Detailed information on rubber products using PFAS - additional

Product	Sector	Application	Key functionalities provided by PFAS for the relevant use	Availability of technically and economically feasible alternatives	Socio economic impact of restrictions	Lifecycle emissions
Rubber hoses and tubes	Multi-sector	Rubber hoses for motor vehicles, construction machinery and plant machinery	Fluorinated mould release agents are used in the moulds for hose production and are important materials for production due to their high mould release properties. Fluorinated resin materials and fluorinated rubbers are also used as materials and sealants for heat-resistant and chemical-resistant hoses, and are important materials for maintaining hose performance. And, fluorine-based resin parts are used for the fittings of hose joints, which is an important material for maintaining the sliding performance of the rotating part of the joint. Also, some metal fittings are coated with fluorine-based materials, which is important for maintaining durability. These hose fittings are used together with the hose as a set, and are essential parts for maintaining the performance of the hose.	The advantages of fluorinated substances, such as high release properties, high lubricity, high chemical resistance and high temperature durability, and anti-corrosion performance, are not available in other general-purpose materials, and there are currently no alternative materials with equivalent performance for any of the applications listed on the left.	Almost all hoses shipped directly into the EU will no longer be manufactured. The supply of such hoses used in construction machinery, plant equipment, etc. shipped to the EU will also be impossible. This will have a direct impact on the users of these products in the EU, as they will no longer be supplied with products and components. It should be noted that in 2022, 398,420 passenger cars were exported from Japan to the EU, worth approximately 1,124.4 billion yen, and 35,067 buses and trucks, worth approximately 85.6 billion yen. (Source: Trade Statistics of Japan, Ministry of Finance Japan)	Mould release agents are stored and managed in dedicated containers. In addition, product scraps and residual materials are managed as industrial waste and disposed of appropriately in accordance with legal regulations.
Rubber seals	Multi-sector	Diaphragms, O-rings, gaskets, rubber valves, rubber composites with metal fittings, resins, fabrics, rubber seals etc. for automotive, housing equipment, infrastructure, semiconductor manufacturing equipment, oil storage tanks and aircraft	For automotive applications, heat resistance (close to 200°C around the engine) is required, while oil and fuel resistance must be maintained, and rubber elasticity is required even in environments of -30°C to -40°C for cold-weather specifications. For housing applications, chlorinated water resistance is required for plumbing specifications, and it is necessary to select materials that can withstand contact with hot water at 90°C or higher and chlorine exposure. In the semiconductor manufacturing equipment field, it is necessary to meet the requirements for piping components that transport refrigerants and highly reactive chemicals. For rubber seals used in sliding parts of oil storage tanks and aircraft, acrylonitrile-butadiene rubber (NBR) and chloroprene rubber (CR) cannot meet the requirements, such as chemical resistance. Fluoro rubber (FKM) is used as a material that meets these requirements.	The potential FKM alternatives differ significantly from FKM in terms of physical properties, making it quite difficult to replace them under equivalent conditions **(see list of physical properties of alternatives in the attachment)**. In order to use non-PFAS alternatives, it is essential to relax the requirements of the specifications of each component (e.g. limitation of operating temperature range (-20 to 100°C), reduction of pressure, limitation of contact fluids, etc.). In limited use conditions, materials such as aromatic polyamides and polyphenylene sulfide (PPS) may be proposed by raw material manufacturers and suppliers, for example in fuel lines, but it is not possible to cover all use conditions in the application concerned and the development of products without any PFAS is difficult at present.	The products are shipped to the EU area via users of the trading partners and are considered to have a significant impact. At present, the fluoro rubber used in the product concerned meets the OECD 'polymers of low concern' criteria and is not considered toxic to living organisms. Currently, it is difficult to develop products that are completely free of PFAS, and the proposed PFAS restrictions pose a potential risk to business. If fluoro rubber is restricted as a PFAS, this could have a significant impact on our business. If raw material suppliers are unable to produce sufficient materials to comply with PFAS restrictions, the supply of raw materials could be reduced. This would cause a shift in the supply-demand balance of raw materials and could result in some raw materials and the products we manufacture disappearing from the market. It is also recognised that restrictions could have an immeasurable impact on industries involved in social infrastructure, such as petroleum and aerospace, and that the issue is also relevant to the existence of aircraft and other products. It should be noted that in 2022, 398,420 passenger cars were exported from Japan to the EU, worth approximately 1,124.4 billion yen, and 35,067 buses and trucks, worth approximately 85.6 billion yen. (Source: Trade Statistics of Japan, Ministry of Finance Japan)	As the products are incorporated into vehicles and electrical appliances, they are not discharged during use, but are disposed of and recycled at the appropriate time, such as when the vehicle is scrapped, in compliance with the law. In addition, burrs and defective products generated in the manufacturing process are minimised by reducing the defective rate (productivity improvement activities) and by reducing the quantity of starting materials for preparing (improvement of production methods and dies), and are finally disposed of as non-combustible waste by regular requests to industrial waste contractors.
Rubber belt	Transport	Automatic tensioner for accessory drive of engine (Tension adjustment device for the accessory drive belt of engine)	PTFE is used for sliding applications in dry bearings, which are plastic parts of automatic tensioners, and is an essential material for achieving high durability and long product life that satisfies the requirements of the manufacturers to whom it is supplied. PTFE improves product life by increasing wear resistance and reducing the coefficient of friction (i.e. control of sliding properties) on component surfaces, thus ensuring the required service life. (See applications falling under Annex A, Table A.41: Transport - Lubricants)	PA6T could be used instead of PTFE, but it does not match PTFE in terms of wear resistance. Currently, there are no materials or alternative technologies with equivalent performance to PTFE. Annex E, Table E.113 lists alternative candidates for transport applications, but there is no mention of lubricants, and it is considered that there are no alternatives that can be assumed in general. In Annex E.2.14.2.4, there is a description of alternatives to PTFE powder for lubricants applications and boron nitrides, graphene, graphite and molybdenum disulphide are mentioned, but none of them satisfy the performance and cost requirements together. There is also no alternative to an automatic tensioner with a belt tensioning mechanism. Without the use of an automatic tensioner, belt tensioning needs to be adjusted, which requires a higher belt tension setting than when an automatic tensioner is used, which worsens fuel efficiency and is inferior in terms of economy.	There are plans to sell the product concerned in Europe, and the customer's products using the product concerned are already distributed in the EU market, which could have an impact on the EU market and users. It should be noted that in 2022, 398,420 passenger cars were exported from Japan to the EU, worth approximately 1,124.4 billion yen, and 35,067 buses and trucks, worth approximately 85.6 billion yen. (Source: Trade Statistics of Japan, Ministry of Finance Japan)	PTFE discharged during product manufacture is landfilled in a controlled environment as industrial waste. As PTFE is contained in the polymeric material, which is a solid matrix, only a small amount of wear particles are discharged externally during product use, and many of these particles remain in the product, so the environmental impact is considered to be negligible. In addition, end-of-life products are landfilled in a controlled environment as industrial waste. From the above, it is estimated that the emissions to the uncontrolled environment during the life cycle of the product, from manufacture to disposal, are negligible in relation to the amount used.

Product	Sector	Application	Key functionalities provided by PFAS for the relevant use	Availability of technically and economically feasible alternatives	Socio economic impact of restrictions	Lifecycle emissions
		Pulleys for the automotive engine accessories (alternators).	PTFE is used for sliding applications in dry bearings, which are plastic parts for alternator pulleys, and is an essential material for achieving high durability that satisfies the requirements of automobile manufacturers.	Aramid fibres could be used instead of PTFE, but they are already added to the dry bearing materials listed on the left to improve wear resistance. As the sliding properties of aramid fibres are far below those of PTFE, the required properties cannot be met if all PTFE is replaced by aramid fibres. Polyacetal is also a candidate alternative material, but its sliding properties are not as good as those of PTFE. For the above reasons, it is difficult to substitute other materials for PTFE.	The Japanese car manufacturers to whom the products concerned are supplied sell vehicles in the EU market, and there is concern about the impact on users in the EU market. It should be noted that in 2022, 398,420 passenger cars were exported from Japan to the EU, worth approximately 1,124.4 billion yen, and 35,067 buses and trucks, worth approximately 85.6 billion yen. (Source: Trade Statistics of Japan, Ministry of Finance Japan)	PFAS discharged during product manufacture are landfilled in a controlled environment as industrial waste. Most of the wear particles emitted during product use are considered to remain inside the product, which is sealed with a rubber cap, and it is estimated that only a small amount is discharged into the external environment. In addition, end-of-life products are landfilled in a controlled environment as industrial waste. From the above, it is estimated that emissions to the uncontrolled environment during the life cycle of a product, from manufacture to disposal, are negligible in relation to the amount used.
		Roller weights for motorcycle transmissions	PTFE improves product life by increasing wear resistance and reducing the coefficient of friction (i.e. control of sliding properties) on component surfaces, thus ensuring the required service life. (See applications falling under Annex A, Table A.41: Transport - Lubricants)	Currently, there are no materials or alternative technologies with equivalent performance to PTFE. Annex E, Table E.113 lists alternative candidates for transport applications, but there is no mention of lubricants, and it is considered that there are no alternatives that can be assumed in general. In Annex E.2.14.2.4, there is a description of alternatives to PTFE powder for lubricants applications and boron nitrides, graphene, graphite and molybdenum disulphide are mentioned, but none of them satisfy the performance and cost requirements together.	The customer's products using the product concerned are already distributed in the EU market, which could have an impact on the EU market and users. It should be noted that in 2022, 230,178 motorcycles and autocycles were exported from Japan to the EU, worth approximately 193.2 billion yen. (Source: Trade Statistics of Japan, Ministry of Finance Japan)	As PTFE is contained in the polymeric material, which is a solid matrix, only a small amount of wear particles are discharged externally during product use, so the environmental impact is considered to be negligible.
	Electronics and semiconductors	Power transmission belts for semiconductor manufacturing equipment	The properties of fluoro rubber, such as weather resistance, chemical resistance and electrical insulation, are essential for achieving the product performance of belts for semiconductor manufacturing equipment.	No proposals have been received from raw material manufacturers or suppliers for materials that could replace PFAS, and at present it is difficult to develop products that do not use PFAS at all.	At present, the fluoro rubber used in the product concerned meets the OECD 'polymers of low concern' criteria and is not considered toxic to living organisms. Currently, it is difficult to develop products that are completely free of PFAS, and the proposed PFAS restrictions pose a potential risk to business. If fluoro rubber is restricted as a PFAS, this could have a significant impact on our business. If raw material suppliers are unable to produce sufficient materials to comply with PFAS restrictions, the supply of raw materials could be reduced. This would cause a shift in the supply-demand balance of raw materials and could result in some raw materials and the products we manufacture disappearing from the market. These situations would also affect users and customers in the EU market.	N/A
Rubber bearings	Construction products	Seismic isolation rubber bearings for bridges and buildings	A sliding surface is formed with PTFE on the upper surface of the rubber bearing in the moving part of the sliding type bearing, enabling the structure to slide between it and the upper shoe.	There is no knowledge on materials that provide equivalent sliding performance to PTFE.	The requirements cannot be met due to critical performance degradation and the product concerned has to be discontinued. The products concerned are essential equipment to protect human life from earthquake disasters and if they are no longer manufactured and supplied, earthquake-prone countries, including some EU countries, would be severely affected.	N/A
Rubber rollers	Electronics and semiconductors	Rubber roller drive mechanisms for OA equipment (Roller gears, allied gears, roller bearings, plastic pawls for peeling paper from rollers)	OA equipment such as copier, multifunction printer incorporates a fixing rubber roller drive mechanism for fixing printed images. The mechanism incorporates roller gears and allied gears, as well as plastic components such as roller bearings that are driven in unison with the roller gears. A plastic peeling pawl is also installed in this mechanism to peel the paper from the rollers. PFAS (PTFE) is used as a release agent (lubricant) to improve the wear resistance of the surfaces of these plastic parts incorporated in the fixing rubber roller drive mechanism and to control their sliding characteristics, and is an essential substance to improve product life and prevent paper dust and toner adhesion. (See applications falling under Annex A, Table A.41: Transport - Lubricants) Fluoropolymers (PTFE, PFA) are also used on the surfaces of fixing rollers to provide electrical characteristic control functions, releasability, non-adhesiveness, heat resistance, dimensional stability and high durability (See comments submitted on 1 August).	Currently, there are no materials or alternative technologies with equivalent performance to PTFE. In Annex E.2.14.2.4, there is a description of alternatives to PTFE powder for lubricants applications and boron nitrides, graphene, graphite and molybdenum disulphide are mentioned, but none of them satisfy the performance and cost requirements together.	Rubber roller drive mechanisms for OA equipment using PFAS are employed in copiers, multifunctional machines and printers for the EU, and if PFAS is restricted, it will be impossible to manufacture OA equipment not only for businesses but also for consumers. As a result, the image quality and functional stability of OA equipment will be reduced, and social convenience will suffer. In addition, if PFAS cannot be used, the durability of OA equipment can no longer be ensured and the frequency of parts replacement will increase, with a consequent rise in environmental impact.	The products concerned are built-in parts of the printing equipment and there is little concern that they will be discharged as general waste. In addition, as PTFE is contained in the polymeric material, which is a solid matrix, only a small amount of wear particles are discharged externally during product use, so the environmental impact is considered to be negligible.