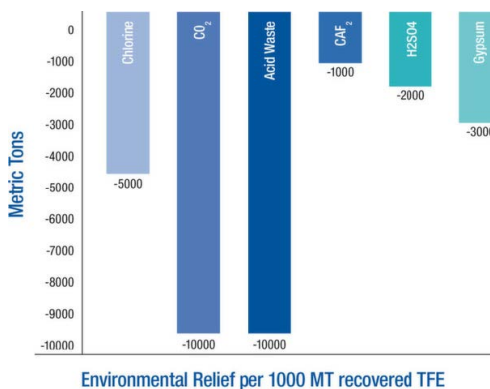


How it Works: First Fluoropolymer Up Cycling Plant Worldwide

Up-Cycling Instead of Littering Plastics

09/02/2015 | Editor: Wolfgang Ernhofer

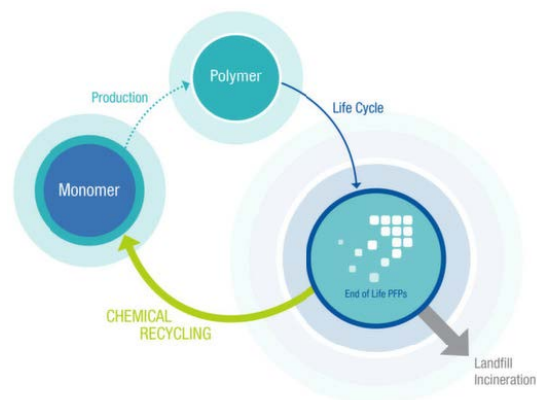
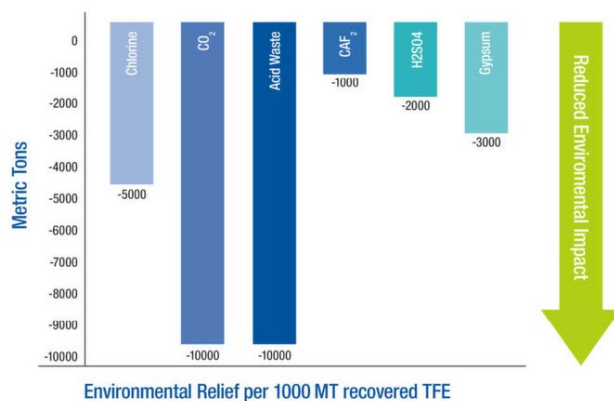


Dyneon has put on stream the world's first fluoropolymer Up-Cycling facility in Burgkirchen/Germany at the beginning of 2015. In contrast to existing recycling methods for fluoropolymers, this innovative process generates new materials rather than recycled materials. In the fluoropolymer sector, these new materials, which have not undergone any processing, are also referred to as 'virgin' PTFE, PFA or FEP.

The new high-temperature recycling process includes a grinding stage, after which the PFPs, which are preferably end-of-life products, are decomposed into their monomers

at temperatures above 600 °C. These monomers are the same chemical components from which the polymers were produced. This process called 'pyrolysis', primarily produces tetrafluoroethylene (TFE) and hexafluoropropylene (HFP) with a recovery rate of 90–95 %.

The resulting gas mixture is then passed to the Dyneon monomer plant and cleaned by distillation. After this step, TFE with a purity of 99.9999 % is obtained and can be used to manufacture arbitrary new fluoropolymers with no loss in performance. So the derived products differ in no way from the source materials, whether it is a PTFE-product, a fluoropolymer or an elastomer. As a result, the description recycling is not considered suitable for this method, so it is now called Up-Cycling, and with good reason. Products reaching the end of their life cycle are converted into new high tech products.



For PTFE compounds there have been no worthwhile or technically feasible solutions to date. PTFE compounds contain fillers mixed into the plastic. Typical fillers include glass fibers, glass beads, coal, graphite and soot. Even in cases where recycling was technically possible, implementation generally failed as, owing to a lack of acceptance among end consumers, there was no opportunity to feed these recycled materials, with known disadvantages, back into the market.