UIC VTA



PET Recycling – Distillation of BHET and Recovery of EG

Case Study

KEY FACTS

Regaining high-purity BHET and EG:

- Recovers BHET and EG from PET waste for reuse in new PET production
- Reduces the need for virgin PET feedstock accordingly whilst reducing waste
- Is crucial for production of high-quality PET



Application

PET, or polyethylene terephthalate, is a popular plastic commonly used in the manufacture of bottles, packaging and textiles. Due to its versatility, durability and light weight, PET has gained worldwide acceptance, resulting in huge consumption and growing markets.

At the same time, the amount of PET waste that needs to be recycled is increasing. The need for recycling is high because PET waste not only takes up space in landfills, but also pollutes the environment when it ends up in nature. Recycling helps to minimize these negative impacts and extend the life of the materials used, which are based on finite resources and are produced at high energy consumption.

Challenges

One way to recycle PET is to simply melt it down and make new PET. The problem is that doing this with colored PET results in low quality material with very limited reuse potential.

Therefore, the preferred process for PET recycling is chemical depolymerization.

Unfortunately, chemical depolymerization only produces a mixture of BHET (bis(hydroxyethyl)terephthalate), EG (ethylene glycol) and oligomers.

To take full advantage of the reuse possibilities for BHET and EG, both substances need to be separated and purified.









Solution

A continuously operated vacuum distillation process is used to obtain pure BHET and EG.

This distillation process is challenging and requires a high level of expertise and sophisticated process design. This distillation process consists of the following two steps:

1. Thin Film Distillation of EG
2. Short Path Distillation of BHET to separate it from oligomers and other impurities, characterized by its short residence times and very low operating pressures.

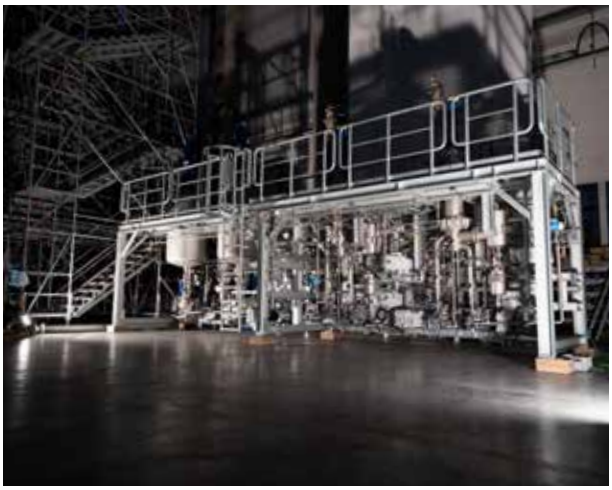
A particular challenge in the distillation of BHET is its tendency to form deposits in the evaporator, cold trap and vacuum system. UIC has developed special processes and components to overcome this problem and avoid downtime.

At UIC and VTA, our experts draw on more than 70 years of experience to provide customized plants of all sizes for any distillation requirement. We operate two state-of-the-art technology centers where we work with our customers throughout the process development phase. Together, we define the perfect distillation technology and evaluate the ideal distillation parameters for each individual request through laboratory and pilot plant testing. Based on the results, we scale up to design individual, industrial scale distillation plants. In addition to our in-house research we additionally deliver such plants for piloting and semi-production to our clients world-wide for their own process development and optimization.

Let us face your next distillation challenge together!









UIC GmbH and VTA Verfahrenstechnische Anlagen GmbH & Co. KG

UIC and VTA are the partners for demanding process solutions of high-end thermal separation tasks. The distillation specialists offer small, standardized laboratory units up to tailor-made, skid-mounted industrial size facilities. Testing, engineering and manufacturing is performed in-house at the headquarters in Germany. UIC and VTA offer contract distillation on different toll processing plants. UIC and VTA are offering wiped and short path distillation equipment and process development for various industrial sectors with high boiling and thermal sensitive products.

Technologies

- Thin Film / Wiped Film Distillation
- Short Path Distillation
- Horizontal Thin Film Distillation
- Thin Film Drying
- Fractionation

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