



recycling. Mechanical recycling basically means melting of polymer, degassing and filtration. KraussMaffei is provider of the EdelweissCompounding line, a two-step system for reprocessing post-consumer recycle.

Keilbach describes it thus: "In the first stage a twin-screw extruder takes in the waste plastic and prepares the raw material to enable the degassed melt to be filtered to high accuracy.

In the second stage the cleaned melt passes through a compound extruder and can now be upcycled with the addition of fillers, reinforcers, stabilizers, or dyes." TER Plastics POLYMER GROUP uses KraussMaffei ZE twin screw extruders for their well known compounded engineering plastics and recognizes a huge benefit of solutions like the EdelweissCompounding line, which combines recycling and compounding.

Solvent-based recycling essentially follows the same principle as the mechanical recycling but due to adding a solvent in the first stage the filtration or "cleaning" process can take place on a very finer basis. As a result, the recycling efficiency and the recycle quality is much higher compared to the mechanical recycling process.

A milestone in large-scale, real-world application of solvent-based recycling is currently under construction for launch this year. In Ironton, Ohio, PureCycle

By 2030, the world is expected to generate 2,590 million tons of waste annually, increasing drastically from 2016's value of 2,017 million tons. In 2018 only 20% of the worldwide generated plastic waste have entered a recycling stream. Franz-Xaver Keilbach, Global Application & Product Owner Circular Economy, explains, "As a

general principle, plastics are extremely well suited to recycling and reuse." So how is post-consumer waste converted into high-quality recycled material?

The three main plastic recycling types can be defined as mechanical recycling, solvent-based recycling and chemical



Technologies (PCT) is building its first commercial-scale solvent-based recycling plant to convert post-consumer PP feedstock. The plant will be equipped with several extruders delivered by KraussMaffei, based primarily on its unparalleled expertise and uncompromising customer support.

For both processes from the molecular point of view, the polymer always remains a polymer. However, in chemical recycling the feedstock waste polymer is converted into a monomer by depolymerization, for example PET recyclates are depolymerized using glycol within a twin-screw extruder. Hence the output of the chemical recycling

process is always a chemical product which has the possibility to be transformed (back) into a virgin polymer by chemical polymerization.

It can be observed that on the one hand all three recycling processes are subject of massive growth and on the other hand especially the solvent-based recycling as well as the chemical recycling processes become more and more popular. As Keilbach sums up, "KraussMaffei is at the very forefront of these developments. The first industrialized are already in place."

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KraussMaffei Group GmbH
Munich, Germany
www.kraussmaffei.com