

GAS/SPEC CS-PLUS

Specialty Amine

GAS/SPEC® CS-Plus specialty amine is specifically designed for maximum CO₂ removal. Since its introduction in 1988, GAS/SPEC has proven to be one of the most cost effective solvents for CO₂ removal in coal seam gas treating and other gas processing plants. This solvent has allowed gas processors to increase gas throughput or reduce energy costs in existing facilities.

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

APPLICATIONS

- Natural Gas Treating
- Cryogenic Systems
- Ethane Treating
- Bulk CO₂ Removal
- Coal Seam Gas Treating

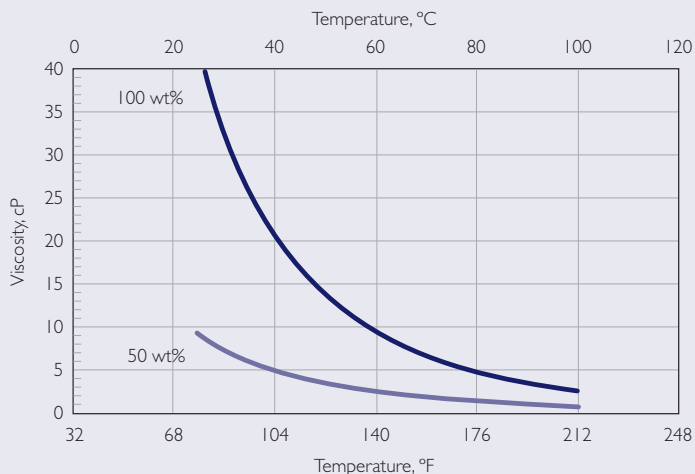
PHYSICAL PROPERTIES ^{1,2}

Specific Gravity @ 25/25° C	1.013
Boiling Point @ 760 mmHg	183.3 °C
	362.0 °F
Freezing Point (50 Wt%)	-30.6 °C
	-23.1 °F
Freezing Point (100 Wt%)	-23.1 °C
	-9.6 °F
Latent Heat of Vaporization @ normal boiling point	218.7 Btu/lb
	121.7 Cal/g
Flash Point (PMCC)	88.9 °C
	192.0 °F

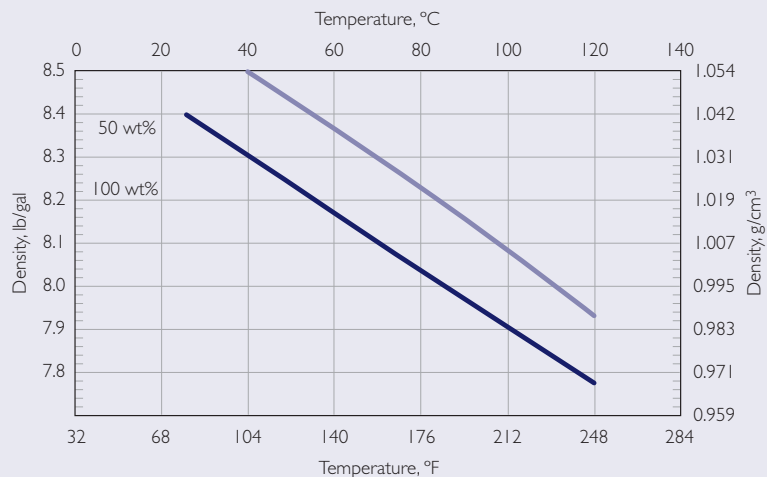
¹GAS/SPEC CS-Plus concentrate. Typical properties, not to be construed as specifications

²100 wt% 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-Plus 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

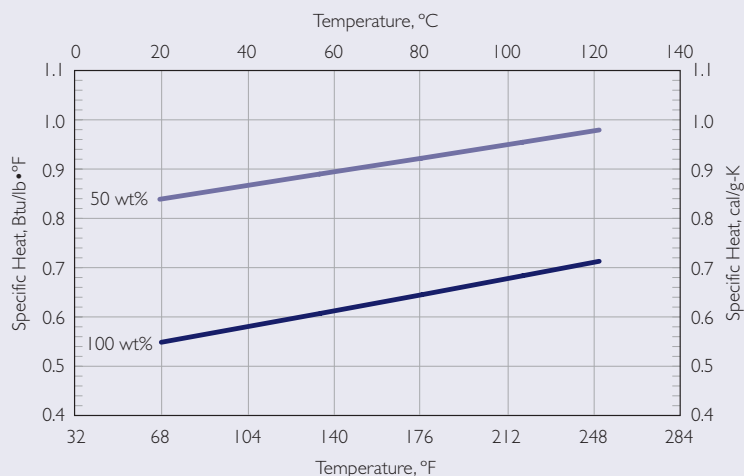
STORAGE TEMPERATURE

- The recommended minimum temperature for storing and pumping 100% GAS/SPEC CS-Plus is 20 °F (-7 °C).
- Dilution of GAS/SPEC CS-Plus 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:

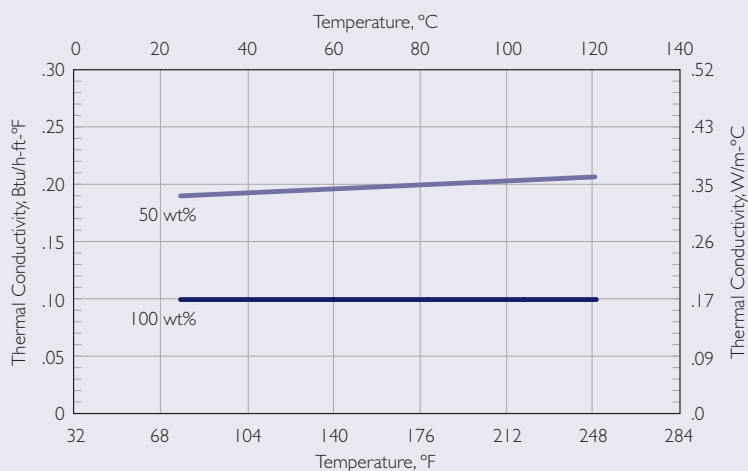
HANDLING AND SAFETY

- Due to the pH of the material, GAS/SPEC CS-Plus 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-Plus is low.
- Swallowing large amounts of GAS/SPEC CS-Plus may cause severe burns to the mouth, throat and digestive tract.
- May cause severe skin burns. Occasional brief contact with the skin should be washed off immediately.
- If GAS/SPEC CS-Plus is heated or a mist produced, concentrations may be sufficient to cause irritation to upper respiratory tract.
- Consult product Material Safety Data Sheet for more details.

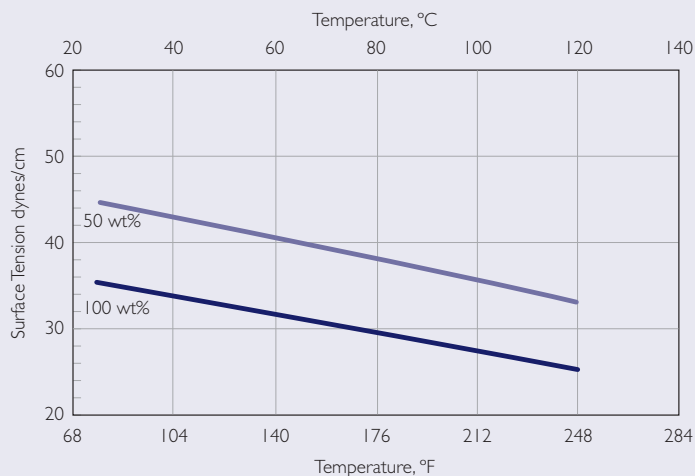
Specific Heat



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

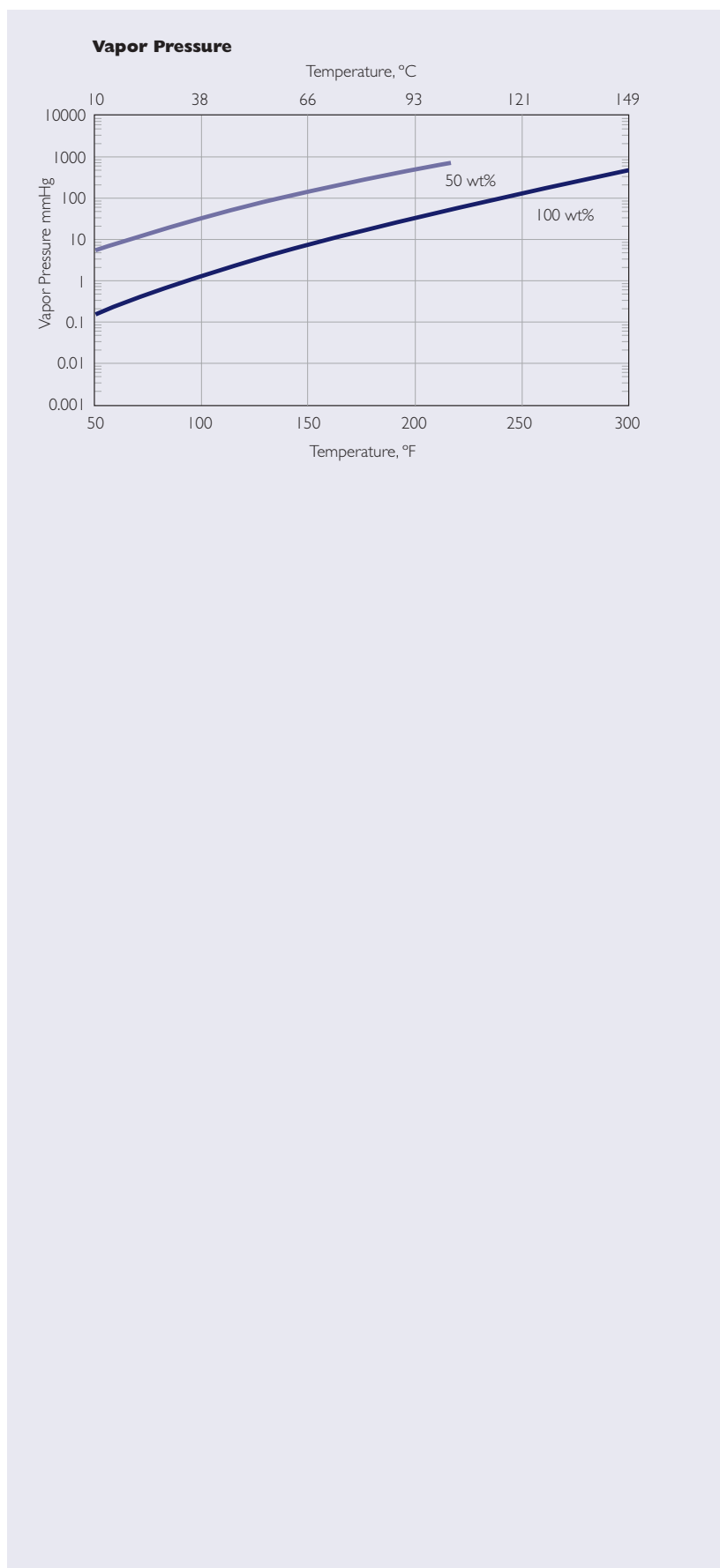
Accidental Release

- 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-Plus is considered hazardous according to the guidelines of the U.S. Department of Transportation (DOT).
- Classified as corrosive to the skin by the DOT.
- GAS/SPEC CS-Plus, as sold, contains no chemical 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 H₂S and CO₂ 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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