



SAFETY DATA SHEET

Section 1. Identification

Product Name:	Manganese carbonyl
Product Type:	Solid
CAS Number:	10170-69-1
Product Number:	MN0691
Product Manufacturer:	Ereztech LLC 11555 Medlock Bridge Road, Suite 100 Johns Creek, GA 30097
Product Information:	(888) 658-1221
<u>In case of an emergency:</u>	CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International); CCN836180 *** Contact manufacturer for all non-emergency calls.

Section 2. Hazards Identification

Emergency Overview

Appearance/Odor: Yellow to gold to dark orange crystalline powder, odor not determined.

Classification: ACUTE TOXICITY, ORAL; - Category 3, H301
ACUTE TOXICITY, DERMAL; - Category 3, H311
ACUTE TOXICITY, INHALATION; - Category 3, H331

GHS label elements

Signal word: DANGER

Hazard statements: H301: Toxic if swallowed.
H311: Toxic in contact with skin.
H331: Toxic if inhaled.

Hazard pictograms:



Precautionary statements

Prevention: P261: Avoid breathing dusts/fumes/gases.
P264: Wash exposed skin thoroughly after handling.

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Section 2. Hazards Identification

Prevention (cont.):	P270: Do not eat, drink or smoke when using this product. P271: Use only outdoors or in a well ventilated area. P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:	P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P302 + P352: IF ON SKIN: Wash with plenty of soap and water. P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P311: Call a POISON CENTER or doctor/physician. P330: Rinse mouth. P361: Remove/Take off immediately all contaminated clothing. P363: Wash contaminated clothing before reuse.
Storage:	P403 + P233: Store in a well ventilated place. Keep container tightly closed. P405: Store locked up.
Disposal:	P501: Dispose of contents/ container to an approved wasted disposal plant.
General:	None.
OSHA/HCS status:	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Hazards not otherwise classified:	None known.

Section 3. Composition/Information on Ingredients

Substances

Synonyms	: Dimanganese decacarbonyl; decacarbonyl dimanganese; decacarbonyldimanganese.
Formula	: $C_{10}Mn_2O_{10}$
Molecular weight	: 389.98 g/mol.
CAS-No.	: 10170-69-1.

Ingredient Name	%	CAS Number
Manganese carbonyl	≥97.5	10170-69-1

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

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Section 4. First Aid Measures

Description of Necessary First Aid Measures

- General Advice:** Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.
- Eye Contact:** Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue rinsing for at least 20 minutes. Call a physician or POISON CONTROL CENTER immediately.
- Skin Contact:** Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear impervious gloves. Continue to rinse for at least 20 minutes. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse. Dispose of leather shoes which have been contaminated. Call a physician or POISON CONTROL CENTER immediately.
- Inhalation:** Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Call a POISON CENTER or doctor/physician immediately.
- Ingestion:** Call a physician or POISON CONTROL CENTER immediately. Rinse mouth. Do NOT induce vomiting. Remove dentures if any. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most Important Symptoms/Effects, Acute And Delayed Potential Acute Health Effects

- Eye Contact:** No specific symptoms identified.
- Inhalation:** Toxic if inhaled. Symptoms may include dizziness, dull headache, weakness, blurred vision, a sense of confusion, shortness of breath, nausea or vomiting and loss of consciousness. See Section 11.
- Skin Contact:** Toxic if in contact with skin. See inhalation symptoms and Section 11.
- Ingestion:** Toxic if ingested. See inhalation symptoms and Section 11.

Indication of Immediate Medical Attention and Special Treatment Needed, If Necessary

- Notes to Physician:** Treat symptomatically.
- Specific Treatments:** No specific treatment.
- Protection of First Responders:** No action taken shall be taken involving any personal risk without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

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Section 5. Fire Fighting Measures

General Hazards:	None identified.
Suitable Extinguishing Media:	Use sand, water spray (fog), dry chemical or carbon dioxide (CO ₂).
Unsuitable Extinguishing Media:	Do not use water jet.
Unusual Fire and Explosion Hazards:	In a fire or if heated, a pressure increase will occur and the product container may burst, with the risk of a subsequent release of product. To reduce the possibility of explosion, use a water spray or fog to cool unopened containers.
Product of Combustion:	Decomposition products may include carbon oxides (CO _x) and manganese oxide fumes.
Protection of Firefighters:	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Fire-fighters should wear appropriate protection equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in a positive pressure mode.

Section 6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

For Non-emergency Personnel:	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid inhalation of dusts, gases and vapors. Provide adequate ventilation. Wear respiratory protection. Put on appropriate personal protective equipment.
For Emergency Responders:	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For nonemergency personnel".
Environmental Precautions:	Do not allow dispersal of spilled material and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for Containment

Small Spill:	Approach spill from upwind. Avoid contact with water and the creation/inhalation of dusts and aerosols.
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Section 6. Accidental Release Measures

Small Spill (cont.):

Contain and collect spillage using an inert binding material (sand, diatomite, acid binders, and universal binders) and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large Spill:

Approach spill from upwind. Avoid contact with water and the creation/inhalation of dusts and aerosols. Contain and collect spillage using an inert binding material e.g. sand, earth, vermiculite or diatomaceous earth and place in an appropriate container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated binding material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and Storage

Precautions:

Product is air/light/heat sensitive. Store in cool/dry/dark place (<5 °C) in tightly closed container under an inert gas. Nitrogen with less than 5 ppm each of moisture and oxygen is recommended. Keep container tightly sealed. Avoid the formation and inhalation of dusts, vapors or gases. Avoid contact with skin. Do not ingest. Avoid prolonged exposure. Provide adequate ventilation.

Protective Measures:

Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing dusts, vapors or gases. Keep in the original container kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

General Occupational Hygiene:

Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Safe Storage Conditions:

Product is air/light/heat sensitive. Store in original container in a dark, cool (<5 °C) and well-ventilated area, away from incompatible materials and food and drink. Store opened product under an inert gas. Nitrogen with less than 5 ppm each of moisture and oxygen is recommended. Keep container tightly closed and sealed until ready for use. Store locked up.

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Section 8. Exposure Controls/Personal Protection

Introductory Remarks:

These recommendations provide general guidance for handling this product. Because work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and conduct regular repairs. Waste from these procedures should be handled in accordance with Section 13.

Occupational Exposure Limits:

List	Components	CAS-No.	Type	Value
ACGIH	Decacarbonyldimanganese	10170-69-1	TLV	0.02 mg/m ³ (Mn metal)
NIOSH	Decacarbonyldimanganese	10170-69-1	IDLH	500 mg/m ³ (Mn metal)
			STEL	3 mg/m ³ (Mn metal)
			TWA	1 mg/m ³ (Mn metal)
OSHA	Decacarbonyldimanganese	10170-69-1	PEL	5 mg/m ³ (Mn metal) Ceiling

Engineering Controls:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute. Provide an eyewash/shower station.

Environmental Exposure Controls:

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual Protection Measures

Hygiene Measures:

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Remove all soiled and contaminated clothing immediately. Contaminated clothing should not be allowed out of the workplace. Do not inhale dusts/fumes/gases. Avoid contact with eyes and skin. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/Face Protection:

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles, faceshield (8-inch minimum). Refer to 29 CFR 1910.133, ANSI Z87.1, or European Standard EN166.

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Section 8. Exposure Controls/Personal Protection

Skin Protection

Hand Protection:

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: Chemical-resistant gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Neoprene or nitrile rubber.

Other Skin Protection:

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory Protection:

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Section 9. Physical and Chemical Properties

Physical State:

Crystalline powder.

Color:

Yellow to gold to dark orange.

Odor:

No data available.

Odor Threshold:

No data available.

pH:

No data available.

Melting Point:

154 °C (309.2 °F) -decomposes.

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Section 9. Physical and Chemical Properties

Boiling Point:	No data available.
Flash Point:	No data available.
Auto-ignition temperature:	No data available.
Specific Gravity:	No data available.
Vapor Pressure:	No data available.
Vapor Density:	No data available.
Water Solubility:	Insoluble @ 20 °C (68 °F).
Evaporation Rate:	No data available.
Viscosity:	No data available.
VOC Content:	No data available.

VOCs are calculated following the requirements under 40 CFR, Part 59, Subpart C for Consumer Products and Subpart D for Architectural Coatings.

Section 10. Stability and Reactivity

Reactivity:	No data available.
Chemical Stability:	Stable at normal ambient temperature and pressure and under recommended storage conditions. Air/heat/light sensitive.
Conditions to Avoid:	Exposure to air, light and heat. Avoid dust formation.
Incompatible Materials:	Strong oxidizing agents, air.
Hazardous Decomposition Products:	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Hazardous decomposition products formed under fire conditions: carbon oxides (CO _x) and manganese oxides. In the event of a fire: see section 5.
Possibility of Hazardous Reactions:	Under normal conditions of storage and use, hazardous reactions will not occur.

Section 11. Toxicological Information

Information on Toxicological Effects

Acute Toxicity	: No specific data available.
Irritation/Corrosion	: No specific data available.
Sensitization	: No specific data available.
Germ Cell Mutagenicity	: No effects known.
Carcinogenicity	
IARC	: No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

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Section 11. Toxicological Information

- ACGIH** : No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by ACGIH.
- NTP** : No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.
- OSHA** : No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by OSHA.

Reproductive Toxicity

: No specific data.

Teratogenicity

: No specific data available.

Specific Target Organ Toxicity (single exposure)

: Respiratory tract irritation.

Specific Target Organ Toxicity (repeated exposure)

: Chronic exposure may result in Central Nervous System disorders.

Aspiration Hazard

: No specific data available.

Information on the likely routes of exposure

: Inhalation, dermal, ingestion.

Additional Information

: Men exposed to manganese dust show a decrease in fertility. A high incidence of pneumonia has been observed in workers exposed to the dust or fumes of some manganese compounds. Chronic manganese poisoning primarily affects the Central Nervous System (CNS). Early symptoms include languor, sleepiness and a weakness in the legs. A stolid, mask-like appearance of the face, emotional disturbances such as uncontrollable laughter and a spastic gait with a tendency to fall in walking have been observed in more advanced cases.

To the best of our knowledge, the chemical, physical, toxicological and ecological properties of this product have not been thoroughly investigated.

Section 12. Ecological Information

Numerical Measures of Toxicity

Toxicity to Fish

: No specific data available.

Toxicity to daphnia and other aquatic invertebrates

: No specific data available.

Toxicity to algae

: No specific data available.

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Section 12. Ecological Information

Persistence and Degradability

- Biodegradability** : No specific data available.
- Bioaccumulative potential** : No specific data available.
- Mobility in soil** : No specific data available.
- Other Adverse Effects** : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Section 13. Disposal Considerations

Waste Treatment Methods

- Product** : Dispose of in accordance with local, state, and federal regulations. Refer to 40 CFR 260-299 for complete waste disposal regulations. Consult your local, state, or federal agency before disposing of any chemicals.
- Contaminated Packaging** : Empty containers retain product residue (dust, vapors and gases) and can be dangerous.

Section 14. Transport Information

	DOT	IMDG	IATA
UN Number	UN3467	UN3467	UN3467
UN Proper Shipping Name	Organometallic compound, solid, toxic, n.o.s. (Dimanganese decacarbonyl)	ORGANOMETALLIC COMPOUND, SOLID, TOXIC, N.O.S. (Dimanganese decacarbonyl)	Organometallic compound, solid, toxic, n.o.s. (Dimanganese decacarbonyl)
Transport Hazard Classes	6.1	6.1	6.1
Packing Group	II	II	II
Environmental Hazards	-	-	-
Additional Information		EMS No: F-A, S-A	

- Special Precautions for User** : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

- Transporting in Bulk According to Annex II of MARPOL 73/78 and the IBC Code** : Not applicable.

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Section 15. Regulatory Information

TSCA (Toxic Substance Control Act):

This product is not listed on the U.S. Toxic Substances Control Act Chemical Inventory (TSCA Inventory). Use of this product is restricted to research and development only. This product must be used under the supervision of a technically qualified individual as defined by the TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard (Acute Toxicity: Oral, Dermal, Inhalation)

Massachusetts Right to Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right to Know Components

Manganese

CAS-No.
7439-96-5

Revision Date

New Jersey Right to Know Components

Manganese

CAS-No.
7439-96-5

Revision Date

California Proposition 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Section 16. Other Information

National Fire Protection Association (U.S.A.)



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Section 16. Other Information

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

HMIS Rating

HEALTH	2
FLAMMABILITY	1
PHYSICAL HAZARD	1

History

Date of printing	: 1/26/2020
Date of issue/Date of Revision	: 1/26/2020
Date of previous issue	: 4/22/19
References	: None available.

Abbreviations and Acronyms

ACGIH: American Conference of Governmental Industrial Hygienists.
ATE: Acute Toxicity Estimate
CAS: Chemical Abstracts Service (division of the American Chemical Society).
DOT: US Department of Transportation.
GHS: Globally Harmonized System of Classification and Labeling of Chemicals.
HMIS: Hazardous Materials Identification System.
IARC: International Agency for Research on Cancer.
IATA: International Air Transport Association.
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA).
IDLH: Immediately Dangerous to Life or Health (US National Institute for Occupation Health and Safety (NIOSH)).
IMDG: International Maritime Code for Dangerous Goods.
NFPA: National Fire Protection Association.
NIOSH: National Institute of Occupational Safety and Health.
NTP: National Toxicology Program.
OSHA: Occupational Safety and Health Administration.
PEL: Permissible Exposure Limits.
REL: Recommended Exposure Limits.
SARA: Superfund Amendments and Reauthorization Act.
STOT: Specific Target Organ Toxicity.
TLV: Threshold Limit Values (ACGIH).

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Section 16. Other Information

Abbreviations and Acronyms (cont.)

TWA: Time Weighted Average.

VOC: Volatile Organic Compound.

Disclaimer

The information herein is believed to be accurate and is presented in good faith; however, no warranties or representations are made by Ereztech LLC regarding the accuracy or completeness of the information. Ereztech LLC shall not be liable for any damages resulting from the handling, or from the contact with the above product.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

