



## CARUSOL® LIQUID PERMANGANATE

CAS Registry No. 10101-50-5 EINECS Reference No. 233-251-1 Data Sheet

CARUSOL® liquid permanganate is an effective oxidant recommended for potable drinking water applications that require a concentrated permanganate solution. Applications include iron and manganese reduction, taste and odor control, disinfection by-product reduction, color reduction, and radium reduction

### PRODUCT SPECIFICATIONS

Assay:	19.5–21.5% as $\text{NaMnO}_4$
pH:	5.0–8.0
Solubility in Water:	Miscible with water in all proportions

#### Standards & Specifications:

CARUSOL meets:

AWWA Standard B603-16

EN: 15482-10 mg/L max

ANSI/NSF 60

NSF Maximum Use Level 176 mg/L

KIWA- Product certification no. K83927-17 mg/L max



### CHEMICAL/PHYSICAL DATA

Formula:	$\text{NaMnO}_4$
Appearance:	Dark Purple Solution
Specific Gravity:	1.15–1.17
Freezing Point:	21° F (-6° C)

### APPLICATIONS

- Drinking Water Purification
- Iron/Manganese Oxidation
- Taste & Odor Control
- Preoxidant for THM & HAA Control
- Hydrogen Sulfide Control
- Radium Removal
- Color Removal

### BENEFITS

- Concentrated liquid oxidant
- More precise dosing of chemical
- Feed equipment is simplified
- Consistent concentration

### HANDLING, STORAGE & INCOMPATIBILITY

Like any strong oxidant, CARUSOL liquid permanganate should be handled with care. Protective equipment during handling should include face shields and goggles, rubber or plastic gloves, and rubber or plastic apron. If clothing has come into contact with sodium permanganate, wash off immediately; spontaneous ignition can occur with cloth or paper. In cases where significant exposure exists, use of the appropriate NIOSH/MSHA dust or mist respirator is recommended.

Store in accordance with NFPA (National Fire Protection Association) Code 400 Hazardous Materials Code, Chapter 15 - Oxidizer Solids and Liquids. The product should be stored in a cool, dry area in closed containers. Concrete floors are preferred. Avoid wooden decks. Spillage should be collected and disposed of properly. Contain and dilute spillage to approximately 6% with water, and then reduce with sodium thiosulfate, a bisulfite, or ferrous salt solution. The bisulfite or ferrous salt may require some dilute sulfuric acid (10% w/w) to promote reduction. Neutralize with sodium carbonate to neutral pH, if acid was used. Deposit sludge in an approved landfill or, where permitted, drain into sewer with large quantities of water.

As an oxidant, the product itself is non-combustible, but will accelerate the burning of combustible materials. Therefore, contact with all combustible materials and/or chemicals must be avoided. These include, but are not limited to, wood, cloth, organic chemicals, and charcoal. Avoid contact with acids, peroxides, metal powders, sulfites, oxalates, and all other oxidizable inorganic chemicals. Contact with sulfuric acid, peroxides, or metal powders may result in an explosion. During contact with hydrochloric acid, chlorine gas is liberated. Additionally, avoid contact with reducing agents (e.g., sulfites, oxalates, etc.) as they can cause violent reactions. **Consult the Safety Data Sheet (SDS) for additional safety information.**

## COMPATIBILITY INFORMATION

CARUSOL® liquid permanganate is compatible with many metals and synthetic materials. Natural rubbers and fibers are often incompatible. Solution pH and temperature are also important factors. The material selected for use with liquid permanganate must also be compatible with any kind of acid or alkali being used.

In neutral and alkaline solutions, liquid permanganate is not corrosive to carbon steel and 316 stainless steel; however, chloride corrosion of metals may be accelerated when an oxidant such as liquid permanganate is present in solution. Plastics such as Teflon™, polypropylene, and HDPE are also compatible with liquid permanganate.

Aluminum, zinc, copper, lead, and alloys containing these metals may be (slightly) affected by liquid permanganate solutions. Actual corrosion or compatibility studies should be made under the conditions in which permanganate will be used prior to use.

## SHIPPING

CARUSOL liquid permanganate is classified and listed as an oxidizer by PHMSA (Pipeline and Hazardous Materials Safety Administration), Department of Transportation, in 49 CFR Subchapter C, HMR (Hazardous Materials Regulation), Part 172.101 HMT (Hazardous Materials Table).

<b>Proper Shipping Name:</b>	Permanganates, inorganics, aqueous solution n.o.s. (contains sodium permanganate).
<b>Hazard Class:</b>	5.1
<b>Identification Number:</b>	UN 3214
<b>Packaging Group:</b>	II
<b>Label Requirements:</b>	Oxidizer, 5.1
<b>Packaging Requirements:</b>	49 CFR Parts 171 to 180
<b>Sections:</b>	173.152, 173.202, 173.242

## SHIPPING CONTAINERS

**5-gallon (20-L) Jerrican** Made of high density polyethylene (HDPE). Weighs 3.3 lbs. (1.5 kg). The net weight is 48.5 lbs. (22 kg). The jerrican stands approximately 13.4 in. tall, 9.4 in. wide, and 13.0 in. deep (33.9 cm high, 23.8 cm wide, and 33.0 cm deep). Weight tolerance +/- 3%.

**55-gallon (208.2L) Closed Head HDPE Drum** Made of high density polyethylene (HDPE). Weighs 21 lbs. (9.3 kg). The net weight is 533.5 lbs. (241.9 kg). The drum stands approximately 34.75 in. tall and has an outside diameter of 23.3 in. (88 cm tall, OD 59.2 cm). Weight tolerance +/- 1%.

**275-gallon (1041 L) IBC (Intermediate Bulk Container)** Weighs 123 lbs. (55.8 kg). The net weight is 2550 lbs. (1160 kg). The IBC contains 263 gallons of product. The IBC dimensions are 45.3 in. (114.9 cm) high, 47.3 in. (120.0 cm) long, and 39.4 in. (100.0 cm) wide. The IBC has a 2 in. male butterfly valve with NPT threads in bottom sump. Weight tolerance +/- 1%.

**Bulk Shipping** Quantities from 3000-4200 gallons are available. Weight tolerance +/- 10%.

## CARUS VALUE ADDED

### LABORATORY SUPPORT

Carus has technical assistance available to answer questions, evaluate treatment alternatives, and perform laboratory testing. Our laboratory capabilities include: consulting, treatability studies, feasibility studies, and analytical services.

### FIELD SERVICES

As an integral part of our technical support, Carus provides extensive on-site treatment assistance. We offer full application services, including technical expertise, supervision, testing, and feed equipment design and installation in order to accomplish a successful evaluation and/or application.

### CARUS

During its more than 100 year history, Carus' ongoing emphasis on research and development, technical support, and customer service has enabled the company to become the world leader in permanganate, manganese, oxidation, and base-metal catalyst technologies.

Permanganate products are not registered as a pesticide under the Federal Insecticide, Fungicide and Rodenticide Act administered by U.S. EPA or similar state laws. Use as a pesticide is not government approved.



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