Product Safety Assessment

**UCARSOL™ LE Solvents**


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**Product Overview**
- The UCARSOL™ LE solvents are colorless to yellow liquids with an ammonia-like odor. These products are completely soluble (mix well) in water and have a high vapor pressure (in other words, they do not evaporate easily). For further details, see **Product Description**.
- UCARSOL LE solvents are high-performance gas-treating products designed for removal of \( \text{H}_2\text{S}, \text{CO}_2 \), and trace sulfur-containing gases (e.g., mercaptans and carbonyl sulfide) from natural-gas and refinery-gas streams. For further details, see **Product Uses**.
- UCARSOL LE solvents are for industrial use only. Worker exposure is possible at a manufacturing facilities for UCARSOL LE solvents or at the gas-treatment plants that use these solvents. For further details, see **Exposure Potential**.
- Eye contact with these solvents may burn the eyes, causing severe irritation with corneal injury, possibly resulting in impairment of vision, even blindness. Brief skin contact may cause irritation with local redness. Prolonged or repeated contact may burn the skin. Prolonged skin contact is unlikely to result in absorption of harmful amounts. Prolonged inhalation or inhalation of heated material or mist may cause respiratory irritation and other effects. These products are aspiration hazards; they can enter the lungs and cause damage. For further details, see **Health Information**.
- The components of UCARSOL LE solvents are biodegradable, unlikely to accumulate in the food chain, and range from practically nontoxic to toxic to fish and other aquatic organisms. The aquatic toxicity of some formulations may result from pH changes. For further details, see **Environmental Information**.
- UCARSOL LE solvents are stable under recommended storage conditions. They are hygroscopic, meaning they absorb moisture from the air. They become corrosive when wet. Exposure to elevated temperatures can cause these solvents to decompose. Avoid contact with nitrites, strong acids, strong oxidizers, and halogenated hydrocarbons. For further details, see **Physical Hazard Information**.

**Manufacture of Product**
- **Capacity** – UCARSOL LE™ solvents are formulated in North America, Europe, and the Pacific, using raw materials produced primarily at Dow facilities in the U.S., with smaller quantities of some equivalent raw materials purchased from regional co-producers.
Product Description

UCARSOL™ LE solvents are colorless to yellow liquids with an ammonia-like odor. These solvents are a blend of components resulting in products with high-performance gas-treating properties. UCARSOL LE solvents are completely soluble (mix well) in water and do not evaporate readily or quickly. They have a high vapor pressure.

Product Uses

UCARSOL™ LE solvents are designed for removal of hydrogen sulfide (H₂S), carbon dioxide (CO₂) and trace sulfur-containing gases (e.g., mercaptans and carbonyl sulfide) from natural-gas and refinery-gas streams.

For information about a particular market application, please Contact Us or ask the Dow Customer Information Group.

Exposure Potential

UCARSOL™ LE solvents are used in natural-gas treatment facilities and refineries. Based on the uses for these solvents the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in an UCARSOL LE solvent manufacturing facility or in the gas-treatment facilities or refineries that use these solvents. They are produced, distributed, stored, and consumed in closed systems. Those working with UCARSOL LE solvents in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit unnecessary exposure. See Health Information.

- **Consumer exposure to UCARSOL LE solvents** – UCARSOL LE solvents are for industrial use only. Consumer contact is not likely. See Health Information.

- **Environmental releases** – The components in UCARSOL LE solvents are soluble in water and have low volatility. Once introduced to water, these chemicals will have a tendency to remain in water. Because the components are biodegradable, they will be removed by wastewater-treatment facilities. The aquatic toxicity of some formulations may result from pH changes. In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. For small spills, absorb with noncombustible absorbents such as sand, clay, vermiculite, or Zorball. Do not use ground corn cobs, sawdust, peat moss, or other organic absorbents. Collect recovered material in suitable and properly labeled containers. UCARSOL LE solvents are completely soluble in water. These materials are biodegradable. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, evacuate the area and keep upwind of the spill. Ventilate the area. Spilled material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. Only trained and properly protected personnel must be involved in clean-up operations. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Keep people away. Isolate the fire and deny unnecessary entry. Use water fog or fine spray, dry-chemical or carbon-dioxide extinguishers, or foam to fight the fire. Alcohol-resistant ATC type foams are preferred. A direct water stream may spread the fire. Firefighters must wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.
For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

**Health Information**

**Eye contact** – Eye contact with these solvents may cause severe irritation or chemical burns with corneal injury, which may result in permanent impairment of vision, even blindness.

**Skin contact** – Skin contact with these solvents may cause mild to severe irritation depending on the product. Repeated contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage. The response may be more severe on scratched or cut skin or if the solvent is confined under gloves, jewelry, or clothing.

**Inhalation** – Prolonged inhalation of these solvents may irritate the upper respiratory tract (nose and throat). At room temperature, exposure to vapor is minimal due to low volatility. Inhaling vapors from heated material or mist may cause respiratory irritation and other effects.

**Ingestion** – These solvents have low toxicity if swallowed. Swallowing small amounts incidental to normal handling operations is not likely to cause injury. Swallowing larger amounts may cause injury; ingestion of these products may result in gastrointestinal irritation or ulceration, abdominal discomfort, or diarrhea. Aspiration into the lungs could occur during ingestion or vomiting, causing tissue damage or lung injury.

**Repeated exposure** – In animals, a component in some formulations has affected the blood, kidneys, liver, heart, and nervous system.

**Other** – In animal studies, contains component(s) which, in laboratory animals, have been toxic to the fetus only at doses toxic to the mother. Contains component(s) which have been shown to interfere with reproduction in animal studies. In vitro and animal genetic toxicity studies have been negative.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

**Environmental Information**

UCARSOL™ LE solvents components have low volatility and are soluble in water. When introduced to water, these chemicals will have a tendency to remain in water. Under environmental conditions, the components range from having a low to high mobility (tendency to bind) in soil or sediment.

The components of UCARSOL LE solvents are unlikely to persist in the environment. The components are biodegradable, which suggests they will be rapidly and completely removed from water and soil environments, including biological wastewater-treatment plants.

UCARSOL LE solvents components have a low potential to accumulate in the food chain and range from practically nontoxic to toxic to fish and other aquatic organisms on an acute basis. The aquatic toxicity of some formulations may result from pH changes.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

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Physical Hazard Information\(^1,^2\)

UCARSOL™ LE solvents are stable under recommended storage conditions. They are hygroscopic, meaning they absorb moisture from the air and become corrosive when wet. Avoid moisture. Exposure to elevated temperatures can cause these solvents to decompose. Generation of gas during decomposition can cause pressure in closed systems.

Avoid contact with nitrites, strong acids, strong oxidizers, halogenated hydrocarbons, and metals such as aluminum, zinc, copper, and galvanized metals. These products may react with various halogenated organic solvents resulting in temperature and/or pressure increases in closed systems. Heating above 60°C (140°F) in the presence of aluminum can result in corrosion and the generation of flammable hydrogen gas.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of UCARSOL™ LE solvents. These regulations may vary by city, state, country, or geographic region. Information may be found by requesting the relevant Safety Data Sheet or Contact Us.

Additional Information

- Safety Data Sheet – For safety data sheets for UCARSOL™ LE solvents, contact the Dow Customer Information Group (http://www.dow.com/webapps/msds/msdssearch.aspx)
- Contact Us (http://www.dow.com/gastreating/contact/index.htm)
- Dow Gas Treating Products and Services (http://www.dow.com/gastreating/)
- UCARSOL™ LE 701, 702, and 703 Solvents for High Efficiency CO\(_2\), H\(_2\)S, and Mercaptan Removal, The Dow Chemical Company, Form No. 170-01427-0704, July 2004 (Request from the Dow Customer Information Group)
- UCARSOL LE™ 713 Solvent for Refinery Gas and LPG Treating, The Dow Chemical Company, Form No. 170-01430-0704, July 2004

For more business information about UCARSOL LE solvents, visit the Dow Gas Treating Products and Services web site at http://www.dow.com/gastreating/.

References

1. UCARSOL™ LE Solvent 713 Plus Material Safety Data Sheet, The Dow Chemical Company
2. UCARSOL LE Solvent 777 Material Safety Data Sheet, The Dow Chemical Company
5. UCARSOL LE Solvent 702 Material Safety Data Sheet, The Dow Chemical Company
NOTICES:

As part of its 2015 Sustainability Goals, Dow has committed to make publicly available safety assessments for its products globally. This product safety assessment is intended to give general information about the chemical (or categories of chemicals) addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the relevant Safety Data Sheet, which should be consulted before use of the chemical. This product safety assessment does not replace required communication documents such as the Safety Data Sheet.

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