

Material Safety Data Sheet

Material Name: Potassium Permanganate

ID: C1-134

*** Section 1 - Chemical Product and Company Identification ***

Chemical Name: Potassium Permanganate

Product Use: For Commercial Use

Synonyms: Chameleon Mineral; Condy's Crystals; Permanganate de Potassium; Permanganic Acid, Potassium Salt; Purple Salt

Supplier Information

Chem One Ltd.

Phone: (713) 896-9966

14140 Westfair East Drive

Fax: (713) 896-7540

Houston, Texas 77041-1104

Emergency # (800) 424-9300 or (703) 527-3887

General Comments: FOR COMMERCIAL USE ONLY; NOT TO BE USED AS A PESTICIDE.

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

*** Section 2 - Composition / Information on Ingredients ***

CAS #	Component	Percent
7722-64-7	Potassium Permanganate	97-99.5%

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Manganese (7439-64-7), Manganese, elemental & inorganic Compounds, as Mn, and Manganese fume, Mn.

Component Information/Information on Non-Hazardous Components

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

*** Section 3 - Hazards Identification ***

Emergency Overview

This product is a dark purple/bronze solid, in crystalline or free-flowing powder form. Potentially fatal if swallowed. Highly corrosive to the skin. Can cause permanent damage to the eyes. Known irritant of the respiratory system. Strong oxidizer. Contact with other combustible material may cause fire. Firefighters should use full protective equipment and clothing.

Hazard Statements

STRONG OXIDIZER. Contact with combustible materials such as wood, paper, oil, etc., may cause fire. MAY BE FATAL IF SWALLOWED OR INHALED. Can cause burns of eyes and skin. May cause respiratory tract irritation. Avoid contact with eyes and skin. Avoid breathing dusts. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Keep from contact with clothing and other combustible materials.

Potential Health Effects: Eyes

Can cause severe eye injury. Contact can produce hardened, ulcer-like injury on eye. Conjunctivitis and bleeding may occur. In extreme cases, cloudiness or discoloration of the cornea may occur.

Potential Health Effects: Skin

Product acts as a highly corrosive agent to the skin. Contact may produce burns and/or tissue necrosis. Contact will also stain skin brown.

Potential Health Effects: Ingestion

May irritate and cause burns of the mouth and throat. Symptoms may include brown discoloration and edema of mucous membranes of mouth, glottis and pharynx, cough, laryngeal edema, nausea, vomiting, gastric lesions, stridor (high-pitched, noisy breathing), laryngeal edema, necrosis of oral and pharyngeal mucosa, slow pulse, cardiovascular collapse, profound hypotension and decreased blood pressure. Fatal oral dose is estimated at 10 grams (0.35 oz). Death may occur up to one month from the time of poisoning. If death is not immediate, jaundice and oliguria or anuria may appear. Ingestion of solutions of Potassium Permanganate has caused mild Parkinsonian syndrome, and distally accentuated polyneuropathies. These symptoms normally occur long after the incident of ingestion exposure, sometimes years later.

Potential Health Effects: Inhalation

May irritate the nose, throat and respiratory tract. In severe cases, pulmonary edema may occur that could potentially lead to death. Symptoms of pulmonary edema may be delayed. Other symptoms could include sore throat, coughing, shortness of breath, and breathing. Workers chronically exposed by inhalation to Potassium Permanganate have showed a 35% increase in the incidence of pneumonia.

HMIS Ratings: Health Hazard: 3* Fire Hazard: 0 Physical Hazard: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

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*** Section 4 - First Aid Measures ***

First Aid: Eyes

In case of contact with eyes, rinse immediately with plenty of water for at least 15 minutes. Seek immediate medical attention if any adverse effect occurs.

First Aid: Skin

Remove all contaminated clothing. For skin contact, wash extremely thoroughly with soap and water. Seek immediate medical attention if irritation develops or persists.

First Aid: Ingestion

DO NOT INDUCE VOMITING, unless directly by physician or other medical personnel. Have victim rinse mouth thoroughly with water, if conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Contact a physician or poison control center immediately.

First Aid: Inhalation

Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention. Get immediate medical attention.

First Aid: Notes to Physician

Provide general supportive measures and treat symptomatically. The following treatment is recommended for overexposure to manganese compounds:

Basic Treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by non-rebreather mask at 10 to 15 L/minutes. Monitor for pulmonary edema and treat if necessary. Monitor for shock and treat if necessary. For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport. Do not use emetics. For ingestion, rinse mouth and administer 5 mL/kg up to 200 mL of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool.

Advanced Treatment: Consider orotracheal or nasotracheal intubation for airway control in the patient who is unconscious or in severe respiratory distress. Monitor cardiac rhythm and treat arrhythmias if necessary. Start an IV with D5W /SRP: "To keep open", minimal flow rate. Use lactated Ringer's if signs of hypovolemia are present. Consider drug therapy for pulmonary edema. For hypotension with signs of hypovolemia, administer fluid cautiously. Consider vasopressors for hypotension with a normal fluid volume. Watch for signs of fluid overload. Use proparacaine hydrochloride to assist eye irrigation.

*** Section 5 - Fire Fighting Measures ***

Flash Point: Not combustible

Upper Flammable Limit (UEL): Not applicable

Auto Ignition: Not applicable

Rate of Burning: Not applicable

General Fire Hazards

Potassium Permanganate is an NFPA Class 2 Oxidizer. This is an oxidizing material that will increase the burning rate or cause a spontaneous ignition with a combustible material. Containers may explode in fire. Contact with paper, wood or other combustible materials may result in fire. If combustible material is in finely divided dust form, an explosion may result. Contact with liquid combustible materials may cause spontaneous combustion and fire.

Hazardous Combustion Products

Upon heating, oxygen will be released.

Extinguishing Media

Do not use dry chemical, carbon dioxide, foam or halon extinguishing materials; use flooding quantities of water only if involved in a fire..

Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing including self contained breathing apparatus. Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution. Prevent the spread of any released product to combustible objects.

NFPA Ratings: Health: 3 Fire: 0 Reactivity: 0 Other: Oxidizer

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Method Used: Not applicable
Lower Flammable Limit (LEL): Not applicable
Flammability Classification: Not applicable

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*** Section 6 - Accidental Release Measures ***

Containment Procedures

Stop the flow of material, if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary use a dust suppressant agent which does not react with product, (see Section 10 for incompatibility information). (DO NOT USE SAWDUST, ACTIVATED CARBON OR OTHER COMBUSTIBLE MATERIAL).

Clean-Up Procedures

For small releases, clean-up spilled liquid wearing gloves, goggles, faceshield, and suitable body protection. Sweep-up or vacuum spilled solid. Decontaminate the area thoroughly. Test area with litmus paper to ensure neutralization. Place all spill residues in a suitable container. Thoroughly wash the area after clean-up. Prevent spill rinsate from contamination of storm drains, sewers, soil or groundwater. Spill rinsate should be neutralized by adding dilute caustic soda (NaOH) or sodium bisulfite (NAHSO3). Spill rinsate may be an oxidizing liquid and so should be prevented to have contact with any combustible materials.

Evacuation Procedures

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep materials which can burn away from spilled material. In case of large spills, follow all facility emergency response procedures.

Special Procedures

Remove soiled clothing and laundry before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

*** Section 7 - Handling and Storage ***

Handling Procedures

All employees who handle this material should be trained to handle it safely. Do not breathe dust. Avoid all contact with skin and eyes. Use this product only with adequate ventilation. Wash thoroughly after handling.

Storage Procedures

Keep container tightly closed when not in use. If this product is transferred into another container, only use portable containers and tools approved for oxidizing solids. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Store containers away from wood, cardboard boxes, and other combustible materials. Storage areas should be made of corrosion- and fire-resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Use corrosion-resistant structural materials, lighting, and ventilation systems in the storage area. Floors should be sealed to prevent absorption of this material. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers). Refer to NFPA 43A, *Liquid, Solid Oxidizers*, for additional information on storage.

Empty containers may contain residual particulates; therefore, empty containers should be handled with care. Never store food, feed, or drinking water in containers which held this product. Keep this material away from food, drink and animal feed. Do not store this material in open or unlabeled containers. Limit quantity of material stored.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines

A: General Product Information

Follow the applicable exposure limits.

B: Component Exposure Limits

The exposure limits given are for Manganese, elemental & inorganic Compounds, as Mn (7439-96-5) or Manganese fume, as Mn.

ACGIH: 0.2 mg/m³ TWA (Notice of Intended Change = 0.03 [respirable fraction])

OSHA: 5 mg/m³ STEL, Ceiling

NIOSH: 1 mg/m³ TWA

3 mg/m³ STEL

DFG MAKs 0.5 mg/m³ TWA, (inhalable fraction), Peak, 30 minutes, average value

Engineering Controls

Use mechanical ventilation such as dilution and local exhaust. Use a corrosion-resistant ventilation system and exhaust directly to the outside. Supply ample air replacement. Provide dust collectors with explosion vents.

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*** Section 8 - Exposure Controls / Personal Protection (Continued) ***

PERSONAL PROTECTIVE EQUIPMENT

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent Standards of Canada. Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment: Eyes/Face

Wear safety glasses with side shields (or goggles) and a face shield, if this material is made into solution. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment: Skin

Wear impervious gloves, boots and coveralls to avoid skin contact. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment: Respiratory

If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998). If airborne concentrations are above the applicable exposure limits, use NIOSH-approved respiratory protection. The following NIOSH Guidelines for Manganese and Compounds (as Mn) are presented for further information.

Up to 10 mg/m³: Dust and mist respirator except single-use and quarter-mask respirator or SAR.

Up to 25 mg/m³: SAR operated in a continuous in a continuous-flow mode, or powered air-purifying respirator with dust and mist filters.

Up to 50 mg/m³: Full-facepiece respirator with high-efficiency particulate filter(s), or SAR with a tight-fitting facepiece operated in a continuous-flow mode, or powered air-purifying respirator with tight-fitting facepiece and high-efficiency particulate filter, or full-facepiece SCBA, or full-facepiece SAR.

Up to 500 mg/m³: Positive pressure SAR.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Positive pressure, full-facepiece SCBA, or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

Escape: Full-facepiece respirator with high-efficiency particulate filter(s), or escape-type SCBA.

NOTE: The IDLH concentration for Manganese Compounds and fume (as Mn) is 500 mg/m³.

Personal Protective Equipment: General

Have an eyewash fountain and safety shower available in the work area.

*** Section 9 - Physical & Chemical Properties ***

Physical Properties: Additional Information

The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

Appearance:	Dark purple/bronze crystals	Odor:	Odorless
Physical State:	Solid	pH:	Not applicable for solid
Vapor Pressure:	Practically zero	Vapor Density:	Not applicable
Boiling Point:	Decomposes	Freezing/Melting Point:	240 deg C (464 deg F) [decomposes]
Solubility (H₂O):	6.38 g/100 cc (@ 20 deg C)	Specific Gravity:	2.70 @ 15 deg C (H ₂ O = 1)
Softening Point:	Not available	Particle Size:	Not available
Molecular Weight:	158.04	Bulk Density:	Not available
		Chemical Formula:	KMnO ₄

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Solid is stable in air and light. Solutions of Potassium Permanganate are unstable.

Chemical Stability: Conditions to Avoid

Avoid high temperatures and ignition sources. Keep away from materials which can burn.

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*** Section 10 - Chemical Stability & Reactivity Information (Continued) ***

Incompatibility

Avoid contact with acetic anhydride, alcohols, ammonium nitrate, arsenites, bromides, iodides, acids, carbon, charcoal, organic material, ferrous or mercurous salts, formaldehyde, hypophosphites, hyposulfites, sulfites, peroxides, oxalates, inorganic oxidizable materials, metal powders, wood, glycerine, phosphorous, polypropylene, reducing materials, and heat. Contact with HCl will liberate chlorine gas. Mixtures of red fuming nitric acid and Potassium Permanganate and solvents such as methanol, ethanol, Isopropanol, pentanol or isopentanol will ignite immediately upon mixing. Admixtures of Potassium Permanganate and ammonium nitrate may result in a delayed explosion, due to the formation of ammonium permanganate. Mixtures of Potassium Permanganate and dimethylformamide can cause explosion. Explosions can occur during preparation of chlorine by addition of concentrated acids such as hydrochloric acid to solid Potassium Permanganate. Potassium Permanganate is spontaneously flammable on contact with ethylene glycol. An attempt to prepare permanganyl chloride, MnO_3Cl , by adding cautiously, concentrated sulfuric acid to an intimate mixture of Potassium Permanganate and potassium chloride kept at 0 deg C in clean all-glass apparatus resulted in a violent explosion. When Potassium Permanganate is dissolved in 95% sulfuric acid, a green solution of permanganyl sulfate is formed. This solution will oxidize most organic compounds and, if the solution is strongly concentrated, explosion may accompany the oxidation. An explosion occurred when concentrated sulfuric acid was mixed with crystalline Potassium Permanganate in a vessel containing moisture. Manganese heptoxide was formed, which is explosive at 70 deg C. Potassium Permanganate being conveyed through polypropylene tube may ignite the tube. When solid hydroxylamine is brought into contact with solid Potassium Permanganate, a white flame is produced immediately. Potassium Permanganate decomposes hydrogen trisulfide so rapidly that sufficient heat is liberated to ignite the trisulfide. When antimony or arsenic and solid Potassium Permanganate are ground together, the metals ignite. Potassium Permanganate can react violently with most metal powders, ammonia and ammonium salts, phosphorus, many finely divided organic compounds, flammable liquids, acids, and sulfur. Permanganates are explosive when treated with sulfuric acid. When both compounds are used in an absorption train, an empty trap should be placed between them.

Hazardous Decomposition

Upon heating, oxygen is released, which increases potential of fire.

Hazardous Polymerization

Will not occur.

*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity

A: General Product Information

Acute toxicity is primarily due to its strong oxidizing activity, and to some extent, its caustic (alkaline) properties. Product is an eye and skin irritant, and may cause burns. Product is a respiratory tract irritant, and inhalation may cause nose irritation, sore throat, coughing, and chest tightness and possibly, burns to the respiratory system. Inhalation exposure to high levels could cause pulmonary edema (buildup of fluid in the lungs) which could result in death. Ingestion can result in shock, pulmonary edema, and jaundice.

Chronic: Long term manganese overexposure (usually in the form of manganese oxides) may lead to an increased incidence of upper respiratory infections, lung irritation, and possible central nervous system disorders, with symptoms simulating Parkinson's disease (difficulty walking, weakness or cramps in the legs, tremors of arms and legs, memory loss, poor coordination, difficulty in speaking clearly). If high exposure continues, the respiratory system may be affected.

B: Component Analysis - LD₅₀/LC₅₀

Potassium Permanganate (7722-64-7)

Oral-rat LD₅₀: 1090 mg/kg; Oral-mouse LD₅₀: 2157 mg/kg; Subcutaneous-Mouse LD₅₀: 500 mg/kg; Oral-guinea pig LD₅₀: 1151 mg/kg; Behavioral: somnolence (general depressed activity)

Manganese (7439-96-5):

Oral-rat LD₅₀: 9 g/kg

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*** Section 11 - Toxicological Information (Continued) ***

Acute and Chronic Toxicity (continued)

B: Component Analysis - TDLo/LDLo

Potassium Permanganate (7722-64-7)

Oral-Woman TDLo: 2400 mg/kg/day: Gastrointestinal tract effects; Oral-woman LDLo: 100 mg/kg: Vascular: BP lowering not characterized in autonomic section; Liver: hepatitis (hepatocellular necrosis), diffuse; Kidney, Urethra, Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Oral-Human LDLo: 143 mg/kg: Pulmonary system effects, Gastrointestinal tract effects; Oral-rat TDLo: 7851 mg/kg/39 weeks-intermittent: Behavioral: alteration of classical conditioning; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: true cholinesterase; Oral-mouse TDLo: 513 mg/kg: male 5 day(s) pre-mating: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count); Intratesticular-Rat TDLo: 400 mg/kg (1 day male): Reproductive effects; Oral-rabbit LDLo: 600 mg/kg; Intratesticular-gerbil TDLo: 25 mg/kg: male 1 day(s) pre-mating: Reproductive: Fertility: male fertility index (e.g. # males impregnating females per # males exposed to fertile non-pregnant females); Oral-Dog, adult LDLo: 400 mg/kg; Intravenous-Rabbit, adult LDLo: 70 mg/kg

Carcinogenicity

A: General Product Information

No information available.

B: Component Carcinogenicity

Potassium Permanganate (7722-64-7)

Potassium Permanganate is not listed by any agency as to carcinogenicity

Manganese & inorganic Compounds as Mn and Manganese fume, as Mn (7439-96-5)

EPA EPA-D (Not Classifiable as to Human Carcinogenicity - inadequate human and animal evidence of carcinogenicity or no data available)

Epidemiology

No information available.

Neurotoxicity

Combination of ingestion and inhalation can incur harmful effects on the central nervous system. Symptoms may include leg cramps, tremors, difficult walking, poor coordination, memory loss, questionable judgment and unstable emotions.

Mutagenicity

Potassium Permanganate has caused mutations in short-term tests of bacteria and mouse cells.

Teratogenicity

In animal studies manganese compounds were not teratogenic. Victims of manganese poisoning have reported impotence and decreased sexual desire.

Reproductive Data:

Potassium Permanganate (7722-64-7)

Oral-mouse Micronucleus test: 205 mg/kg/24 hours-continuous; Oral-mouse Sperm Morphology: 513 mg/kg/5 days-continuous; Subcutaneous-Mouse LD₅₀: 500 mg/kg; Mutation in microorganisms-Bacteria - Salmonella typhimurium: 10 µL/tube; DNA Damage-Escherichia coli 200 mmol/L; DNA Repair-Bacillus subtilis 17 mg/L; Mutation in Microorganisms-other microorganisms 10 ppm; DNA repair-Bacteria - Escherichia coli: 625 µg/well; Phage inhibition capacity: Bacteria - Escherichia coli: 200 µmol/L

Other Toxicological Information

Workers exposed to airborne manganese have had a higher incidence of pneumonia.

*** Section 12 - Ecological Information ***

Ecotoxicity

A. General Product information

Harmful to aquatic life in very low concentrations

B: Aquatic Toxicity

Potassium Permanganate (7722-64-7)

LC₅₀ (96 hr) *Carassius auratus*- gold fish: 3.6 mg/L. Conditions of bioassay not specified; LC₅₀ (96 hr) *Ictalurus punctatus*- channel catfish: 0.75 mg/L Conditions of bioassay not specified; LC₅₀ (96 hr) *Leopomis macrochirus*-bluegill sunfish: 2.7-3.6 mg/L Conditions of bioassay not specified. LC₅₀ (24 hours) *Mesocyclops leuckartii* 2.45 mg/L (static bioassay @ 25°C); LC₅₀ (24 hours) *Chanos chanos* milkfish 1.4886 mg/L (static bioassay @ 25°C, 30% salinity, seawater).

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*** Section 13 - Disposal Considerations ***

U.S. PA Water Number & Descriptions

A: General Product Information

As shipped, this product is considered an ignitable waste, D001, under RCRA.

B. Component Waste Numbers

No EPA Waste Numbers are applicable for this product.

Disposal Instructions

All wastes must be handled in accordance with local, State and Federal regulations. This material can be converted to a less hazardous material by weak reducing agents, followed by neutralization.

*** Section 14 – Transportation Information Ground ***

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under 49 CFR, IATA and IMDG to assure regulatory compliance.

US DOT 49 CFR 100-185 Revised July 24, 2009 Information

UN/NA #: UN 1490

Shipping Name: Potassium permanganate

Hazard Class: 5.1

Packing Group: II

Required Label(s): 5.1(Oxidizer)

Special Provision: IB8, IP4

Packaging: 172.212

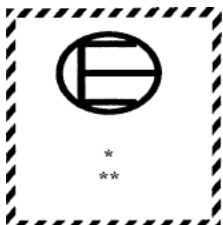
RQ Quantity: For a single package less than the RQ of 100lb (45.4 kg), the RQ designation should be not be used.

Additional Shipping Information

Limited Quantity Shipments: Shipments, except for air, need not be marked with the Proper Shipping Name of the contents, but shall be marked with the UN Number (1490) of the contents, preceded by the letters "UN", placed within a diamond. The width of the line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. The total weight of each outer packaging cannot exceed 30 kg (66 pounds.) .

Small Quantities for Highway and Rail: The maximum quantity of this material per inner receptacle is limited to 30 g (1 ounce) per receptacle. The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement of the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg (64 pounds). The completed package must meet the drop test requirements of 173.4(6) (i). The outside of the package must be marked with the statement "**This package conforms to 49 CFR 173.4 for domestic highway or rail transport only.**"

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30 g (1 ounce) per receptacle and the aggregate quantity of this material per completed package does not exceed 500g (1.1 pounds). The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg (64 pounds). The completed package must meet a drop test. The requirements are found in 173.4(6) (i). The package must not be opened or otherwise altered until it is no longer in commerce. For highway or rail transportation no shipping paper is required. The package must be legibly marked with the following marking:



NOTE: The "" must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The "" must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm (3.9 inches) x 100 mm (3.9 inches), and must be durable and clearly visible.

De minimis Exceptions: The maximum quantity of this material per inner receptacle is limited to 1g (0.04 ounce) per receptacle and the aggregate quantity of this material per completed package does not exceed 100 g (0.22 pounds). The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg (64 pounds). The completed package must meet the drop test. The requirements are found in 173.4(6) (i). The package must not be opened or otherwise altered until it is no longer in commerce and may be transported by aircraft. If all of the above requirements are met, then this material is not regulated.

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*** Section 14 – Transportation Information Air ***

50th Edition International Air Transport Association (IATA):

For Shipments by Air transport: This information applies to air shipments both within the U.S. and for shipments originating in the U.S., but being shipped to a different country.

UN/NA #: UN 1490

Proper Shipping Name: Potassium permanganate

Hazard Class: 5.1

Packaging Group: II

Passenger & Cargo Aircraft Packing Instruction: 508

Passenger & Cargo Aircraft Maximum Net Quantity: 5 kg

Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y508

Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 2.5 kg

Cargo Aircraft Only Packing Instruction: 511

Cargo Aircraft Only Maximum Net Quantity: 25 kg

Excepted Quantities: E2

Special Provisions: None

ERG Code: 5L

Limited Quantity Shipments: Shipments for air must be marked with the Proper Shipping Name, Potassium permanganate, and shall be marked with the UN Number (1490) preceded by the letters "UN", placed within a diamond. The width of the line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. The total weight of each outer packaging cannot exceed 30 kg.

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30 g per receptacle and the aggregate quantity of this material per completed package does not exceed 500g. The inner receptacles must be securely packed in an intermediate packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg. The completed package must meet a drop test. The requirements are found in 2.7.6.1. The package must not be opened or otherwise altered until it is no longer in commerce. For air transportation no shipping paper is required. The package must be legibly marked with the following marking:



NOTE: The "*" must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The "**" must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm x 100 mm and must be durable and clearly visible.

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*** Section 14 – Transportation Information Vessel ***

Amendment 34-08 International Maritime Dangerous Goods (IMDG) Code

For shipments via marine vessel transport, the following classification information applies.

UN/NA #: UN 1490

Proper Shipping Name: POTASSIUM PERMANGANATE

Hazard Class: Class 5.1

Packing Group: II

Special Provisions:

Limited Quantities: 1kg

Excepted Quantities: E2

Packing Instructions: P002

Provisions: None

IBC Instructions: IBC08

IBC Provisions: B2, B4

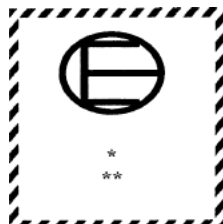
EmS: F-H, S-Q

Stowage and Segregation: Category D. Category D-“Separated From” ammonium compounds, cyanides and peroxides.

RQ Quantity: For a single package less than the RQ of 100lb (45.4 kg), the RQ designation should be not be used.

Limited Quantity Shipments: Shipments need not be marked with the Proper Shipping Name of the contents, but shall be marked with the UN Number (1490) of the contents, preceded by the letters "UN", placed within a diamond. The width of the line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. The total weight of each outer packaging cannot exceed 30kg.

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30g per receptacle and the aggregate quantity of this material per completed package does not exceed 500g. Maximum number of packages per Cargo Transport Unit (CTU) shall not exceed 1,000 packages. The inner receptacles must be securely packed in an intermediate packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29 kg. The completed package must meet a drop test. The requirements are found in 3.5.3.1. Packages must not be opened or otherwise altered until it is no longer in commerce and a shipping paper is required. The package must be legibly marked with the following marking:



NOTE: The "*" must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The "**" must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm x 100 mm and must be durable and clearly visible.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

No additional information.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

Potassium Permanganate (7722-64-7)

SARA 302 There are no specific Threshold Planning Quantities for Potassium permanganate. The default Federal MSDS (EHS TPQ) submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.

CERCLA: final RQ = 100 pounds (45.4 kg)

C: Sara 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Potassium Permanganate	7722-64-7	Yes	No	No	Yes	Yes

Material Safety Data Sheet

Material Name: Potassium Permanganate

ID: C1-134

*** Section 15 - Regulatory Information (Continued) ***

State Regulations

A: General Product Information

California Proposition 65

Potassium Permanganate is not on the California Proposition 65 chemical lists.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Potassium Permanganate	7722-64-7	No	Yes	Yes	Yes	No	No

Other Regulations

A: General Product Information

The U.S. Drug Enforcement Agency requires reporting on the sale of Potassium Permanganate and an export license.

Potassium Permanganate is a List II Chemical (formerly titled "essential chemicals"). If you import, export or distribute Potassium Permanganate in the U.S., you are responsible for the record keeping and reporting requirements set forth in the Chemical Diversion and Trafficking Act of 1988.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Potassium Permanganate	7722-64-7	Yes	Yes	Yes

Other Regulations (continued)

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Potassium Permanganate	7722-64-7	1%

ANSI LABELING (Z129.1): DANGER! STRONG OXIDIZER. CONTACT WITH COMBUSTIBLE MATERIALS MAY CAUSE FIRE. MAY BE FATAL IF SWALLOWED. CAUSES SKIN, EYE AND RESPIRATORY TRACT IRRITATION OR BURNS. HARMFUL IF INHALED. Keep from contact with clothing and other combustible materials. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing vapors or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH/MSHA-approved respiratory protection, as appropriate. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, dry chemical, CO₂, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

*** Section 16 - Other Information ***

Other Information

Chem One Corp. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("Information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this Information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this Information. By providing this Information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product (s) and/or the program (s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration

Contact: Sue Palmer-Koleman, PhD

Contact Phone: (713) 896-9966

Revision Log

08/23/00 4:45 PM SEP Changed company name, Sect 1 and 16, from Corporation to Ltd.

Material Safety Data Sheet

Material Name: Potassium Permanganate

ID: C1-134

05/31/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review, add SARA 311/312 Haz Ratings.
08/20/01 2:25 PM CLJ Changed contact to Sue, non-800 Chemtrec Num.
02/18/02 10:50 AM HDF: Up-date of SARA Hazard Ratings.
07/31/03 7:00 PM HDF Up-date of entire MSDS.
06/22/05 9:40AM SEP Update IATA Section 14
09/05/06 3:16 PM SEP Updated DOT & IMO Section 14
10/15/08 9:09 AM DLY Changed Chem One Physical Address, Section 1
09/18/09 MMK Updated Section 14 limited & excepted quantities and exceptions

This is the end of MSDS # C1-134