Case study: **Use of Fluoroplastic Sealing elements in Chemical production and transport**

There is no other chemistry available to replace the performance that Fluoropolymers provide for chemical, thermal, plasma and radioactive resistance as seals. By definition any chemical that could withstand those situations would also be considered persistent.

A ban, or a class regulation, of polymeric PFAS materials and their raw materials will have a profound impact on global industry and everyday lives. The following case study is given to showcase just a tiny fraction of the uses of PFAS sealing materials where no alternative technology exists.

Key facts:

- Fluorinated polymers are used as gaskets in equipment for chemical processing, transport and storage
- The fluorinated gasket market exceeds €100 Million globally per annum
- Refining of petroleum and chemical, drug and food production all use reactive chemicals, e.g., strong acids, where in many instance fluoroplastics, specifically PTFE are the only choice for sealing
- Stringent control on the amount of leachable extracts that can be released into the media from the gasket exit, e.g., in Food and Pharmaceutical applications

Chemicals processing and storage industries produce and use an array of aggressive media (such as strong acids) as feedstocks, intermediates and as final product where chemical compatibility issues dictate the utilisation of certain materials for sealing equipment. Many applications require sealing systems that can work at the extreme of pH; 0 to 14.

PTFE polymers are preferred due to their substantial chemical resistance to media attack, extremely low fugitive emission sealing characteristic as well as favourable mechanical properties such as creep resistance, stress retention properties, low friction characteristics - particularly in valve stem and rotary shaft sealing applications and where other materials and compounds do not perform to the

same category of sealing integrity required from the industry and EPA. Virgin PTFE also has excellent permeability resistance and no or low leachables which make it critical for food and pharmaceutical industries.

The options for alternative non-fluoropolymer-based sealing materials in these critical process sectors has proved unsatisfactory and unsafe. The unique properties of PTFE polymers are an essential component in the manufacture of gaskets and sealing components within the chemicals processing sector and offer high integrity sealing of VOC's and other aggressive chemicals protecting the environment from harmful and unintended emissions or leakage.