KOCH-GLITSCH™

A KOCH ENGINEERED SOLUTIONS BUSINESS



SOLUTIONS FOR MASS TRANSFER

FLEXIPRO® TECHNOLOGY

NEXT GENERATION FLOATING VALVE TRAY

The FLEXIPRO® Floating Valve Tray provides up to 30% more capacity than conventional floating valve trays.

- **Extended operating range with high efficiency – up to 9:1 turndown**
- **Anti-fouling features increase reliability**

The FLEXIPRO® Floating Valve Tray, the latest innovation from Koch-Glitsch, is a versatile, high-performance solution for distillation and absorption applications. The tray features a patented directional floating valve designed with a downwardly coined edge above an upwardly extruded deck opening.

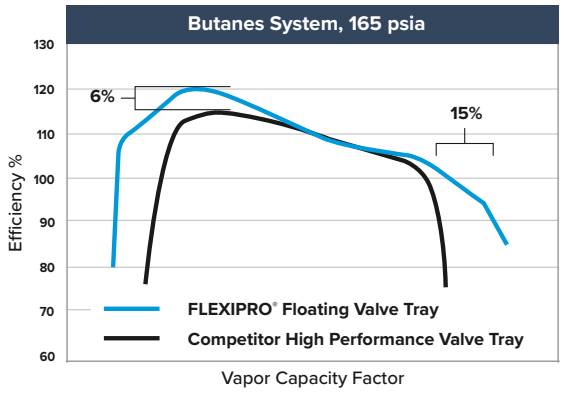
Conventional valves allow the vapor to exit with an upward trajectory. By creating a downward angle to the exiting vapor, FLEXIPRO® Floating Valve Tray gives plant operators higher efficiency, increased capacity, and improved reliability over a wider operating range.

Wider operating range without sacrificing reliability

The total combination of features available with the FLEXIPRO® Floating Valve Tray gives plant operators the reliability of fixed valves, but with a significantly wider operating range. The net rise of the valve is larger than conventional floating valves, and is on par with large fixed valves typically utilized in fouling applications.

FLEXIPRO® Floating Valve Tray vs Competitor's High Capacity Tray

Both trays were tested under the same operating conditions and at the same independent research facility located in the United States. The FLEXIPRO® Floating Valve Tray test showed a 15% higher useful capacity, while obtaining a wider operating range than the competitor tray (data taken from PTQ 2006, Revamps, pp. 26-33).



With its superior capacity and operating range, we can offer the FLEXIPRO® Floating Valve Tray as a solution for any existing floating valve tray, including competitor trays, in lieu of a replacement in kind.

Applications

- RENEWABLE FUELS
- REFINERY FRACTIONATORS
- REFINERY GAS PLANTS
- NGL FRACTIONATION
- PETROCHEMICALS
- ALCOHOL DISTILLATION
- AMINE TREATING



Independently Tested Operating Range

- Hydrocarbon testing at the Koch-Glitsch R&D facility was performed on 1-pass trays at 16” spacing [406mm] and at an independent, third-party test center at 18” [457mm] spacing.
- Flexibility is a function of the number of flow passes, tray spacing and allowable pressure drop. For example, at 24" [610mm] tray spacing, the 1-pass FLEXIPRO® Floating Valve Tray achieves at least a 9:1 operating range.

Engineered for high performance

1. **Valve edge coined downwards above deck opening reduces entrainment and improves mixing**
   - ▼ Benefit: Higher throughput: increases capacity up to 30% compared to conventional valves.

2. **Upwards deck orifice extrusion creates a tortuous path for vapor when valve is "fully closed" to reduce tendency to weep at minimum rates**
   - ▼ Benefit: Wider operating range; maintains good tray efficiency even at minimum rates. Higher tray efficiencies result in lower operating costs.

3. **Upstream leg wider than the downstream leg for pushing action that prevents liquid gradients**
   - ▼ Benefit: Improves efficiency at turndown and increases capacity with enhanced fouling resistance.



4. **Tabs prevent valve cap from closing completely or touching extruded deck opening and reduce risk of sticking in closed position**
   - ▼ Benefit: Enhanced fouling resistance increases reliability.

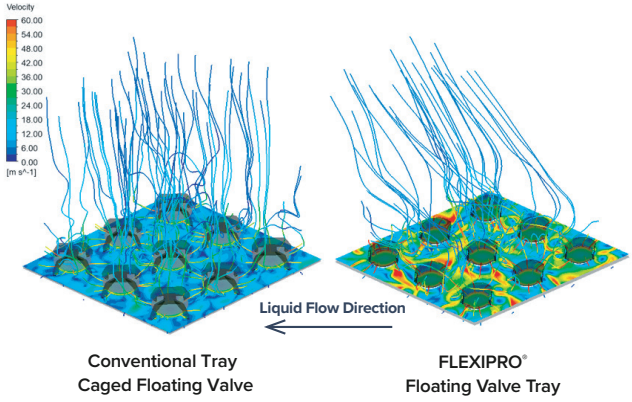
CASE STUDY

New NGL fractionation plant depropanizer

The following case study presents the CapEx benefits and greater operating flexibility to the end user when the FLEXIPRO® Floating Valve Tray is used instead of conventional trays. There are significant reductions in vessel diameter and weight, and the operating range is extended from 4:1 to 6:1.

Design Parameter	Specification
Design Pressure	350psig [2.4 MPag]
Feed Rate	206,700 lb/h [93,750kg/h]
Overhead Specification	>95%mol Propane

Design Parameter	Conventional Valve Trays	FLEXIPRO® Floating Valve Trays
Tower Diameter Top	9'-6" [2.9m]	8'-6" [2.7m]
Tower Diameter Bottom	12'-0" [3.7m]	10'-5" [3.2m]
Number of Trays	27 + 30	27 + 30
Tray Spacing	24" [610mm]	24" [610mm]
Operating Range	30 – 120%	20 – 120%
Vessel Height (Tan-Tan)	152'-6" [46.5m]	152'-6" [46.5m]
Vessel Weight	432,000 lb [196,000kg]	338,000 lb [153,000kg]
Vessel Weight Reduction	-	22%



FLEXIPRO® Floating Valve Tray vapor velocity profiles compared with conventional valves

The yellow-red highlights demonstrate the enhanced downward vapor trajectory produced by the FLEXIPRO® Floating Valve, which leads to significantly less entrainment compared to a conventional valve. The streamlines clearly indicate a preference for vapor flow to follow the direction of liquid flow. This forward-pushing effect eliminates liquid froth gradients. Additionally, the efficiency of the system is improved by better mixing of vapor and liquid on the tray deck, which increases the interfacial area available for mass transfer.

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Contact us to learn more about the high capacity FLEXIPRO® Floating Valve Tray.

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