

EDC Heavy Ends Column Revamp

A Vinyl Chloride Monomer producer wanted to revamp its EDC Heavy Ends column to achieve a significant capacity increase and eliminate frequent shutdowns because of tray fouling. Simulations of the operating data, evaluation of the tray hydraulics, and a gamma scan of the column revealed that the existing sieve trays were at their operating limit.

The column upgrade included:

- Replacing all one-pass sieve trays above the feed with one-pass **SUPERFLUX**® Trays on the same 15 in. tray space.
- Increasing tray spacing below the feed from 15 in. to 18 in. without welding in new tower attachments.
- Replacing the tray immediately below the feed with a transition tray, which was used to mix the liquid from the tray above with the liquid from the feed and to distribute the mixed liquid to the two-pass trays below.
- Using expansion tray rings and special downcomer adapters to support the new SUPERFLUX trays and eliminate field welding to the vessel wall.

During the test run, the target design rate of 110% was met at the midpoint of the first day with a target purity of 99.6% EDC in the overhead product stream. The product specification for the 1,1,2 Trichloroethane impurity in the overhead was also met. Even though three trays were eliminated in the column because of increased tray space, the required product purities were achieved at the same reflux rate.

The column has operated at 124% of original capacity over a two-year period and has not lost operation time because of tray fouling. A comparison of the column's performance before and after the revamp is shown in the table below.

	Before Revamp	After Revamp
Feed Rate, gpm	327	406
OVHD Product Rate, gpm	310	385
OVHD EDC Purity, wt%	99.60	99.61
OVHD Temperature, °F	221	236
Bottom Temperature, °F	250	252 – 257
Column Pressure Drop, psi	9.0	8 – 9.5
Capacity	100%	124%
Reflux Ratio (L/D)	0.48%	0.45 – 0.52%