



Distillation columns

Distillation is one of the most important and widely used physical separation methods. It is based on the distribution of components between two phases, liquid and gas. Distillation is one of the most common methods of separating materials from each other due to the difference in boiling point.

Distillation columns in the industry are divided into two categories:

- 1) Plate columns
- 2) Packed columns



Plate columns

In a plate (tray) distillation column, the liquid flow moves downward through the trays, and the vapor flow moves upwards. The number, size, and the trays' placement depend on the separated solution's volatility. The gas and liquid phases are placed next to each other on these trays, and the phase transfer from gas to liquid or vice versa occurs in each tray. To maximize the separation efficiency in each tray, the two-phase proximity time and the contact surface should be as high as possible. The diameter of the column and the distance between the trays depends on the amount of liquid and gas that passes through the tray each time. Each column tray is a separation phase.

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Packed columns

The working method of the packed columns is the same as the plate columns, but with the difference that there is no tray in the packed columns, but the entire column is packed with objects of a certain shape, size, and type, which are called packing.

Packing is divided into two categories: structured and random. In structured packing, liquid flows from the top, and gas flows from the bottom. These columns have a small height, and liquid distribution is very important because if the liquid is not distributed properly, it will cause some parts of the bed to remain dry and reduce the gas-liquid contact efficiency. At the bottom of the packing columns, a tray is designed to hold the packing bed, and a tray is designed in the upper part of the column to prevent the expansion of the bed.