contain PFAS in electrode binders, separator films or coatings, polymer electrolyte and electrolyte additives.		
			Primary lithium batteries (coin, cylindrical)	*This use category is available for stakeholders to provide information specific for primary lithium batteries. Generic information on binders, electrolytes and separator coatings should be provided under the category batteries in general (primary/secondary).* Primary lithium batteries can contain PFSA in the binder of the positive electrode and in the electrolyte. Examples include non-rechargeable batteries in smoke alarms for homes and blood glucose meters.		
			Coin lithium rechargeable (secondary)	*This use category is available for stakeholders to provide information specific for coin lithium rechargeable batteries. Generic information on binders, electrolytes and separator coatings should be provided under the category batteries in general (primary/secondary).* Coin lithium rechargeable (secondary) batteries can contain PFAS in the binder of the positive electrode, and in the electrolyte. Examples include rechargeable batteries in earphones, watches, hearing aids.		
			Nickel metal hybrid battery/nickel cadmium battery (secondary)	*This use category is available for stakeholders to provide information specific for nickel metal hybrid/nickel cadmium batteries. Generic information on binders, electrolytes and separator coatings should be provided under the category batteries in general (primary/secondary).* Nickel metal hybrid battery/Nickel Cadmium battery (secondary) can contain PFAS in the positive electrode binder and in the negative electrodes. Examples include rechargeable batteries in electric vehicles, electronic devices, smart home applications.		
			Lithium thionyl chloride battery (ER) (primary)	*This use category is available for stakeholders to provide information specific for lithium thionyl chloride batteries. Generic information on binders, electrolytes and separator coatings should be provided under the category batteries in general (primary/secondary).* Lithium thionyl chloride battery (ER) (primary) can contain PFAS in the positive electrode binder. Examples include non-rechargeable batteries in smart meters or in military applications.		
			Alkaline button (LR) (primary)	*This use category is available for stakeholders to provide information specific for alkaline button batteries. Generic information on binders, electrolytes and separator coatings should be provided under the category batteries in general (primary/secondary).* Alkaline button (LR) (primary) batteries can contain PFAS in the positive electrode binder. Examples include non-rechargeable batteries in toys, thermometers.		
			Electric double layer	*This use category is available for stakeholders to provide information specific for electric double layer capacitors. Generic information on*		

Sector	Use category	Description	Sub-use	Description	Application	Description
			capacitors (EDLCs)	*binders, electrolytes and separator coatings should be provided under the category batteries in general (primary/secondary).* Electric double layer capacitors (EDLCs) can contain PFAS with the function of water repellence, chemical, heat and oxidation resistance. Examples include batteries in blood glucose meters, security cameras.		
			Solid-state batteries	*This use category is available for stakeholders to provide information specific for solid-state batteries. Generic information on binders, electrolytes and separator coatings should be provided under the category batteries in general (primary/secondary).* Solid-state batteries can contain PFAS in the electrolyte, cathode or binder, providing functionalities of conductivity, stability and mechanical strength.		
			Zinc-air batteries	*This use category is available for stakeholders to provide information specific for silver oxide batteries. Generic information on binders, electrolytes and separator coatings should be provided under the category batteries in general (primary/secondary).* Zinc-air batteries can contain PFAS in the binder in active material. Examples include batteries in hearing and cochlear implants.		
			Silver oxide batteries (SR)	*This use category is available for stakeholders to provide information specific for silver oxide batteries. Generic information on binders, electrolytes and separator coatings should be provided under the category batteries in general (primary/secondary).* Silver oxide (SR) batteries can contain PFAS in the binder in active material. Examples include batteries in insulin pumps or watches.		
			H_2-gas generation battery	*This use category is available for stakeholders to provide information specific for H_2-gas generation batteries. Generic information on binders, electrolytes and separator coatings should be provided under the category batteries in general (primary/secondary).* H2-gas generation batteries can contain PFAS in the binder in active material. Examples include batteries in drug delivery, automatic pipette, reservoir and gas pressure source.		
			Flow batteries	*This use category is available for stakeholders to provide information specific for flow batteries. Generic information on binders, electrolytes and separator coatings should be provided under the category batteries in general (primary/secondary).* Flow batteries covers rechargeable batteries that can be used as energy storage systems. They may contain PFAS in the ionomer exchange membrane. Examples include vanadium flow batteries. Information on the membrane of flow batteries should be provided under this use category, even if the membrane used would be similar to the one used in fuel cells and electrolysers.		
	Electrical grids	Electrical grids covers the uses of PFAS in switchgear and circuit brakers for gas- and air- insulated switchgear. Examples include nozzles in circuit brakes.	**Switchgear/circuit breakers (gas-insulated switchgear and air-insulated switchgear)**	Switchgear / Circuit brakers (gas insulated switchgear and air-insulated switchgear) can contain PFAS in the nozzles of the circuit brakes, with the function of thermal and chemical resistance, pressure, dielectric properties, flame retardance, low water absorption and arc reduction through ablation.		
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
Lubricants	**Industrial use**	Industrial use covers uses of PFAS-based lubricants which are intended to remain within the factory environment. The lubricants in this category typically operate in sealed systems or closed applications, though some may be used in open settings within the scope of the Lubricants sector. Examples include uses of PFAS-based lubricants for machinery in production lines.				
	Professional use	Professional use covers uses of PFAS-based lubricants which are intentionally incorporated into or sealed within articles, providing functionality throughout their service life after leaving the factory. These lubricants may also be reapplied in professional settings outside factories, for example during repair or maintenance activities.				
	Consumer use	Consumer use covers uses of PFAS-based lubricants purchased and applied directly by consumers, typically for DIY maintenance activities.				
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
Electronics and semiconductors (Electronics)	**Wires and cables incl. connectors**	Wires and cables (including connectors) covers the use of PFAS in wire and cable insulation, sheaths, tapes, jackets, sleeves and binders, cable glands, breather drains and electrical connectors. Examples include coaxial cables, high voltage cables, heat shrink tubing, data cables, data connectors and power cables. Wires and cables (including connectors) are used in various applications such as consumer products, transport, semiconductors etc. Note that optical fibres are not part of this category (optical fibres are assessed under the Photonics use category).	**Low/mid-temperature applications of wire and cable insulation**	This category covers low/mid-temperature range applications of wires and cable insulation. There are indications that a "low/mid-temperature range" could for wire and cable insulation be referenced to -40°C-100°C ± 20°C.		
			Other applications of wires and cables (including connectors), except low/mid-temperature applications of wire and cable insulation	This category covers any other applications of wires and cables (including connectors), except low/mid-temperature applications.		
	Insulation material of electronics components (excluding wires and cables)	Insulation material of electronics components (excluding wires and cables) covers the use of PFAS in electrical insulation of various electronic components. Examples include insulators in connectors, transducers, induction coil insulation, insulation in surge protection devices, etc.	**Low/mid-temperature applications of insulation material of electronics components (excluding wires and cables)**	This category covers low/mid-temperature range applications of insulation material of electronics components (excluding wires and cables).		
			Other applications of insulation material of electronics components (excluding wires and cables),	This category covers any other applications of insulation material of electronics components (excluding wires and cables), except low/mid-temperature applications.		

Sector	Use category	Description	Sub-use	Description	Application	Description
			except low/mid-temperature applications			
	Coating/film of electronic components	Coating / film of electronic components covers the use of PFAS in coatings or films to provide properties such as dielectric properties, optical properties, resistance against heat, electrical, chemical or UV, or surface protection.	**Coating/film of electronic components (excluding displays and lenses)**	Coating / film of electronic components (excluding displays and lenses) covers the use of PFAS in coatings or films e.g. on printed circuit boards, anisotropic conductive film, ferroelectric or piezoelectric panels or films, transducers and sensors.		
			Coating/film on displays and lenses of electronic complex objects	Coating/film on displays and lenses of electronic complex objects covers the use of PFAS in coatings or films e.g. on foldable devices and other similar applications.		
	Electronic components	Electronic components covers the use of PFAS in various electronic components to create complex objects to provide properties such as high thermal stability, low dielectric loss and low dielectric constant. Examples include printed circuit boards and antennas, radiofrequency and waveguides, capacitors, etc.	**Printed circuit boards and antennas**	Printed circuit boards and antennas covers uses of PFAS in printed circuit boards (e.g. low dielectric copper clad laminate, dielectric layer, PTFE cores in high-frequency application for radios and radars etc.) and antennas (e.g. in mobile phones, microwave communication, radars, defence and aerospace, etc.).		
			Radiofrequency equipment and waveguides	Radiofrequency equipment and waveguides covers uses of PFAS in radiofrequency equipment (e.g. radiofrequency filter technology) and waveguides, which are used in telecommunications and electronics for optical and sound transmission lines.		
			Capacitors	Capacitors may contain PFAS in components such as binders, spacers, electrodes (anode), etc. Note that capacitors are shortly mentioned in the Energy sector (double layer capacitors) as there are similarities to batteries, however the broad assessment of capacitors is carried out in Electronics and Semiconductors.		
			Other applications of electronic components	Other applications of electronic components covers uses of PFAS in other electronic components, such as trimmers, tuners, inductors, piezoelectric devices, sensors, microwave filters, electrochromic glazing, etc.		
	Photonics	Photonics covers uses of PFAS in components that involve the generation, control, manipulation and detection of light. Examples include liquid crystal displays (LCD), organic light-emitting diode (OLED), polymer optical fibres, optical additives, optical filters, optical systems and rod lenses.				
	Plastic additives	Plastic additives covers the uses of PFAS additives that provide properties such as high melt viscosity, char formation, heat resistance and low outgas at high temperatures, in applications related to Electronics. Examples include anti-drip agents, flame retardants, clarity additives and additives in liquid crystal polymers.	**Anti-drip agents**	Anti-drip agents may contain PFAS with several advantageous properties, including flame retardancy, impact resistance and ductility. Note that this use refers to anti-drip agents in electronics only. Anti-drip agents are also assessed under the Construction products sector for uses in construction products (the "Polymer additives used for fire safety purposes" use category).		
			Other applications of plastic additives, except anti-drip agents	Other applications of plastic additives, except anti-drip agents, includes plastic additives in electronics as clarity additives or liquid crystal polymers.		
	Heat transfer fluids (immersion cooling and cold plate cooling, excl. vapor phase soldering)	Heat transfer fluids (immersion cooling and cold plate cooling, excl. vapor phase soldering) covers the uses of PFAS as heat transfer fluids in single-phase (1-phase) immersion cooling and two-phase (2-phase) immersion cooling, and PFAS as engineered fluid in cold plate cooling / indirect cooling. These technologies may be used for the cooling of semiconductors and devices, servers of data centres, thermal management systems of batteries, and of electronic devices.	**1-phase immersion cooling**	1-phase immersion cooling may use PFAS as dielectric fluids. During 1-phase immersion cooling electronic components or semiconductor devices are fully submerged in the dielectric liquid. The liquid does not boil during operation.		
			2-phase immersion cooling	2-phase immersion cooling may use PFAS as dielectric fluids. During 2-phase immersion cooling electronic components or semiconductor devices are submerged in the dielectric liquid. The liquid boils during operation. The fluid evaporates and enters a condenser that transform the gas back into a liquid.		
			Cold plate cooling / indirect cooling	Cold plate cooling / indirect cooling may use PFAS. During cold plate / indirect cooling electronic or semiconductors devices are attached to a cold plate and not in contact with any liquid.		
	Vapor phase soldering	Vapor phase soldering covers uses of PFAS as process chemicals in the production of electrical, electronic and photonic components when high precision and defined temperatures are necessary for the soldering process.				
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
Electronics and semiconductors (Semiconductors)	**Photolithography**	Photolithography covers uses of PFAS in photolithography during semiconductors manufacturing. During the photolithography step, the wafer (a thin silicon disc) is coated with a light-sensitive material called photoresist. Ultraviolet light is used to transfer a circuit pattern from a photomask to the wafer. Examples of PFAS uses include in photoacid generators (PAGs), top antireflection coatings (TARCs), bottom antireflective coatings (BARCs), photoresists, immersion barriers, dielectric polymers (PBO/PI), topcoats, pellicle membranes, surfactants and photo-patterning.				
	Etching, deposition and cleaning of wafer	Etching, deposition and cleaning of wafer covers uses of PFAS in the steps following photolithography that allow to obtain the desired circuit pattern on the wafer. Examples include wafer cleaning, wet etch, dry etch, chemical vapour deposition (CVD) and chamber cleaning, MEMS etching, and surfactants for etching solutions.	**Surfactants for etching solutions**	Surfactants for etching solutions refers to PFAS that may be use as surfactants in etching solutions with various functions e.g. to reduce surface tension, improve wetting or to adsorb to a surface.		
			Other applications of etching, deposition and cleaning of wafer, except surfactants for etching solutions	This category covers any other applications of etching, deposition and cleaning of wafer, except surfactants for etching solutions.		
	Semiconductor equipment	Semiconductor equipment covers uses of PFAS in the manufacturing process of semiconductors. The PFAS are not intended to remain on the semiconductor within the final article. Examples include inspection and testing equipment, equipment for the transportation of wafers (such as front opening shipping boxes), release films/ tape, wafer polishing pads and lithography equipment.	**Lithography equipment**	Lithography equipment may contain PFAS in e.g. optics module.		
			Other applications of semiconductor equipment, except lithography equipment	This category covers any other applications of semiconductor equipment, except lithography equipment.		

Sector	Use category	Description	Sub-use	Description	Application	Description
	Advanced semiconductor packaging	Advanced semiconductor packaging covers uses of PFAS in several steps related to advanced semiconductor packaging and can involve e.g. the stacking of multiple semiconductor chips and/or the integration of electrical connections. Examples of PFAS uses include in encapsulants, adhesives, coatings, underfills, flux and flux removers and mould release films.				
	Micro-electromechanical systems (MEMS)	Micro-electromechanical systems (MEMS) covers uses of PFAS in the packaging of micro-electromechanical systems (MEMS), which are semiconductor chips with moving parts. Examples include in passivation gels, adhesives, anti-stiction coatings and underfills. Note that this use category refers to packaging of MEMS only, and that MEMS etching is included under the "Etching, deposition and cleaning of wafer" use category.				
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				
PFAS manufacturing	**PFAS manufacturing**	The PFAS manufacturing sector covers all process steps in the manufacture of PFAS compounds at the manufacture site, including the processing of PFAS at the manufacturing site. This category also covers the use of PFAS as polymerisation aids in the manufacture of fluoropolymers. Note that processing PFAS into articles or mixtures offsite (e.g., foam moulding or fluoropolymer extrusion) is excluded and considered as part of other relevant sectors (e.g., Transport or Food Contact Materials and Packaging).				
	Other uses	Other uses covers any uses that appear to fit the sector description but are not included among the uses identified above.				