

Media-Information

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New, more sustainable process for HDPE plastics recycling

HDPE for bottle production made from 100% LVP for the first time - Interzero receives patent for previously impossible mechanical recycling process

- Interzero develops mechanical recycling process with a chemically controlled rheology modification to produce blow-moulded products from 100% lightweight packaging material from post-consumer streams, previously only suitable for extrusion processes
- European Patent Office recognises novel recycling process based on chemically controlled modification without addition of newly produced plastic and re-sorting of used packaging
- A special combination of additives produces high-density polyethylene (HDPE) whose flowability during processing is comparable to that of virgin plastic

Berlin/Cologne. Europe's leading circular economy services provider, Interzero, has patented a procedure that significantly improves the recycling of HDPE plastics, following years of development work.

This recycling procedure eliminates previously required efforts in the final sorting stage of polyethylene lightweight packaging waste as it is retrieved from the yellow bin, as well as the need for adding primary plastics to the so-called PPC (post consumer commercial) or PIR (post industrial) classes.

Mechanical recycling with chemically controlled rheology modification

The patent relates to the production of a prepared plastic material made of lightweight packaging with a minimum 95 percent HDPE share. It refers to a mechanical recycling process with a chemically controlled rheology modification to produce blow moulded products made of 100 percent lightweight packaging post-consumer material, which has to date only been qualitatively suitable for extrusion processes.

The process was developed in our own Competence Centre for recycling of plastics at Interzero Plastics Innovations in Maribor, Slovenia. The Centre of Competence is the only state-accredited research institute in the EU based on the laboratory standard ISO/IEC 17025:2017, which has specialised in the development and analysis of recycled plastics.

"We can look back on long-term experience and competency in plastic development and analytics", claims Markus Müller-Drexel, CEO of Interseroh+, the recycling alliance for Europe's leading supplier of recycling solutions, Interzero.

The laboratory has consistently developed in the past few years and is now entering the market with a further range of services. In five laboratories equipped with state-of-the-art technical devices for analysing material quality - from the mechanical, thermal, and rheological properties to sensor technology and colour - there are also machines for processing materials as well as an NIR separator for simulating the behaviour of packaging in the sorting process.

The new performance is also reflected in the HDPE patent. "With this process we gain significant savings in raw material, energy, CO₂ emissions and effort invested in the sorting of lightweight packaging waste, when generating recycled plastics." outlines Dr. Manica Ulcnik-Krump, Managing Director of Interzero Plastics Innovations. "These savings mean that the sustainability balance is leading on a global scale compared to conventional procedures. Taking us a very large step closer to our vision of a world without waste."

The addition of a special combination of additive compounds makes all the difference

A special combination of additive compounds alters the flow properties of polyethylene, leading to an increased viscosity and reduced melt flow rate. This enables the leap from the previously experienced extrusion quality to the blow moulded quality, suitable for the manufacturing of bottles.

This results in significant savings in the use of new materials and therefore oil and CO₂ emissions for Interzero and its customers. Additional CO₂ emissions can be avoided by saving energy in the sorting process. Sorting plant capacity can be better utilized for the consistently increasing volumes of used packaging. In the case of blow moulded production of new recycling products, the manufacturers can retain their standard technology.

The Slovenian company Rupar Plastika is one of the first to use the new process. They produce moulded plastic parts from bottles to closures for well-known manufacturers, such as BORA, and offer a range of different plastic processing technologies, such as extrusion blow moulding, injection stretch blow moulding, injection blow moulding and injection moulding. Special cleaning cartridges (two-chamber system) have been developed and produced for the innovative BORA Flexback oven X BO.

"When working with renewed plastics, changes have to frequently be made to the production lines. The new process at Interzero eliminates any need for those changes. An immense time and cost advantage for us", says Rok Miklavčič, Managing Director at Plastika Rupar.

Competence Centre for recycling of plastics is setting standards throughout Europe

The accreditation confirms that the institution fulfils international standards for mechanical and physical analyses of plastics. As such the Centre of Competence is setting standards throughout Europe in the implementation of uniform quality norms. It supports Interzero's customers to test packaging made of different materials for recyclability and to improve them. The experts not only test the materials and the design of the packaging, but also their practical sorting capability. Positive results have also been confirmed for the label "Made for Recycling", which Interzero has developed in conjunction with the bifa environmental institute, which was then confirmed by the German Fraunhofer Institute for Process Engineering and Packaging IVV.

The European Patent Office recognized the process with the patent number EP2770016.

About Interzero:

Interzero is one of the leading service providers in the field of closing product, material and logistics loops as well as innovation leader in plastics recycling with the largest sorting capacity in Europe. Under the guiding principle of "zero waste solutions", the company supports over 50,000 customers throughout Europe on the responsible handling of recyclable materials, thus helping them to improve their own sustainability balance and conserve primary resources. With about 2,000 employees, the company achieves a turnover of over one billion euros (2021). According to Fraunhofer UMSICHT, Interzero's recycling activities will save one million tonnes of greenhouse gases compared to primary production and more than 12.5 million tonnes of primary raw materials in 2021 alone. Further information can be found at www.interzero.com.

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