



UCARSOL™ Hybrid Solvents for gas treating

Remove organic sulfur and reduce energy consumption

We're here to help you select solvents to meet your unique system requirements and optimize performance overtime. Our offering includes a portfolio of specialized solvent blends, including UCARSOL™ Hybrid Solvents, and an array of technical services through our Amine ManagementSM Program.

UCARSOL™ Hybrid Solvents combine the deep H₂S removal benefits of chemical solvents and the mercaptan removal benefits of physical solvents. These products help deliver reduced energy consumption compared to chemical solvents and reduced hydrocarbon losses compared to physical solvents.

Hybrid solvent blends can help you remove H₂S and:

- Remove mercaptans
- Slip or remove CO₂
- Remove COS
- Remove other organic sulfur species
- Achieve total sulfur specification

Our advanced proprietary simulation model helps us accurately predict the performance of our product at your plant and customize the formulation to your needs. Process simulations can be performed for new plant construction, existing plant optimization, or existing plant upgrades.

If you're looking to remove...	We recommend...
H ₂ S, mercaptans, and other organic sulfur species	UCARSOL™ Hybrid 700 series
H ₂ S, mercaptans, other organic sulfur species, CO ₂ , and COS	UCARSOL™ Hybrid 900 series

We'll even train your staff on operating conditions prior to start-up, and our engineers will be available to assist throughout the start-up process. Long-term, we'll help you monitor and optimize performance through sample analysis and continuous improvement efforts.

Our engineering staff will deliver a customized product recommendation and gas treating plant operational design to achieve your specific treatment objectives. No process license is required, and Dow will provide a solvent performance warranty for UCARSOL™ Hybrid Solvent designs rendered by our engineering team.



Which UCARSOL™ Hybrid Solvent is best suited for your needs?



UCARSOL™ Hybrid 700 Series for selective sulfur removal

- Complete H₂S removal
- Mercaptan and other organic sulfur removal
- Slips (does not capture) CO₂
- Moderate COS removal

Representative Hybrid 700 performance case

A Caspian region gas plant faced challenging requirements for a high pressure natural gas treating application. The plant needed to achieve almost complete removal of H₂S and mercaptans while maintaining maximum CO₂ slip. The feed gas contained 5 mol% CO₂, 4 mol% H₂S, and over 300 ppm_v of mercaptans.

Dow UCARSOL™ Hybrid 701, a selective sulfur removal solvent, was ideal for this application. For nearly two decades since start-up, the plant has successfully met a treated gas specification of <12 ppm_v H₂S while typically removing greater than 90 mol% of the mercaptans in the feed, allowing the total sulfur specification of 50 ppm_v to be met.

Feed gas composition		Treated gas composition	
Component	Plant data	Plant data	Simulation
CO ₂	5 mol%	2.6 mol%	2.6 mol%
H ₂ S	4 mol%	8 ppm _v	8 ppm _v
Mercaptans	300 ppm _v	24 ppm _v	22 ppm _v

Table 1: Typical acid gas removal performance for a Caspian region high pressure natural gas treating application requiring sulfur removal with maximum CO₂ slip. These are typical properties, not to be construed as specifications.

UCARSOL™ Hybrid 900 Series Solvent for total acid gas removal

- Complete H₂S removal
- Mercaptan and other organic sulfur removal
- Deep CO₂ removal
- Deep COS removal

Representative Hybrid 900 performance case

A North American gas plant producing sales gas and natural gas liquids (NGL) recently converted to UCARSOL™ Hybrid 940 from an aqueous amine solvent. Exceptionally high mercaptan content in the feed gas, which continued to result in off-spec NGL, was an ongoing problem. The feed gas also had CO₂ and H₂S present and required COS removal. Through simulation and analysis, UCARSOL™ Hybrid 940 was recommended to address the plant's needs.

By switching to UCARSOL™ Hybrid 940, mercaptan removal increased from <20 mol% to over 95 mol%. The plant additionally met a <4 ppm_v H₂S specification despite lean solvent temperatures regularly exceeding 135°F. The conversion enabled the plant to meet NGL total sulfur sales specifications (Figure 2) and avoid burdensome disposal costs of off-spec NGL.

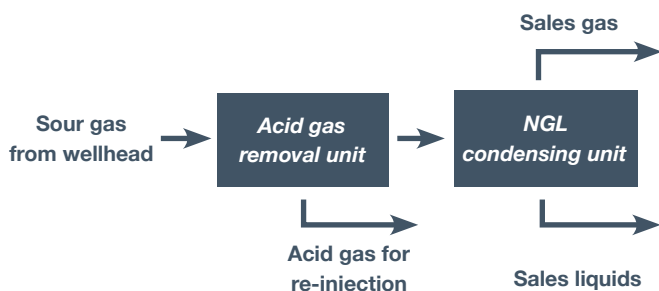


Figure 1: Block diagram of the plant process configuration. The acid gas removal unit was converted to UCARSOL™ Hybrid 940 Solvent to enable the NGL product to meet total sulfur content sales specification.

“Converting to UCARSOL™ Hybrid 940 enabled the plant to increase revenue from NGL sales and eliminate disposal costs of off-spec NGL.”

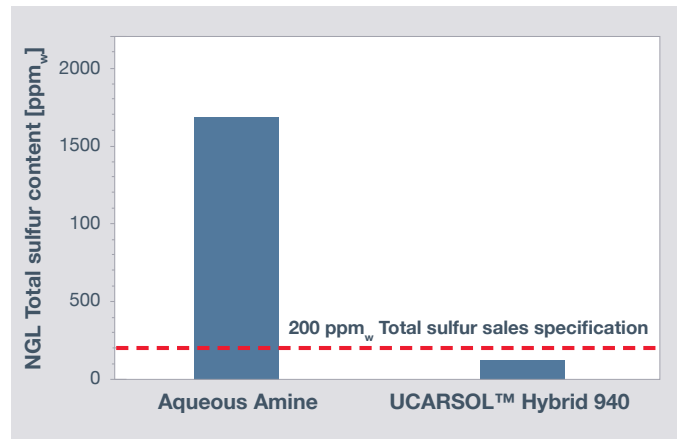


Figure 2: Total sulfur content of NGL declined to under 200 ppm_w over the trial period, allowing the NGL to meet total sulfur sales specification.

The graphic representations are presented here for illustrative purposes only and should not be construed as product specifications.

We're here to help you get more out of your operations.

- 65+ years of gas treating experience
- More than 1,400 references worldwide
- Global distribution network
- Global technical service team operating locally
- Range of in-depth analytical capabilities
- Broad portfolio to address unique needs
- Largest manufacturer of ethanolamines, isopropanolamines and alkanolamines in the world today



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