

# GAS/SPEC CS-1 Specialty Amine

GAS/SPEC® CS-1 specialty amine is a formulated MDEA (methyldiethanolamine) solvent designed for removal of H<sub>2</sub>S and CO<sub>2</sub> from gas or liquid hydrocarbon streams. GAS/SPEC CS-1 is typically used in applications where low levels of CO<sub>2</sub> are required in the treated gas. GAS/SPEC CS-1 provides greater gas removal capacity per volume of circulating solution than generic amines such as monoethanolamine (MEA) or diethanolamine (DEA). GAS/SPEC CS-1 is less corrosive than generic amines and can be used at up to 50 weight percent amine strength, which reduces amine circulation rate and energy usage. This translates into lower operating costs and increased capacity for existing equipment and reduced capital for new equipment.

\* GAS/SPEC is a trademark and service mark of INEOS LLC.

## APPLICATIONS

- Natural Gas Treating
- Ethane Treating
- Bulk CO<sub>2</sub> Removal
- LPG & NGL Treating

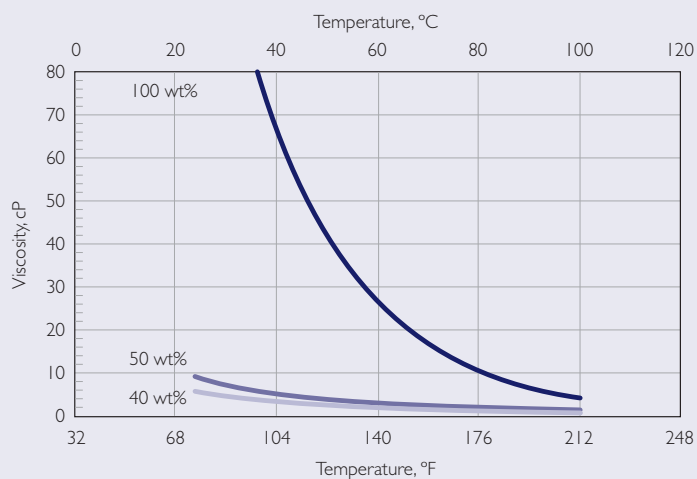
## PHYSICAL PROPERTIES <sup>1,2</sup>

Specific Gravity @ 25/25° C _____	1.06
Boiling Point @ 760 mmHg _____	135.0 °C
_____	275.0 °F
Freezing Point (50 Wt%) _____	-33.7 °C
_____	-28.7 °F
Freezing Point (100 Wt%) _____	-21 °C
_____	-5.8 °F
Latent Heat of Vaporization @ normal boiling point _____	280.9 Btu/lb
_____	156.0 Cal/g
Flash Point (COC) _____	134.4 °C
_____	274.0 °F

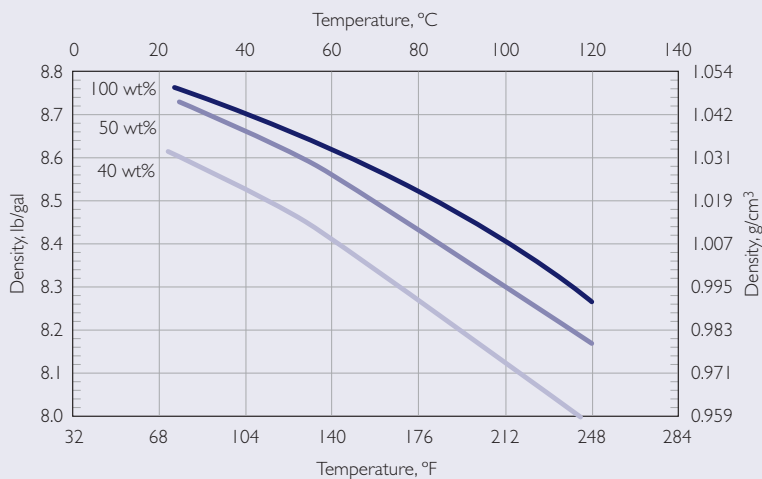
<sup>1</sup>GAS/SPEC CS-1 concentrate. Typical properties, not to be construed as specifications

<sup>2</sup>100% indicate solvent concentrate as sold, and not a water-free solvent

### Viscosity



### Density



## PRODUCT SERVICES

INEOS offers a broad line of services to our specialty amine customers, including:

- superior simulation capabilities
- troubleshooting consultations
- on-site start-up and optimization
- solvent analysis and interpretation
- local stocking and supply

## MATERIALS OF CONSTRUCTION

The preferred material for storage of GAS/SPEC CS-1 is 304L or 316L stainless steel. Carbon steel tanks are also satisfactory, although discoloration and iron in the amine may occur. Nitrogen padding of the tanks is recommended to prevent oxidation and discoloration of the amine during extended storage. The amine can also be stored in high-density polyethylene (HDPE) or polypropylene (HDPP).

Materials to avoid include:

- Aluminum
- Copper
- Brass
- Copper alloy

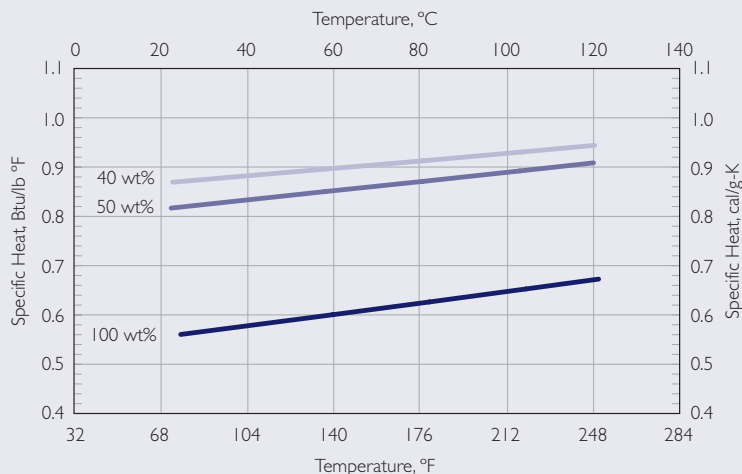
## STORAGE TEMPERATURE

- The recommended minimum temperature for storing and pumping 100% GAS/SPEC CS-1 is 20 °F (-7 °C).
- Dilution of GAS/SPEC CS-1 with a small amount of water will depress the freezing point and lower the viscosity for pumping.
- Steam tracing and insulation may be required in cold weather:

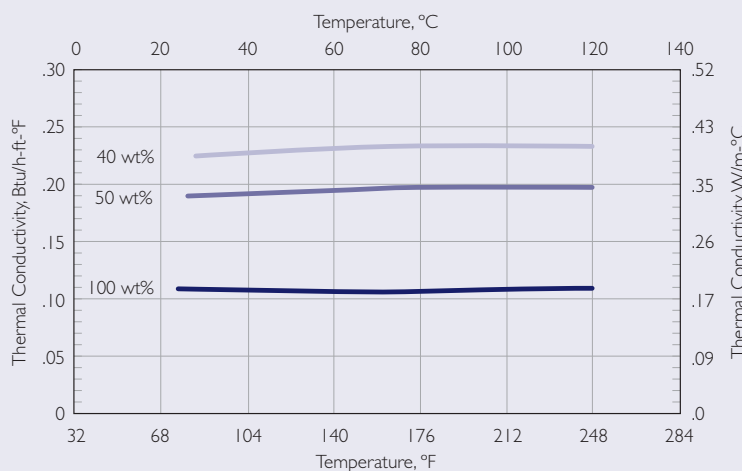
## HANDLING AND SAFETY

- GAS/SPEC CS-1 can cause serious injury to the eyes and may result in permanent eye damage. If accidental contact with the eyes occurs, flush them thoroughly with water and seek medical attention.
- Single-dose oral toxicity of GAS/SPEC CS-1 is low.
- Swallowing large amounts of GAS/SPEC CS-1 may cause severe burns to the mouth, throat and digestive tract. This product contains component that may affect the liver and kidneys.
- May cause irritation to the skin. Occasional brief contact with the skin should be washed off immediately and should have few adverse effects.
- If GAS/SPEC CS-1 is heated or a mist produced, concentrations may be sufficient to cause irritation to the upper respiratory tract.
- Consult product Material Safety Data Sheet for more details.

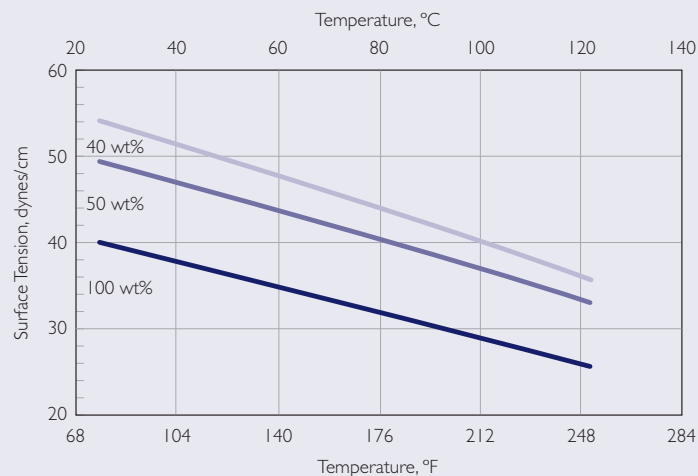
### Specific Heat



### Thermal Conductivity



### Surface Tension



The following precautions should be observed when the possibility of exposure exists:

- A safety shower and eyewash facility located nearby
- Chemical goggles
- Protective clothing, including chemically resistant gloves
- A well-ventilated work area

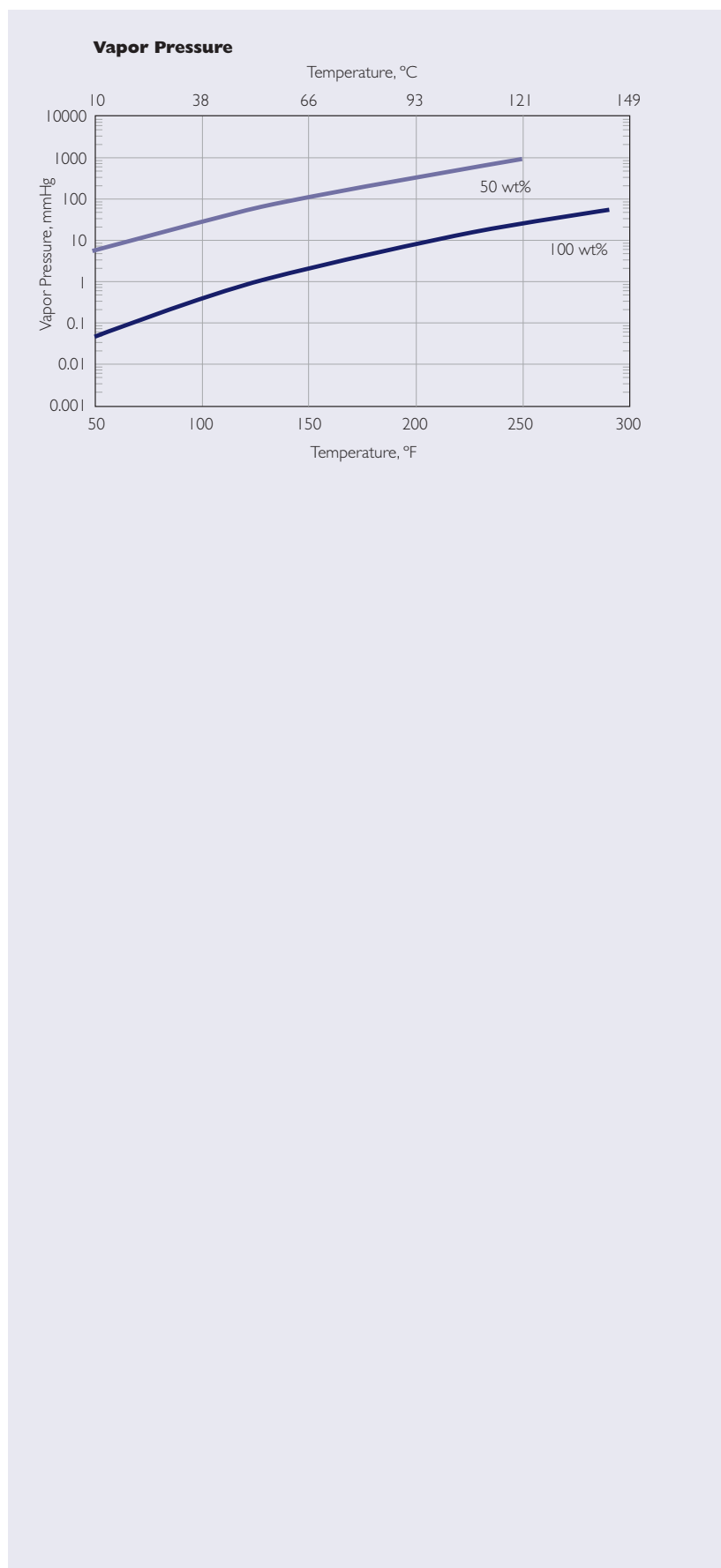
#### Accidental Release

- Clear non-emergency personnel from area.
- **PROTECT THE ENVIRONMENT:** Keep out of sewers, storm drains, surface waters and soil.
- Contain spill, if possible. Clean up with a non-combustible absorbent. Do not use sawdust.

#### REGULATORY

Regulatory requirements may vary for different locations. Contact your INEOS representative for more information.

- GAS/SPEC CS-1 is considered hazardous according to the guidelines of the U.S. Department of Transportation (DOT). This product is regulated for transportation in bulk quantities.
- GAS/SPEC CS-1, as sold, contains chemicals subject to the requirements of Section 313 Title III of the U.S. Superfund Amendments and Authorization Act (SARA).
- The export of this product is regulated under the provisions of the Chemical Weapons Convention.



## **GAS/SPEC**

Since 1982, the GAS/SPEC name has represented a special focus on the products, technology and service to chemically remove acid gases from process streams. The GAS/SPEC business unit has been continuously headquartered in Houston, Texas, with its major technical facility in Freeport, Texas.

The family of specialty amines offered by the GAS/SPEC Technology Group, all based on MDEA technology, provides custom H<sub>2</sub>S and CO<sub>2</sub> removal in amine treating operations. The GAS/SPEC products and technology are exclusively offered by INEOS LLC and its specialized distributors.

The GAS/SPEC Technology Group is dedicated to achieving the highest degree of customer satisfaction globally through the application of the best available technology through the supply of cost-effective products and services. Other companies offer MDEA based products, some even attempting to emulate GAS/SPEC with similar sounding names... But only products with the GAS/SPEC name bring you the formulations, technology and service you are used to.

INEOS LLC is a part of INEOS Oxide.

INEOS Oxide manufactures a full range of products based on its production of ethylene oxide.

## **INEOS Oxide**

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