

High Vacuum Batch Distillation

Customer: Major Flavor/Ingredients Company

Location: Southeastern US

Problem: Client had production capacity limitations on a batch distillation unit used to separate and purify a high-value product.

History: Market demand for the valuable distillate product had increased to the point that the process needed debottlenecking to increase capacity. The processor was considering installing a costly new batch still to triple capacity.

Solution: The client requested that ChemPro visit the plant to make a facility assessment of the distillation area and recommend changes to increase throughput for the stills. During the engineering study ChemPro made recommendations for several modifications to the existing stills that would reduce outages, increase throughput, and improve product quality. Specifically, for the highest value product, the column and internals were large enough to handle significantly more capacity, but could not be loaded properly due to limitations in still pot volume and heat transfer to generate boil-up. ChemPro designed, engineered, and built a skid-mounted batch stillpot, incorporating a custom-designed reboiler with proprietary ChemPro internals and a circulation pump and controls for increased throughput. The unique design was compact and in a vertical format to fit into the tight space available next to the existing unit. Pre-fabricated vapor and liquid piping connected the new, larger batch stillpot to the existing column, and the upgrade included all instrumentation necessary to control the increased process throughput.

Results: Production of distillate began just four months later, after field vapor, utility piping, and control system tie-ins were completed. The unit has met all process criteria, increased production capacity six-fold, and eliminated the need to add a costly new, complete still.

Modular distillation system upgrade:

- Structural frame: Epoxy-coated steel
- Stillpot: 304SS
- Forced Circulation Reboiler: 316SS, with proprietary internals
- Reboiler Circulation Pump: Sealless, 316SS
- Piping: 304SS
- Instrumentation: 316SS Wetted parts
- Functional write-up and logic to upgrade
- Existing control system

