

# Material Safety Data Sheet

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Revision Date

Revision Number 0

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name** Magnesium Alloys

**Synonyms** Mg.

**Distributor**

ThyssenKrupp Materials NA, Inc.  
22355 W. Eleven Mile Road  
Southfield, Michigan 48034  
TEL: 248-233-5681

**Emergency Telephone Number** 248-233-5681

## 2. HAZARDS IDENTIFICATION

**WARNING!**

### Emergency Overview

Non-combustible as supplied.  
Small chips, fines and dust from processing may be readily ignitable.  
Hazardous fumes can also occur in post-processing operations  
Product dust may be irritating to eyes, skin and respiratory system.  
Dust may form explosive mixture in air  
Possibly cancer hazard by inhalation

**Appearance** Metallic

**Physical State** Solid.

**Odor** Odorless

**OSHA Regulatory Status**

**General Hazard Statement:** Solid metallic products are generally classified as "articles" and do not constitute hazardous materials in solid form under the definitions of the OSHA Hazard Communication Standard (29 CFR 1910.1200). Any articles manufactured from these solid products would be generally classified as non-hazardous. However, some hazardous elements contained in these products can be emitted under certain processing conditions such as but not limited to: burning, melting, cutting, sawing, brazing, grinding, machining, milling, and welding.

**Potential Health Effects**

**Principle Routes of Exposure**

Eye contact. Skin contact. Inhalation.

**Acute Toxicity**

**Eyes**  
**Skin**

Dust contact with the eyes can lead to mechanical irritation.  
Contact with dust can cause mechanical irritation or drying of the skin. Contact with oils from processing may cause irritation. Prolonged skin contact may defat the skin and produce dermatitis. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.

**Inhalation**

May be harmful if inhaled. Inhalation of dust in high concentration may cause irritation of respiratory system. Inhalation of fumes may cause metal-fume fever.

**Ingestion**

May be harmful if swallowed. May cause additional affects as listed under "Inhalation".

<b>Chronic Effects</b>	Repeated contact may cause allergic reactions in very susceptible persons. Avoid repeated exposure. Prolonged exposure may cause chronic effects. Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination. May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects.  Elevated temperature processing such as welding and plasma arc cutting may release hazardous fumes. Overexposure to metal fumes may cause pulmonary edema (fluid in the lungs) and methemoglobinemia. May also cause pulmonary fibrosis and lung cancer.
<b>Aggravated Medical Conditions</b>	Allergies. Skin disorders. Respiratory disorders. Central nervous system. Pre-existing eye disorders. Blood disorders. Kidney disorders. Liver disorders. Nasal cavities. Lungs.
<b>Interactions with Other Chemicals</b>	Irritants. Sensitizers. Epoxies. Use of alcoholic beverages may enhance toxic effects.
<b>Environmental Hazard</b>	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. See Section 12 for additional Ecological Information.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Each alloy may contain one or more of the following ingredients. Consult the Technical Data Sheet for the composition of specific alloys.

Chemical Name	CAS-No	Weight %
Magnesium	7439-95-4	80.0-99.7
Aluminum	7429-90-5	0.01-9.0
Zinc oxide	1314-13-2	1.0-3.0
Manganese	7439-96-5	0.01-1.0

Magnesium alloys may be comprised of all or variations of the alloys shown here.

### 4. FIRST AID MEASURES

<b>Eye Contact</b>	Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Consult a physician.
<b>Skin Contact</b>	Wash skin with soap and water. In the case of skin irritation or allergic reactions see a physician.
<b>Inhalation</b>	Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Consult a physician.
<b>Ingestion</b>	Do NOT induce vomiting. Call a physician or Poison Control Center immediately. Drink plenty of water. Never give anything by mouth to an unconscious person.
<b>Notes to Physician</b>	May cause sensitization of susceptible persons. Treat symptomatically.

### 5. FIRE-FIGHTING MEASURES

<b>Flammable Properties</b>	This product does not present fire or explosion hazards as shipped. Small chips, fines, and dust from processing may be readily ignitable.
<b>Flash Point</b>	Not applicable.
<b>Suitable Extinguishing Media</b>	Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chips and fines.
<b>Unsuitable Extinguishing Media</b>	DO NOT use halogenated extinguishing agents on small chips or fines. DO NOT use water for fires involving molten metal. These fire extinguishing agents will react with burning material.

**Explosion Data**

**Sensitivity to Mechanical Impact** None  
**Sensitivity to Static Discharge** None

**Specific Hazards Arising from the Chemical** Thermal decomposition can lead to release of irritating gases and vapors. In the event of fire and/or explosion do not breathe fumes. May cause sensitization by inhalation and skin contact.

**Protective Equipment and Precautions for Firefighters** As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

<b>NFPA</b>	<b>Health Hazard 2</b>	<b>Flammability 0</b>	<b>Instability 0</b>	<b>Physical and Chemical Hazards -</b>
<b>HMIS</b>	<b>Health Hazard 2*</b>	<b>Flammability 0</b>	<b>Physical Hazard 0</b>	<b>Personal Protection X</b>

*\*Indicates a chronic health hazard.*

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions** Use personal protective equipment. Keep people away from and upwind of spill/leak.

**Environmental Precautions** Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system.

**Methods for Containment** Prevent further leakage or spillage if safe to do so.

**Methods for Cleaning Up** Avoid dust formation. Collect scrap for recycling.

If product is molten, contain the flow using dry sand or salt flux as a dam. All tools and containers which come in contact with molten metal must be preheated or specially coated and rust free. Allow the spill to cool before remelting as scrap.

## 7. HANDLING AND STORAGE

**Handling** Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Avoid dust formation. Keep material dry. Avoid contact with sharp edges or heated material. Hot and cold aluminum are not visually different. Hot aluminum does not always glow red.

**Storage** Keep container tightly closed in a dry and well-ventilated place.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Aluminum 7429-90-5	TWA: 1 mg/m <sup>3</sup> respirable fraction	TWA: 15 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable fraction (vacated) TWA: 15 mg/m <sup>3</sup> total dust (vacated) TWA: 5 mg/m <sup>3</sup> respirable fraction	TWA: 10 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable dust
Zinc oxide 1314-13-2	STEL: 10 mg/m <sup>3</sup> respirable fraction TWA: 2 mg/m <sup>3</sup> respirable fraction	TWA: 5 mg/m <sup>3</sup> fume TWA: 15 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable fraction (vacated) TWA: 5 mg/m <sup>3</sup> fume (vacated) TWA: 10 mg/m <sup>3</sup> total dust (vacated) TWA: 5 mg/m <sup>3</sup> respirable fraction (vacated) STEL: 10 mg/m <sup>3</sup> fume	IDLH: 500 mg/m <sup>3</sup> Ceiling: 15 mg/m <sup>3</sup> dust TWA: 5 mg/m <sup>3</sup> dust and fume STEL: 10 mg/m <sup>3</sup> fume
Manganese 7439-96-5	TWA: 0.2 mg/m <sup>3</sup>	(vacated) TWA: 1 mg/m <sup>3</sup> fume (vacated) STEL: 3 mg/m <sup>3</sup> fume (vacated) Ceiling: 5 mg/m <sup>3</sup> Ceiling: 5 mg/m <sup>3</sup> fume	IDLH: 500 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup> fume STEL: 3 mg/m <sup>3</sup>

*ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value. OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits. NIOSH IDLH: Immediately Dangerous to Life or Health.*

### Other Exposure Guidelines

Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992). Hexavalent chrome may be formed during welding.

### Engineering Measures

Showers  
Eyewash stations  
Ventilation systems

### Personal Protective Equipment

#### Eye/Face Protection Skin and Body Protection Respiratory Protection

Safety glasses with side-shields.  
Impervious clothing. Impervious gloves.  
If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

### Hygiene Measures

Do not breathe vapors/dust. When using, do not eat, drink or smoke. Provide regular cleaning of equipment, work area and clothing. Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Keep away from food, drink and animal feeding stuffs.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	Metallic.	<b>Odor</b>	Odorless.
<b>Odor Threshold</b>	No information available	<b>Physical State</b>	Solid
<b>pH</b>	No information available.	<b>Autoignition Temperature</b>	No information available.
<b>Flash Point</b>	Not applicable.	<b>Boiling Point/Boiling Range</b>	No information available
<b>Decomposition Temperature</b>	No information available.		
<b>Melting Point/Range</b>	626.67°C / 1160°F		
<b>Flammability Limits in Air</b>	No information available.		
<b>Specific Gravity</b>	1.77	<b>Solubility</b>	No information available.
<b>Evaporation Rate</b>	No information available	<b>Vapor Pressure</b>	No data available.
<b>Vapor Density</b>	No data available.		

**10. STABILITY AND REACTIVITY**

<b>Stability</b>	Stable under recommended storage conditions.
<b>Incompatible Products</b>	Acids. Alkalies. Water. Halogenated compounds. Metal oxides. Iron powder and water: may cause an explosive reaction forming hydrogen gas when heated above 1470F (800C).
<b>Conditions to Avoid</b>	Dust formation. Heat, flames and sparks. Protect from water. Aluminum fines are attacked by strong acids and alkalis and by some halogenated organic compounds especially at elevated temperatures. Operations generating aluminum fines may produce hydrogen gas when exposed to moisture. Hydrogen gas is highly flammable and can accumulate in poorly ventilated areas. Liberates flammable hydrogen gas on contact with water, alcohols, acidic or basic materials, and metals or metallic compounds.
<b>Hazardous Decomposition Products</b>	Magnesium oxides. Fumes of aluminum or aluminum oxide. Welding of aluminum alloys may generate carbon monoxide, carbon dioxide, ozone, and nitrogen oxides. Zinc oxides.
<b>Hazardous Polymerization</b>	Hazardous polymerization does not occur.

## 11. TOXICOLOGICAL INFORMATION

### Acute Toxicity

#### Product Information

<b>Inhalation</b>	May cause irritation of respiratory tract. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count.
<b>Eye Contact</b>	Dust contact with the eyes can lead to mechanical irritation.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Magnesium	= 230 mg/kg ( Rat )		
Zinc oxide	> 5000 mg/kg ( Rat )		
Manganese	= 9 g/kg ( Rat )		

### Chronic Toxicity

**Chronic Toxicity** Repeated contact may cause allergic reactions in very susceptible persons. Avoid repeated exposure. Prolonged exposure may cause chronic effects. Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination. May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects.

Elevated temperature processing such as welding and plasma arc cutting may release hazardous fumes. Overexposure to metal fumes may cause pulmonary edema (fluid in the lungs) and methemoglobinemia. May also cause pulmonary fibrosis and lung cancer.

**Carcinogenicity** This product contains one or more substances which are classified by IARC as carcinogenic to humans (Group I), probably carcinogenic to humans (Group 2A) or possibly carcinogenic to humans (Group 2B).

**ACGIH: (American Conference of Governmental Industrial Hygienists)**

A3 - Animal Carcinogen

**IARC: (International Agency for Research on Cancer)**

Group 1 - Carcinogenic to Humans

Group 2A - Probably Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

**NTP: (National Toxicity Program)**

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

**OSHA: (Occupational Safety & Health Administration)**

X - Present

**Target Organ Effects** Blood. Central nervous system (CNS). Eyes. Kidney. Liver. Lungs. Nasal cavities. Respiratory system. Skin.

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Zinc oxide	Selenastrum capricornutum 72-hour EC50: 0.14 mg/l	Oncorhynchus mykiss 96-hour LC50: 0.14 mg/l		Daphnia magna 48-hour EC50: 0.07 mg/l

### 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Methods** Dispose of in accordance with local regulations.

**Contaminated Packaging** Do not re-use empty containers.

This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical Name	California Hazardous Waste
Aluminum	Ignitable powder
Zinc oxide	Toxic
Manganese	Ignitable powder

### 14. TRANSPORT INFORMATION

**DOT** Not regulated

**TDG** Not regulated

**MEX** Not regulated

### 15. REGULATORY INFORMATION

#### International Inventories

<b>TSCA</b>	Complies
<b>DSL</b>	Complies
<b>EINECS</b>	Complies
<b>ENCS</b>	Complies
<b>IECSC</b>	Complies
<b>KECL</b>	Complies
<b>PICCS</b>	Complies
<b>AICS</b>	Complies

#### Legend

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

#### U.S. Federal Regulations

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

Chemical Name	CAS-No	Weight %	SARA 313 - Threshold Values %
Aluminum	7429-90-5	9	1.0
Manganese	7439-96-5	1	1.0
Zinc oxide	1314-13-2	3	1.0

#### SARA 311/312 Hazard Categories

**Acute Health Hazard**

Yes

<b>Chronic Health Hazard</b>	Yes
<b>Fire Hazard</b>	No
<b>Sudden Release of Pressure Hazard</b>	No
<b>Reactive Hazard</b>	No

**Clean Water Act**

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

**CERCLA**

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

**U.S. State Regulations****California Proposition 65**

This product contains the following Proposition 65 chemicals:

**U.S. State Right-to-Know Regulations**

Chemical Name	New Jersey	Massachusetts	Pennsylvania	Illinois	Rhode Island
Magnesium	X	X	X		X
Aluminum	X	X	X		X
Zinc oxide	X	X	X		X
Manganese	X	X	X	X	X

**International Regulations**

Chemical Name	Carcinogen Status	Exposure Limits
Aluminum		Mexico: TWA= 10 mg/m <sup>3</sup>
Zinc oxide		Mexico: TWA 5 mg/m <sup>3</sup> Mexico: TWA 10 mg/m <sup>3</sup> Mexico: STEL 10 mg/m <sup>3</sup>
Manganese		Mexico: TWA 0.2 mg/m <sup>3</sup> Mexico: TWA 1 mg/m <sup>3</sup> Mexico: STEL 3 mg/m <sup>3</sup>

**Canada**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

**WHMIS Hazard Class**

Non-controlled

Chemical Name	NPRI
Aluminum	X

**Legend**

NPRI - National Pollutant Release Inventory



**16. OTHER INFORMATION**

**Prepared By** Product Stewardship  
23 British American Blvd.  
Latham, NY 12110  
1-800-572-6501

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**Revision Date**

**Revision Note** Initial Release.

**General Disclaimer**

The information provided on this MSDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

**End of Safety Data Sheet**