

MATERIAL SAFETY DATA SHEET
MAGNESIUM OXIDE

SECTION I: CHEMICAL PRODUCT & COMPANY INFORMATION

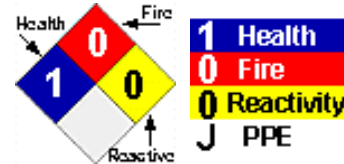
MARTIN MARIETTA MAGNESIA SPECIALTIES LLC
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BALTIMORE, MARYLAND 21220-0470
(410) 780-5500

MSDS No. 6000

DATE:

Emergency Phone: (800)424-9300 CHEMTREC

PRODUCT NAME(S): MagChem 10 (all grades and sizings)



CHEMICAL DESCRIPTION: Magnesium Oxide FORMULA: MgO

SECTION II: COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENT	CAS No	Approx Wt %	LD50 or LC50 (species/route)
Magnesium Oxide Dust	01309-48-4	60-100	No data available (dust)
Magnesium oxide *FUME*	01309-48-4	unknown	TCLo 400 mg/m3 (human/inhalation)
Magnesium oxide *FUME* may be generated in a reducing environment when temperatures exceed 1700C.			

SECTION III: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Product contains mechanical irritants to skin, eyes and respiratory tract and may present a nuisance dust hazard. Avoid breathing dust. Avoid contact with skin. Wear protective clothing including gloves, goggles or safety glasses with side shields and NIOSH approved dust mask. Magnesium oxide FUME may be generated in a reducing environment when temperatures exceed 1700°C (3092°F).

EFFECTS OF ACUTE EXPOSURE: Dust may irritate eyes, skin, nasal passages and respiratory tract. Inhalation of freshly generated magnesium oxide FUME may result in metal fume fever. Ingestion generally causes purging of the bowels, however, swallowing large amounts may lead to bowel obstruction.

EFFECTS OF CHRONIC EXPOSURE: No data available.

SIGNS & SYMPTOMS OF EXPOSURE:

INHALED DUST: sneezing, coughing, discolored sputum

INHALED FUME: metal fume fever has influenza-like symptoms including fever, chills, perspiration, cough, nasal irritation, chest pain, nausea, head aches, vomiting and muscular weakness. Symptoms may be delayed 1-3 hours after exposure however no reports of such exposures from industrial contact have been reported.

EYE CONTACT: redness, tearing, conjunctivitis.

SKIN CONTACT: drying, chapping, dermatitis.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: As with exposure to any environment without adequate personal protection, inhalation of magnesium oxide dust or fume may aggravate any pre-existing respiratory disease; prolonged/frequent skin contact may lead to dermatitis.

SECTION IV: FIRST AID MEASURES

INHALATION: Remove to fresh air immediately. Do not permit exposed person to remain in dusty environment without adequate respiratory protection. Treat metal fume fever with bed rest and treat for fever and pain.

EYE CONTACT: Do not rub eyes. Wash eyes under slowly running water for at least fifteen minutes, making sure eyes are held wide open and moved slowly in every direction. Ensure no solid particles remain in creases of eyelids. If so, continue to wash. If irritation persists, consult an ophthalmologist.

SKIN CONTACT: Remove from source of irritation. Remove contaminated clothing and wash affected area thoroughly with a mild soap and water. Wash contaminated clothing before reusing.

INGESTION: Treat symptomatically. If bowel obstruction occurs, immediately consult a physician.

SECTION V: FIRE FIGHTING MEASURES

FLASH POINT (METHOD): Product is not flammable or combustible.

AUTO-IGNITION TEMP: Not applicable LEL: Not applicable UEL: Not applicable

SENSITIVE TO MECHANICAL IMPACT? No SENSITIVE TO STATIC DISCHARGE? No

FLAMMABILITY CLASSIFICATION: Not flammable CONDITIONS OF FLAMMABILITY: Not flammable

EXTINGUISHING MEDIA: Use media appropriate to primary source of fire. Otherwise, use dry chemical, carbon dioxide, water spray or foam.

SPECIAL FIREFIGHTING PROCEDURES: No special procedures; avoid breathing fumes or dust; keep upwind.

UNUSUAL FIRE & EXPLOSION HAZARDS: None known.

HAZARDOUS COMBUSTION PRODUCTS: None known.

SECTION VI: ACCIDENTAL RELEASE MEASURES

Ventilate enclosed spaces and use appropriate respiratory protection. Sweep or vacuum spilled material in a manner to avoid generation of dust. Reclaim product for re-use, if possible, or collect in containers for disposal in an appropriate manner.

SECTION VII: HANDLING & STORAGE

HANDLING PROCEDURES AND EQUIPMENT: Keep container closed when not in use. Avoid contact with eyes. Avoid breathing dust or fume and only use in a well ventilated area. Consumption of food and beverages should be avoided in work area where product is being used. After handling product, always wash hands and face thoroughly with soap and water before eating,

drinking or smoking.

STORAGE REQUIREMENTS: Keep under cover -- exposure to water may cause this product to slowly hydrate, during which heat may be generated (exothermic reaction). Otherwise, product is suitable for any general chemical storage area.

SECTION VIII: EXPOSURE CONTROLS/PERSONAL PROTECTION

SPECIFIC ENGINEERING CONTROLS: Local and general mechanical dust collection and ventilation in accordance with good engineering practices should be provided to maintain dust levels below permissible exposure levels specified in Section VIII.

PERSONAL PROTECTIVE EQUIPMENT:

GLOVES: Dust impervious gloves during manual handling of product.

EYES: Safety glasses with side-shields or tight fitting goggles.

FOOTWEAR: Steel reinforced shoes when handling pallets of product.

CLOTHING: Long sleeves, buttoned collar, long pants extended over shoes or coveralls.

RESPIRATORY - UP TO 100 MG/M3: Any dust, mist or fume respirator; any air supplied respirator; or, self-contained breathing apparatus.

UP TO 250 MG/M3: Any supplied air respirator operated in a continuous flow mode or any powered air purifying respirator with a dust/mist/fume filter.

UP TO 500 MG/M3: High efficiency particulate filter with full face piece; any powered air supplied respirator with a tight fitting face piece and a high efficiency particulate filter; any self contained breathing apparatus with a full face piece; any supplied air respirator with a full face piece.

UP TO 7500 MG/M3: Any air supplied respirator with full face piece and operated in a pressure demand or other positive pressure mode.

EMERGENCY or ENTRY INTO UNKNOWN CONCENTRATIONS: Self contained breathing apparatus with full face piece and operated in pressure demand mode or air supplied respirator with full face piece operated in a pressure demand or other positive pressure mode in combination with auxiliary self contained breathing apparatus operated in pressure demand or positive pressure mode.

ESCAPE: Any air purifying full face piece respirator with high efficiency particulate filter or any appropriate escape type self contained apparatus.

EXPOSURE LIMITS

ACGIH - Time Weighted Averages Magnesium oxide fume 10 mg/m3 TWA

ACGIH - TLV Basis: Critical Effects Magnesium oxide fume irritation; metal fume fever

Australian Exposure Standards Magnesium oxide fume 10 mg/m3 TWA

California - Exposure Limits: PELs Magnesium oxide fume as Mg: 10 mg/m³

Canada - Alberta -

15 Minute Occupational Exposure Limit Magnesium oxide fume 20 mg/m³
STEL

8 Hour Occupational Exposure Limit Magnesium oxide fume as Mg: 10 mg/
m³ TWA

Canada - British Columbia -

15 Minute Exposure Limits Magnesium oxide fume 10 mg/m³

8 Hour Exposure Limits Magnesium oxide fume as Mg;

Total dusts: 10 mg/m³ TWA;
Respirable dust and fumes: 3 mg/m³ TWA

Canada - Ontario -

OHSA - TWAEVs Magnesium oxide fume 10 mg/m³ TWAEV

Proposed Occupational STEVs 5 mg/m³ STEV

Canada - Quebec - Magnesium oxide fume

Time-Weighted Average Exposure Magnesium oxide fume as Mg: 10 mg/m³
TWAEV

German (DFG) -

MAK Values Magnesium oxide fume respirable fraction: 1.5 mg/m³ MAK
(includes magnesium oxide fume)

Peak Limitations Magnesium oxide fume 2 x normal MAK (30 min. average
value); don't exceed 4 times during shift; half-life <2h

Israel -

Action Levels Magnesium oxide fume 5 mg/m³ AL

Time Weighted Averages Magnesium oxide fume 10 mg/m³ TWA

Mexico - Instruction No. 10 - TWAs Magnesium oxide fume 10 mg/m³ TWA

Final PELs: Time Weighted Average Magnesium oxide fume total particulate:
15 mg/m3 TWA

Vacated PELs: Time Weighted Avg Magnesium oxide fume total particulate:
10 mg/m3 TWA

United Kingdom -

Occupational Exposure Standard:STEL Magnesium oxide fume fume and
respirable dust, as Mg: 10 mg/m3 STEL

Occupational Exposure Standards:TWA Magnesium oxide fume fume and
respirable dust, as Mg: 5 mg/m3 TWA; total inhalable dust, as Mg: 10
mg/m3 TWA

SECTION IX: PHYSICAL & CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Dry white powder to granular solid; no odor

BOILING POINT (F): 3582 C @ 760 mm H	FREEZE POINT (F): Not applicable
pH: ~10 saturated sol	VAP PRESS (mm Hg): ~Zero at 20 C
% VOLATILE (by VOL): Not applicable	SPEC GRAV: 3.5 to 3.6
VAPOR DENSITY: Not applicable	EVAPOR RATE: Not applicable
SOLUBILITY IN WATER: Slightly soluble	ODOR THRESH (ppm): Not determined
PHYSICAL STATE: Solid	OIL/WATER COEFFIC: Not applicable

SECTION X: STABILITY & REACTIVITY

STABLE: Yes

CONDITIONS OF REACTIVITY: Will react with incompatibles (see below)

CONDITIONS OF CHEMICAL INSTABILITY: Stable under ambient temperatures and pressures.

INCOMPATIBILITY (MATERIALS TO AVOID): ACID (Strong) - vigorous reaction, heat generated;
CHLORINE TRIFLUORIDE reacts violently, producing flame; PHOSPHORUS PENTACHLORIDE -
incandesces brilliantly.

NOTE: Exposure to water may cause this product to slowly hydrate, during which heat may be
generated (exothermic reaction).

HAZARDOUS DECOMPOSITION PRODUCTS: If magnesium oxide is heated to the point of
volatilization (i.e., >1700 C), magnesium oxide FUMES may be generated.

IS THIS PRODUCT SUBJECT TO POLYMERIZATION? No

CONDITIONS UNDER WHICH PRODUCT WILL POLYMERIZE: None known.

SECTION XI: TOXICOLOGICAL INFORMATION

ROUTES OF ENTRY - SKIN CONTACT: Yes SKIN ABSORPTION: No
EYE CONTACT: Yes INHALATION: Yes INGESTION: Yes

NAME OF TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None known.

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IRRITANCY OF PRODUCT: No data available.

REPRODUCTIVE TOXIN? No TERATOGEN? No MUTAGEN? No SENSITIZER? No

CONSIDERED CARCINOGENIC BY - NTP? No IARC? No OSHA? No

SECTION XII: ECOLOGICAL INFORMATION

No data available.

SECTION XIII: DISPOSAL CONSIDERATIONS

Dispose according to local, state/provincial and federal regulations.

If discarded in its purchased form, this product would not be hazardous waste either by listing or by characteristic. **However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)**

SECTION XIII: TRANSPORT INFORMATION

DOT SHIPPING NAME: Not regulated under DOT DOT CLASS: Not applicable

SPECIAL SHIPPING INFORMATION: No special precautions. For further information, refer to -

- Handling & Storage (Section VII)
- Stability & Reactivity (Section X)

SECTION XV: REGULATORY INFORMATION

All of the ingredient(s) contained in this product are included on the following inventory and/or regulatory lists:

Australian Inventory of Chemical Substances (ACIS): 1309-48-4

Canada - Domestic Substance List (DSL): 1309-48-4

Canada - WHMIS: Ingredient Disclosure (Magnesium oxide FUME) 1% item 959 (1314)

Toxic Substances Control Act (TSCA) 8(b)Inventory List: 1309-48-4

European Inventory of Existing Commercial Chemical Substances (EINECS): 215-171-9

Japan - Existing and New Chemical Substances (ENCS) - 1-465 (Magnesium oxide fume)

Korea - Existing and Evaluated Chemical Substances (KECL) - KE-22728 (Magnesium oxide fume)

Philippines Inventory of Chemicals and Chemical Substances (PICCS) - Present (Magnesium

oxide)

Swiss Giftliste 1 (List of Toxic Substances 1), 31 May 1999 - G-2368 Toxic Category 4:
Acute oral lethal dose of 500 - 2000 mg/kg.

Toxic Substances Control Act (TSCA) 8(b)Inventory List: 1309-48-4

US REPORTING REQUIREMENTS:

CERCLA Hazardous Substance: No

SARA Title III:

Section 311/312 - Categories: Magnesium oxide - Acute hazard (nuisance dust)

Section 312 - Inventory Reporting: Although not specifically listed, magnesium oxide does meet the definition of a hazardous material under OSHA's Hazard Communication Standard at 29 CFR 1910.1200, and therefore is subject to Tier I and/or Tier II annual inventory reporting.

Section 313 - Emission Reporting - This notification must not be detached from this MSDS and any copying and redistribution of this MSDS must include this notice, as required by 40 CFR part 372:

Magnesium oxide is not subject to Form R reporting requirements.

Section 302 - Extremely Hazardous Substances: Magnesium oxide is not listed.

US CLEAN AIR ACT:

This product complies in all respects to the requirements of Section 611 of Title VI (Stratospheric Ozone Depletion) of the Clean Air Act as amended 1990; namely, that the product neither contains, nor is "manufactured with" (as defined by U.S. EPA) any Class I or Class II Ozone Depleting Substances listed in Title VI, and therefore is not required to carry the warning stated as dictated in the amended Act.

STATE LISTS:

California -

Directors List of Hazardous Substances (8 CCR 339) (Magnesium oxide fume): Present

Florida Hazardous Substance List (Magnesium oxide fume): Present

Illinois Right-to-Know Toxic Substances List (Magnesium oxide fume): Present

Massachusetts Right To Know List (Magnesium oxide fume): Present

Minnesota Hazardous Substance List (Magnesium oxide fume): Present

NJ Department of Health RTK List (Magnesium oxide fume): Present (sn 1144)

Pennsylvania Right to Know List (Magnesium oxide): Present

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Rhode Island Hazardous Substance List (Magnesium oxide fume): Present (toxic)

SECTION XVI: OTHER INFORMATION

NFPA Ratings: Health: 1 Flammability: 0 Reactivity: 0 Other: <blank>

HMIS Ratings: Health: 1 Flammability: 0 Reactivity: 0 PPE: J

SAFETY & RISK PHRASES:

- R 20/22 Harmful By Inhalation And If Swallowed.
- R 36/37/38 Irritating To Eyes, Respiratory System And Skin.
- S 26 In Case Of Contact With Eyes, Rinse Immediately With Plenty Of Water and Seek Medical Advice.
- S 36 Wear Suitable Protective Clothing.
- S 39 Wear Eye/Face Protection.

SOURCES USED: ACGIH 2000; RTECS June 1998; Sax - 8th Ed.; Ind. Exposure & Control Techn. for OSHA Regulated Substances - MgO (fume), March, 1989, pp. 1181-1184; NIOSH Occupational Health Guide for Chemical Substances - Vol. II, September, 1978.