

Specific Information Requests

Question 6: Missing uses – Analysis of alternatives and socio-economic analysis

a/b. In general, heat exchangers have the task of transferring heat from one material flow to another to a controllable extent. The material flows are separated from each other by a wall. This heat transfer is carried out by means of tubes. These tubes can be made of various materials. Among other things, they are made of AlwaFlon, a modified PTFE. They are used to transfer this heat from aggressive flue gas in power plants without corrosion. The advantage of PTFE is that they are 100% corrosion resistant, can withstand temperatures up to ~250 °C, do not clog, are durable and require very little maintenance compared to metallic heat exchangers.

c.

d. There are potential alternative materials such as fibre threads available from different suppliers. In the past, some of these contained asbestos, which needs to be taken into account from an overall safety perspective. Currently, these fibres provide lower performance, which results in higher power consumption and shorter lifespan of these materials (resulting in higher replacement rates, adding costs to the process and the value chain). Such fibres are less resistant to higher temperatures, they have limited ability to incorporate catalysts and other active components which destroy or capture harmful emissions. Lower chemical resistance results in higher filter failures, increased emissions, and more frequent replacement. Other materials such as PP and polyether sulfones (PES) can also be used for filter systems, but again they are not expected to perform at the same demanding conditions under which fluoropolymer-based filter pieces can provide reliable operation.

Furthermore, when alternatives are evaluated, their potential toxicological and ecotoxicological impacts should be taken into consideration. In the case of PES, publications suggest that they may have potential endocrine disrupting properties and may actually be considered of equivalent concern to bisphenol A – BPA (Kang et al., 2014), and based on recent research, they are related to generation of other bisphenols during degradation (Li et al., 2022), therefore this and similar materials may not be considered a suitable alternative from a safety perspective, as this could lead to regrettable substitution.

In general, the reason that fluoropolymers are used in most applications is because no other substance is really a suitable substitute for one reason or another. There may certainly be instances where this is not the case, but it appears that more often than not, the ability to replace fluoropolymers with non-fluoro alternatives will be either rare or non-existent.