

Comment on proposed restriction of PFAS

TOA Industrial Co.,Ltd.

a) Restriction range of PFAS and affection to the valve manufacturing

On 22nd March 2023, released the proposed restriction of PFAS that is prepared by five European countries (Germany, Netherland, Norway, Sweden, Denmark) to the public by ECHA. As this restriction, it is a content that wide range of PFAS is uniformly prohibited

TOA Industrial Co.,Ltd. and group companies have now supplied the valve (Globe, Gate, Ball, Butterfly, Tank, Check valves) in the market and applied the PTFE as sealing parts i.e. (Gland) packing, gasket, ball seat, seat rubber / O-ring with Fluorine coating. This proposed restriction is not only Chemical composition but also extending to polymer, therefore, it may be restricted Fluorine Rubber as possibility.

b) Status of response to alternative products by PFAS manufactures

This proposed restriction of PFAS has mentioned the possibility of renewing the alternative material against several application from fluorocarbon polymers. There are PFOA free material and fine particles / ultra-high molecular weight polyethylene as alternative product of PTFE. However, it is not satisfied the important performance (Heat-resistant, chemical-resistance, Low wear. Non-adhesive etc.) during the evaluation of alternative material and the alternative material has also the problems about delivery term and prices.

c) Valve applied area and how to use the parts that will be restricted by proposal

3.1 Valve applied area

Please see the following area for applied the valve at this moment. It will be affected the manufacturing and production line in the market if restrict the material of parts of section and as it results, it has a tremendous impact on the lives and economies of the international community. For example, the ball valve had delivered 13.5 million units in 2021 (Cited data by Japan Valve manufacture's Association)

Related electric power generation (Steam / Water/ Nuclear power and Gas etc.)

Related the public infrastructure (Dam and Water supply and sewerage system)

Related Steel (Steel and non-ferrous manufacture)

Related chemical plant (Medicine manufacture, petrochemistry)

Related foodstuff (Foodstuff, drinking water)

Related construction, transportation and electricity

(Industrial Machinery, shipbuilding and water treatment (include semi-conductor) etc.)

3.2 How to use the parts that will be restricted by proposal

(Gland) packing (Material: TFE, FKM)

Normally, it is used as a sealing material for the power transmission part of valves, and a part of the sealing point contacts with fluid. However, there is no loss or leakage of material due to sliding of the valve or influence of fluid.

Gasket (Material: PTFE)

It is used as sealing material for connection of metal parts of valves, and a part of the sealing point contacts with fluid. However, there is no loss or leakage of material due to sliding of the valve or influence of fluid.

Gaskets are also applied as sealing materials for connection between valves and pipe flanges, and a part of the sealing point contacts with fluid. However, there is no loss or leakage of material due to sliding of the valve or influence of fluid.

Ball seat (Material: PTFE, R-PTFE)

This part is in contact with the fluid, and the valve ball (rotating in the body) comes into contact when the valve is operating, but the molecules of the organic fluorine compound are condensed, so the molecules of the organic fluorine compound do not precipitate on the surface of the seat and flow out.

Seat rubber, O-ring (Material: NBR rubber plus Fluorine coating)

Seat rubber is in contact with fluid, and the valve Disc comes into contact when the valve is operating, but increased the lubricating ability and durability compare with nominal rubber the molecules of the organic fluorine compound do not precipitate on the surface of the seat and flow out. O-ring is used as a sealing material for the power transmission part of valves, and a part of the sealing point contacts with fluid. However, there is no loss or leakage of material due to sliding of the valve or influence of fluid.

d) Concerns of proposed restriction of PFAS

Europe has now ROHS (Restriction of Hazardous substances directive) and REACH use restrictions. ROHS currently has 10 substances subject to regulation. In principle, the use of these substances is prohibited, but the maximum allowable concentration is set

numerically, although it is very small. REACH also requires evaluation and reporting of target materials.

This proposed restriction of PFAS will introduce restrictions on all PFAS based on the assumption that the persistence will have adverse effects due to accumulation in the human body. As mentioned above, ROHS, REACH requires numerical evaluation and material evaluation and reporting, and we think that this proposed restriction of PFAS is being requested with a lack of scientific basis (limit values).

There are two types of PFAS: perfluoroalkyl compounds and polyfluoroalkyl compounds. PFOS and PFOA are belong in perfluoroalkyl compounds that are generally publicized as having an impact on human health. PTFE and FKM (that are used as sealing materials for valves) are belong in polyfluoroalkyl compounds and are generally known as fluoropolymers.

Fluoropolymers are also the result of research, "The carbon bond between carbon and fluorine is very strong. The fluorine atom is protected by the carbon bond, and a large amount of energy is required to separate this bond, and it is also difficult to dissolve in water. The molecular structure of the molded product is too large to be taken into the human body due to its insolubility in water." It is clearly a different material from PFOS and PFOA. For this reason, we think that restricting the use of all PFAS is an over-interpretation of safety assurance.

Therefore, ECHA should be collecting scientific data on each substance and reexamine with experts whether restrictions are necessary for PFOS, PFOA and all other fluorine compounds. We would also like to request a longer period (10 to 15 years) than the current period for consider whether the proposed PFAS limits should be applied. During a longer period, each of the manufacturers will develop the alternative material based on the collecting scientific date to reduce the impact on the market

Works cited

- (1) Integrated Environmental Assessment and Management. Vol 14 (3) Page 317 to 334 by Society of Environment Toxicology and Chemistry
- (2) Integrated Environmental Assessment and Management. Vol 19 (3) Page 326 to 355 by Society of Environment Toxicology and Chemistry
- (3) Reducing the input of chemicals into waters: Trifluoroacetate (TFA) as a persistent and mobile substance with many sources 2021 by German Environment Agency

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