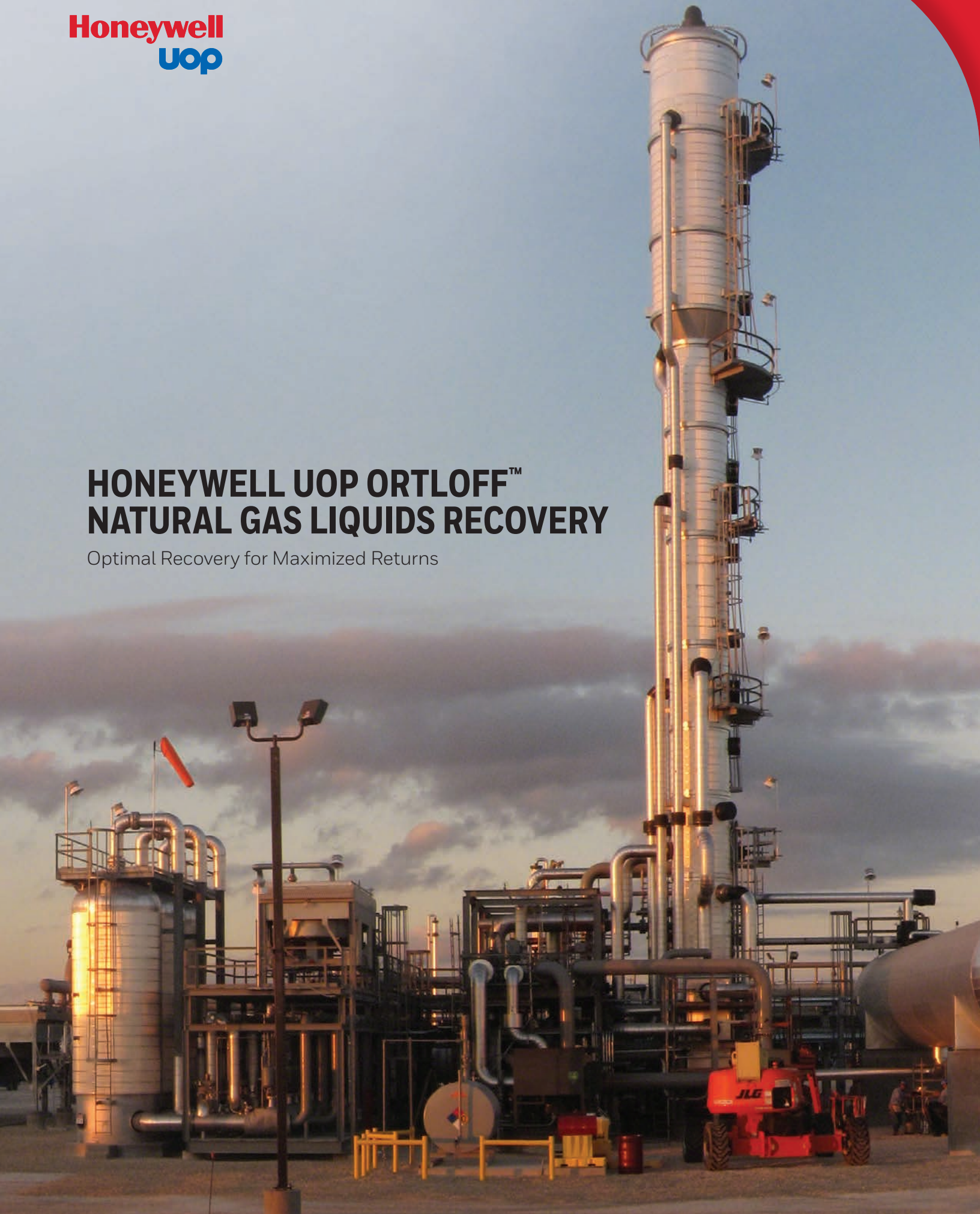
Honeywell UOP

HONEYWELL UOP ORTLOFF™ NATURAL GAS LIQUIDS RECOVERY

Optimal Recovery for Maximized Returns



Optimal Recovery for Maximized Returns

The value of natural gas liquids (NGLs), such as ethane and propane, is increasing as a result of global demand for petrochemical feedstock, heating and power. Honeywell UOP Ortloff technologies are specialized to maximize gas liquid recovery while providing customers with high operational flexibility and greater returns on their plant investments.

Key Ortloff Advantages

- *Guaranteed recovery to maximize revenue*
- *Flexibility for changing economic or operating conditions*
- *Proven process designs from the technology inventor*
- *Unmatched knowledge and experience*
- *Operating efficiency, optimized heating and low compression power requirements*
- *Guaranteed product specifications*
- *Minimized capital expense*
- *Reduced project risk*
- *Robust aftermarket support*

Optimized NGL Recovery Solutions

As a process technology inventor and continued innovator, UOP has defined the forefront of gas processing technology for decades. UOP Ortloff NGL recovery technologies are state-of-the-art processes developed for optimizing gas liquid recovery with higher recovery, more operational flexibility and lower energy requirements for essentially any gas processing project. Proven Ortloff processes have been used in more than 90 percent of expander plants in North America over the last decade, while 80 percent of international liquids recovery projects have employed Ortloff designs.

Broad Portfolio to Meet Industry Demands

Whether an operator requires High Recovery, Ultra-High Recovery or Flexible Recovery, UOP Ortloff technologies can meet stringent product specifications and operational demands more efficiently. These industry-leading processes enable the gas processor to invest in technologies that will accomplish their goals. Ultra-High Recovery technologies provide the operator more than 99 percent product recoveries, while our Flexible Recovery technologies allow the operator to efficiently reject or recover ethane without losing propane recovery. This allows an operator to maximize plant profits based on current NGL product pricing. With the right solution for their needs, gas processors can maximize returns, even in shifting markets.

High Recovery

When speed to market is essential, gas processors turn to High Recovery standard plant solutions to recover valuable NGLs. Developed in the late 1970s, Ortloff Gas Subcooled Process (GSP) technology is the workhorse in the gas processing industry, providing significantly higher ethane and/or propane recoveries from natural gas streams than traditional standard single-stage expander designs. UOP offers the GSP technology as a UOP Russell standard plant, which utilizes a streamlined design and fabrication process enabling rapid onstream production after investment. The pre-engineered, factory-built approach allows producers to quickly begin earning revenue.

Ultra-High Recovery

The Ortloff Recycle Split Vapor (RSV) and Ortloff Single Column Overhead REcycle (SCORE) processes provide significantly higher NGL recovery with lower operating costs. These technologies can achieve more than 99 percent recovery. The Ortloff RSV process provides ultra-high recovery in both ethane recovery and partial ethane rejection mode, while the UOP Ortloff SCORE process provides ultra-high recovery of propane in ethane rejection mode.

Flexible Recovery

Ortloff Flexible Recovery solutions combine both flexibility with ultra high NGL or LPG recovery. The Ortloff Supplemental Rectification (SRP), Supplemental Rectification with Compression (SRC) and Supplemental Rectification with RefluX (SRX) processes are innovative systems for gas liquids recovery, which are all uniquely designed to maximize propane recovery, while enabling the operator to efficiently switch between ethane recovery and full or partial rejection.

Based on Ortloff expertise, these next-generation processes can provide variable levels of ethane recovery, up to ultra-high rates, while maintaining 99-plus percent propane recovery. This allows gas processors to maximize plant profits based on economic conditions.

Retrofits

As the original inventor of GSP as well as the new Ultra-High and Flexible Recovery technologies, UOP is uniquely positioned to help gas processors improve their operations by evaluating existing plants to identify opportunities to increase capacity and/or improve recoveries.

- For increased capacity, UOP technical experts conduct revamp studies to determine limitations in plant equipment considering changes in feed conditions across a variety of operating scenarios. Based on this evaluation, UOP can execute revamp solutions to improve capacity, while minimizing downtime and optimizing operating and capital expenses.
- For higher recoveries, UOP retrofit solutions are designed to upgrade any GSP-type cryogenic unit, allowing gas processors to capture more value with minimal downtime. These solutions are aligned with UOP Ultra-High and Flexible Recovery licensing offerings, so our experts can consider the full range of recoveries and flexible solutions while optimizing operating and capital expense.

	FLEXIBLE				ULTRA-HIGH RECOVERY				HIGH RECOVERY	
	SRX/SRC		SRP		SCORE		RSV		GSP	
Operating Mode[1]	Rejection	Recovery	Rejection	Recovery	Rejection	Recovery	Rejection	Recovery	Rejection	Recovery
Ethane[2] Rejection or Recovery	Full	Ultra-High	Full	High	Full	–	Partial	Ultra-High	Partial	High
Propane Recovery	Ultra-High	Ultra-High	Ultra-High	Ultra-High	Ultra-High	–	Ultra-High	Ultra-High	High	Ultra-High
Energy Efficiency	High	High	High	Base	High	–	Base	High	Base	Base

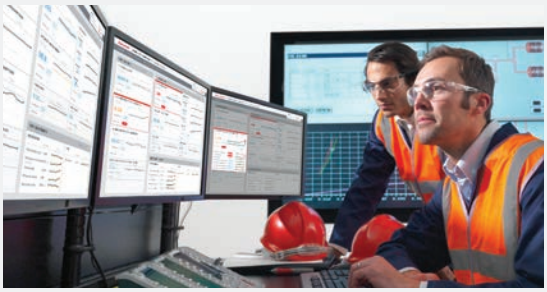
1. High Recovery ranges from 80-92 percent, while Ultra-High recovery ranges from 92-100 percent.
2. Full ethane rejection is where ethane in the liquid product is less than two percent by volume. Partial rejection is where ethane in the liquid product is less than 50 percent by volume
3. Technologies listed are a partial representation of UOP's full portfolio. Other UOP recovery technologies may be optimal for a gas processor's needs.

Dedicated Aftermarket Support

From start to finish, UOP global sales, engineering, service and support staff is there to understand customer goals and ensure needs are met with proven products and technology. UOP's dedicated customer support organization addresses aftermarket needs, including retrofits and revamps, debottlenecking and capacity increases, process performance improvement, hardware upgrades, licensor training for engineers and operators and field support supervision. Extensive service offerings, coupled with unmatched technical knowledge and experience, can help gas processors focus on profitability.

Connected Plant

UOP's connected solutions and services ensure that gas processing plants run at the peak of their capability. The Honeywell Connected Plant is a suite of applications that delivers higher levels of safety, reliability, efficiency and profitability. These proven industry solutions are based on decades of Honeywell's domain knowledge and controls experience. Turning data into actionable insight to optimize operations, predict plant failures and eliminate unplanned downtime.



More than 100 Years of Global Experience, and Counting

UOP provides process technology, materials, and equipment for gas processing, refining and petrochemical industries. With 19 engineering and R&D centers and 14 manufacturing facilities in 19 countries, UOP is close to its customers wherever they are. Since 1914, UOP has developed more than 70 licensed processes and 5,000 active patents and applications for the industries served.

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For more information

To schedule a call or an onsite meeting to review your operation and needs, contact us at 847-391-2000 or visit uop.com.

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