



VacuFil Visco+ sample system with downstream pelletizer

From waste to value: controllable viscosity build-up in PET

The VacuFil process, an innovative LSP (liquid state polycondensation) process developed by German machine builder BB Engineering, enables polyester waste to be processed into high-quality rPET.

VacuFil is an innovative recycling system for polyester waste developed by BB Engineering. The German machine builder is an expert in plastic extrusion and filtration for the manufacture of films and manmade fibers. The VacuFil system was developed with the objective of offering spinning plant customers a solution for directly processing their own spinning plant waste into high-end products. Because while the recycling world is focusing on bottle flakes, which are limited in terms of volume, the potential of this resource remains extensively unexploited. The result is an innovative LSP (liquid state polycondensation) process, which recycles all polyester waste in an inexpensive, easy and reliable manner, and prepares it for reutilization in spinning or other applications. VacuFil produces an extremely homogeneous melt, whose viscosity is controlled in a targeted and stable manner. This creates a precisely-definable, high-quality raw material for further processing.

By the way, the material recycling is not the only sustainable aspect of VacuFil. It also reduces CO² emissions, which in turn can save money

(depending on the local regulations of the country of production). We are facing an average CO² emission of 2,18 kg CO² per kg PET. In contrast to this it is only 0,45 kg CO² per kg PET during recycling. This is an enormous saving of 79%. On top of this you can avoid the emission from the usual waste incineration of additional 2,83 kg CO² per kg PET.

The so-called Visco+ vacuum filter forms the core component of the recycling process and unites gentle large-area filtration with fast and flexibly-controllable viscosity build-up. To this end, the melt properties required for the end application can be achieved in a reliable and reproducible manner and controlled during ongoing operation. The intrinsic viscosity is continually monitored by means of an integrated viscosity measurement unit and the process parameters reliably adjusted in the event of deviations. These deviations can be the result of disparate input qualities, which are compensated during the ongoing process in this way. A reactor is not required. The automatically-regulated vacuum (1-30 mbar) removes volatile contamination and ensures a controlled, throughput-dependent IV increase of up to 30%. Macro- and

microscopic melt homogeneity is achieved by means of homogenization drying, controlled plasticizing, gentle filtration and controlled vacuum degassing. The high degasification performance also dispenses with energy-intensive predrying. The GUIDE system monitors the entire recycling process, hence ensuring operational reliability.

With its modular structure and a performance spectrum of between 300 kg/h and a maximum 3,000 kg/h, the VacuFil system opens up various possibilities for processing polyester waste. The melt can either first be granulated or fed directly into the system to manufacture the end product – even in the case of challenging further processing procedures, such as the production of FDY filaments, for example. With an optional 3DD mixer, a tried-and-tested BBE mixing technology, manufacturers are able to feed dyes and additives, but also the rPET melt, into a main melt flow. ♦



Visco+ filter – core component of the VacuFil recycling process