

## Section 1 Identification

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**INNOVATING SCIENCE**<sup>®</sup> by Aldon Corporation  
 "Cutting edge science for the classroom"  
 221 Rochester Street  
 Avon, NY 14414-9409  
 (585) 226-6177

**CHEMTREC 24 Hour Emergency  
 Phone Number (800) 424-9300**  
 For laboratory and industrial use only.  
 Not for drug, food or household use.

<b>Product</b>	<b>MANGANESE(IV) DIOXIDE, 85%</b>
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<b>Synonyms</b>	Manganese Dioxide, Native Powder
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## Section 2 Hazards identification

**Signal word:** WARNING

**Pictograms:** GHS07

**Target organs:** Respiratory system, Central nervous system

**GHS Classification:**

Acute toxicity, oral (Category 4)

Acute toxicity, inhalation (Category 4)

**GHS Label information: Hazard statement:**

H302: Harmful if swallowed.

H332: Harmful if inhaled.

**Precautionary statement:**

P261: Avoid breathing dust.

P264: Wash hands thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P271: Use only outdoors or in a well-ventilated area.

P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P301+P330+P312: IF SWALLOWED: Rinse mouth. Call a POISON CENTER or doctor if you feel unwell.

P501: Dispose of contents/container to a licensed chemical disposal agency in accordance with local/regional/national regulations.

**Hazards not otherwise classified:**

Health hazards not otherwise classified (HHNOC) - Not Known

Physical hazards not otherwise classified (PHNOC) - Not Known

## Section 3 Composition / information on ingredients

Chemical Name	CAS #	%	EINECS
Manganese dioxide*	1313-13-9	81-85%	215-202-6
*Contains: Barium compound (as Ba)	7440-39-3	0.1-1.8%	231-149-1

## Section 4 First aid measures

**INGESTION:** HARMFUL IF SWALLOWED. Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

**INHALATION:** HARMFUL IF INHALED. CAUSES RESPIRATORY TRACT IRRITATION. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**EYE CONTACT:** CAUSES EYE IRRITATION. Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

**SKIN ABSORPTION:** MAY BE HARMFUL IF ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

## Section 5 Fire fighting measures

**Suitable Extinguishing Media:** Use water. Do not use dry chemicals or foams. CO<sub>2</sub> or Halon<sup>®</sup> may provide limited control.

**Protective Actions for Fire-fighters:** In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool.

**Specific Hazards:** During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Although not flammable, substance is a strong oxidizer which releases oxygen on heating, increasing the burning rate of any material with a flare-burning effect. It may cause re-ignition after a fire is extinguished.

## Section 6 Accidental release measures

**Personal Precautions:** Evacuate personnel to safe area. Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation.

**Environmental Precautions:** Avoid runoff into storm sewers and ditches which lead to waterways.

**Containment and Cleanup:** Remove all sources of ignition. Recover for reuse if not contaminated. Sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water.

**Precautions for Safe Handling:** Read label on container before using. Do not wear contact lenses when working with chemicals. Keep out of reach of children. Avoid contact with eyes, skin and clothing. Do not inhale dusts. Use with adequate ventilation. Avoid ingestion. Wash thoroughly after handling. Remove and wash clothing before reuse.

**Conditions for Safe Storage:** Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from ignition sources.

## Section 8 Exposure controls / personal protection

Exposure Limits:	Chemical Name	ACGIH (TLV)	OSHA (PEL)	NIOSH (REL)
	Manganese, fume, as Mn	TWA: 0.2 mg/m <sup>3</sup>	STEL: C 5 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> STEL: 3 mg/m <sup>3</sup>

**Engineering controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

**Respiratory protection:** None should be needed in normal laboratory handling at room temperatures. If dusty conditions prevail, work in fume hood or wear a NIOSH/MSHA-approved respirator.

## Section 9 Physical and chemical properties

<b>Appearance:</b> Solid. Black crystalline powder. <b>Odor:</b> No odor. <b>Odor threshold:</b> Data not available. <b>pH:</b> Data not available. <b>Melting / Freezing point:</b> 535°C (995°F) <b>Boiling point:</b> Data not available <b>Flash point:</b> Data not available	<b>Evaporation rate ( = 1):</b> Data not available <b>Flammability (solid/gas):</b> Data not available. <b>Explosion limits: Lower / Upper:</b> Data not available <b>Vapor pressure (mm Hg):</b> Data not available <b>Vapor density (Air = 1):</b> Data not available <b>Relative density (Specific gravity):</b> 5.0 <b>Solubility(ies):</b> Insoluble in water.	<b>Partition coefficient:</b> Data not available <b>Auto-ignition temperature:</b> Data not available <b>Decomposition temperature:</b> Data not available. <b>Viscosity:</b> Data not available. <b>Molecular formula:</b> MnO <sub>2</sub> <b>Molecular weight:</b> 86.94
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## Section 10 Stability and reactivity

**Chemical stability:** Stable  
**Hazardous polymerization:** Will not occur.  
**Conditions to avoid:** Do not heat or rub with organic matter or other oxidizable substance. e.g. sulfur, sulfides, phosphides, hypophosphites, etc.  
**Incompatible materials:** Chlorates, strong oxidizers, organic materials, combustible materials, aluminum powder and sulfur.  
**Hazardous decomposition products:** Heating above 535°C (995°F) will produce oxygen and manganese oxides and/or fumes.

## Section 11 Toxicological information

**Acute toxicity:** Oral-rat LD50: 9000 mg/kg  
**Skin corrosion/irritation:** Data not available  
**Serious eye damage/irritation:** Data not available  
**Respiratory or skin sensitization:** Data not available  
**Germ cell mutagenicity:** Data not available  
**Carcinogenicity:** Data not available  
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.  
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.  
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.  
Ca Prop 65: This product does not contain any chemicals known to the State of California to cause cancer or reproductive toxicity.  
**Reproductive toxicity:** Data not available  
**STOT-single exposure:** Data not available  
**STOT-repeated exposure:** Data not available  
**Aspiration hazard:** Data not available  
**Potential health effects:**  
Inhalation: Chronic excess inhalational exposures may lead to pulmonary inflammation and subsequent reactive airway disease. Metal fume fever has been reported with manganese inhalation.  
Ingestion: May be harmful if ingested.  
Skin: Prolonged or repeated contact with dust may irritate skin.  
Eyes: Contact with eyes may cause irritation.  
**Signs and symptoms of exposure:** Toxicity from acute ingestion or acute inhalation of manganese is rare. Chronic inhalation over many years, usually from occupational exposure, may lead to manganese toxicity. Exercise appropriate procedures to minimize potential hazards.  
**Additional information: RTECS #:** OP0350000

## Section 12 Ecological information

**Toxicity to fish:** No data available  
**Toxicity to daphnia and other aquatic invertebrates:** No data available  
**Toxicity to algae:** No data available  
**Persistence and degradability:** No data available  
**Bioaccumulative potential:** No data available  
**Mobility in soil:** No data available  
**PBT and vPvB assessment:** No data available  
**Other adverse effects:** An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

## Section 13 Disposal considerations

These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local, state and federal regulations or contract with a licensed chemical disposal agency.

## Section 14 Transport information

**UN/NA number:** UN1479  
**Shipping name:** Oxidizing solid, n.o.s., (Manganese dioxide)  
**Hazard class:** 5.1  
**Packing group:** III  
**Reportable Quantity:** No  
**Exceptions:** Limited quantity equal to or less than 5 Kg  
**2020 ERG Guide #** 140  
**Marine pollutant:** No

## Section 15 Regulatory information

A chemical is considered to be listed if the CAS number for the anhydrous form is on the Inventory list.

Component	TSCA	CERLCA (RQ)	RCRA code	DSL	NDSL	CA Prop 65
Manganese dioxide	Listed	Not listed	Not listed	Listed	Not listed	This product does not contain any chemicals known to the State of California to cause cancer or reproductive toxicity.

## Section 16 Other information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. NTP: National Toxicology Program, IARC: International Agency for Research on Cancer, OSHA: Occupational Safety and Health Administration, STOT: Specific Target Organ Toxicity, SE: Single Exposure, RE: Repeated Exposure, ERG: Emergency Response Guidebook.

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<b>Product</b>	POTASSIUM CHLORATE
<b>Synonyms</b>	Chlorate of Potash ; Chloric Acid, Potassium Salt ; Potassium Oxymuriate

## Section 2 Hazards identification

**Signal word:** DANGER  
**Pictograms:** GHS03 / GHS07 / GHS09  
**Target organs:** Liver, Kidneys, Blood



**GHS Classification:**  
 Oxidizing solid (Category 1)  
 Acute toxicity, oral (Category 4)  
 Acute toxicity, inhalation (Category 4)  
 Serious eye damage/irritation (Category 2A)  
 Aquatic, chronic (Category 2)

**GHS Label information: Hazard statement:**  
 H271: May cause fire or explosion; strong oxidizer.  
 H302: Harmful if swallowed.  
 H319: Causes serious eye irritation.  
 H332: Harmful if inhaled.  
 H411: Toxic to aquatic life with long lasting effects.

**Hazards not otherwise classified:**

Health hazards not otherwise classified (HHNOC) - Not Known  
 Physical hazards not otherwise classified (PHNOC) - Not Known

**Precautionary statement:**

P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.  
 P220: Keep away from clothing/incompatible/combustible materials.  
 P221: Take any precaution to avoid mixing with combustibles/acids/oxidizers.  
 P261: Avoid breathing dust.  
 P264: Wash hands thoroughly after handling.  
 P270: Do not eat, drink or smoke when using this product.  
 P271: Use only outdoors or in a well-ventilated area.  
 P273: Avoid release to the environment.  
 P280: Wear protective gloves/protective clothing/eye protection/face protection.  
 P283: Wear fire/flammable resistant/retardant clothing.  
 P301+P330+P312: IF SWALLOWED: Rinse mouth. Call a POISON CENTER or doctor if you feel unwell.  
 P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
 P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 P337+P317: If eye irritation persists: Get medical help.  
 P306+P360: IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.  
 P371+P380+P375: In case of fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.  
 P370+P378: In case of fire: Use water to extinguish.  
 P391: Collect spillage.  
 P501: Dispose of contents/container to a licensed chemical disposal agency in accordance with local/regional/national regulations.

## Section 3 Composition / information on ingredients

Chemical Name	CAS #	%	EINECS
Potassium chlorate	3811-04-9	99.7%	223-289-7

## Section 4 First aid measures

**INGESTION:** HARMFUL IF SWALLOWED. Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

**INHALATION:** HARMFUL IF INHALED. CAUSES RESPIRATORY TRACT IRRITATION. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**EYE CONTACT:** CAUSES EYE IRRITATION. Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

**SKIN ABSORPTION:** MAY BE HARMFUL IF ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

## Section 5 Fire fighting measures

**Suitable Extinguishing Media:** Use water. Do not use dry chemicals or foams. CO<sub>2</sub> or Halon® may provide limited control.

**Protective Actions for Fire-fighters:** In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool.

**Specific Hazards:** During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is a strong oxidizer which releases oxygen on heating. Forms explosive mixtures with combustible, organic, reducing agents or other easily oxidizable materials. Explodes with sulfuric acid or ammonium chloride. These mixtures are easily ignited with friction or heat.

## Section 6 Accidental release measures

**Personal Precautions:** Evacuate personnel to safe area. Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation.

**Environmental Precautions:** Avoid runoff into storm sewers and ditches which lead to waterways.

**Containment and Cleanup:** Remove all sources of ignition. Sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water.

**Precautions for Safe Handling:** Read label on container before using. Do not wear contact lenses when working with chemicals. Keep out of reach of children. Avoid contact with eyes, skin and clothing. Do not inhale dusts. Use with adequate ventilation. Avoid ingestion. Wash thoroughly after handling. Remove and wash clothing before reuse.

**Conditions for Safe Storage:** Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from ignition sources.

## Section 8 Exposure controls / personal protection

Exposure Limits:	Chemical Name	ACGIH (TLV)	OSHA (PEL)	NIOSH (REL)
	Particles not otherwise classified	Not established	TWA: 15 mg/m <sup>3</sup> total dust	Not established

**Engineering controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

**Respiratory protection:** None should be needed in normal laboratory handling at room temperatures. If dusty conditions prevail, work in fume hood or wear a NIOSH/MSHA-approved respirator.

## Section 9 Physical and chemical properties

<b>Appearance:</b> Solid. White, crystalline powder <b>Odor:</b> No odor. <b>Odor threshold:</b> Data not available. <b>pH:</b> Data not available. <b>Melting / Freezing point:</b> 368°C (694°F) <b>Boiling point:</b> 400°C (752°F) <b>Flash point:</b> Non-combustible	<b>Evaporation rate ( = 1):</b> Not applicable <b>Flammability (solid/gas):</b> Data not available. <b>Explosion limits: Lower / Upper:</b> Not applicable <b>Vapor pressure (mm Hg):</b> Negligible <b>Vapor density (Air = 1):</b> Data not available <b>Relative density (Specific gravity):</b> 2.34 <b>Solubility(ies):</b> Soluble in water.	<b>Partition coefficient:</b> Data not available <b>Auto-ignition temperature:</b> Data not available <b>Decomposition temperature:</b> Data not available. <b>Viscosity:</b> Data not available. <b>Molecular formula:</b> KClO <sub>3</sub> <b>Molecular weight:</b> 122.55
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## Section 10 Stability and reactivity

**Chemical stability:** Stable **Hazardous polymerization:** Will not occur.

**Conditions to avoid:** Excessive temperatures, heat, sparks, open flame and other sources of ignition.

**Incompatible materials:** Ammonia, combustible materials, strong reducing agents, finely powdered metals, alcohols, strong acids, sulfur and metal-sulfur compounds, sugars and metal-phosphorous compounds.

**Hazardous decomposition products:** Chlorine, oxygen, potassium oxides.

## Section 11 Toxicological information

**Acute toxicity:** Oral-rat LD50: 1870 mg/kg ; Dermal-rabbit LDo: >2000

**Skin corrosion/irritation:** Skin-rabbit - Slight irritant.

**Serious eye damage/irritation:** Eyes-rabbit - Moderate irritant.

**Respiratory or skin sensitization:** Data not available

**Germ cell mutagenicity:** Data not available

**Carcinogenicity:** Data not available

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Ca Prop 65: This product does not contain any chemicals known to the State of California to cause cancer or reproductive toxicity.

**Reproductive toxicity:** Data not available

**STOT-single exposure:** Data not available

**STOT-repeated exposure:** Data not available

**Aspiration hazard:** Data not available

**Potential health effects:**

Inhalation: Inhalation may cause cough, sore throat.

Ingestion: Ingestion causes abdominal pain, cyanosis, confusion, convulsions, diarrhea, dizziness, headache, nausea, shortness of breath, sore throat, unconsciousness, vomiting. Substance can be absorbed into the body by ingestion. Symptoms may be delayed.

Skin: Contact with skin causes redness.

Eyes: Contact with eyes causes redness and pain.

**Signs and symptoms of exposure:** The substance may cause effects on the blood and kidneys. This may result in lesions of blood cells, kidney impairment and formation of methaemoglobin. The effects may be delayed.

**Additional information:** RTECS #: FO0350000

## Section 12 Ecological information

**Toxicity to fish:** Oncorhynchus mykiss (fish, fresh water), LC50 = 2750 mg/L/48 hours

**Toxicity to daphnia and other aquatic invertebrates:** Daphnia magna (Crustacea), LC50 = 880 mg/L/24 hours

**Toxicity to algae:** Chlorella vulgaris (Algae) = 424 mg/L

**Persistence and degradability:** No data available

**Bioaccumulative potential:** No data available

**Mobility in soil:** No data available

**PBT and vPvB assessment:** No data available

**Other adverse effects:** An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

## Section 13 Disposal considerations

These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local, state and federal regulations or contract with a licensed chemical disposal agency.

## Section 14 Transport information

**UN/NA number:** UN1485

**Shipping name:** Potassium chlorate

**Hazard class:** 5.1

**Packing group:** II

**Reportable Quantity:** No

**Marine pollutant:** No

**Exceptions:** Limited quantity equal to or less than 1 Kg

**2020 ERG Guide #** 140

## Section 15 Regulatory information

A chemical is considered to be listed if the CAS number for the anhydrous form is on the Inventory list.

Component	TSCA	CERLCA (RQ)	RCRA code	DSL	NDSL	CA Prop 65
Potassium chlorate	Listed	Not listed	D001 ; D003	Listed	Not listed	This product does not contain any chemicals known to the State of California to cause cancer or reproductive toxicity.

## Section 16 Other information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. NTP: National Toxicology Program, IARC: International Agency for Research on Cancer, OSHA: Occupational Safety and Health Administration, STOT: Specific Target Organ Toxicity, SE: Single Exposure, RE: Repeated Exposure, ERG: Emergency Response Guidebook.