



Product processing

High Temperature Vacuum Distillation Plant



Fraunhofer CBP in Leuna, central Germany, closes the gap between the lab and industrial implementation.”

The Fraunhofer Center for Chemical-Biotechnological Processes CBP in Leuna, central Germany, develops and scales up chemical and biotechnological processes for the utilization of renewable raw materials. By providing infrastructure, pilot plant facilities and a staff of highly qualified experts, the CBP closes the gap between laboratory and industrial implementation and enables partners from research and industry to scale up processes to production-relevant dimensions, and thus accelerate process developments.

The Chemical Processes working group focuses on the process-technological development of chemical processes to produce biobased basic and fine chemicals for further processing in the chemical, pharmaceutical or food industries. In addition to new process concepts, the optimization of the resource and energy efficiency of existing processes also plays an important role here. Established processes can be adapted and optimized from the ecological and economic viewpoint. In doing this, we both consider biobased raw materials and also examine conventional processes for manufacturing petrochemical products.

Portfolio

A high-temperature vacuum distillation plant is employed for the distillative purification of high boiling point substances or mixtures of substances. The core features of the plant are a degasser, a short-path evaporator as well as a thin-film evaporator with a rectification column. The various units can be connected with one another as required. Especially with temperature-sensitive substances it is important to distill these substances at moderate temperatures in the fine vacuum range in order to avoid decomposition.

Technical data

- Pressure range 0.005–100 mbar(a)
- Temperature ranges 200/250/350°C
- Degasser, short-path evaporator 0.4 m²
- Thin-film evaporator 1.0 m² with rectification column
- Feed rate max. 50 kg/h
- Material stainless steel
- ATEX compliant (zone 2, T1/T2)
- Inert product filling in drums or IBCs

Process accompanying analytics to determine the product purity





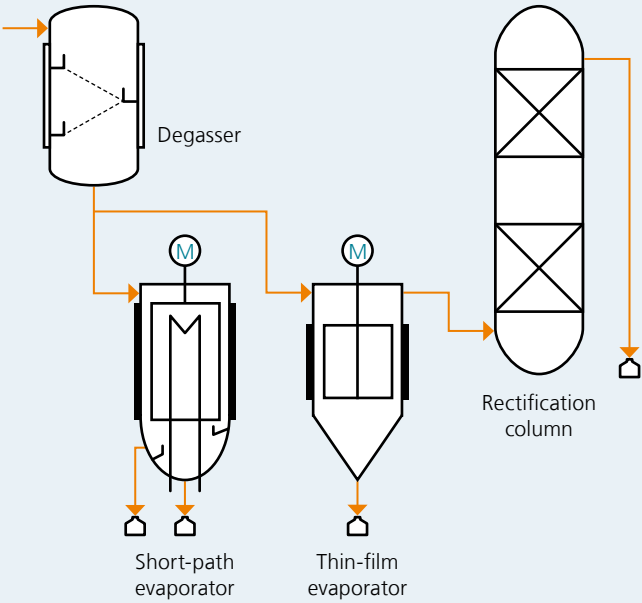
High-temperature vacuum distillation plant

Process

Distillative purification of tall oil and fatty acids

The high-temperature vacuum distillation plant is used, for instance, for the distillative purification of tall oil. (Raw) tall oil is produced as a by-product of cellulose production. It consists mainly of tall oil fatty acids (especially oleic acid and linoleic acid), resin acids (mainly abietic acid), as well as neutral and unsaponifiable components, the main component of which is β -sitosterol. First, volatile impurities are separated in the degasser. Then, a rough fractionation of the fatty and resin acids from the unsaponifiable matter takes place in the short-path evaporator. Subsequently, in the thin-film evaporator with a rectification column, fatty acids can be obtained with a purity of more than 95 percent. Among other things, fatty acids are known as input material for derived products such as fatty acid epoxy resins.

Flow chart of the high-temperature vacuum distillation plant



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