Material Safety Data Sheet

Magnesium Fluoride MgF2 (Powder, Granules, Tablets, Target)

1 . Chemical product and company identification

Common name	:	Magnesium Fluoride MgF2 (Powder, Granules, Tablets, Target)
Material uses	:	Industrial applications: Coating by Physical Vapor Deposition (PVD).
IPDS Code	:	17114781
e-mail address of person responsible for this SDS	:	info.ipds@umicore.com
Validation date	:	10 / 23 / 2008 United States
In case of emergency	:	Emergency telephone number North America : 1-800-567-7455 Emergency telephone number IPDS Umicore : 011 32 2 2277026
Supplier or representative of supplier	:	Umicore Thin Film Products USA Division of Umicore USA, Inc 4 Townsend West, Unit 12 NH 03063 Nashua US USA Phone: +1 603 594 1500

2 . Hazards identification

Physical state	:	Solid. [Powder. Granules. Tablets.]
Odor	:	Odorless.
OSHA/HCS status	:	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview	:	WARNING! CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY BE HARMFUL IF SWALLOWED. May be harmful if swallowed. Irritating to eyes, respiratory system and skin. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat. Do not ingest. Avoid breathing dust. Avoid contact with eyes, skin and clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.
Routes of entry	:	Not available.

Potential acute health effects

Eyes	:	Irritating to eyes.
Skin	:	Irritating to skin.
Inhalation	:	Irritating to respiratory system.
Ingestion	:	Harmful if swallowed.
Potential chronic health effects	:	**CARCINOGENIC EFFECTS**: Classified 3 (Not classifiable for humans.) by IARC [magnesium fluoride]. **MUTAGENIC EFFECTS**: Not available. **TERATOGENIC EFFECTS**: Not available.
Medical conditions aggravated by over-exposure	:	None known.

See toxicological information (section 11)

Additional hazards	:	Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat.

3 . Composition/information on ingredients

Name	CAS number	%
magnesium fluoride	7783-40-6	100

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.

4 . First aid measures

Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion : Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If potentially dangerous quantities of this material have been swallowed, call a physician immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

5 . Fire-fighting measures

Flammability of the product : No specific fire or explosion hazard.

Hazardous combustion products : Decomposition products may include the following materials:
halogenated compounds
metal oxide/oxides

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : 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.

See section 11 for more detailed information on health effects and symptoms.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : 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 breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Large spill : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Small spill

6 . Accidental release measures

: Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

Handling : No special measures required.

Storage : This material does not require packaging measures related to product safety.

8 . Exposure controls/personal protection

Product name	Exposure limits
magnesium fluoride	**ACGIH TLV (United States, 1/2006). Notes: as F Substances for which there is a Biological Exposure Index or Indices** TWA: 2,5 mg/m³, (as F) 8 hour(s). **OSHA PEL (United States, 11/2006). Notes: as F** TWA: 2,5 mg/m³, (as F) 8 hour(s). **OSHA PEL 1989 (United States, 3/1989). Notes: as F See Table Z-2.** TWA: 2,5 mg/m³, (as F) 8 hour(s). **OSHA PEL Z2 (United States, 11/2006).** TWA: 2,5 mg/m³ 8 hour(s). Form: Dust

Consult local authorities for acceptable exposure limits.

Engineering measures : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Personal protection

Eyes : 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 operating conditions cause high dust concentrations to be produced, use dust goggles.
Recommended:
Wear chemical safety goggles.

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.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Recommended:
Protective gloves should be worn under normal conditions of use.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Personal protective equipment (Pictograms) :

Hygiene measures

General information : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed.

9 . Physical and chemical properties

Physical state and Appearance : Solid. [Powder. Granules. Tablets.]

Color : White.

Odor : Odorless.

Boiling/condensation point : 2239°C (4062,2°F)

Melting/freezing point : 1261°C (2301,8°F)

Relative density : 3,18

Solubility : Very slightly soluble in the following materials: cold water.

10 . Stability and reactivity

Stability : The product is stable.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions of reactivity : Non-explosive in the presence of the following materials or conditions: open flames, sparks and static discharge, heat, shocks and mechanical impacts, oxidizing materials, reducing materials, combustible materials, organic materials, metals, acids, alkalis and moisture.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
magnesium fluoride	LD50 Oral	Rat	2330 mg/kg	-

Chronic effects on humans : **CARCINOGENIC EFFECTS**: Classified 3 (Not classifiable for humans.) by IARC [magnesium fluoride].

Other toxic effects on humans : Very hazardous by the following route of exposure: of skin contact (irritant), of eye contact (irritant), of inhalation (lung irritant).
Hazardous by the following route of exposure: of ingestion.

Remarks : **magnesium fluoride**: Repeated or prolonged ingestion may cause fluorosis characterized by nausea, vomiting, anorexia, diarrhea or constipation, weight loss, anemia, weakness and general ill health. Repeated or prolonged contact with irritants may cause dermatitis. Repeated or prolonged contact with the eyes may cause conjunctivitis and possible damage to the cornea.

Special remarks on other toxic effects on humans : **magnesium fluoride:** In the presence of moisture, corrosive hydrogen fluoride may be formed, especially in the stomach. Contact with dusts or solutions may cause irritation and possibly burns. Human: passes through the placenta, excreted in maternal milk.

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Teratogenicity / Reproductive toxicity : No known significant effects or critical hazards.

Sensitization

Ingestion : No known significant effects or critical hazards.

Inhalation : Irritating to respiratory system.

Eyes : Irritating to eyes.

Skin : Irritating to skin.

12 . Ecological information

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

Environmental precautions : No known significant effects or critical hazards.

Mobility : Not available.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	Not regulated.	-	-	-		-
TDG Classification	Not regulated.	-	-	-		-
Mexico Classification	Not regulated.	-	-	-		-
ADR/RID Class	Not regulated.	-	-	-		-
IMDG Class	Not regulated.	-	-	-		-
IATA-DGR Class	Not regulated.	-	-	-		-

15 . Regulatory information

HCS Classification : Irritating material

U.S. Federal regulations : **United States inventory (TSCA 8b):** All components are listed or exempted.

15 . Regulatory information

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: magnesium fluoride
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: magnesium fluoride: Delayed (chronic) health hazard

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

State regulations : **Connecticut Carcinogen Reporting**: None of the components are listed.
Connecticut Hazardous Material Survey: None of the components are listed.
Florida substances: None of the components are listed.
Illinois Chemical Safety Act: None of the components are listed.
Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.
Louisiana Reporting: None of the components are listed.
Louisiana Spill: None of the components are listed.
Massachusetts Spill: None of the components are listed.
Massachusetts Substances: None of the components are listed.
Michigan Critical Material: None of the components are listed.
Minnesota Hazardous Substances: None of the components are listed.
New Jersey Hazardous Substances: None of the components are listed.
New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: None of the components are listed.
New York Acutely Hazardous Substances: None of the components are listed.
New York Toxic Chemical Release Reporting: None of the components are listed.
Pennsylvania RTK Hazardous Substances: None of the components are listed.
Rhode Island Hazardous Substances: None of the components are listed.

EU regulations

Hazard symbol or symbols :

Risk phrases : R20/21/22- Harmful by inhalation, in contact with skin and if swallowed.
R36/37/38- Irritating to eyes, respiratory system and skin.
R64- May cause harm to breastfed babies.

Safety phrases : S22- Do not breathe dust.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28- After contact with skin, wash immediately with plenty of water.
S36/37- Wear suitable protective clothing and gloves.

International regulations

International lists : **Australia inventory (AICS):** All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Korea inventory (KECI): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.
Japan inventory (ENCS): All components are listed or exempted.
Japan inventory (ISHL): At least one component is not listed.

Canada : **CEPA Toxic substances**: None of the components are listed.
Canadian ARET: None of the components are listed.
Canadian NPRI: None of the components are listed.
Alberta Designated Substances: None of the components are listed.
Ontario Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed.

15 . Regulatory information

WHMIS (Canada) : Class E: Corrosive material

16 . Other information

Label requirements : CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY BE HARMFUL IF SWALLOWED.

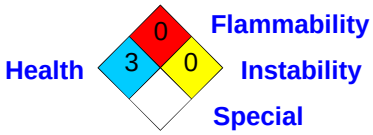
Hazardous Material Information System (U.S.A.) :

Health	2
Flammability	0
Physical hazards	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

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



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Notice to reader

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