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**Question 49: What criteria for materials of construction do you use for structured packing at the different sections of the crude, vacuum, and coker towers? What criteria do you use to replace packing during turnaround?**

**CHRIS STEVES** (Norton Engineering)

316SS works well against naphthenic acid corrosion attack. Inconel 625 is another alternative for extreme service conditions, but it is generally not required. The cost associated with Inconel 625 is three to four times that of 316SS. Due to the requirement of tower inspection and removal of the packed section, 316SS is the recommended material for towers in this service.

More importantly, one must consider both the process and the mechanical designs of the components that support the structured packing section, including details, a number of details.

\*Redistribution must be used every 15 to 20 feet of packing.

\*Hold-down grids are mandatory.

\*Wiper rings must be installed on every layer of packing to ensure the liquid phase does not rain down the walls.

\*Each packing layer must be rotated 90 degrees of the packing layer above and below.

\*The liquid distributor must be level and the tower must be plumb.

\*The liquid and gas distributor must be designed to provide complete distribution of the top layer and bottom layer of packing; otherwise, the first few layers of packing will be lost.

\*The correct amount of gas disengaging space must be used between each packed section and the gas distributor.

\*A structured packing layer cannot be allowed to rain down on another packed section without collection and redistribution.

\*The efficiency of the packing must take into account the flood point, vapor and liquid rates, and turndown.

\*The minimum liquid rate to ensure the packing is wetted should be ensured in the design.

Typically, structured packing is stainless steel. The grade of stainless steel is selected based on the fluid S, TAN, and temperature. Also, application is typically in the vacuum column unless a crude column has to be debottlenecked.

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