LIQUOX® sodium permanganate is a liquid oxidant recommended for use in electronics and fine chemical synthesis, that require a concentrated permanganate solution.

**PRODUCT SPECIFICATIONS**

- **Assay**: 40 - 41% as NaMnO₄
- **pH**: 5.0 - 8.0
- **Specific Gravity**: 1.37 - 1.40
- **Insolubles**: ≤ 0.005%

**CHEMICAL/PHYSICAL DATA**

- **Formula**: NaMnO₄
- **Appearance**: Deep purple solution
- **Shelf Life**: This product should be used within two years of the date of production.
- **Decomposition**: May start at 150 °C / 302 °F

**APPLICATIONS**

- **Desmearing/Etchback**: Printed circuit board desmearing and etchback.
- **Oxidation and Synthesis**: Organic chemicals and intermediates manufacture. Oxidizes impurities in organic and inorganic chemicals.

**BENEFITS**

- Concentrated liquid oxidant
- More precise dosing of chemical
- Feed equipment is simplified
- Consistent concentration
- Dust problems are eliminated
- High solubility at room temperature
- Can be used whenever potassium ion cannot be tolerated

**SHIPPING CONTAINERS**

- **55-gallon drum**: (208-L) (UN Specification: UN1H1/Y 1.9/100) Made of high-density polyethylene (HDPE), weighs 21 lbs (9.5 kg). The net weight is 550 lbs (250 kg). The drum stands approximately 34.8 in (88.3 cm) tall, has an outside diameter of 23.3 in (59.1 cm). (Domestic and international)

- **275-gallon IBC**: (1040-L) (UN Specification: UN31HA1/Y1.9/100) They are also marked “MX” for multi-trip. IBC weighs 123 lbs (55.8 kg). The net weight is 3000 lbs (1360 kg). The IBC contains 263 gallons (1000 L) of product. The IBC dimensions are 45.3 in (114.9 cm) high, 47.3 in (120.0 cm) long, and 39.4 in (100.0cm) wide. The IBC has a 2 in (5 cm) butterfly valve with NPT threads in bottom sump. (Domestic)

**HANDLING, STORAGE, AND INCOMPATIBILITY**

Like any strong oxidant, LIQUOX sodium permanganate should be handled with care. Protective equipment during handling should include face shields and/or goggles, rubber or plastic gloves, rubber or plastic apron. If clothing becomes spotted, 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 or an air supplied respirator is advised.

The product should be stored in a dry area in closed containers. Product should be stored above 50°F. 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 reduce with sodium thiosulfate, a bisulfite, or ferrous salt. The bisulfite or ferrous salt may require dilute sulfuric acid to promote reduction. Neutralize any acid used with sodium bicarbonate. 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, sulfites, oxalates, and all other oxidizable inorganic chemicals. With hydrochloric acid, chlorine is liberated.

**C A R U S  C O R P O R A T I O N**

**Responsibility**

Carus and Design is a registered service mark of Carus Corporation. LIQUOX® is a registered trademark of Carus Corporation. Responsible Care® is a registered service mark of the American Chemistry Council.

**Carus Chemical Company**

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Form LX 1501
COMPARABILITY
LiQUOX® sodium 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 sodium permanganate must also be compatible with any acid or alkali being used.

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

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

SHIPPING
LiQUOX sodium 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).

Proper Shipping Name: Permanganates, inorganics, aqueous solution n.o.s. (Contains sodium permanganate).

Hazard Class: 5.1

Identification Number: UN 3214

Packaging Group: II

Label Requirements: Oxidizer, 5.1

Packaging Requirements: 49 CFR Parts 171 to 180
Sections: 173.152, 173.202, 173.242

CARUS VALUE ADDED
LABORATORY SUPPORT
Carus Corporation 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 CORPORATION
During its 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.