

Public consultation on restriction on the manufacture, placing on the market and use of per- and polyfluoroalkyl substances

Summary

This document is based on insights from our production facility and supplier data and represents the view of Topsoe on the proposal of Restriction on the manufacture, placing on the market and use of PFASs published by ECHA 23 March 2023. Fluoropolymer coatings play a key role in our production facility. Inclusion of fluoropolymers in the restriction of PFAS will negatively impact Topsoe's capabilities to provide safe working conditions and mitigate environmental risks. Fluoropolymers should not be taken in scope of this proposal. In case they remain, the maximum derogation time is required.

Initial thoughts

Foremost, Topsoe would like to emphasize its support to the EU in reducing environmental pollution by eliminating long lasting water soluble polyfluoroalkyl substances (PFAS). However, it is problematic that the scope of the proposed restriction is so broad, and even targets substances without proven hazardousness. A blanket, non-risk-based ban of this many chemicals without regard to the use and societal benefit vs. impact may have catastrophic effects. The lack of considerations for the chemical industry is particularly worrying for Topsoe. This work will highlight the expected impact upon Topsoe's production facilities as well as two examples of fluoropolymer-dependent emission solutions.

Impact on Topsoe's production

Topsoe operates one EU manufacturing site in Denmark (estimated annual turnover 100-500 million euros). A second manufacturing site, also in Denmark, is currently in the process of being build. The existing site manufactures inorganic catalysts, and the upcoming site will manufacture high temperature solid oxide electrolyzer cells (SOEC) which are key to the transition to the clean energy economy. Topsoe does not manufacture any products that are considered PFAS.

At Topsoe's catalyst manufacturing site, the PFAS type of largest concern is fluoropolymers. Fluoropolymers are used for their thermal and chemical resistance properties and are found as coatings on several component categories, such as gaskets, valves, instruments and PPEs. They were particularly chosen for their safety enhancing properties. The proposing countries are aware of these properties as mentioned in Annex E of the restriction proposal. These properties of fluoropolymer coatings lead to increased durability of its coated articles versus non-PFAS alternatives. Durability is extremely important to Topsoe given the hazardousness of the chemicals used in production. The increased durability of components means fewer replacements necessary and thus lower exposure risks of chemicals to workers and the environment. Furthermore, there is currently an ongoing analysis on using fluoropolymer coated pipes to reduce non-chemical related

accident rates during cleaning. In other words, fluoropolymers aid in improving workplace safety and reducing environmental exposure risks.

Topsoe reached out to all our spare part suppliers, the majority of which are providers of fluoropolymer coated parts. A substantial number of suppliers have stated they will have difficulties in finding technically comparable and safe alternatives. In addition, a large amount of time is necessary for the development of documentation for technical and safety feasibility and on the hazard properties and relevant risk management measures. To prevent regrettable substitution, a longer time span is required than currently provided by the proposal.

To summarize, Topsoe as a downstream user of fluoropolymer coated parts, is highly dependent on suppliers to offer technically comparable and safe alternatives. Based on information provided by suppliers, the current proposal does not provide enough time to find safe alternatives. Therefore, this proposal poses a serious threat to Topsoe's capabilities to provide safe working conditions and mitigate environmental risks.

Emission solutions

As stated above, Topsoe does not manufacture any PFAS. However, Topsoe does provide two emission solutions, Wet gas Sulfuric Acid (WSA) technology and CataFlex that rely on PFAS. Both products are catalytic solutions that require fluoropolymers due to the operating environment.

WSA technology removes > 99,5% sulfur from dilute or lean off-gases and waste streams across many industries (e.g., paper & pulp, petrochemicals, metallurgy, etc.) to produce sulfuric acid. The high thermal and harsh chemical environment would result in fast degradation of the installation, were it not for fluoropolymers. Topsoe has co-signed a joint submission on the necessity of fluoropolymers in WSA technology (see submission e31402ec-cd57-4a11-b8e5-d5d8519afbc2).

CataFlex is a filter, as part of a larger filter system, for the removal of NO_x and dioxins from exhaust gases. The filter bags used are coated in fluoropolymers required to resist the high temperatures of the exhaust gases. CataFlex is easy to implement in combination with existing dust filters and does not require any additional reaction conditions.

Both emission cleaning solutions require fluoropolymers to operate in harsh chemical and/or thermal conditions. Without fluoropolymers, neither of these technologies would be possible and the respective emissions and/or any associated costs would go up. As a downstream user of PFAS articles for chemical treatment, Topsoe depends on suppliers to offer these products to be able to provide these solutions.

Aside from these existing products, Topsoe is investigating possibilities to utilize our long-standing expertise on catalysis gained via research and development over decades, to remove PFAS from exhaust emissions. This idea is derived from CataFlex, in terms of using a fluoropolymer coated filter bag to clean exhaust emissions. However, in this case short chain gaseous PFAS would be

catalytically decomposed instead of NO_x or dioxins. This is based on the suspicion that these molecules are released from waste incinerators or PFAS manufacturing plants. Unfortunately, this project is still in an early stage and hindered by limited availability of data on the origin of these emissions. A joint effort from industry and governments could lead to finding the source of PFAS emissions. Topsoe believes this targeted approach would be better to tackle PFAS pollution than via this unprecedented PFAS blanket ban.

Conclusion

The primary PFAS of concern for Topsoe are fluoropolymers. Various investigations on the stability of the fluoropolymer coatings have not given any indications of erosion or degradation of the material. The restriction proposal for PFAS in its current form will heavily affect Topsoe's production sites and specific products. Given the stability of fluoropolymers and their technical importance, we consider that these materials should not be in the scope for the proposal.

Based on information provided by spare part suppliers, finding technically comparable and safe alternatives will be difficult in the short timespan given in the proposal. Developing an alternative to fluoropolymers, establishing documentation for technical and safety feasibility, documentation on hazard properties and relevant risk management measures, will take a long time. If fluoropolymers remain in the restriction as is, a maximum derogation time is needed.

Key points

Topsoe relies on fluoropolymers for both occupational and environmental safety. Furthermore, no emissions are expected. Hence:

- Fluoropolymers should be taken out of the proposal's scope.
- The maximum derogation time is needed to establish technically comparable and safe alternatives to prevent regrettable substitution, if fluoropolymers remain in the proposal.