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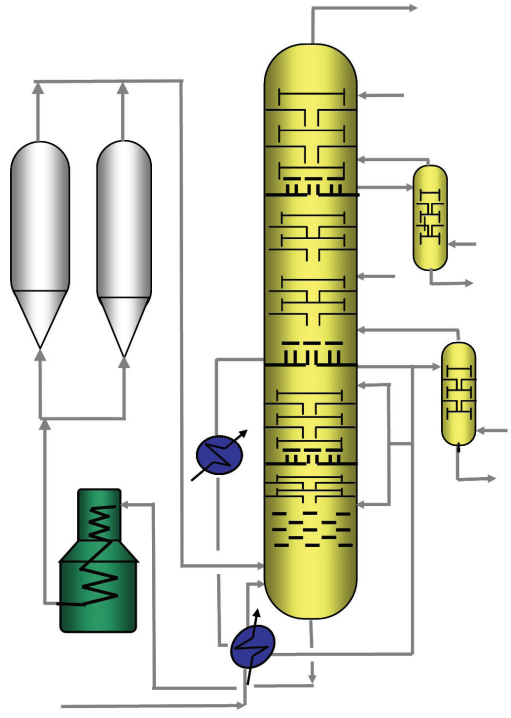
# Tower Technical Bulletin

## Anti-fouling Trays Maximize Coker Main Fractionator Profitability

### Background

The Coker Main Fractionator is systematically subjected to harsh operating conditions that can lead to deteriorating efficiency and performance due to coking and fouling. Poor reliability results in loss of profitable coking margins for the refinery.



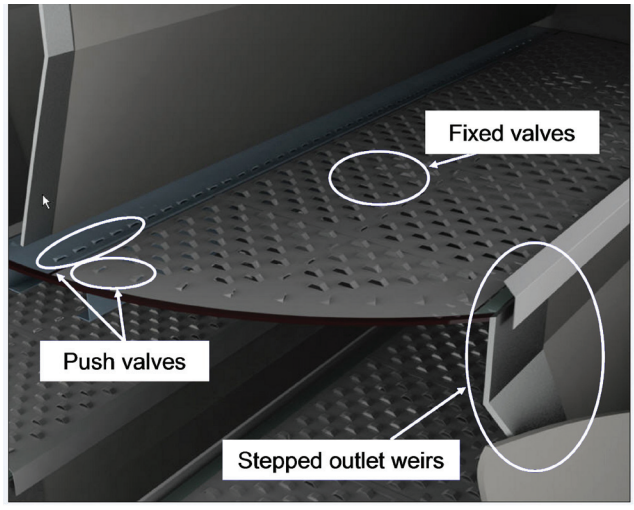
**Coker main fractionator general schematic**

### Extreme Operating Conditions

The main fractionator vapor feed from the coke drum overhead is characterized by a tendency for further cracking, as well as the presence of fine coke particles carried from the drums. The hottest zones of the column (bottom quench, wash, and heavy gas oil sections) are particularly susceptible to accumulation of coke, ultimately forcing frequent shutdowns for maintenance. Internals specifically designed to resist fouling and increase run length can positively affect unit profitability.

### Anti-Fouling Design Strategy

Sulzer VG AF™ trays can be particularly useful in fouling services like the heavy coker gas oil section, above the wash zone. While the wash sprays are designed to knock down coke particulate and quench the unstable feed, coke still often ends up in the HCGO trays. While an anti-fouling tray cannot prevent coking, its unique features can substantially delay the onset of coke-related problems. Specifically, push valves ensure a strong, uniform liquid flow across the tray deck that moves the froth and associated coke particles forward, minimizing stagnant zones that could allow fouling to accumulate. Fixed, large open area V-Grid™ valves are also used for fouling resistance. SVG™ or LVG™ valves force the vapor laterally across the deck in a sweeping motion to prevent fouling.




**Sulzer VG AF™ Tray with anti-fouling design features**

VG AF trays typically use sloped or stepped outlet weirs in HCGO service to allow particulates to be swept into the downcomer from the active zone. Highly sloped downcomers can also be used to minimize residence time in the downcomer, thus reducing the risk of further cracking.

These advanced fouling-resistant technologies have been successfully applied in a variety of commercial applications. The net result is a significant increase of unit on-stream time and a reduction in operating and maintenance expenses.

**The Sulzer Refinery Applications Group**

Sulzer Chemtech has over 50 years of operating and design experience in refinery applications. We understand your process and your economic drivers. Sulzer has the know-how and the technology to provide an internals design with reliable, high performance.

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