

MEET YOUR ENVIRONMENTAL GOALS



Achieve higher operational efficiencies with high-performance upgrades.

Upgrading to Honeywell UOP's high-performance distillation trays and heat transfer tubes can provide up to 15% reduction in the utility consumption per ton of product for an ethylene fractionator.

UOP column internals and heat exchanger tubes offer these potential benefits:



15–30%
lower column and
exchanger costs*



20–30%
lower utility
consumption*



20–50%
more capacity*



Improved
product purity*

*Benefits are achieved by reducing heat exchanger approach temperatures, providing the ability to operate at higher reflux rates, increasing the number of theoretical trays, and reducing column reflux rates and heat exchanger duties.

IMPROVE PROJECT ECONOMICS AND PLANT PROFITABILITY WITH HIGH FLUX™ AND HIGH COND™ TUBING

Do you have shell-and-tube heat exchangers that are nearing the end of their operating life? Are you experiencing corrosion, fouling, production bottlenecks and/or excessive energy consumption in your current operation? Our High Flux and High Cond tubing can help you address these challenges while maintaining the existing foundation, piping and process controls in your operation.

High Flux Tubes

Our High Flux tubes help maximize **reboiling** performance by enabling the use of low-cost, low-pressure steam vs. high-cost, medium-pressure steam.



2X to 5X higher U-value
vs. bare tubes



Design **LMTDs** as
low as **1°C**



1,750+ applications
worldwide

High Cond Tubes

Our High Cond tubes help maximize **condensing** performance and eliminate summertime cooling water temperature limitations.



2X to 3X higher U-value
vs. bare tubes



30% higher performance
than low fin tubing



Design to low
LMTDs < 5°C



32 applications
worldwide

INCREASE CAPACITY WITHOUT LOSING EFFICIENCY USING ECMD+™ TRAYS

Are your columns able to maintain throughput demand? Are you looking for increased product yields or improved product purity? If you're interested in lower energy consumption to debottleneck refrigerant systems, compressors, heat exchangers and other equipment, our high-performance distillation trays offer solutions.

ECMD+ trays can help you get more production from your existing assets with the potential for:

Up to
\$2.3MM

in additional production value for a 450 kMTA plant (\$5.1MM for a 1,000 kMTA plant), compared to assets that are not upgraded

~8% Increase

in tray capacity as a result of adding proprietary features to the ECMD platform as proven by side-by-side independent testing and experience with the performance of over 1,100 tray installations worldwide

ECMD™, ECMD+ and PFMD Trays

Our high-performance distillation trays offer up to 65% more capacity than conventional trays.¹ The capacity and technical features of the trays can be applied to provide several different solutions to help you:

Maximize production¹
Minimize pressure drop²
Reduce energy consumption³

Extend run times⁴
Reuse existing columns⁵
Increase product purities⁶

Increase product recoveries
Accommodate divided wall designs

WHY HONEYWELL UOP?

UOP has a century of experience using breakthrough chemistry and engineering to power global growth. For over 50 years, UOP has been a leading supplier of high-performance heat transfer and separation equipment for the petrochemical, gas and refining industries, providing high-performance trays, packing and tubes in over 3,000 process units.

- ✓ **3,000+** active patents
- ✓ **Global** presence
- ✓ **100+** years of experience
- ✓ **50+** years in heat transfer and separation equipment

¹ M.S.M. Shakur, R.E. Tucker, K.J. Richardson, M.R. Sobczyk, R.D. Prickett, C. Polito, and S.E. Harper, "Increase C2 Splitter Capacity with ECMD Trays and High Flux Tubing," American Institute of Chemical Engineers Spring National Meeting, Houston, Texas, March 18, 1999.

² P.J. McGuire and M. R. Sobczyk, "Maximizing Return on Assets and Process Optimization of New Units with UOP Equipment Technologies," 2008.

³ S.G. Fry, J.M. Moll, P. Ronan, L. Scanlon, "NGL Unit Debottlenecked with UOP ECMD Trays and High Flux Tubing for Significant Production Expansion and Energy Optimization," American Institute of Chemical Engineers Spring National Meeting, Austin, Texas, April 29, 2015.

⁴ M.R. Resetarits, J.L. Navarre, D. R. Monkelbaan, G.W.A. Hangx, R. M. A. van den Akker, "Trays Inhibit Foaming," Hydrocarbon Processing, March 1992.

⁵ Daniel R. Summers, Peter J. McGuire, Michael R. Resetarits, Caryn E. Graves, Steven E. Harper, Salvatore J. Angelino, "Enhanced Capacity Multiple Downcomer (ECMD) Trays Debottleneck C3 Splitter," AIChE Spring National Meeting, Houston, Texas, March 22, 1995.

⁶ Mohamed S. M. Shakur, Peter, J. McGuire, Larry G. Bayer, "Converting UTP's Chemical-Grade C3 Splitter to Polymer-Grade Using UOP MD Trays at 10-Inch Spacings," Spring National Meeting AIChE 1997, Ethylene Producers Conference, March 11, 1997.

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