Response to REACH PFAS Restriction Proposal

September 22, 2023

TechnipFMC supports the per- and polyfluoroalkyl substances (PFAS) restriction proposal made by ECHA (European Chemicals Agency) where human and environmental health are threatened. However, due to their high temperature and chemical resistance, fluoropolymers provide the safest operating parameters for equipment used to acquire and produce traditional oil and gas (petroleum) and renewable energy products, such as offshore floating wind, wave, tidal and hydrogen.

Fluoropolymers, such as polyvinylidene fluoride (PVDF), polytetrafluoroethylene (PTFE), fluoroelastomers (FKM) and perfluoroelastomers (FFKM), are used in construction of onshore and offshore (including subsea) oil and gas production equipment. Extensive testing has shown fluoropolymers are required to ensure operational, safety, and environmental performance. Despite significant materials research since the first discovery of fluoropolymers nearly 100 years ago, there is no known equivalent polymer substitute for fluoropolymers in extreme conditions such as those often encountered during energy production.

The existing and renewable energy projects rely on these products as an enabling technology. During the lifetime of a project, replacement products and maintenance parts are required. If the industry is not able to supply necessary spares, this may lead to premature project closure which will negatively impact energy security and affordability for decades to come.

Fluoropolymers are the only known polymer solution for high pressure, high temperature (HPHT) applications and to date there are no alternatives. Barriers to fluids and gases at extremely high pressures in onshore and offshore (subsea) oil and gas production equipment, comprised of fluoropolymers, are used at the most extreme temperatures. PFAS-free alternatives, such as polyethylene, polyamide, polyepichlorohydrin, polychloroprene and acrylonitrile butadiene rubber-based materials, are limited to lower temperatures. The consequences of a complete ban of PFAS include among others: shorter equipment lifetimes, more frequent re-work and a significant regression in technology. Replacement with one of these PFAS-free substitutions would result in accessing fewer gas and oil fields, as a large proportion of future gas and oil fields are at HPHT conditions. Fluoropolymers are essential materials for equipment for hydrogen technology, offering an alternate energy supply and, thus, critical in the energy transition and net zero goals defined by many industries.

Materials considered as alternatives in the proposal are not technically feasible replacements for the abovementioned applications. As acknowledged in section 2.15 of annex E of the restriction proposal, the development of alternative products could take several decades or may never be found without concomitant trade-offs that include negative safety, environmental and economic

impacts.[1] Despite the proposed derogation of 12 years for the petroleum and mining industry, energy exploration and production would be dramatically impacted due to this disruption in the supply chain, resulting in shortages of raw materials necessary to produce pressure containing and controlling equipment in the energy industry.

TechnipFMC proposes that fluoropolymers used for the above applications be exempted from restriction based on essential use[2] until like replacements have been identified. TechnipFMC will support a supply chain with control technologies in place to capture, recover and recycle PFAS during manufacturing and processing of fluoropolymers.

[1] CENTRE TECHNIQUE DES INDUSTRIES MÉCANIQUES (CETIM), 2023, ISSN 1767-2546, ISBN 978-2-36894-273-4: "Study of alternatives to PFAS in the critical applications for mechanical engineering"

[2] Eionet Report -ETC/WMGE 2021/9, "Fluorinated polymers in a low carbon, circular and toxic-free economy"