

Gas Treating Chemicals Technical Bulletin

HUNTSMAN

JEFFTREAT® M-500 SERIES SOLVENTS JEFFTREAT® M-510 SOLVENT

The JEFFTREAT® M-500 series of methyldiethanol amine (MDEA) based formulated solvents provide deep removal of carbon dioxide (CO₂) from gas processing applications requiring deep CO₂ removal such as hydrogen production, ammonia manufacture and cryogenic gas processing. In comparison to the ethanolamines (MEA and DEA) and ethanolamine formulated solvents, the formulation of the JEFFTREAT® M-500 products allow deep CO₂ removal with greater capacity, superior chemical stability and longer product life under severe operating conditions.

JEFFTREAT® M-510 bulk CO₂ solvent is a multipurpose product which provides deep, bulk removal of CO₂ and demonstrates exceptional stability under high temperature and highly loaded conditions. Improved product stability and longer solvent life in CO₂ service is a major advantage of JEFFTREAT® M-510 solvent.

JEFFTREAT® M-510 bulk CO₂ solvent also has higher reaction rates with CO₂ than ethanolamine based formulated MDEA solvents. Rapid reaction with CO₂ allows JEFFTREAT® M-510 solvent to achieve very deep CO₂ removal, and custom formulation allows deep regeneration.

APPLICATIONS

JEFFTREAT® M-510 bulk CO₂ solvent is an improved second generation MDEA-based formulated solvent for gas and liquid treating applications. It should be considered as an alternative for applications which currently use first generation primary or secondary alkanolamines such as MEA and DEA to remove CO₂. JEFFTREAT® M-510 solvent should also be considered for applications which currently use MDEA or formulated MDEA solvents, but require deeper CO₂ removal such as:

- Hydrogen Production Facilities,
- Ammonia Plants,
- Natural Gas Upgrading, and
- LNG Production.

JEFFTREAT® M-510 bulk CO₂ solvent should be considered mainly for applications in which H₂S is not present or applications in which the mole ratio of CO₂ to H₂S in the untreated gas is fairly high. Huntsman recommends JEFFTREAT® M-510 solvent use in concentrations of 40 to 50 wt.% for optimum process efficiency.

Conversions of Existing Solvent Inventories

Huntsman's Gas Treating Team can assist customers in evaluating the value of solvent conversions and determining the best strategy for performing a solvent conversion. On the fly conversions (e.g. backfill of JEFFTREAT® M-510 solvent on top of the original solvent) offer some benefit but usually do not result in performance equivalent to that obtained from dump and fill conversions.

JEFFTREAT® M-510 bulk CO₂ solvent can usually be added to existing MDEA solvent inventories, however, an engineering evaluation of the application by Huntsman's Gas Treating Team is recommended. In certain situations, Huntsman can supply JEFFTREAT® M-500 solvent additive to convert existing MDEA solvent inventories to JEFFTREAT® M-510 solvent. After formulating with the Additive during the initial stage of the conversion, solvent makeup with JEFFTREAT® M-510 solvent or one of the other JEFFTREAT® M-500 products derives full benefit from the product.

ADVANTAGES

The tailored properties of JEFFTREAT® M-500 products offer the following advantages over conventional solvents:

- Lower Operating Costs,
- Increased Processing Capacity of Existing Treating Equipment,
- Reduced Capital Cost for New Installations,
- Improved Product Stability.

Additionally, the purchase of JEFFTREAT® solvents entitles customers to access a full slate of technical services provided by Huntsman's Gas Treating Team. These services include assistance with initial process designs, start-up assistance, training programs, plant operational troubleshooting and solution analysis and interpretation.

HANDLING AND STORAGE

The handling of JEFFTREAT® M-500 products presents no unusual problems. A carbon steel storage tank, constructed according to a recognized code, is generally satisfactory. JEFFTREAT® M-500 products should not be stored in tanks made from zinc, galvanized steel, or copper and its alloys. Carbon steel transfer lines, joined by welds or flanges, are suitable. Screw joints are subject to failure unless back-welded. U.S. Rubber Company 899 gasket material, or its equivalent, is satisfactory for use with flange connections. Centrifugal pumps are preferred, although carbon steel rotary pumps can be used. A Durametalllic Type RO-TT seal, or equivalent is suitable.

TOXICITY AND SAFETY

The JEFFTREAT® M-500 products should be considered moderately irritating to the eyes, but only slightly irritating to the skin. Chemical-type goggles with face shield should be worn during handling or use of the undiluted product or concentrated solutions. Contact lenses should not be worn. Protective clothing and gloves resistant

to chemicals and petroleum distillates should be worn.

Should accidental eye contact occur, flush eyes with large amounts of water for at least 15 minutes and get medical attention. For skin contact, immediately flush skin with large amounts of water. Contaminated clothing should be laundered before reuse. For further information, please refer to the material Safety Data Sheet (MSDS) for this product.

AVAILABILITY

JEFFTREAT® M-510 bulk CO₂ solvent as well as other JEFFTREAT® M-500 series products are currently available in 55-gallon drums, tank wagons, and tank cars. Due to the proprietary nature of the product formulation, Huntsman typically supplies the product under confidentiality agreement. Sample confidentiality agreements are available from Huntsman's Gas Treating team in Houston at (713) 235-6198.

PHYSICAL PROPERTIES

JEFFTREAT® M-510 bulk CO₂ solvent exhibits physical properties similar to those of conventional alkanolamines and other formulated MDEA solvents. These include acceptable handling characteristics such as low freezing point and moderate viscosity. Selected physical properties of JEFFTREAT® M-510 solvent are presented below:

	JEFFTREAT® M-510 Solvent 100 Wt.%	JEFFTREAT® M-510 Solvent 45 Wt.%	JEFFTREAT® M Solvent 45 Wt.%
Freezing Point, °C	-38.2	NA	<-30
Viscosity, cP 100°F (38°C)	32	3.9	4.3
Density, g/ml 100°F (38°C)	1.033	1.031	1.035