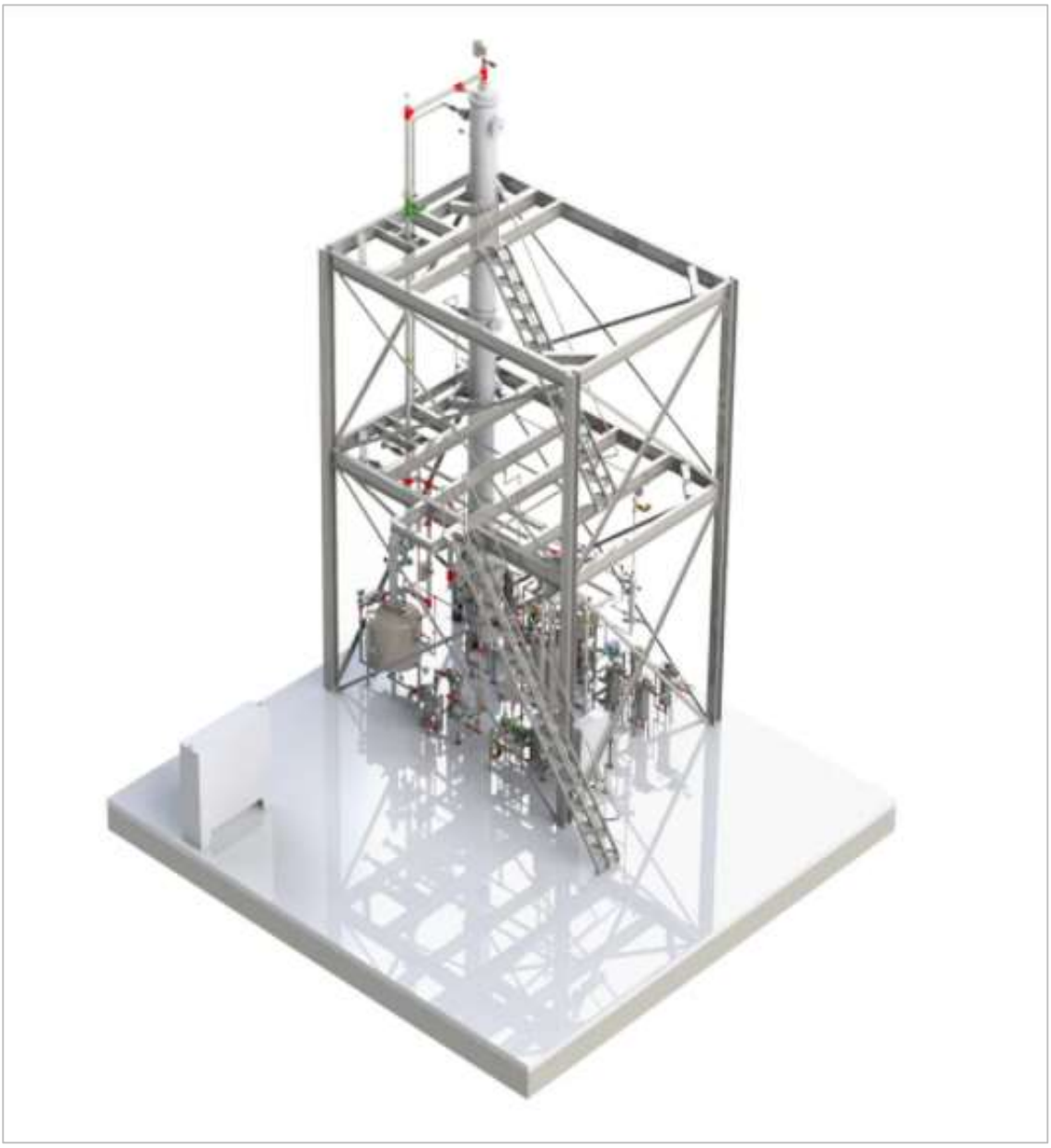
How Fractional Distillation Equipment Works



Introduction to Fractional Distillation

Fractional distillation is a separation process that separates the mixture into different fractions or components parts. By applying heat to the mixture, the specific temperature setting allows one or more fractions to vaporize. Vacuum is also needed in the system when the different components' boiling points are similar to one another. The biggest difference between a regular distillation unit and a fractional distillation unit is the introduction of a fractionating column.

It can be either a lab/bench scale or an industrial scale. For industrial fractional distillation, it is the most common separation method used in the petroleum refineries, petrochemical, and related industries. There are options for stand-alone systems, as well as continuous systems. The latter has been used most frequently in the industries mentioned above, and simply means adding new feeds and removing products constantly.

Industrial distillation normally happens in a fractionation tower which is a high vertical cylindrical column with plates and/or packing inside. There are also liquid outlets that allow different fractions to be withdrawn based on different boiling points of the mixture components, with the lowest boiling point (lightest component) fraction exiting from the top and highest boiling point (heaviest component) exiting from the bottom.

To improve the separation efficiency and increase the solvents purity, boil-up and reflux are often introduced into the industrial scaled fractional distillation units. Boil-up means a part of the solvent-lean liquid is reevaporated at the bottom. Reflux means returning a portion of the condensed liquid back to the fractionation tower, where it will be heated up by the heat source and evaporated again. Both boil-up, reflux ratio and theoretical plates need to be considered when deciding the goal of a separation process.

Unit and Service from Maratek

Maratek's distillation systems are continuous, fully automated processes. This ensures continuous processing of the feed and the consequent collection and removal of the distillate and the bottom products, respectively. They are equipped with state-of-the-art instruments and are fully customizable for continuous and reliable process monitoring to ensure operator and plant safety.

The columns are uniquely designed by the in-house engineering team to be customizable based on the exact solvent stream. Maratek's team of engineers use a variety of tools, Aspen Plus and SolidWorks to properly simulate the reaction, assess the energy usage, design the 3D model, and implement, eventually, a custom fractionation column in order to optimize the solvent purity and recovery rate.

Maratek's fractional distillation equipment is available in many standard ranges from 1 to 500+ gallons per hour of throughput. The customizable features on the unit, allow it to handle different solvent mixtures, no matter the complexity. With the customized plates and outlets, the fractional distillation can be operated efficiently and more targeted at the desired outcome. By applying the unit to waste streams, companies could also reduce solvent and disposal costs.

About Maratek

Maratek is a Canadian based, award-winning, industry leader in professionally engineered solvent recycling and cannabis & hemp extraction technologies, which has proudly served industrial manufacturers globally for more than 50 years. Maratek manufactures environmentally conscious products that recycle waste for reuse from printing, coatings, automotive, aerospace, paint, cannabis, and many other related types of manufacturers to help them stay competitive in the marketplace by cutting costs and saving money. In 2011, Maratek acquired Omega Recycling Technologies, allowing the company to significantly expand its product offering. Maratek focuses its development efforts on reducing, reusing, and recycling solvents and other liquid wastes in a wide range of industries. Our company develops the latest technologies, utilizing our vast experience of supplying clients worldwide to provide the best return on investment possible.

Now, the company is using that experience to take the cannabis world by storm. Maratek's strengths lie in the ethanol extraction and related processes like winterization and looks to limit solvent waste and increase efficiency. Also, Maratek has developed in the direction of solventless extraction, like water extraction, in recent years.

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