* * * Section 1 - PRODUCT AND COMPANY IDENTIFICATION * * *

Material Name: FERROUS SULPHATE MONOHYDRATE GRANULAR

Manufacturer Information

CMC Cometals
CONTACT:
2050 Center Avenue, Suite 250
Ft. Lee, NJ 07024
Mfg Contact: CMC Cometals

EMERGENCY

Synonyms

* * * Section 2 - HAZARDS IDENTIFICATION * * *

EMERGENCY OVERVIEW

Physical Form: granules

Health Hazards: potentially fatal if inhaled, harmful if swallowed, eye burns, respiratory tract irritation, skin irritation

POTENTIAL HEALTH EFFECTS

Inhalation

Short Term: irritation, cough, metal fume fever, difficulty breathing, death

Long Term: irritation, cough, difficulty breathing, asthma, lung congestion, lung damage, cancer

Skin

Short Term: irritation, skin disorders

Long Term: irritation, skin disorders

Eye

Short Term: burns

Long Term: burns

Ingestion

Short Term: irritation (possibly severe), metallic taste, changes in body temperature, changes in blood pressure, nausea, vomiting, digestive disorders, diarrhea, constipation, stomach pain, difficulty breathing, irregular heartbeat, drowsiness, bluish skin color, lung congestion, lung damage, blood disorders, kidney damage, liver damage, convulsions, coma

Long Term: irritation (possibly severe), liver damage

* * * Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS * * *

CAS	Component	Percent	Symbol(s)	Risk Phrase(s)
17375-41-6	FERROUS SULFATE, MONOHYDRATE 231-753-5	>=91	Xn Xi	R:22-36/38-37-38-41
7720-78-7	FERROUS SULFATE 231-753-5	>=81	Xn Xi	R:22-36/38-22-37-38-41
7439-89-6	IRON 231-096-4	>=30	---	---
7704-34-9	SULFUR 231-722-6	>=18	Xi	R:38-36-37-38
7439-95-4	MAGNESIUM 231-104-6	<=2	F	R:15-17

13463-67-7	TITANIUM DIOXIDE 236-675-5	<=0.5	---	---
7439-92-1	LEAD 231-100-4	<=0.00200	Xn N T	R:20/22-33-50-53-61-62
7440-43-9	CADMIUM 231-152-8	<=0.00100	T+ T N Xn	R:26-45-48/23/25-50-53-62-63-68
7440-38-2	ARSENIC 231-148-6	<=0.00100	T N	R:23/25-50-53
7439-97-6	MERCURY 231-106-7	<=0.00030	T+ T N	R:26-48/23-50-53-61

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Ferrous sulfate (7720-78-7), Iron Salts, magnesium inorganic compounds, Titanium compounds, Lead compounds, Lead, inorganic compounds, Arsenic compounds, n.o.s., Arsenic, inorganic compounds, Cadmium compounds, Cadmium inorganic compounds, Mercury compounds, Mercury inorganic compounds.

* * * Section 4 - FIRST AID MEASURES * * *

Inhalation

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Skin

Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

Eyes

Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Ingestion

If swallowed, drink plenty of water, do NOT induce vomiting. Get immediate medical attention. Induce vomiting only at the instructions of a physician. Do not give anything by mouth to unconscious or convulsive person.

Note to Physicians

For ingestion, consider gastric lavage.

* * * Section 5 - FIRE FIGHTING MEASURES * * *

See Section 9 for Flammability Properties

NFPA Ratings: Health: 3 **Fire:** 0 **Reactivity:** 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Flammable Properties

Negligible fire hazard.

Extinguishing Media

Use extinguishing agents appropriate for surrounding fire.

Fire Fighting Measures

Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

* * * Section 6 - ACCIDENTAL RELEASE MEASURES * * *

Water Release

Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

Occupational spill/release

Large spills: Collect spilled material in appropriate container for disposal. Avoid generating dust. Clean up residue with a high-efficiency particulate filter vacuum. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

* * * Section 7 - HANDLING AND STORAGE * * *

Handling Procedures

Use methods to minimize dust.

Storage Procedures

Store and handle in accordance with all current regulations and standards. See original container for storage recommendations. Keep separated from incompatible substances.

* * * Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION * * *

Component Exposure Limits

TITANIUM DIOXIDE (13463-67-7)

ACGIH: 10 mg/m3 TWA
NIOSH: 5000 mg/m3 IDLH
OSHA (US): 15 mg/m3 TWA (total dust)
Mexico: 10 mg/m3 TWA (as Ti)
20 mg/m3 STEL (as Ti)

LEAD (7439-92-1)

ACGIH: 0.05 mg/m3 TWA
NIOSH: 0.050 mg/m3 TWA
100 mg/m3 IDLH
Europe: 0.15 mg/m3 TWA
OSHA (US): 30 µg/m3 Action Level (Poison, See 29 CFR 1910.1025); 50 µg/m3 TWA
50 µg/m3 TWA
Mexico: 0.15 mg/m3 TWA (as Pb, dust and fume)

ARSENIC (7440-38-2)

ACGIH: 0.01 mg/m3 TWA
NIOSH: 0.002 mg/m3 Ceiling (15 min)
5 mg/m3 IDLH
OSHA (US): 10 µg/m3 TWA (Cancer hazard, See 29 CFR 1910.1018, except Arsine, as As); 5 µg/m3 Action Level (as As)
10 µg/m3 TWA (as As)
Mexico: 0.01 mg/m3 TWA

CADMIUM (7440-43-9)

ACGIH: 0.01 mg/m3 TWA; 0.002 mg/m3 TWA (respirable fraction)
NIOSH: 9 mg/m3 IDLH (dust)
OSHA (US): 5 µg/m3 TWA (Do not eat, drink or chew tobacco or gum or apply cosmetics in regulated areas. Carcinogen - dust can cause lung and kidney disease, See 29 CFR 1910.1027); 2.5 µg/m3 Action Level
0.1 mg/m3 TWA (fume, applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect); 0.2 mg/m3 TWA (dust, applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect); 5 µg/m3 TWA
0.3 mg/m3 Ceiling (applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect, fume); 0.6 mg/m3 Ceiling (applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect, dust)
Mexico: 0.01 mg/m3 TWA (total dust); 0.002 mg/m3 TWA (respirable dust)

MERCURY (7439-97-6)

ACGIH: 0.025 mg/m3 TWA
Skin - potential significant contribution to overall exposure by the cutaneous route
NIOSH: 0.05 mg/m3 TWA (vapor)
0.1 mg/m3 Ceiling
Potential for dermal absorption
10 mg/m3 IDLH
OSHA (US): 0.1 mg/m3 Ceiling
Mexico: 0.05 mg/m3 TWA
Skin - potential for cutaneous absorption

Component Analysis

LEAD (7439-92-1)

Lead in blood: 70 µg/100mL (binding biological limit value); 0.075 mg/m3 TWA (medical surveillance threshold in air measured as a time weighted average over 40 hours per week); Lead in blood: 40 µg/100mL (medical surveillance threshold measured in individual workers)

Ventilation

Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eyes/Face

Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Protective Clothing

Wear appropriate chemical resistant clothing.

Glove Recommendations

Wear appropriate chemical resistant gloves.

Respiratory Protection

Under conditions of frequent use or heavy exposure, respiratory protection may be needed.

Respiratory protection is ranked in order from minimum to maximum.

Consider warning properties before use.

Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100 or P100.

Any air-purifying full-facepiece respirator equipped with an N95, R95, or P95 filter. The following filters may also be used: N99, R99, P99, N100, R100 or P100.

Any powered, air-purifying respirator with a high-efficiency particulate filter.

Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter.

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

* * * Section 9 - PHYSICAL AND CHEMICAL PROPERTIES * * *

Physical State:	Solid	**Appearance:**	Not available
Physical Form:	granules	**Odor:**	Not Available
Odor Threshold:	Not available	**Melting Point:**	Not available
Boiling Point:	Not applicable	**Vapor Pressure:**	Not applicable
Vapor Density (air = 1):	Not applicable	**Density:**	Not available
Specific Gravity (water = 1):	Not available	**Water Solubility:**	Not available
Coeff. Water/Oil Dist:	Not available		

* * * Section 10 - STABILITY AND REACTIVITY * * *

Chemical Stability

Stable at normal temperatures and pressure.

Conditions to Avoid

Avoid generating dust.

Materials to Avoid

acids, alkalis, alkali metals, ammonium salts, halogens, halogenated compounds, isocyanates, metals, metal oxides, metal salts, nitrates, nonmetallic halogens, organic solvents and compounds, oxidizing materials, peroxides, phosphorus, potassium compounds
FERROUS SULFATE:
ALKALIES: Incompatible.
ARSENIC TRIOXIDE + SODIUM NITRATE: Spontaneously combustible mixture.
CARBONATES (SOLUBLE): Incompatible.
GOLD SALTS: Incompatible.
LEAD ACETATE: Incompatible.
LIMEWATER: Incompatible.
METHYL ISOCYANOACETATE: May decompose explosively at 25 C.
OXIDIZERS: Fire and explosion hazard.
POTASSIUM IODIDE: Incompatible.
POTASSIUM TARTRATE: Incompatible.
SODIUM BORATE: Incompatible.
SODIUM TARTRATE: Incompatible.
IRON:
ACETALDEHYDE: Polymerizes readily.
AMMONIUM NITRATE: Violent or explosive reaction.
AMMONIUM PEROXODISULFATE: Violent reaction.
BROMINE PENTAFLUORIDE: Violent reaction and possible ignition.
CHLORIC ACID: Forms explosive compound.
CHLORINE (GAS): Ignites.
CHLORINE TRIFLUORIDE: Violent reaction and possible ignition.
CHLOROFORMAMIDINIUM NITRATE: Explosive ignition.
DINITROGEN TETRAOXIDE: Ignites.
FLUORINE: Ignites.
HYDROGEN PEROXIDE: Violent decomposition.
MINERAL ACIDS: Readily attacked.
NITROGEN DIOXIDE: Incandescent reaction.
NITRYL FLUORIDE: Incandesces when heated.
ORGANIC ACIDS: Attacked or dissolved.
PEROXYFORMIC ACID: Incompatible.
PHOSPHORUS: Incandesces when heated.
POLYSTYRENE BEADS: Possible static ignition.
POTASSIUM DICHROMATE: Ignites on contact.
POTASSIUM PERCHLORATE + MANGANESE DIOXIDE: Ignites.
SODIUM ACETYLIDE: Possible violent reaction.
SODIUM PEROXIDE: Ignites under friction @ 240 C.

SULFURIC ACID: Possible explosion hazard.
MAGNESIUM:
ACETYLENIC COMPOUNDS: Forms explosive metal acetylides.
ACIDS: Reacts to form flammable hydrogen gas.
ALUMINUM: Forms readily ignitable compound when heated.
ALUMINUM + POTASSIUM PERCHLORATE: Formation of an explosive mixture.
AMMONIUM NITRATE: Forms explosive mixture.
AMMONIUM SALTS + CHLORATE SALTS: May ignite when wet.
BARIUM CARBONATE: Forms explosive acetylide.
BERYLLIUM FLUORIDE: Violent exothermic reaction.
BORON DIIODOPHOSPHIDE: Ignition.
BROMOBENZYL TRIFLUORIDE: Possible violent reaction.
CALCIUM CARBONATE + HYDROGEN: Violent explosion if heated.
CARBONATES: Possible explosion.
CHLOROFORMAMIDINIUM NITRATE: Explosive ignition when wet.
DINITROGEN TETRAOXIDE: Violent combustion.
ETHYLENE OXIDE: Possible explosion.
FLUOROCARBON POLYMERS: May ignite.
GOLD CYANIDE: May cause incandescent reaction when heated.
HALOCARBONS: Violent reaction and possible explosion.
HALOGENS OR INTERHALOGENS: Ignition.
HYDROGEN IODIDE: Ignition on contact.
HYDROGEN PEROXIDE: May ignite on contact.
MANGANESE: Incandescent reaction.
METAL CYANIDES: Incandescent reaction by heating.
METAL HALOGENATES: Forms an explosive mixture.
METAL OXIDES: Explosive reduction.
METAL OXOSALTS: Possible explosive reaction.
METHANOL: Violent reaction.
NITRIC ACID: Possible ignition.
NITROGEN (LIQUID): Violent reaction when ignited.
OXIDIZERS (STRONG): Fire and explosion hazard.
OXYGEN (LIQUID): Formation of an explosive compound.
PERFORMIC ACID: Possible violent reaction.
PHOSPHATES: Possible explosion.
POTASSIUM CARBONATE: Possible explosion.
SILICON DIOXIDE: Possible violent explosion.
SODIUM PEROXIDE + CARBON DIOXIDE: Probable explosion.
STEEL (RUSTED): Possible ignition and explosion hazard.
SULFATES: Possible explosion.
SULFUR: Explosive reaction.
TELLURIUM: Explosive reaction.
TRICHLOROETHYLENE: Formation of ignitable compound.
SULFUR:
ALKALI METAL NITRIDES: Forms highly flammable mixture which evolves ammonia and hydrogen sulfide on contact with water.

ALUMINUM (POWDER): Possible explosion.
AMMONIA: May form explosive sulfur nitride.
AMMONIUM NITRATE: Forms shock-sensitive mixture.
BORON: Incandescent reaction above 600 C.
BROMATES: Contact may result in ignition or an explosion.
CADMIUM: Explosive reaction.
CALCIUM: Explodes on ignition.
CALCIUM HYPOCHLORITE: Explosive reaction on heating in a closed container.
CALCIUM PHOSPHIDE: Incandesces at 300 C.
CARBON (ACTIVATED): May ignite spontaneously.
CHLORATES: Contact may result in ignition or an explosion.
CHLORINE DIOXIDE: Ignition with possible explosion.
CHLORINE MONOXIDE: Violent explosion.
CHLORINE TRIOXIDE: Violent reaction.
CHROMIC ANHYDRIDE: Ignition on heating, possible explosion.
CHROMYL CHLORIDE: Ignites.
COPPER (POWDER): Ignition on warming.
FLUORINE: Ignition at ambient temperatures.
GADOLINIUM: Possible explosion.
HEPTASILVER NITRATE OCTAOXIDE: Explosion on impact.
HYDROCARBONS: May form explosive concentrations of hydrogen sulfide and carbon disulfide.
INDIUM: Ignition and incandescence on heating.
INTERHALOGENS: Ignition with possible incandescence.
IODATES: Contact may result in ignition or an explosion.
IODINE PENTOXIDE: Explosive reaction on warming.
IRON: Incandescent reaction on heating.
LEAD CHLORITE: Explodes.
LEAD CHROMATE: Forms pyrophoric mixture.
LEAD DIOXIDE: Explodes.
LITHIUM: Violent, possibly explosive reaction.
MAGNESIUM: Exothermic reaction.
MERCURIC NITRATE: Explosive reaction.
MERCURIC OXIDE: Violent explosion.
MERCUROUS OXIDE: Ignition on light impact.
MERCURY: Exothermic reaction.
METAL ACETYLIDES: Contact may result in ignition and possible incandescence.
METAL CARBIDES: Contact may result in ignition and possible incandescence.
METAL OXIDES: Possible ignition or explosion.
METALS: Possible ignition or explosion.
NICKEL (POWDER): Ignites with incandescence with boiling sulfur.
NITROGEN DIOXIDE: Burns vigorously.
OSMIUM (POWDER): Ignites with incandescence in boiling sulfur.
OXIDIZERS (STRONG): Fire and explosion hazard.
PALLADIUM: Ignites with incandescence on heating.
PERCHLORATES: Forms shock sensitive mixtures.

PHOSPHORUS: Ignition or explosion whem warmed.
PHOSPHORUS TRIOXIDE: Violent reaction.
POTASSIUM: Violent reaction on warming.
POTASSIUM + STANNIC IODIDE: Explosive mixture.
POTASSIUM CHLORITE: Violent reaction.
POTASSIUM NITRATE + ARSENIC TRISULFIDE: Forms explosive mixture.
POTASSIUM PERMANGANATE: Possible explosion with friction or heating.
RHODIUM: Ignition and incandescence on heating.
RUBIDIUM (MOLTEN): Ignites in the vapor.
SELENIUM: Ignition with incandescence.
SILVER CHLORITE: Explodes with friction.
SILVER NITRATE: Violent explosion on impact.
SILVER OXIDE: Ignites on friction.
SODIUM: Violent or explosive reaction with heat or friction.
SODIUM + STANNIC IODIDE: Impact sensitive mixture.
SODIUM CHLORITE: Ignites with moisture.
SODIUM HYDRIDE: Vigorous reaction with sulfur vapor.
SODIUM NITRATE + CHARCOAL: Explosive reaction.
SODIUM PEROXIDE: Forms explosive mixture.
TANTALUM: Possible explosion.
TETRAPHENYLLEAD: Possible explosion.
TETRAPHOSPHORUS HEXOXIDE: Violent reaction @ 160 C.
THALLIC OXIDE: Explodes with friction.
THORIUM: Ignition and incandescence with heating.
TIN: Vigorous reaction with incandescence and ignition on heating.
URANIUM: Incandescence and ignition with boiling sulfur.
VANADIUM (V) OXIDE, WATER: Ignition.
ZINC (POWDER): Explosive reaction when warmed.

Decomposition Products

miscellaneous decomposition products

Possibility of Hazardous Reactions

Will not polymerize.

* * * Section 11 - TOXICOLOGICAL INFORMATION * * *

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

FERROUS SULFATE, MONOHYDRATE (17375-41-6)
Oral LD50 Rat: 237 mg/kg
FERROUS SULFATE (7720-78-7)
Oral LD50 Rat: 237 mg/kg
IRON (7439-89-6)
Oral LD50 Rat: 984 mg/kg
SULFUR (7704-34-9)
Inhalation LC50 Rat: >9.23 mg/L/4H; Oral LD50 Rat: >3000 mg/kg; Dermal LD50 Rabbit: >2000 mg/kg

MAGNESIUM (7439-95-4)
Oral LD50 Rat: 230 mg/kg
TITANIUM DIOXIDE (13463-67-7)
Oral LD50 Rat: >10000 mg/kg
ARSENIC (7440-38-2)
Oral LD50 Rat: 763 mg/kg
CADMIUM (7440-43-9)
Oral LD50 Rat: 2330 mg/kg; Inhalation LC50 Rabbit: 8 mg/L/4H

RTECS Acute Toxicity (selected)

The components of this material have been reviewed, and RTECS publishes the following endpoints:

FERROUS SULFATE, MONOHYDRATE (17375-41-6)

Oral: 533 mg/kg oral rat LD50; 319 mg/kg oral rat LD50

FERROUS SULFATE (7720-78-7)

Oral: 533 mg/kg oral rat LD50; 319 mg/kg oral rat LD50

IRON (7439-89-6)

Oral: 30 gm/kg oral rat LD50

SULFUR (7704-34-9)

Inhalation: 1660 mg/m3 inhalation mammal LC50

Acute Toxicity Level

FERROUS SULFATE, MONOHYDRATE (17375-41-6)

Toxic: ingestion.

FERROUS SULFATE (7720-78-7)

Toxic: ingestion.

IRON (7439-89-6)

Non Toxic: ingestion.

SULFUR (7704-34-9)

Highly Toxic: inhalation.

TITANIUM DIOXIDE (13463-67-7)

Moderately Toxic: inhalation.
Slightly Toxic: ingestion.

ARSENIC (7440-38-2)

Moderately Toxic: ingestion.

CADMIUM (7440-43-9)

Highly Toxic: inhalation.
Moderately Toxic: ingestion.

Component Carcinogenicity

TITANIUM DIOXIDE (13463-67-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 93 [in preparation]; Monograph 47 [1989] (Group 2B (possibly carcinogenic to humans))
DFG: Category 3A (could be carcinogenic for man, inhalable fraction with the exception of ultra small particles)
OSHA: Present

LEAD (7439-92-1)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
IARC: Monograph 87 [2006] (Group 2A (probably carcinogenic to humans))
NTP: Reasonably Anticipated To Be A Human Carcinogen
DFG: Category 2 (considered to be carcinogenic for man)
OSHA: Present

ARSENIC (7440-38-2)

ACGIH: A1 - Confirmed Human Carcinogen
IARC: Monograph 84 [2004]; Supplement 7 [1987]; Monograph 23 [1980] (Group 1 (carcinogenic to humans))
NTP: Known Human Carcinogen
DFG: Category 1 (causes cancer in man)
OSHA: Present
Cancer hazard - see 29 CFR 1910.1018 (except Arsine)

CADMIUM (7440-43-9)

ACGIH: A2 - Suspected Human Carcinogen
IARC: Monograph 58 [1993]; Supplement 7 [1987] (Group 1 (carcinogenic to humans))
NTP: Known Human Carcinogen
DFG: Category 1 (causes cancer in man)
OSHA: Present
Carcinogen - dust can cause lung and kidney disease - See 29 CFR 1910.1027

MERCURY (7439-97-6)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 58 [1993] (Group 3 (not classifiable))
DFG: Category 3B (could be carcinogenic for man)

RTECS Irritation

The components of this material have been reviewed, and RTECS publishes the following endpoints:

SULFUR (7704-34-9)

8 ppm eyes human

TITANIUM DIOXIDE (13463-67-7)

300 ug/3 day(s) intermittent skin human mild

Local Effects

FERROUS SULFATE, MONOHYDRATE (17375-41-6)

Irritant: inhalation, skin.
Corrosive: eye, ingestion.

FERROUS SULFATE (7720-78-7)

Irritant: inhalation, skin.
Corrosive: eye.

SULFUR (7704-34-9)

Irritant: inhalation, skin, eye.

ARSENIC (7440-38-2)

Irritant: inhalation, skin, eye.

CADMIUM (7440-43-9)

Irritant: inhalation.

MERCURY (7439-97-6)

Irritant: inhalation.

Target Organs

LEAD (7439-92-1)

nervous system, kidneys, teratogen.

ARSENIC (7440-38-2)

immune system (sensitizer), nervous system.

CADMIUM (7440-43-9)

kidneys.

MERCURY (7439-97-6)

immune system (sensitizer), nervous system, kidneys.

An inhalation study showed an increase in the incidence of benign and malignant lung tumors in female rats. In another inhalation study, the incidences of lung adenomas were increased in the high-dose groups of male and female rats; cystic deratinizing lesions (non-neoplastic pulmonary keratinizing cysts) were also observed in the high dose groups of female rats. Intratracheal administration of titanium dioxide to female rats resulted in an increase in the incidence of benign and malignant lung tumors. Significant exposure is not expected when bound in materials such as paint. Iron itself has not been evaluated by IARC. However iron and steel founding has been evaluated as IARC Group 1 (Human Sufficient Evidence). Studies have shown that certain exposures in iron and steel founding can cause lung cancer in humans. Excesses of leukemia and urogenital and digestive system cancers have also been reported.

Medical Conditions Aggravated by Exposure

respiratory disorders

RTECS Tumorigenic

The components of this material have been reviewed, and RTECS publishes the following endpoints:

FERROUS SULFATE, MONOHYDRATE (17375-41-6)

1600 mg/kg subcutaneous mouse TDLo (16 week(s))

FERROUS SULFATE (7720-78-7)

1600 mg/kg subcutaneous mouse TDLo (16 week(s))

IRON (7439-89-6)

450 mg/kg intratracheal rat TDLo (15 week(s))

TITANIUM DIOXIDE (13463-67-7)

10 mg/m3 inhalation rat TC (18 hour(s)); 250 mg/m3 inhalation rat TCLo (6 hour(s)); 260 mg/kg intramuscular rat TD (84 week(s)); 360 mg/kg intramuscular rat TDLo (2 year(s))

RTECS Mutagenic

The components of this material have been reviewed, and RTECS publishes the following endpoints:

FERROUS SULFATE, MONOHYDRATE (17375-41-6)

morphological transformation hamster embryo 900 umol/L; cytogenetic analysis hamster ovary 5 mmol/L; cytogenetic analysis hamster fibroblast 1250 mg/L; DNA damage human lymphocyte 0.01 mmol/L/30 minute(s); DNA damage mammal lung 100 mg/L/4 hour(s); DNA damage mouse liver 0.1 umol/L/2 hour(s); DNA damage mouse other cell types 10 umol/L; DNA damage mouse oral 33.2 mg/kg; DNA damage mouse oral 7975 mg/kg/6 day(s); micronucleus test mouse oral 252 mg/kg/3 week(s) continuous; micronucleus test mouse oral 33.2 mg/kg; DNA damage other microorganisms 2 umol/L; mutation in microorganisms Saccharomyes cerevisae 100 mmol/L (-S9); gene conversion and miotic recombination Saccharomyes cerevisae 100 mmol/L

FERROUS SULFATE (7720-78-7)

morphological transformation hamster embryo 900 umol/L; cytogenetic analysis hamster ovary 5 mmol/L; cytogenetic analysis hamster fibroblast 1250 mg/L; DNA damage human lymphocyte 0.01 mmol/L/30 minute(s); DNA damage mammal lung 100 mg/L/4 hour(s); DNA damage mouse liver 0.1 umol/L/2 hour(s); DNA damage mouse other cell types 10 umol/L; DNA damage mouse oral 33.2 mg/kg; DNA damage mouse oral 7975 mg/kg/6 day(s); micronucleus test mouse oral 252 mg/kg/3 week(s) continuous; micronucleus test mouse oral 33.2 mg/kg; DNA damage other microorganisms 2 umol/L; mutation in microorganisms Saccharomyes cerevisae 100 mmol/L (-S9); gene conversion and miotic recombination Saccharomyes cerevisae 100 mmol/L

TITANIUM DIOXIDE (13463-67-7)

sister chromatid exchange hamster ovary 1 umol/L; DNA inhibition hamster lung 500 mg/L; micronucleus test hamster ovary 5 umol/L; micronucleus test mouse intraperitoneal 3 gm/kg/3 day(s) continuous

RTECS Reproductive Effects

The components of this material have been reviewed, and RTECS publishes the following endpoints:

FERROUS SULFATE, MONOHYDRATE (17375-41-6)

12153 ug/kg intratesticular rat TDLo (male 1 day(s)); 7200 mg/kg oral rat TDLo (pregnant female 9-14 day(s), continuous)

FERROUS SULFATE (7720-78-7)

12153 ug/kg intratesticular rat TDLo (male 1 day(s)); 7200 mg/kg oral rat TDLo (pregnant female 9-14 day(s), continuous)

Additional Data

Interactions with drugs may occur. Interactions with drugs may occur.

HEALTH EFFECTS

Inhalation - Acute Exposure

FERROUS SULFATE: May cause irritation of the respiratory tract. IRON: Dust may cause mucous membrane and respiratory irritation due to mechanical action. Metal fume fever, an influenza-like illness, may occur due to the inhalation of freshly formed iron oxide particles sized below 1.5 microns and usually between 0.02-0.05 microns. Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes. Lassitude and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea and prostration may also occur. Tolerance to fumes develops rapidly, but is quickly lost. All symptoms usually subside within 24-36 hours. MAGNESIUM: Exposure to a large concentration of dust may cause mucous membrane irritation. Magnesium fumes may irritate the respiratory system and cause metal fume fever with cough, headache, fever, chills, sneezing, nausea, vomiting, dyspnea, chest pain, and leukocytosis. SULFUR: Inhalation of large amounts of the dust may cause catarrhal inflammation of the nasal mucosa which may lead to hyperplasia with abundant nasal secretions. Tracheobronchitis is a frequent occurrence, with dyspnea, persistent cough and expectoration which may sometimes be streaked with blood.

Inhalation - Chronic Exposure

FERROUS SULFATE: No data available. IRON: Prolonged or repeated exposure may cause a mottling of the lungs, a condition called siderosis which is considered to be a benign pneumoconiosis that does not cause significant physiologic impairment. Symptoms may include chronic bronchitis, emphysema, and dyspnea on exertion. MAGNESIUM: There is no evidence that the chronic inhalation of dust has led to lung injury. Fine dust has caused complaints of irritation and cough. Some investigators have reported a higher incidence of digestive disorders in magnesium plant workers and suggest that a relationship may exist between magnesium absorption and gastroduodenal ulcers. SULFUR: Repeated or prolonged exposure to dust may cause irritation to the mucous membranes. Bronchopulmonary disease may occur which, after several years, may be complicated by emphysema and bronchiectasis. Early symptoms in sulfur miners often include upper respiratory tract catarrh, with cough and expectoration which is mucoid and may even contain granules of sulfur. Asthma is a frequent complication. The maxillary and frontal sinuses may be affected; involvement is usually bilateral and pansinuitis may occur. Pulmonary function may be reduced. Radiological examinations have revealed irregular opacities in the lungs and occasionally nodulation has been reported, but not true nodular fibrosis.

Skin Contact - Acute Exposure

IRON: Dust may cause irritation. Penetration of iron particles in the skin may cause an exogenous siderosis which may be characterized by a red-brown pigmentation of the affected area. MAGNESIUM: Particles which perforate the skin and gain entry through cuts and scratches may produce a severe local lesion characterized by the evolution of gas and an inflammatory reaction, frequently with necrosis. The condition has been called "chemical gas gangrene". Gaseous blebs may develop within 24 hours of the injury with extensive necrosis, ulceration, subcutaneous emphysema, and lymphangitis. The lesion is very slow to heal. Contact with the molten metal may cause burns. SULFUR: May cause irritation, redness, and pain. Sensitivity to sulfur, particularly when used as a topical agent, is rare. Two cases of allergic hypersensitivity to sulfur have been reported. Absorption of sulfur used to treat scabies and other skin disorders may occur and cause poisoning with shock, syncope, fever, and possibly death. Absorption depends on the degree of injury to the skin with intact skin being almost impervious. Molten material may cause skin burns. FERROUS SULFATE: May cause irritation.

Skin Contact - Chronic Exposure

IRON: May cause same effects as reported in acute exposure. MAGNESIUM: No data available. SULFUR: Repeated or prolonged contact may cause dermatitis, possibly with erythematous and eczematous lesions and signs of ulceration. FERROUS SULFATE: Repeated or prolonged exposure to irritants may cause dermatitis.

Eye Contact - Acute Exposure

FERROUS SULFATE: Contact with the eye may cause severe irritation and corrosive action due to the acidity of the solution. IRON: May cause irritation due to mechanical action. Iron particles imbedded in the eye may cause ocular siderosis. Effects may include discoloration of the cornea and iris, and pupillary effects including poor reaction to light and accomodation. If a particle enters the lens there may be cataract formation. Glaucoma occurs rarely in some cases of ocular siderosis. MAGNESIUM: Experimental introduction of splinters of the metal into the anterior chamber of human and rabbit eyes has resulted in the formation of hydrogen bubbles, but caused no apparent injury. The intraocular pressure remained subnormal for several weeks while the metal was being absorbed. In animal eyes a 2 mm splinter has been observed to disappear in about ten days either from anterior chamber or vitreous without causing irritation. SULFUR: As low as 8 ppm have caused irritation of human eyes. Dust may cause irritation, redness, and pain with lacrimation, photophobia, conjunctivitis, and blepharoconjunctivitis. Cases of damage to the crystalline lens have been reported with the formation of opacities and even cataract and focal chorioretinitis. Molten material may cause severe corneal burns and eye damage.

Eye Contact - Chronic Exposure

FERROUS SULFATE: Effects depend on concentration and duration of exposure. Repeated or prolonged contact with corrosive substances may result in conjunctivitis or effects as in acute exposure. IRON: Repeated and prolonged contact may cause conjunctivitis and other effects reported in acute exposure. MAGNESIUM: No data available. SULFUR: Repeated or prolonged exposure to irritants may cause conjunctivitis.

Ingestion - Acute Exposure

FERROUS SULFATE: Side effects of ingestion of iron salts may include heartburn, metallic taste in the mouth, nausea, upper gastric discomfort, and constipation or diarrhea. Symptoms of severe poisoning may occur within 30 minutes or be delayed for several hours. Severe hemorrhagic gastritis with abdominal pain, retching, violent diarrhea and vomiting may occur. The vomitus may be bloody. Dehydration may become intense. The circulatory system may be affected with symptoms of shock, pallor, cyanosis and coldness, rapid, weak or imperceptible pulse, severe hypotension and pulmonary changes with dyspnea, focal atelectasis and emphysema may occur. Other symptoms may include hemoconcentration, tachycardia, lethargy, drowsiness, mental confusion, hypotonia and hyperglycemia. If poisoning is not immediately fatal, the patient may be asymptomatic for 24 hours, after which symtpoms may return with cyanosis, convulsions, circulatory collapse, massive hepatic failure with jaundice, severe bleeding with altered clotting and bleeding parameters, severe renal impairment or failure, diffuse vascular congestion, pulmonary edema and pulmonary hemorrhage, acidosis, anuria, hyperthermia, coma and death within 24-48 hours. Death is always preceded by shock. If the victim survives, late complications due to pyloric, antral or intestinal obstruction, hepatic cirrhosis with fine diffuse fibrotic changes with fatty degeneration and central nervous damage may occur 2 to 5 weeks after ingestion. Degenerative changes of the pancreas, lymph nodes, and heart are also possible. The average human lethal dose of iron is about 200 to 250 mg per kg of body weight. IRON: There are no reports available on poisoning from metallic iron, which is poorly absorbed. The principal manifestations of poisoning with iron compounds are vomiting, diarrhea, and circulatory collapse. MAGNESIUM: Ingestion of a large dose of powder metal may cause gastrointestinal irritation with nausea, abdominal pain, and diarrhea. SULFUR: Survival after ingestion of 60 grams of sulfur over a period of 24 hours has been reported. Large individual doses (15 grams) by mouth may lead to hydrogen sulfide production chiefly due to bacterial action within the colon. With lesser amounts this is rare and unlikely in the absence of mechanical obstruction. Small particles are generally more toxic than large ones. In rabbits, a dose of 175 mg/kg caused convulsions, unconsciousness, a hydrogen sulfide odor of the breath, fall in blood pressure, bradycardia, stimulation of respiration followed by respiratory arrest, and death. Pathological findings included pulmonary edema and hemorrhage. Thermal burns may result from oral contact with molten material.

Ingestion - Chronic Exposure

FERROUS SULFATE: Reproductive effects have been reported in animals. IRON: Repeated or prolonged exposure may cause hemosiderosis or hemochromatosis. MAGNESIUM: No data available. SULFUR: Volunteers who ingested daily doses of 500 or 750 mg of colloidal sulfur absorbed it completely, tolerated it easily, and excreted most of it within 24 hours.

* * * Section 12 - ECOLOGICAL INFORMATION * * *

Component Analysis - Aquatic Toxicity

FERROUS SULFATE, MONOHYDRATE (17375-41-6)

Fish: 96 Hr LC50 Poecilia reticulata: 925 mg/L [static]; 96 Hr LC50 Cyprinus carpio: 0.56 mg/L [semi-static]

Invertebrate: 48 Hr EC50 Daphnia magna: 152 mg/L; 48 Hr EC50 Daphnia magna: 6.15 - 9.26 mg/L [Static]

FERROUS SULFATE (7720-78-7)

Fish: 96 Hr LC50 Poecilia reticulata: 925 mg/L [static]; 96 Hr LC50 Cyprinus carpio: 0.56 mg/L [semi-static]

Invertebrate: 48 Hr EC50 Daphnia magna: 152 mg/L; 48 Hr EC50 Daphnia magna: 6.15 - 9.26 mg/L [Static]

IRON (7439-89-6)

Fish: 96 Hr LC50 Morone saxatilis: 13.6 mg/L [static]; 96 Hr LC50 Cyprinus carpio: 0.56 mg/L [semi-static]

SULFUR (7704-34-9)

Fish: 96 Hr LC50 Brachydanio rerio: 866 mg/L [static]; 96 Hr LC50 Lepomis macrochirus: <14 mg/L [static]; 96 Hr LC50 Oncorhynchus mykiss: >180 mg/L [static]

LEAD (7439-92-1)

Fish: 96 Hr LC50 Cyprinus carpio: 0.44 mg/L [semi-static]; 96 Hr LC50 Oncorhynchus mykiss: 1.17 mg/L [flow-through]; 96 Hr LC50 Oncorhynchus mykiss: 1.32 mg/L [static]

Invertebrate: 48 Hr EC50 water flea: 600 µg/L

CADMIUM (7440-43-9)

Fish: 96 Hr LC50 Oncorhynchus mykiss: 0.003 mg/L [flow-through]; 96 Hr LC50 Oncorhynchus mykiss: 0.006 mg/L [static]; 96 Hr LC50 Cyprinus carpio: 0.002 mg/L; 96 Hr LC50 Cyprinus carpio: 4.26 mg/L [semi-static]; 96 Hr LC50 Cyprinus carpio: 0.24 mg/L [static]; 96 Hr LC50 Lepomis macrochirus: 21.1 mg/L [flow-through]; 96 Hr LC50 Oryzias latipes: 0.016 mg/L; 96 Hr LC50 Pimephales promelas: 0.0004-0.003 mg/L

Invertebrate: 48 Hr EC50 Daphnia magna: 0.0244 mg/L [Static]

MERCURY (7439-97-6)

Fish: 96 Hr LC50 Cyprinus carpio: 0.5 mg/L; 96 Hr LC50 Cyprinus carpio: 0.16 mg/L [semi-static]; 96 Hr LC50 Cyprinus carpio: 0.18 mg/L [static]; 96 Hr LC50 Oryzias latipes: 0.9 mg/L [flow-through]

Invertebrate: 96 Hr EC50 water flea: 5.0 µg/L

* * * Section 13 - DISPOSAL CONSIDERATIONS * * *

Disposal Methods

Dispose in accordance with all applicable regulations. Hazardous Waste Number(s): D004. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level- 5.0 mg/L. Hazardous Waste Number(s): D006. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level- 1.0 mg/L. Hazardous Waste Number(s): D008. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level- 5.0 mg/L. Hazardous Waste Number(s): D009. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level- 0.2 mg/L.

Component Waste Numbers

LEAD (7439-92-1)
RCRA: 5.0 mg/L regulatory level
ARSENIC (7440-38-2)
RCRA: 5.0 mg/L regulatory level
CADMIUM (7440-43-9)
RCRA: 1.0 mg/L regulatory level
MERCURY (7439-97-6)
RCRA: waste_number U151
0.2 mg/L regulatory level

* * * Section 14 - TRANSPORT INFORMATION * * *

US DOT Information

Shipping Name: RQ Environmentally hazardous substances, solid, n.o.s. (Contains: FERROUS SULFATE, MONOHYDRATE, FERROUS SULFATE)
UN/NA #: UN3077 **Hazard Class:** 9 **Packing Group:** III
Required Label(s): 9

TDG Information

Shipping Name: Environmentally hazardous substance, solid, n.o.s. (Contains: FERROUS SULFATE, MONOHYDRATE, FERROUS SULFATE)
UN #: UN3077 **Hazard Class:** 9 **Packing Group:** III
Required Label(s): 9

ADR Information

Shipping Name: Environmentally hazardous substance, solid, n.o.s. (Contains: FERROUS SULFATE, MONOHYDRATE, FERROUS SULFATE)
UN #: UN3077 **Hazard Class:** 9 **Packing Group:** III
Required Label(s): 9

ADR Tunnel Code Restrictions

This list contains tunnel restriction codes for those substances and/or chemically related entries which are found in chapter 3.2 of the ADR regulations.

SULFUR (7704-34-9)

MAGNESIUM (7439-95-4)

ARSENIC (7440-38-2)

CADMIUM (7440-43-9)

MERCURY (7439-97-6)

RID Information

Shipping Name: Environmentally hazardous substance, solid, n.o.s. (Contains: FERROUS SULFATE, MONOHYDRATE, FERROUS SULFATE)
UN #: UN3077 **Hazard Class:** 9 **Packing Group:** III
Required Label(s): 9

IATA Information

Shipping Name: Environmentally hazardous substance, solid, n.o.s. (Contains: FERROUS SULFATE, MONOHYDRATE, FERROUS SULFATE)
UN #: UN3077 **Hazard Class:** 9 **Packing Group:** III
Required Label(s): 9

ICAO Information

Shipping Name: Environmentally hazardous substance, solid, n.o.s. (Contains: FERROUS SULFATE, MONOHYDRATE, FERROUS SULFATE)
UN #: UN3077 **Hazard Class:** 9 **Packing Group:** III
Required Label(s): 9

IMDG Information

Shipping Name: Environmentally hazardous substance, solid, n.o.s. (Contains: FERROUS SULFATE, MONOHYDRATE, FERROUS SULFATE)
UN #: UN3077 **Hazard Class:** 9 **Packing Group:** III

* * * Section 15 - REGULATORY INFORMATION * * *

U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

FERROUS SULFATE, MONOHYDRATE (17375-41-6)

CERCLA: 1000 lb final RQ; 454 kg final RQ

FERROUS SULFATE (7720-78-7)

CERCLA: 1000 lb final RQ; 454 kg final RQ

LEAD (7439-92-1)

SARA 313: 0.1 % Supplier notification limit; 0.1 % de minimis concentration (when contained in stainless steel, brass, or bronze)

CERCLA: 10 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 4.54 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

ARSENIC (7440-38-2)

SARA 313: 0.1 % de minimis concentration

CERCLA: 1 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 0.454 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

CADMIUM (7440-43-9)

SARA 313: 0.1 % de minimis concentration

CERCLA: 10 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 4.54 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

MERCURY (7439-97-6)

SARA 313: 1.0 % Supplier notification limit

CERCLA: 1 lb final RQ; 0.454 kg final RQ

TSCA 12b: Section 5, 1 %

SARA Section 311/312 (40 CFR 370 Subparts B and C)

Acute Health: Yes **Chronic Health:** Yes **Fire:** No **Pressure:** No **Reactive:** No

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
FERROUS SULFATE, MONOHYDRATE ([1]related to: Ferrous sulfate)	17375-41-6	Yes[1]	Yes[1]	No	Yes[1]	Yes[1]	No
FERROUS SULFATE	7720-78-7	Yes	Yes	No	Yes	Yes	No
IRON	7439-89-6	Yes	No	No	No	No	No
SULFUR	7704-34-9	Yes	Yes	No	Yes	Yes	Yes
MAGNESIUM	7439-95-4	Yes	Yes	No	Yes	Yes	Yes
TITANIUM DIOXIDE	13463-67-7	No	Yes	Yes	Yes	Yes	Yes
LEAD	7439-92-1	Yes	Yes	Yes	Yes	Yes	Yes
ARSENIC	7440-38-2	Yes	Yes	Yes	Yes	Yes	Yes
CADMIUM	7440-43-9	Yes	Yes	Yes	Yes	Yes	Yes
MERCURY	7439-97-6	Yes	Yes	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Component Analysis

LEAD (7439-92-1)

Carc: carcinogen, initial date 10/1/92

Repro/Dev. Tox: developmental toxicity, initial date 2/27/87
male reproductive toxicity, initial date 2/27/87
female reproductive toxicity initial_date 2/27/87

ARSENIC (7440-38-2)

Carc: carcinogen, initial date 2/27/87

CADMIUM (7440-43-9)

Carc: carcinogen, initial date 10/1/87

Repro/Dev. Tox: developmental toxicity, initial date 5/1/97
male reproductive toxicity, initial date 5/1/97

MERCURY (7439-97-6)

Repro/Dev. Tox: developmental toxicity, initial date 7/1/90

Canada

Canada WHMIS

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

FERROUS SULFATE, MONOHYDRATE (17375-41-6)

1 %

FERROUS SULFATE (7720-78-7)

1 %

Germany Water Classification

FERROUS SULFATE, MONOHYDRATE (17375-41-6)

Number 514, hazard class 1 - low hazard to waters (footnote 8)

FERROUS SULFATE (7720-78-7)

Number 514, hazard class 1 - low hazard to waters (footnote 8)

IRON (7439-89-6)
Number 748, not considered hazardous to water
SULFUR (7704-34-9)
Number 842, not considered hazardous to water
SULFUR (7704-34-9)
Number 753, hazard class 1 - low hazard to waters
MAGNESIUM (7439-95-4)
Number 1443, not considered hazardous to water
TITANIUM DIOXIDE (13463-67-7)
Number 1345, not considered hazardous to water
LEAD (7439-92-1)
Number 1443, not considered hazardous to water
MERCURY (7439-97-6)
Number 393, hazard class 3 - severe hazard to waters

EU Marking and Labelling

Symbols

Xn Harmful
Xi Irritant

Risk Phrases

R22 Harmful if swallowed.
R36/38 Irritating to eyes and skin.

Component Analysis - Inventory

Component	CAS	US	CA	EU	AU	PH	JP	KR	CN	NZ
FERROUS SULFATE, MONOHYDRATE	17375-41-6	No	No	No	Yes	No	No	No	No	Yes
FERROUS SULFATE	7720-78-7	Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	Yes
IRON	7439-89-6	Yes	DSL	EIN	Yes	Yes	No	Yes	Yes	Yes
SULFUR	7704-34-9	Yes	DSL	EIN	Yes	Yes	No	Yes	Yes	Yes
MAGNESIUM	7439-95-4	Yes	DSL	EIN	Yes	Yes	No	Yes	Yes	Yes
TITANIUM DIOXIDE	13463-67-7	Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	Yes
LEAD	7439-92-1	Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	Yes
ARSENIC	7440-38-2	Yes	DSL	EIN	Yes	Yes	No	Yes	Yes	Yes
CADMIUM	7440-43-9	Yes	DSL	EIN	Yes	Yes	No	Yes	Yes	Yes
MERCURY	7439-97-6	Yes	DSL	EIN	Yes	Yes	No	Yes	Yes	Yes

* * * Section 16 - OTHER INFORMATION * * *

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

Full text of R phrases in Section 3

R15 Contact with water liberates extremely flammable gases.
R17 Spontaneously flammable in air.
R20/22 Harmful by inhalation and if swallowed.
R22 Harmful if swallowed.
R23/25 Toxic by inhalation and if swallowed.
R26 Very toxic by inhalation.
R33 Danger of cumulative effects.
R36 Irritating to eyes.
R36/38 Irritating to eyes and skin.
R37 Irritating to respiratory system.
R38 Irritating to skin.
R41 Risk of serious damage to eyes.
R45 May cause cancer.
R48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R48/23/25 Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R50 Very toxic to aquatic organisms.
R53 May cause long-term adverse effects in the aquatic environment.
R61 May cause harm to the unborn child.
R62 Possible risk of impaired fertility.
R63 Possible risk of harm to the unborn child.
R68 Possible risk of irreversible effects.

Other Information

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