

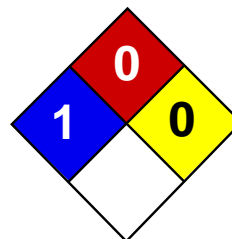
# Material Safety Datasheet (MSDS) for Lanthanum Manganese Oxide (LMO)

LMO is composed of following oxides

- Lanthanum oxide ( $\text{La}_2\text{O}_3$ )
  
- Manganese oxide
  - o  $\text{MnO}$
  - o  $\text{MnO}_2$
  - o  $\text{Mn}_2\text{O}_3$
  - o  $\text{Mn}_3\text{O}_4$

The MSDS for all the individual oxides is provided in this document.

Please turn to next page for individual MSDSs.



Health	1
Fire	0
Reactivity	0
Personal Protection	E

## Material Safety Data Sheet

### Lanthanum oxide MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** Lanthanum oxide

**Catalog Codes:** SLL1351, SLL1726

**CAS#:** 1312-81-8

**RTECS:** OE5330000

**TSCA:** TSCA 8(b) inventory: Lanthanum oxide

**CI#:** Not available.

**Synonym:**

**Chemical Formula:** La<sub>2</sub>O<sub>3</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Lanthanum oxide	1312-81-8	100

**Toxicological Data on Ingredients:** Not applicable.

#### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Hazardous in case of ingestion. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation.

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

#### Section 4: First Aid Measures

**Eye Contact:** No known effect on eye contact, rinse with water for a few minutes.

**Skin Contact:**

After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention.

**Serious Skin Contact:** Not available.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**

Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

### Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

### Section 6: Accidental Release Measures

**Small Spill:**

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill:**

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

### Section 7: Handling and Storage

**Precautions:** No specific safety phrase has been found applicable for this product.

**Storage:**

No specific storage is required. Use shelves or cabinets sturdy enough to bear the weight of the chemicals. Be sure that it is not necessary to strain to reach materials, and that shelves are not overloaded.

### Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection:** Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:** Not available.

### Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid.

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** 325.82 g/mole

**Color:** Not available.

**pH (1% soln/water):** Not applicable.

**Boiling Point:** 4200°C (7592°F)

**Melting Point:** 2307°C (4184.6°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 6.51 (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** Not available.

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:** Insoluble in cold water.

### Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

### Section 11: Toxicological Information

**Routes of Entry:** Ingestion.

**Toxicity to Animals:**

LD50: Not available. LC50: Not available.

**Chronic Effects on Humans:** Not available.

**Other Toxic Effects on Humans:**

Hazardous in case of ingestion. Slightly hazardous in case of skin contact (irritant), of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

## Section 15: Other Regulatory Information

**Federal and State Regulations:** TSCA 8(b) inventory: Lanthanum oxide

**Other Regulations:** Not available..

**Other Classifications:**

**WHMIS (Canada):** Not controlled under WHMIS (Canada).

**DSCL (EEC):**

This product is not classified according to the EU regulations.

**HMIS (U.S.A.):**

**Health Hazard:** 1

**Fire Hazard:** 0

**Reactivity:** 0

**Personal Protection:** E

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

**Health:** 1

**Flammability:** 0

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:20 PM

**Last Updated:** 05/21/2013 12:00 PM

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# Manganese Oxide MnO



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## MATERIAL SAFETY DATA SHEET

### I. PRODUCT IDENTIFICATION

**Manufacturer/Supplier:**

ESPI Metals

1050 Benson Way, Ashland, OR 97520

Toll Free (800) 638-2581 \* Fax (541) 488-8313

E-Mail: [sales@espimetals.com](mailto:sales@espimetals.com)

**Product Name:** Manganese Oxide

**Formula:** MnO

**CAS Number:** 1344-43-0

### II. HAZARDOUS INGREDIENTS

**Hazardous Components:** Manganese Oxide

**Percent (%):** 0-100

**OSHA PEL:** 5 mg (Mn)/m<sup>3</sup>

**ACGIH TLV:** 0.2 mg (Mn)/m<sup>3</sup>

**HMIS Ratings:**

**Health:** 1

**Flammability:** 0

**Reactivity:** 0

### III. PHYSICAL DATA

**Boiling Point:** N/E

**Melting Point:** N/E

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Contact

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Ashland, Oregon 97520

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800.638.2581 toll-free

541.488.8313 fax  
800.488.0060 toll-free fax

[sales@espimetals.com](mailto:sales@espimetals.com)

Precious Metal Prices

Jan 13, 2014 at 06:25 New York				
	Price	Change	High	
Gold	1245.80	-2.80	1253.30	
Silver	20.03	-0.14	20.36	
Platinum	1432.00	+0.00	1447.00	
Palladium	735.00	-7.00	749.00	

**Specific Gravity:** 5.43 -5.46 g/cc  
**Solubility in H<sub>2</sub>O:** Insoluble  
**Appearance and Odor:** Green powder, no odor.

#### **IV. FIRE AND EXPLOSION HAZARDS DATA**

**Flash Point:** N/A

**Autoignition Temperature:** N/E

**Flammable Limits: Upper:** N/A **Lower:** N/A

**Extinguishing Media:** Use suitable extinguishing media for surrounding material and type of fire.

**Special Fire Fighting Procedures:** Firefighters must wear full face, self contained breathing apparatus and full protective clothing to prevent contact with skin and eyes.

**Unusual Fire & Explosion Hazards:** None known

#### **V. HEALTH HAZARD INFORMATION**

##### **Health Hazards:**

To the best of our knowledge the chemical, physical and toxicological properties of manganese oxide have not been thoroughly investigated and recorded.

Some manganese compounds are experimental tumorigens. They can cause central nervous and pulmonary system damage by inhalation of fumes and dust. Very few poisonings have occurred from ingestion. Chronic manganese poisoning is a clearly characterized disease which results from inhalation of fumes or dusts of manganese. The central nervous system is the chief site of damage. Exposure to dusts and fumes can possibly increase the incidence of upper respiratory infections and pneumonia (Sax, Dangerous Properties of Industrial Materials).

##### **Acute Effects:**

**Inhalation:** May cause irritation of the respiratory tract and mucous membranes, increase the incidence of upper respiratory tract and pulmonary infections. May cause metal fume fever. May also cause emphysema and acute pulmonary edema.

**Ingestion:** Absorption of manganese compounds from the gastrointestinal tract is poor under normal conditions. May cause abdominal pain and nausea.

**Skin:** May cause irritation.

**Eye:** May cause irritation.

##### **Chronic Effects:**

**Inhalation:** May cause pulmonary pneumonitis, manganism (psychosis and neurological disorders affecting the central nervous system).

**Ingestion:** May cause manganism.

**Skin:** May cause dermatitis.

**Eye:** May cause conjunctivitis.

**Target Organs:** May affect the central nervous system, respiratory system, liver and reproductive system.

**Medical Conditions Generally Aggravated By Exposure:** Pre-existing respiratory disorders.

**Carcinogenicity: NTP:** No **IARC:** No **OSHA:** No

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## **EMERGENCY AND FIRST AID PROCEDURES:**

**INHALATION:** Remove victim to fresh air, keep warm and quiet, give oxygen if breathing is difficult and seek medical attention immediately.

**INGESTION:** Give 1-2 glasses of water or milk and induce vomiting; seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

**SKIN:** Remove contaminated clothing, brush material off skin, wash affected area with soap and water. Seek medical attention.

**EYE:** Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention.

## **VI. REACTIVITY DATA**

**Stability:** Stable

**Conditions to Avoid:** No data

**Incompatibility (Material to Avoid):** Strong oxidizing agents

**Hazardous Decomposition Products:** Manganese fume

**Hazardous Polymerization:** Will not occur

## **VII. SPILL OR LEAK PROCEDURES**

**Steps to Be Taken in Case Material Is Released or Spilled:** Wear appropriate respiratory and protective equipment specified in section VIII. Isolate spill area, provide ventilation. Sweep or vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

**Waste Disposal Method:** Dispose of in accordance with all Local, State and Federal regulations.

## **VIII. SPECIAL PROTECTION INFORMATION**

**Respiratory Protection:** NIOSH-approved dust respirator.

**Ventilation:** Use local exhaust to maintain concentration at or below the PEL, TLV. Mechanical exhaust is not recommended.

**Eye Protection:** Safety glasses

**Protective Gloves:** Impervious gloves

**Other Protective Clothing or Equipment:** Protective gear suitable to prevent contamination.

## **IX. SPECIAL PRECAUTIONS**

**Precautions to Be Taken in Handling and Storage:** Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation at the workplace.

**Work Practices:** Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

**TSCA Listed:** Yes

**DOT Regulations:**

**Hazard Class:** None

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. ESPI shall not be held liable for any damage resulting from handling or from contact with the above product.

Issued by: S. Dierks

Revised/Verified: August 2011

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# Manganese Oxide MnO<sub>2</sub>



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**MATERIAL SAFETY DATA SHEET**

**I. PRODUCT IDENTIFICATION**

**Manufacturer/Supplier:**

ESPI Metals

1050 Benson Way, Ashland, OR 97520

Toll Free (800) 638-2581 \* Fax (541) 488-8313

E-Mail: [sales@espimetals.com](mailto:sales@espimetals.com)

**Product Name:** Manganese Oxide (Manganese IV Oxide)

**Formula:** MnO<sub>2</sub>

**CAS Number:** 1313-13-9

**II. HAZARDOUS INGREDIENTS**

**Hazardous Components:** Manganese Oxide

**Percent (%):** 0-100

**OSHA PEL:** 5 mg (Mn)/m<sup>3</sup>

**ACGIH TLV:** 0.2 mg (Mn)/m<sup>3</sup>

**HMIS Ratings:**

**Health:** 1

**Flammability:** 0

**Reactivity:** 2

**III. PHYSICAL DATA**

**Boiling Point:** N/E

**Melting Point:** 535 °C

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**ESPI Metals**

1050 Benson Way  
Ashland, Oregon 97520

541.488.8311 telephone  
800.638.2581 toll-free

541.488.8313 fax  
800.488.0060 toll-free fax

[sales@espimetals.com](mailto:sales@espimetals.com)

Precious Metal Prices

Jan 13, 2014 at 06:27 New York				
	Price	Change	High	
Gold	▼ 1245.80	-2.80	1253.30	
Silver	▼ 20.00	-0.17	20.36	
Platinum	▼ 1431.00	-1.00	1447.00	
Palladium	▼ 735.00	-7.00	749.00	

**Specific Gravity:** 5.026 g/cc  
**Solubility in H<sub>2</sub>O:** Insoluble  
**Appearance and Odor:** Black powder, no odor.

#### **IV. FIRE AND EXPLOSION HAZARDS DATA**

**Flash Point:** N/A

**Autoignition Temperature:** N/E

**Flammable Limits: Upper:** N/A    **Lower:** N/A

**Extinguishing Media:** Use suitable extinguishing media for surrounding material and type of fire.

**Special Fire Fighting Procedures:** Wear NIOSH/MSHA approved self contained breathing apparatus, protective clothing, boots and gloves. If without risk, remove material from fire area.

**Unusual Fire & Explosion Hazards:** This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Promotes fire.

#### **V. HEALTH HAZARD INFORMATION**

##### **Health Hazards:**

To the best of our knowledge the chemical, physical and toxicological properties of manganese oxide have not been thoroughly investigated and recorded.

Some manganese compounds are experimental tumorigens. They can cause central nervous and pulmonary system damage by inhalation of fumes and dust. Very few poisonings have occurred from ingestion. Chronic manganese poisoning is a clearly characterized disease which results from inhalation of fumes or dusts of manganese. The central nervous system is the chief site of damage. Exposure to dusts and fumes can possibly increase the incidence of upper respiratory infections and pneumonia (Sax, Dangerous Properties of Industrial Materials).

##### **Acute Effects:**

**Inhalation:** May cause irritation of the respiratory tract and mucous membranes, increase the incidence of upper respiratory tract and pulmonary infections. May cause metal fume fever. May also cause emphysema and acute pulmonary edema.

**Ingestion:** Absorption of manganese compounds from the gastrointestinal tract is poor under normal conditions. May cause abdominal pain and nausea.

**Skin:** May cause irritation.

**Eye:** May cause irritation.

##### **Chronic Effects:**

**Inhalation:** May cause pulmonary pneumonitis, manganism (psychosis and neurological disorders effecting the central nervous system).

**Ingestion:** May cause manganism.

**Skin:** May cause dermatitis.

**Eye:** May cause conjunctivitis.

**Target Organs:** May affect the central nervous system, respiratory system, liver, reproductive system.

**Carcinogenicity: NTP:** No    **IARC:** No    **OSHA:** No

#### **EMERGENCY AND FIRST AID PROCEDURES:**

**INHALATION:** Remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek

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medical attention immediately.

**INGESTION:** Give 1-2 glasses of water or milk and induce vomiting; seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

**SKIN:** Remove contaminated clothing; brush material off skin; wash affected area with soap and water. Seek medical attention.

**EYE:** Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention.

## **VI. REACTIVITY DATA**

**Stability:** Stable

**Conditions to Avoid:** No data

**Incompatibility (Material to Avoid):** Reducing agents, easily oxidized materials, organic materials, acids, aluminum powder, interhalogens.

**Hazardous Decomposition Products:** Toxic metal oxide fumes.

**Hazardous Polymerization:** Will not occur

## **VII. SPILL OR LEAK PROCEDURES**

**Steps to Be Taken in Case Material Is Released or Spilled:** Wear appropriate respiratory and protective equipment specified in section VIII. Isolate spill area, provide ventilation and extinguish sources of ignition. Scoop up or vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust. Use non-sparking tools.

**Waste Disposal Method:** Dispose of in accordance with Federal, State and Local regulations.

## **VIII. SPECIAL PROTECTION INFORMATION**

**Respiratory Protection:** NIOSH approved respirator.

**Ventilation:** Use local exhaust to maintain concentration at or below the PEL, TLV. Mechanical exhaust is not recommended.

**Eye Protection:** Safety glasses

**Protective Gloves:** Impervious gloves

**Other Protective Equipment:** Protective gear suitable to prevent contamination.

## **IX. SPECIAL PRECAUTIONS**

**Precautions to Be Taken in Handling and Storage:** Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Minimize dust generation and accumulation. Ensure good ventilation at the workplace.

**Work Practices:** Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

**TSCA Listed:** Yes

**DOT Regulations:**

**Hazard Class:** None

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. ESPI shall not be held liable for any damage resulting from handling or from contact with the above product.

Issued By: S. Dierks

Revised/Verified: August 2011

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# Manganese Oxide Mn<sub>2</sub>O<sub>3</sub>



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## MATERIAL SAFETY DATA SHEET

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1050 Benson Way, Ashland, OR 97520

Toll Free (800) 638-2581 \* Fax (541) 488-8313

E-Mail: [sales@espimetals.com](mailto:sales@espimetals.com)

**Product Name:** Manganese Oxide (Manganese III Oxide)

**Formula:** Mn<sub>2</sub>O<sub>3</sub>

**CAS Number:** 1317-34-6

### II. HAZARDOUS INGREDIENTS

**Hazardous Components:** Manganese Oxide

**Percent (%):** 0-100

**OSHA PEL:** 5 mg (Mn)/m<sup>3</sup>

**ACGIH TLV:** 0.2 mg (Mn)/m<sup>3</sup>

**HMIS Ratings:**

**Health:** 1

**Flammability:** 0

**Reactivity:** 0

### III. PHYSICAL DATA

**Boiling Point:** N/E

**Melting Point:** N/E

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Precious Metal Prices

Jan 13, 2014 at 06:25 New York			
	Price	Change	High
Gold	1245.80	-2.80	1253.30
Silver	20.03	-0.14	20.36
Platinum	1432.00	+0.00	1447.00
Palladium	735.00	-7.00	749.00

**Specific Gravity:** 4.50 gm/cc  
**Solubility in H<sub>2</sub>O:** Insoluble  
**Appearance and Odor:** Black crystalline powder

#### **IV. FIRE AND EXPLOSION HAZARDS DATA**

**Flash Point:** N/A

**Autoignition Temperature:** N/A

**Flammable Limits: Upper:** N/A    **Lower:** N/A

**Extinguishing Media:** Use suitable extinguishing media for surrounding material and type of fire.

**Special Fire Fighting Procedures:** Firefighters must wear full face, self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes.

**Unusual Fire & Explosion Hazards:** May emit toxic fumes when heated to decomposition.

#### **V. HEALTH HAZARD INFORMATION**

##### **Health Hazards:**

To the best of our knowledge the chemical, physical and toxicological properties of manganese oxide have not been thoroughly investigated and recorded.

Some manganese compounds are experimental tumorigens. They can cause central nervous and pulmonary system damage by inhalation of fumes and dust. Very few poisonings have occurred from ingestion. Chronic manganese poisoning is a clearly characterized disease which results from inhalation of fumes or dusts of manganese. The central nervous system is the chief site of damage. Exposure to dusts and fumes can possibly increase the incidence of upper respiratory infections and pneumonia (Sax, Dangerous Properties of Industrial Materials).

##### **Acute Effects:**

**Inhalation:** May cause irritation of the respiratory tract and mucous membranes, increase the incidence of upper respiratory tract and pulmonary infections. May cause metal fume fever. May also cause emphysema and acute pulmonary edema.

**Ingestion:** Absorption of manganese compounds from the gastrointestinal tract is poor under normal conditions. May cause abdominal pain and nausea.

**Skin:** May cause irritation.

**Eye:** May cause irritation.

##### **Chronic Effects:**

**Inhalation:** May cause pulmonary pneumonitis, manganism (psychosis and neurological disorders effecting the central nervous system).

**Ingestion:** None recorded.

**Skin:** May cause dermatitis.

**Eye:** May cause conjunctivitis.

**Target Organs:** May affect the central nervous system, respiratory system, liver and reproductive system.

**Carcinogenicity: NTP:** No    **IARC:** No    **OSHA:** No

#### **EMERGENCY AND FIRST AID PROCEDURES:**

**INHALATION:** Remove victim to fresh air, keep warm and quiet, give oxygen if breathing is difficult and seek

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medical attention.

**INGESTION:** Give 1-2 glasses of water or milk and induce vomiting; seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

**SKIN:** Remove contaminated clothing, brush material off skin, wash affected area with soap and water. Seek medical attention.

**EYE:** Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention.

## **VI. REACTIVITY DATA**

**Stability:** Stable

Conditions to Avoid: No data

**Incompatibility (Material to Avoid):** Strong oxidizing agents.

**Hazardous Decomposition Products:** Manganese fume.

**Hazardous Polymerization:** Will not occur

## **VII. SPILL OR LEAK PROCEDURES**

**Steps to Be Taken in Case Material Is Released or Spilled:** Wear appropriate respiratory and protective equipment specified in section VIII. Isolate spill area, provide ventilation and extinguish sources of ignition. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust. Use non-sparking tools.

**Waste Disposal Method:** Dispose of in accordance with Federal, State and Local regulations.

## **VIII. SPECIAL PROTECTION INFORMATION**

**Respiratory Protection:** NIOSH-approved dust respirator.

**Ventilation:** Use local exhaust to maintain concentration at or below the PEL, TLV. Mechanical exhaust is not recommended.

**Eye Protection:** Safety glasses

**Protective Gloves:** Impervious gloves.

**Other Protective Clothing or Equipment:** Protective gear suitable to prevent contamination.

## **IX. SPECIAL PRECAUTIONS**

**Precautions to Be Taken in Handling and Storage:** Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation at the workplace.

**Work Practices:** Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

**TSCA Listed:** Yes

**DOT Regulations:**

**Hazard Class:** None

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Issued By: S. Dierks

Revised/Verified: August 2011

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# Manganese Oxide Mn3O4



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**MATERIAL SAFETY DATA SHEET**

**I. PRODUCT IDENTIFICATION**

**Manufacturer/Supplier:**

ESPI Metals

1050 Benson Way, Ashland, OR 97520

Toll Free (800) 638-2581 \* Fax (541) 488-8313

E-Mail: [sales@espimetals.com](mailto:sales@espimetals.com)

**Product Name:** Manganese Oxide

**Formula:** Mn<sub>3</sub>O<sub>4</sub> (plus MnO)

**CAS Number:** 1317-35-7

**II. HAZARDOUS INGREDIENTS**

**Hazardous Components:** Manganese Oxide

**Percent (%):** 0-100

**OSHA PEL:** 5 mg(Mn)/m<sup>3</sup>

**ACGIH TLV:** 0.2 mg(Mn)/m<sup>3</sup>

**III. PHYSICAL DATA**

**Boiling Point:** N/E

**Melting Point:** 1564 °C

**Specific Gravity:** 4.856 g/cc

**Solubility in H<sub>2</sub>O:** Insoluble

**Appearance and Odor:** Black crystalline powder and pieces, no odor.

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Contact

**ESPI Metals**

1050 Benson Way  
Ashland, Oregon 97520

541.488.8311 telephone  
800.638.2581 toll-free

541.488.8313 fax  
800.488.0060 toll-free fax

[sales@espimetals.com](mailto:sales@espimetals.com)

Precious Metal Prices

Jan 13, 2014 at 06:25 New York				
	Price	Change	High	
Gold	1245.80	-2.80	1253.30	
Silver	20.03	-0.14	20.36	
Platinum	1432.00	+0.00	1447.00	
Palladium	735.00	-7.00	749.00	

#### **IV. FIRE AND EXPLOSION HAZARDS DATA**

**Flash Point:** N/A

**Autoignition Temperature:** N/E

**Flammable Limits: Upper:** N/A **Lower:** N/A

**Extinguishing Media:** Use suitable extinguishing media for surrounding material and type of fire.

**Special Fire Fighting Procedures:** Wear NIOSH/MSHA approved self contained breathing apparatus, protective clothing, boots and gloves. If without risk, remove material from fire area.

**Unusual Fire & Explosion Hazards:** When heated to decomposition this material may emit toxic fumes.

#### **V. HEALTH HAZARD INFORMATION**

##### **Effects of Exposure:**

To the best of our knowledge the chemical, physical and toxicological properties of manganese oxide have not been thoroughly investigated and reported.

Some manganese compounds are experimental tumorigens. They can cause central nervous system and pulmonary system damage by inhalation of fumes and dust. Very few poisonings have occurred from ingestion. Chronic manganese poisoning is a clearly characterized disease which results from inhalation of fumes or dusts of manganese. The central nervous system is the chief site of damage. Exposure to dusts and fumes can possibly increase the incidence of upper respiratory infections and pneumonia (Sax, Dangerous Properties of Industrial Materials).

##### **Acute Effects:**

**Inhalation:** Inhalation of manganese compounds is considered the primary route of exposure, they may cause irritation of the respiratory tract and mucous membranes. Inhalation of manganese compounds' fine dusts and fumes may cause metal fume fever.

**Ingestion:** Absorption of manganese compounds from the gastrointestinal tract is poor under normal conditions.

**Skin:** Absorption by skin is poor.

**Eye:** May cause moderate irritation.

##### **Chronic Effects:**

**Inhalation:** Chronic inhalation of manganese compounds' dust particles, approximately 3  $\mu\text{m}$  in size, for a period of a few months may cause pulmonary pneumonitis. Manganese compounds may also cause manganism, psychic and neurological disorders affecting the central nervous system, to develop (not fatal but can cause permanent disability).

**Ingestion:** No chronic effects recorded.

**Skin:** No chronic effects recorded.

**Eye:** No chronic effects recorded.

**Routes of Entry:** Inhalation

**Target Organs:** May affect the central nervous system, kidneys, respiratory system and liver.

**Medical Conditions Generally Aggravated By Exposure:** It has been recorded that when exposed to manganese dust and fumes, there is a higher incidence of upper respiratory infection and pneumonia compared to general population.

**Carcinogenicity: NTP:** No **IARC:** No **OSHA:** No

#### **EMERGENCY AND FIRST AID PROCEDURES:**

**INHALATION:** Remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek

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medical attention immediately.

**INGESTION:** Give 1-2 glasses of water or milk and induce vomiting; seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

**SKIN:** Remove contaminated clothing; brush material off skin; wash affected area with soap and water. Seek medical attention.

**EYE:** Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention.

## **VI. REACTIVITY DATA**

**Stability:** Stable

**Conditions to Avoid:** None

**Incompatibility (Material to Avoid):** Easily oxidized materials and reducing agents.

**Hazardous Decomposition Products:** Manganese oxide fume.

**Hazardous Polymerization:** Will not occur

## **VII. SPILL OR LEAK PROCEDURES**

**Steps to Be Taken in Case Material Is Released or Spilled:** Wear appropriate respiratory and protective equipment specified in section VIII. Isolate spill area, provide ventilation and extinguish sources of ignition. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

**Waste Disposal Method:** Dispose of in accordance with Local, State and Federal regulations.

## **VIII. SPECIAL PROTECTION INFORMATION**

**Respiratory Protection:** NIOSH approved dust respirator.

**Ventilation:** Use local exhaust to maintain concentration at or below the PEL, TLV. Mechanical exhaust is not recommended.

**Eye Protection:** Safety glasses

**Protective Gloves:** Rubber gloves

**Other Protective Equipment:** For long periods of exposure, wear protective clothing.

## **IX. SPECIAL PRECAUTIONS**

**Precautions to Be Taken in Handling and Storage:** Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Avoid breathing dust and use adequate ventilation. Store away from oxidizers. Wash thoroughly after handling.

**Work Practices:** Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

**TSCA Listed:** Yes

**Dot Regulations:**

**Hazard Class:** None

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