

Application Number	E.2.3 Food Contact Materials and Packaging Materials
Application Name	PTFE-containing composite packings, gaskets, fluorine-based elastomer seal materials
CAS RN (Candidate Substance CAS RN to be regulated)	9002-84-0
Name of Candidate Substance to be regulated	Fluorine-based elastomers
Generic Name of End Product for Application	Piping, valves, pumps, vessels
Generic Name of Part for Application	Seat gaskets, fluororubber O-rings, gland packings
Description of Application (Details) Drawings, Diagrams, Photographs, Videos, etc.	"VALQUA_Group_Sustainability_Report_2022(extract)r1" "zm01_2007_Elastomer(extract)r2" "zy03_0611_Gland_Packing(extract)r2" "zy03_1601_Gasket(extract)r2"
Explanation of Irreplaceable Technology) Pictorial Photographic Data, Information on Reference Websites, etc.	Materials that can be used for seal members are selected according to the temperature and fluid. (In specifications where fluorine-based materials are used, temperatures of 150°C or higher, resistance to fluid, or purity is required, and they are expensive, but are used because they cannot be substituted with other materials.) (VALQUA handbooks, etc.)
Shipping Volume Information	The amount of raw materials used for this product is 44,823 tons/year, but the amount used only in Japan for the applications is estimated to be 1,100 tons/year. The amount used in each product is <20~50% in terms of weight, but the areas where it is used are limited to facility equipment and piping seals, and there is almost no contact with fluids. For the domestic production scale in the applications in which PFAS is used: About 28 million KL/year for beverages and about 19,300 thousand tons/year for processed foods.)
Heat Resistance (Highest Working Temperature)	260°C (PTFE), 200°C (fluororubber))
Weather Resistance	No influence of direct sunlight
Chemical Resistance	Stable against most chemicals. Slightly affected by molten alkali metals (solutions), high-temperature fluorine, and chlorine trifluoride.
Non-Adhesiveness	Wet resistance (Contact angle with water $\geq 110^\circ$)
Purity	No impurities are eluted (ppb level or less) when in contact with chemicals.
PVC	Heat resistance < 90°C
PP	Heat resistance < 130°C
High-Density PE	Heat resistance < 70°C
Silicon Resin	Silicone resin is inferior in solvent resistance, chemical (strong acid and strong alkali) resistance, and water resistance)
Silicon Rubber	Silicon rubber is inferior to fluororubber in mechanical strength and solvent resistance when used as a seal member

EPDM	Heat resistance < 150°C EPDM is inferior to fluororubber in oil resistance
NBR (Nitrile Rubber))	Heat resistance) < 130°C NBR is inferior to fluororubber in oil resistance
PEEK (Polyether Ether Ketone)	Heat resistance < 240°C PEEK is inferior to PTFE in acid resistance. PEEK is basically injection-molded, and cannot be blended with materials
Remarks	Heat resistance https://www.kda1969.com/study/study_pla_compare.htm Chemical resistance https://www.kda1969.com/study/study_pla_chem.htm List of physical properties of rubber https://www.kayo-corp.co.jp/common/pdf/rub_propertylist.pdf