

High-quality recycling of complex plastic packaging

APK's innovative recycling technology enables a circular economy for plastics



Design for recycling & innovation in technology need to go hand in hand

Dear reader,

If we are to truly come full circle in creating a circular economy for plastics, the plastics value chain must account for innovations in both product design and recycling technology.

With the European Commission's Green Deal as well as the new Circular Economy Action Plan reinforcing the Commission's commitment, as outlined in its 2018 EU Plastics Strategy, now is the right time to take stock of what the results have been to date of the various debates among and initiatives from legislators, industry representatives, NGOs, and the scientific community. If we do so, we will quickly realise that discussions and initiatives aiming at circularity for plastics need to take a much more active approach to linking ideas for 'design for recycling' with the assessment of efficient and future-bound plastics recycling technology.

It is a pressing and essential matter that we develop a common understanding of the relevance of today's existing mechanical recycling as well as that of advanced physical recycling processes available at industrial scale – such as APK's Newcycling® – and future chemical processes.

Top-level discussions on guidelines for 'design for recyclability' must incorporate a sound understanding of (innovative) technology. Only this understanding will allow us to determine which plastics products are recyclable, both small and large scale: today, short-term, and medium term. This will also allow us to avoid unsustainable re-designs.

APK's mission is to produce plastic recyclates with virgin-near properties from mixed plastic waste streams, such as flexible, multilayer packaging waste. It is often stated that this type of waste is not recyclable with most mechanical processes. However, with Newcycling® – APK's advanced physical recycling technology – these fractions can be easily transformed into high-quality secondary raw materials. Technology such as that used in Newcycling® is the missing link – along with efficient re-design – to establishing a circular economy for plastic where there is no compromise on product performance.

We look forward to working with you to close more product cycles and to discuss how all of us can contribute to achieving closed loop recycling, ultimately achieving the packaging recycling targets set by the European Commission and the provisions outlined in the Plastics Strategy for 2030.

**Yours,
APK AG**

*High-quality LDPE recyclate from
APK's Newcycling®-process.*

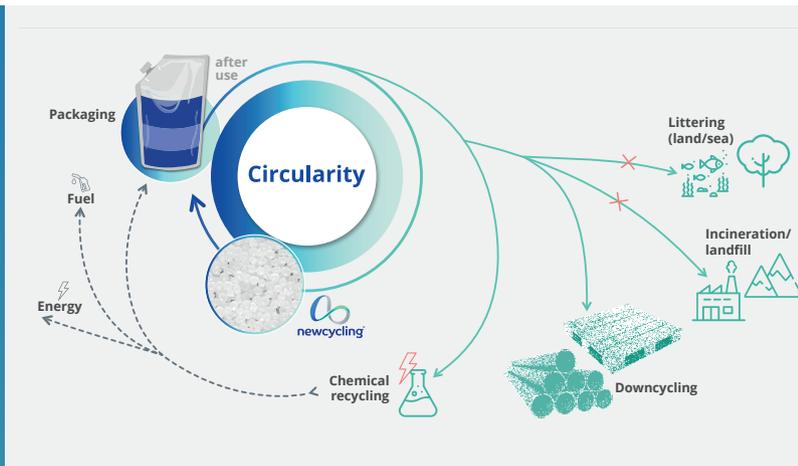




Newcycling® – the closest loop back into packaging

In terms of positioning Newcycling® in the recycling technology spectrum, a distinction must be made between physical and chemical processes. Mechanical recycling and advanced processes that add a solvent-based purification step (aka 'dissolution recycling') are both physical processes. These technologies keep the molecular structure of the polymer intact and retain the energy originally invested in polymerisation. This is also the major contrast to chemical recycling processes that effect and break down polymer chains, which partially explains why such processes feature far higher energy use than physical ones.

Within the category of physical recycling technologies APK's Newcycling® counts towards the dissolution recycling processes. It features a mechanical pre-treatment step (cleaning, etc.) and in addition a solvent-based process step which enables the separation of different polymers in complex plastic packaging. What is more, in this part of the process contaminants of all sorts (additives, colours, organic residues, etc.) are separated and the target polymer is obtained in much higher purity than in solely mechanical processes. The target polymer is brought back into solid state and re-granulated.



APK's Newcycling® products Mersamid® (recycled PA) and Mersalen® (recycled LDPE) feature near-virgin functionalities and on average a 66% reduced carbon footprint compared to virgin LDPE and PA (ifeu-Institut, Heidelberg (Germany), 2018).

Mersalen® is used in a number of high-quality packaging solutions. Mersamid® is focussing on durable, performance products e.g. vents, pegs and even sports equipment.

APK is using input material from post-industrial and post-consumer sources and also works on blends combining the two sources. Due to the solvent-based process step, Newcycling® is able to recycle more complex plastic products and waste fractions, such as mixed, flexible multilayer plastic packaging, into high-quality secondary raw materials.

Product examples featuring APK's Newcycling® products Mersalen® (recycled LDPE, to the left) and Mersamid® (recycled PA, to the right).



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