



RemOx® L-D ISCO reagent has been specifically manufactured for environmental applications such as remediation of soils and associated groundwater. This product can be used to degrade a variety of contaminants including chlorinated solvents, polyaromatic hydrocarbons, phenolics, organo-pesticides, and substituted aromatics. RemOx L-D is shipped with a certificate of analysis to document assay, pH, and trace metals.

## PRODUCT SPECIFICATIONS

### Assay

19.5-21.0% as NaMnO<sub>4</sub>

### pH

5.0-8.0

### Trace Metals

(see Table I)

## CHEMICAL/PHYSICAL DATA

<b>Formula</b>	NaMnO <sub>4</sub>
<b>Formula Weight</b>	141.93 g/mol
<b>Appearance</b>	Dark Purple Solution
<b>Specific Gravity</b>	1.15-1.17
<b>Freezing Point</b>	-6° C / 21° F
<b>Solubility in Water</b>	Miscible with water in all proportions.

Material will pass through a 10 micron filter.

## APPLICATIONS

RemOx L-D is used for soil and groundwater remediation by *in situ* or *ex situ* chemical oxidation and as an active agent in subsurface reactive barriers for treatment of: chlorinated ethenes, phenolic compounds, polyaromatic hydrocarbons, RDX, HMX, and various pesticides.

## SHIPPING CONTAINERS

**5-gallon pail (20-L)** (UN Specification: UN3H1/Y1.8/100) Made of high-density polyethylene (HDPE), weighs 3.3 lbs (1.5 kg). The net weight is 48.5 lbs (21.9 kg). The pail stands approximately 14.8 in (37.6 cm) tall, 10.6 in (26.9 cm) wide, and 11.0 in (27.9 cm) deep. (Domestic and international)

**55-gallon drum (208-L)** (UN Specification: UN1H1/Y 1.9/100) Made of high-density polyethylene (HDPE), weighs 22 lbs (10 kg). The net weight is 533.5 lbs (241.9 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)

## SHIPPING CONTAINERS

**275-gallon IBC (Intermediate Bulk Container) (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 2550 lbs (1156 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)

**275-gallon IBC (Intermediate Bulk Container) (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 2550 lbs (1156 kg). The IBC contains 263 gallons (1000 L) of product. The IBC dimensions are 45.3 in (115.1 cm) high, 47.2 in (119.9 cm) long, and 39.4 in (100.1 cm) wide. The IBC has a 2 in (5 cm) butterfly valve with NPT threads in bottom sump. (International)

**Bulk Shipping-** Quantities up to 4000-gallons (15,142-L) are available. (Domestic only)

## HANDLING, STORAGE, AND INCOMPATIBILITY

Like any strong oxidizer RemOx L-D should be handled with care. Protective equipment during handling should include face shields and/or goggles, rubber or plastic gloves, and 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 the appropriate NIOSH-MSHA dust or mist respirator.

Store in accordance with NFPA 30 requirements in the United States or the European Fire Protection Association in Europe for Class II oxidizers. Additional regulations in Europe are REACH (Regulation for Registration, Evaluation, Authorisation and Restriction of Chemicals), and CLP (Classification, Labeling, Packaging). REACH is a regulation that increases the responsibility of the industry to manage the risks that the chemical may pose. For REACH registration numbers refer to the eSDS. The product should be stored in a cool, dry area in closed containers. Concrete floors are preferred. Check local regulations to ensure proper storage. Avoid wooden decks. Spillage should be collected and disposed of properly. To clean up spills and leaks follow the steps recommended in our SDS or eSDS.

Avoid contact with acids, peroxides, and all combustible organic or readily oxidizable materials including inorganic oxidizable materials and metal powders. With hydrochloric acid, chlorine gas is liberated. RemOx L-D is not combustible, but will support combustion. It may decompose if exposed to intense heat. Fires may be controlled and extinguished by using large quantities of water. Refer to the SDS or eSDS for more information.



RemOx® L-D ISCO reagent is classified as an oxidizer for both domestic and international transportation. Liquid permanganate is shipped domestically as Freight Class 70 and in E.U. as Class 5.1.

**Proper Shipping Name:** Permanganates, inorganic, aqueous solution n.o.s. (contains sodium permanganate).

**Hazard Class:** Oxidizer, Class 5.1

**Identification Number:** UN 3214

**Division/APR/RID Class:** 5.1

**Label Requirements:** Oxidizer, 5.1

**Packaging Group:** II

**Packaging Requirements:** 49 CFR Parts 171 to 180

**Sections:** 173.152, 173.202, 173.242

**Quantity Limitations:**

1 liter net for passenger aircraft or railcar:

5 liters net for cargo aircraft.

**Vessel Stowage, (IMDG Regulation):**

D-material must be stowed "on-deck" on a cargo vessel, but is prohibited on a passenger vessel. Other provisions: stow separately from ammonium compounds, hydrogen peroxide, peroxides, super-oxides, cyanide compounds, and powdered metal.

H.S. Code 28.41.69.00

**SHIPPING CONTAINERS**

RemOx L-D 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 be compatible with any kind of acid or alkali being used.

In neutral and alkaline solutions, RemOx L-D 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 RemOx L-D. Actual corrosion or compatibility studies should be made under the conditions in which RemOx L-D will be used.

**Table 1: Typical Trace Metal Content and Specifications**  
Reported values in table are derived from 40% product used to manufacture RemOx L-D

Element	Typical Analysis (mg/kg)	Specifications (mg/kg)	DL* (mg/kg)	Element	Typical Analysis (mg/kg)	Specifications (mg/kg)	DL* (mg/kg)
Ag	BDL	0.15	0.034	Fe	BDL	2.00	0.053
Al	BDL	2.00	0.24	Hg	BDL	0.03	0.003
As	BDL	4.00	0.006	Ni	BDL	0.1	0.03
Ba	2.96	15.00	0.016	Pb	BDL	0.70	0.16
Be	BDL	0.50	0.08	Sb	BDL	0.70	0.16
Cd	BDL	0.10	0.016	Se	0.0034	0.50	0.0003
Cr	2.71	5.00	0.031	Tl	BDL	3.50	0.80
Cu	BDL	0.10	0.022	Zn	0.034	0.40	0.011

DL\* is detection limit

BDL is below detection limit

