



TECHNICAL INFORMATION

UCARSOL™ AP 802 SOLVENT

FOR BULK CO₂ REMOVAL

INTRODUCTION

UCARSOL™ AP 802 Solvent is one in a series of advanced-performance gas treating solvents from The Dow Chemical Company. Specifically designed for bulk carbon dioxide (CO₂) removal in natural and synthesis gas processing, UCARSOL AP 802 Solvent is effective in both sweet and sour gas streams.

Low heats of reaction, combined with the ability to remove both CO₂ and hydrogen sulfide (H₂S), allow the gas processor to conform to current environmental regulations concerning sulfur emissions, while meeting product gas Btu specifications. UCARSOL AP 802 Solvent is particularly useful for processing feed gas with high amounts of CO₂. For those applications where bulk removal of CO₂ is required and very low energy consumption is demanded, UCARSOL AP 802 Solvent is the solvent of choice.

SPECIAL FEATURES

UCARSOL™ AP 802 Solvent offers these important advantages versus generic gas treating solvents:

- Significant energy savings through reduced reboiler duty, decreased pumping requirements because of lower solvent circulation, elimination of the need for solvent reclaiming and possible elimination of a regenerator
- Ideal for use in flash-regenerated systems designed for bulk removal
- Reduced solvent loss because of low foaming tendency and lower solvent vapor pressure
- Increased acid gas processing capacity within existing facilities
- Technical support and complete solvent services to assure ongoing trouble-free operation
- Noncorrosive at normal use concentrations (40-50 wt%)
- Supported by Dow Oil & Gas, the global leader in providing gas treating processors with specialized technology and services

CORROSION EFFECTS

The results of actual field experience in numerous operating units indicate that solutions of UCARSOL™ AP solvents, maintained properly and used as specified, exhibit very low corrosion rates.

PHYSICAL PROPERTIES

UCARSOL™ AP 802 Solvent can be used as an aqueous solution in various concentrations; however, a 40-50% aqueous solution has been found to offer optimal performance. Physical property data for pure and 50% aqueous solutions of UCARSOL AP 802 Solvent have been developed and are presented on the following pages.

Additional information on UCARSOL AP 802 Solvent, its properties and advantages, is available on request. To explore more specifically what UCARSOL AP 802 Solvent can do for an existing or proposed gas treating unit, contact Dow at the numbers listed at the end of this publication.

TABLE 1 • PHYSICAL PROPERTIES⁽¹⁾ OF UCARSOL™ AP 802 SOLVENT

	50 Wt% Aqueous
Density, lb/gal at 0°C at 20°C at 40°C at 60°C at 80°C	8.74 8.67 8.57 8.45 8.32
Boiling Point, °C at 760 mm Hg at 50 mm Hg at 10 mm Hg	103.8 42.4 17.2
Freezing Point, °C	-26.6
pH at 20°C	11.5
Thermal Conductivity, Btu/ft hr °F at 25°C	0.198
Solubility in Water at 20°C, weight percent of Water in at 20°C, weight percent	Complete Complete
Viscosity, cSt at 25°C at 50°C at 75°C	9.08 3.56 1.88
Surface Tension, dyne/cm at 20°C at 40°C at 60°C	48.6 45.7 42.9

⁽¹⁾Physical properties based on 50 wt% aqueous solution

FIGURE 1 • DENSITY OF UCARSOL™ AP 802 SOLVENT

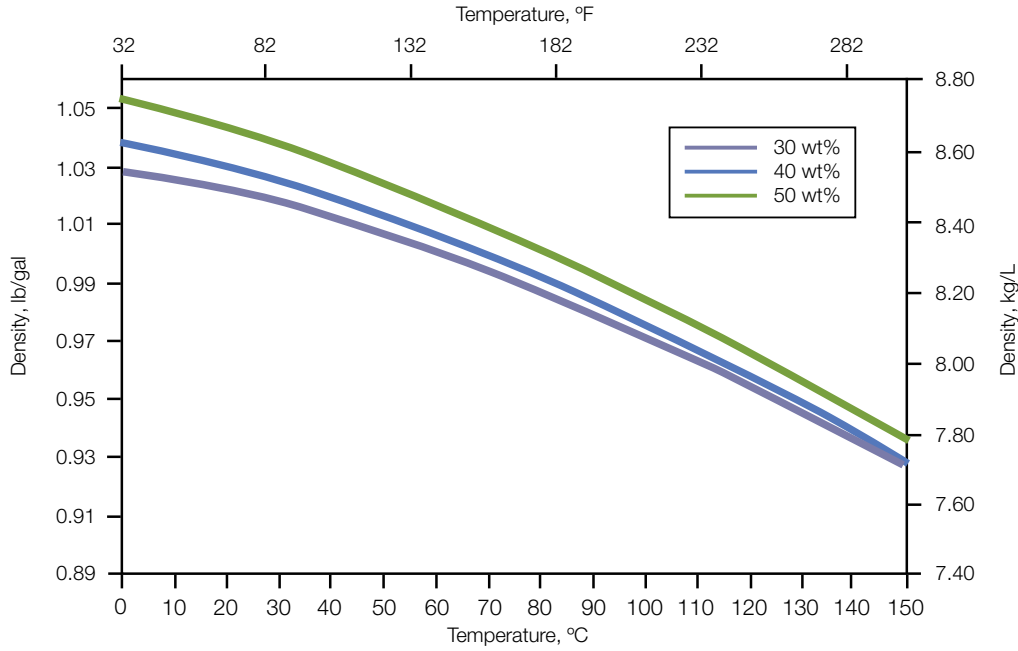


FIGURE 2 • VISCOSITY OF UCARSOL™ AP 802 SOLVENT

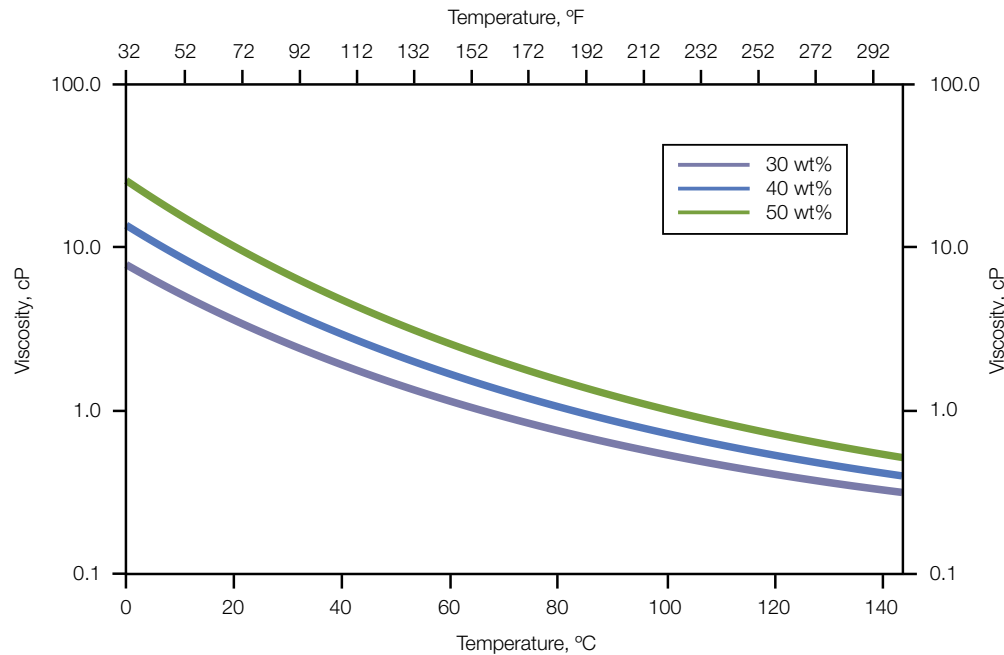


FIGURE 3 • HEAT CAPACITY OF UCARSOL™ AP 802 SOLVENT

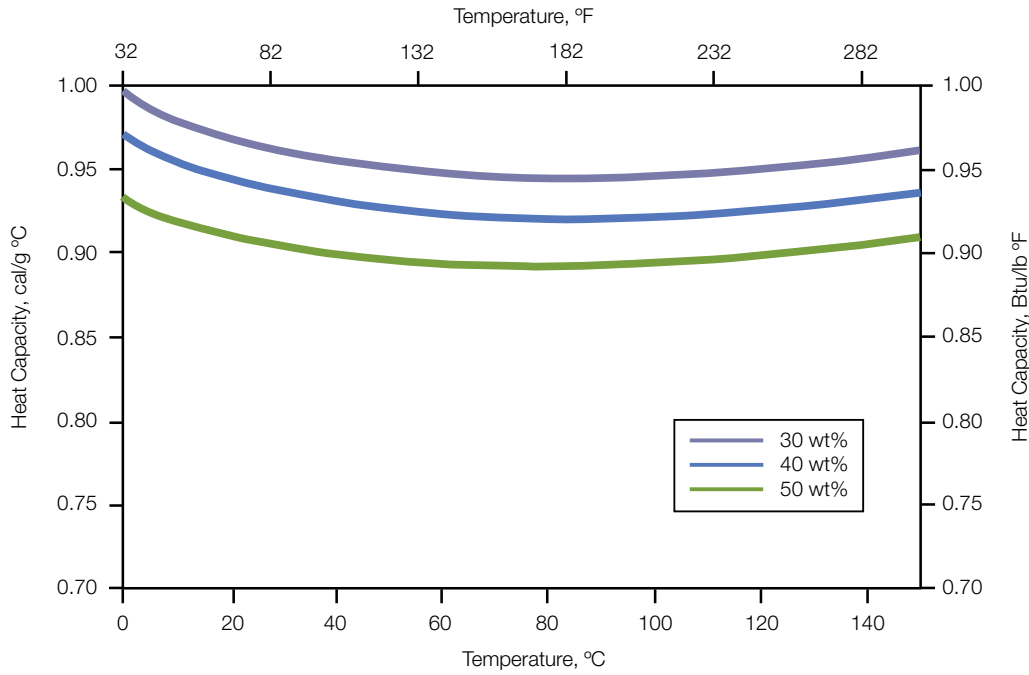


FIGURE 4 • THERMAL CONDUCTIVITY OF UCARSOL™ AP 802 SOLVENT

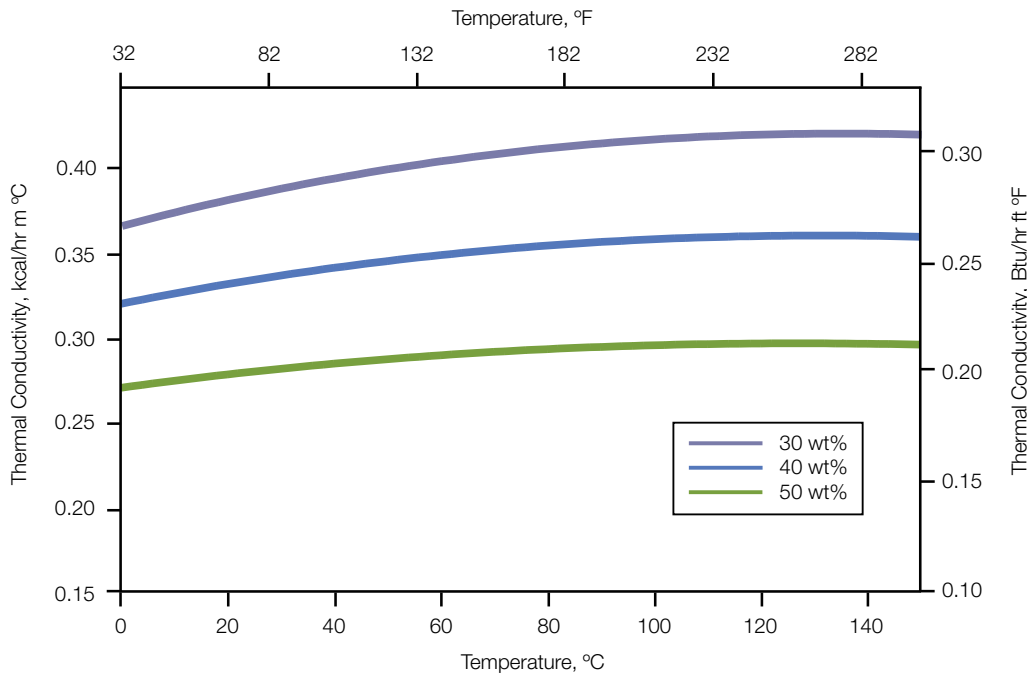
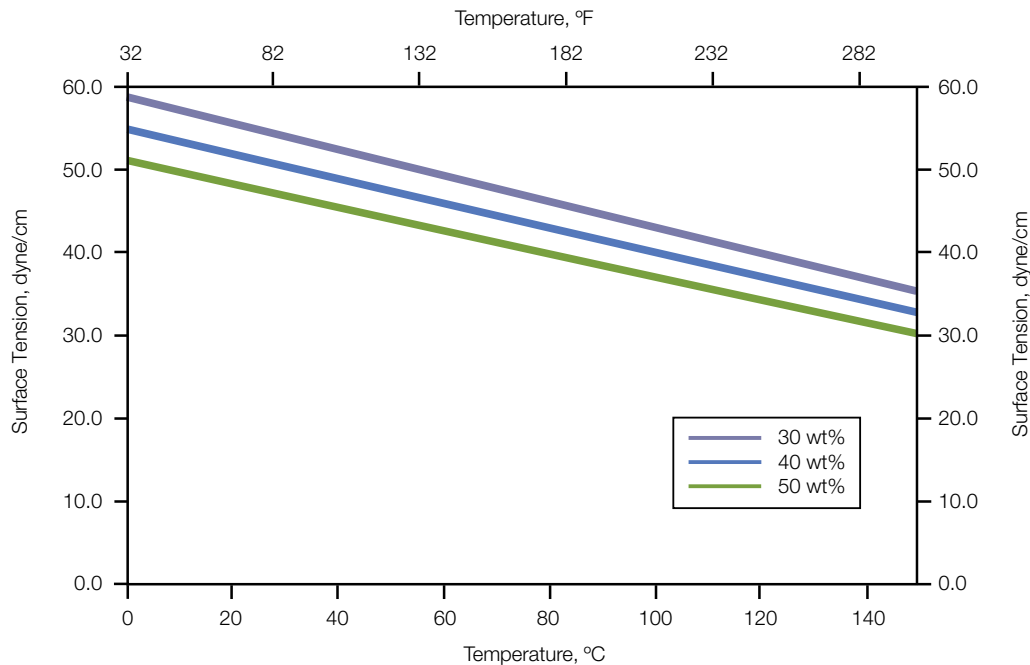


FIGURE 5 • SURFACE TENSION OF UCARSOL™ AP 802 SOLVENT



GAS TREATING SERVICES

Dow is a worldwide leader in providing gas treating processors with specialized technology and services. To aid in both plant design and operation, UCARSOL™ solvents are supported by advanced computer capabilities, a state-of-the-art laboratory, field test equipment, analytical procedures and an optimization program. The services Dow provides encompass preliminary assessments, start-up services, continual monitoring and follow-up services. Included in this total support program is the training for people in the field, regular sample testing and performance evaluation. To help ensure complete customer protection and satisfaction, Dow is there every step of the way – before, during and after installation.

SIMULATION CAPABILITIES

With information drawn from actual operating conditions of over 1,000 plants, Dow has an extensive formulated solvent database used to optimize the simulation programs used in design. This sophisticated computer program provides a powerful tool for process analysis and design, including tray-by-tray calculations. Basic hydraulic evaluations can be made of existing trayed or packed towers to help ensure that conversion to UCARSOL™ solvents will be trouble-free.

Field representatives have the latest equipment and programs that make it possible to predict the performance of UCARSOL solvents under actual plant conditions. In addition, their use as an in-field preliminary design tool is extremely valuable after conversion to make any adjustments necessary to optimize the process.

LABORATORY AND FIELD TESTING

The Dow Oil & Gas Characterization Lab performs regular service analyses of customer solvents to ensure good performance of the amine unit, as well as specialized analyses to assist in trouble-free operation. Routine analysis performed includes ion chromatography, inductively coupled plasma and solution alkalinity. Analysis is normally completed and reported to the customer within a few days upon receiving the sample. Dow's customer report includes a technical service review of the analytical results and their impact on the customer's operation.

SAMPLE KITS

Dow offers a unique sample kit. Completely self-contained, the kit provides everything necessary – from containers to labels – to obtain lean and rich amine samples, seal them and safely ship them for routine analysis.

OTHER SERVICES

Dow's engineering expertise is available to provide information on process and equipment requirements. Dow also trains customer personnel prior to and during conversion and follows up with them to ensure optimal performance.

STORAGE AND HANDLING

UCARSOL™ AP 802 Solvent is usually stored and handled in steel equipment. They are also compatible with stainless steel. **Zinc or galvanized steel and copper and its alloys should not be used. Materials of construction guidelines for specific plant areas are available upon request.**

These products become viscous at outside winter temperatures and have a freezing point of -23°C. Therefore, storage inside a warm building or in a heated, insulated tank may be desirable. A centrifugal pump is suitable for transfer service, assuming the temperature of the product is sufficiently above its pour point. A rotary or gear pump is suggested for low-temperature transfers.

Piping should be of adequate size to handle the maximum viscosity expected to be encountered. Valves, piping, etc. are usually of steel construction. Type 304 stainless steel, spiral-wound GRAFOIL gaskets for flanges and GRAFOIL packing for valves are recommended. For O-rings, ethylene propylene rubber (EPR) is recommended below 50°C, and Kalrez elastomers or equivalent above 50°C. Do **not** use Viton or Buna N elastomers.

Aqueous solutions of UCARSOL AP 802 Solvent can be handled in steel equipment. They should **not** be handled or stored in contact with aluminum, zinc or galvanized iron, or with copper and its alloys.

PRODUCT STEWARDSHIP

When considering the use of any Dow products in a particular application, you should review the latest Material Safety Data Sheets from Dow and ensure that they are intended for safe use. For Material Safety Data Sheets and other product safety information, contact Dow. Before handling any other products mentioned in the text, you should obtain available product safety information and take necessary steps to ensure safety of use.

No chemical should be used as or in a food, drug, medical device or cosmetic, or in a product or process in which it may contact a food, drug, medical device or cosmetic until the user has determined the suitability and legality of the use. Since government regulations and use conditions are subject to change, it is the user's responsibility to determine that this information is appropriate and suitable under current, applicable laws and regulations.

Dow requests that the customer read, understand, and comply with the information contained in this publication and the current Material Safety Data Sheet(s). The customer should furnish the information in this publication to its employees, contractors and customers, or any other users of the product(s), and request that they do the same.

TO LEARN MORE...

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**Toll-free service not available in all countries.*



Oil & Gas

For more information, visit www.dowoilandgas.com.

Note: This guide is designed as a general product overview. Please contact your local Dow Oil & Gas representative for up-to-date, detailed technical information including general registrations and use limitations and to discuss individual applications or requirements.

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