

POSITION PAPER

Brussels, 7th February 2020

Per- and Polyfluoroalkyl Substances: HFCs and HFOs a distinct subset

Introduction

Per- and polyfluoroalkyl substances (“PFASs”) covers a broad range of substances that have in common that they contain at least one perfluoroalkyl moiety¹. More than 4000 individual substances have been identified which have very different (eco)toxicological and physical properties. Some subsets of PFASs have very persistent and/or very bioaccumulative properties leading to classification or potential classification as Substances of Very High Concern. In view of the large number of PFASs, there have been calls to regulate these substances as a group, rather than individually or by subset. Such an approach might initially seem attractive as it would reduce the regulatory burden. The obvious risk is, however, that such a broad-brush approach would also unnecessarily impact substances that are not classified as very persistent and/or bioaccumulative.

The HFCs and HFOs

The HFCs (hydrofluorocarbons with up to C₅ chain length) and HFOs (hydrofluoro-olefins and hydrochlorofluoro-olefins with up to C₅ chain lengths) are low boiling point substances, typically of low toxicity, that do not bio-accumulate and that breakdown down in days, months or years in the atmosphere. For example, HFC-134a (1,1,1,2-tetrafluoroethane) and HFC-227ea (1,1,1,2,3,3,3-heptafluoropropane) are used as propellants in Metered-Dose Inhalers (MDIs) for treatment of asthma and other respiratory conditions. Recently the Inter-Organization Programme for the sound Management of Chemicals (IOMC) published an updated database of PFASs which includes “several new groups of PFASs that fulfil the common definition of PFASs (i.e. they contain at least one perfluoroalkyl moiety) but have not yet been commonly regarded as PFASs”. The data base identifies both HFCs and HFOs as a group of substances that are covered by the definition (700: other PFAA precursors or related compounds – semifluorinated, 701.1 - HFCs and derivatives, 703 - HFOs).² None of the most commonly used HFCs and HFOs are identified as individual substances (“Overview with CAS”).

EFCTC Position

EFCTC takes the view that any regulatory action should be at the subset or individual substance level and not at the PFAS group level and should be based on sound scientific evidence that takes into account specific structures and properties. In view of the physico-chemical properties of HFCs and HFOs (relatively low boiling points, (very) short atmospheric life-times and absence of functional

¹ OECD Environment, Health and Safety Publications Series on Risk Management No. 39, 2018

² <https://www.oecd.org/chemicalsafety/risk-management/global-database-of-per-and-polyfluoroalkyl-substances.xlsx>

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groups they are not classified as very persistent and/or very bioaccumulative substances. This seems to be recognized by IOMC which confirms that HFCs and HFOs have not been commonly regarded as PFASs. We therefore strongly recommend that any regulatory action focuses on relatively homogenous groups or subsets that have common properties. Indeed, the HFCs are regulated as group of substances due to their global warming potentials (GWPs) and are subject to a phase-down in the European Union through the F-gas Regulation 517/2014 and globally by the Kigali Amendment to the Montreal Protocol.

The European FluoroCarbons Technical Committee is a Cefic Sector Group that monitors legislation related to HFCs (hydrofluorocarbons), and HFOs (hydrofluoro-olefins) in the EU and at global level. Fluorocarbons are used as feedstock, as refrigerants, as solvents and as blowing agents for insulation plastic foams.

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