Mill Scale

Safety Data Sheet

according to the Hazardous Products Regulation (February 11, 2015)
Issue date: 2022-11-23 Revision date: 2022-11-23 Version: 1.0

SECTION 1: Identification

1.1. Product identifier

Product form	:	Substance
Substance name	:	Mill Scale
CAS-No.	:	65996-74-9

1.2. Recommended use and restrictions on use

Recommended use	:	By-product

1.3. Supplier

Manufacturer
Algoma Steel
105 West Street
Sault Ste. Marie Ontario P6A 7B4
Canada
T – 705-945-2351

1.4. Emergency telephone number

Emergency number	:	1-888-CAN-UTEC (226-8832), 613-996-6666

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

Classification (GHS CA)

Carc. 1A	H350	May cause cancer.
Comb. Dust		May form combustible dust concentrations in air

2.2. GHS Label elements, including precautionary statements

GHS-CA labelling

Hazard pictograms (GHS-CA) :

Signal word (GHS CA) : Danger

Hazard statements (GHS-CA) : May form combustible dust concentrations in air
H350 - May cause cancer.

Precautionary statements (GHS-CA) : P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P308+P313 - IF exposed or concerned: Get medical advice/attention.
P405 - Store locked up.
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS CA)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substances

Name : Mill Scale
CAS-No. : 65996-74-9

Name	Chemical name / Synonyms	Product identifier	%
Mill scale, ferrous metal	Mill scale (ferrous metal) / Mill scale, ferrous metal (The oxidized surface of steel produced during reheating, conditioning, hot rolling, and hot forming operations. This substance is usually removed by process waters used for descaling, roll and material cooling, and other purposes. It is subsequently recovered by gravity separation techniques. Composed primarily of high-purity iron oxides. May contain varying amounts of other oxides, elements, and trace compounds.) / Mill scale / Iron oxides / Mill scales	CAS-No.: 65996-74-9	100
The following components comprise this product and were used for hazard determination:			
Iron	Iron, elemental / Direct reduced Iron / Iron, reduced / Elemental iron / IRON POWDER / iron	CAS-No.: 7439-89-6	≤ 70
Iron oxide (Fe2O3)	C.I. 77491 / C.I. Pigment Red 101 / Diiron trioxide / Ferric oxide / Iron sesquioxide / Iron(III) oxide / Red Iron Oxide / Rouge / CI 77491 / Iron trioxide / Sienna / Pigment Red 101 / Red iron oxide / Red iron oxide pigment / Iron Oxide Red / Diiron(III) trioxide / Iron oxide / Ferric oxide red / Iron oxide, red	CAS-No.: 1309-37-1	≤ 70
Magnetite (Fe3O4)	Magnetic iron oxide / Magnetic Black / Magnetite / Triiron tetraoxide / Iron oxide black / Iron oxide, Black / Iron(II,III) oxide / Iron oxide Black / Iron oxide, black	CAS-No.: 1309-38-2	≤ 70
Iron oxide (FeO)	Ferrous oxide / Iron(II) oxide / C.I. 77489 / CI 77489 / Ferrous monoxide / Iron oxide	CAS-No.: 1345-25-1	≤ 70
Calcium oxide	Lime / Quicklime / CALCIUM OXIDE / Quicklime (CaO) / Calcium oxide (CaO) / Lime (calcium oxide)	CAS-No.: 1305-78-8	0.1 – 1
Manganese oxide (MnO)	Cassel Green / Manganese monoxide / Manganous oxide / Manganese(II) oxide / Manganese(2+) oxide / Manganese oxide / Manganese monooxide / MANGANESE OXIDE	CAS-No.: 1344-43-0	0.1 – 1
Quartz	Quartz, silica	CAS-No.: 14808-60-7	0.1 – 1

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if you feel unwell.

First-aid measures after skin contact	:	If skin irritation occurs: Wash skin with plenty of water. Obtain medical attention if irritation persists.
First-aid measures after eye contact	:	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion	:	Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical advice/attention if you feel unwell.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after inhalation	:	May cause irritation to the respiratory tract.
Symptoms/effects after skin contact	:	May cause skin irritation. Repeated exposure may cause skin dryness or cracking. Skin contact with metallic dusts may cause physical abrasion.
Symptoms/effects after eye contact	:	May cause eye irritation. Particles of iron or iron compounds may become imbedded in the eye. Symptoms may include discomfort or pain, excess blinking and tear production, with possible redness and swelling.
Symptoms/effects after ingestion	:	May be harmful if swallowed. May cause gastrointestinal irritation, nausea, vomiting and diarrhea.
Chronic symptoms	:	May cause cancer.

4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment	:	Symptoms may be delayed. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media	:	Use extinguishing media appropriate for surrounding fire.

5.2. Unsuitable extinguishing media

Unsuitable extinguishing media	:	Do not use water jet.

5.3. Specific hazards arising from the hazardous product

Fire hazard	:	Combustible dust. Products of combustion may include, and are not limited to: oxides of carbon. Metal oxides. Toxic fumes.
Explosion hazard	:	Airborne dust in sufficient concentrations when confined and exposed to a sufficient ignition source can explode.

5.4. Special protective equipment and precautions for fire-fighters

Protection during firefighting	:	Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA). Cool closed containers exposed to fire with water spray.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	:	Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid dispersal of dust in the air (ie, clearing dust surfaces with compressed air). Use only non-sparking tools.

6.2. Methods and materials for containment and cleaning up

For containment	:	Contain spill, then place in a suitable container. Minimize dust generation. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE).

Methods for cleaning up : Sweep or shovel spills into appropriate container for disposal. Provide ventilation.

6.3. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection"

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid contact with skin and eyes. Avoid generating and breathing dust. Do not swallow. Handle and open container with care. When using do not eat, drink or smoke. Good housekeeping is important to prevent accumulation of dust. The use of compressed air for cleaning clothing, equipment, etc, is not recommended. Use only in well ventilated areas. Handling this product may result in electrostatic accumulation. Use proper grounding procedures.

Hygiene measures : Wash contaminated clothing before reuse. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep out of the reach of children. Keep away from sources of ignition. Keep container tightly closed. Store in dust-tight, dry, labelled containers. Avoid any dust buildup by frequent cleaning and suitable construction of the storage area. Store locked up.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Particulates not otherwise regulated (PNOR) and Particulates not otherwise classified (PNOC)	
USA - ACGIH - Occupational Exposure Limits	
ACGIH OEL TWA	10 mg/m³ (inhalable particles)
ACGIH OEL TWA	3 mg/m³ (respirable particles)
USA - OSHA - Occupational Exposure Limits	
OSHA PEL TWA	15 mg/m³ (total dust)
OSHA PEL TWA	5 mg/m³ (respirable fraction)

Calcium oxide (1305-78-8)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Calcium oxide
ACGIH OEL TWA	2 mg/m³
Remark (ACGIH)	TLV® Basis: URT irr
Regulatory reference	ACGIH 2020

Iron oxide (Fe2O3) (1309-37-1)	
USA - ACGIH - Occupational Exposure Limits	
ACGIH OEL TWA	5 mg/m³ (respirable particulate matter)
ACGIH chemical category	Not Classifiable as a Human Carcinogen

Quartz (14808-60-7)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Silica crystaline - quartz
ACGIH OEL TWA	0.025 mg/m³ (respirable particulate matter)
Remark (ACGIH)	TLV® Basis: Pulm fibrosis; lung cancer. Notations: A2 (Suspected Human Carcinogen)
ACGIH chemical category	Suspected Human Carcinogen
Regulatory reference	ACGIH 2022

8.2. Appropriate engineering controls

Appropriate engineering controls : Ensure good ventilation of the work station. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e, there is not leakage from the equipment). Use only appropriately classified electrical equipment and powered industrial trucks.

Environmental exposure controls : Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

Hand protection:
Wear suitable gloves

Eye protection:
Safety glasses or goggles are recommended when using product.

Skin and body protection:
Wear suitable protective clothing

Respiratory protection:
In case of insufficient ventilation, wear suitable respiratory equipment. 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.

Other information:
Handle in accordance with good industrial hygiene and safety procedures. Do not eat, drink or smoke when using this product.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Solid
Appearance : Metallic.
Colour : Grey
Odour : No data available
Odour threshold : No data available
pH : No data available
Relative evaporation rate (butylacetate=1) : No data available
Relative evaporation rate (ether=1) : No data available

Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	May form combustible dust concentrations in air
Vapour pressure	:	No data available
Relative vapour density at 20°C	:	No data available
Relative density	:	No data available
Solubility	:	Negligible in water.
Partition coefficient n-octanol/water	:	No data available
Viscosity, kinematic	:	No data available
Explosive limits	:	No data available

Calcium oxide (1305-78-8)	
Boiling point	2850 °C Atm. press.: 101325 Pa Decomposition: 'no'
Vapour pressure	0 hPa (at 20 °C)

Iron (7439-89-6)	
Boiling point	2861 °C Atm. press.: 1013 hPa
Auto-ignition temperature	> 100 °C
Vapour pressure	0.000001 hPa (at 25 °C)

Quartz (14808-60-7)	
Boiling point	2230 °C

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

Reactivity	:	No dangerous reactions known under normal conditions of use.
Chemical stability	:	Stable under normal conditions. May form combustible dust concentrations in air.
Possibility of hazardous reactions	:	No dangerous reactions known under normal conditions of use.
Conditions to avoid	:	Heat. Incompatible materials. Avoid dust formation.
Incompatible materials	:	calcium hypochlorite. reducing agents. Strong acids. Strong bases.
Hazardous decomposition products	:	May include, and are not limited to: oxides of carbon. Metal oxides. Toxic fumes.
Hardening time:	:	No additional information available

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Not classified.
Acute toxicity (dermal)	:	Not classified.
Acute toxicity (inhalation)	:	Not classified.

Calcium oxide (1305-78-8)	
LD50 oral rat	> 2000 mg/kg bodyweight Animal: rat, Animal sex: female, Guideline: OECD Guideline 425 (Acute Oral Toxicity: Up-and-Down Procedure)

Calcium oxide (1305-78-8)	
LD50 dermal rat	> 2000 mg/kg bodyweight Animal: rat, Guideline: OECD Guideline 402 (Acute Dermal Toxicity), Guideline: EU Method B.3 (Acute Toxicity (Dermal))
LD50 dermal rabbit	> 5000 mg/kg bodyweight Animal: rabbit, Guideline: other:US Federal Register 38: 187, Part 1500, Section 41, 1973.
LC50 inhalation rat	> 6.04 mg/l/4h

Manganese oxide (MnO) (1344-43-0)	
LD50 oral rat	1000 mg/kg (mouse)
LC50 inhalation rat	> 5.35 mg/l/4h

Iron (7439-89-6)	
LD50 oral rat	30 g/kg
ATE CA (oral)	30000 mg/kg bodyweight

Iron oxide (Fe2O3) (1309-37-1)	
LD50 oral rat	> 10000 mg/kg
LD50 oral	> 5000 mg/kg bodyweight Animal: , Guideline: EU Method B.1 (Acute Toxicity (Oral))

Iron oxide (FeO) (1345-25-1)	
LD50 oral rat	> 15 g/kg

Skin corrosion/irritation : Not classified.

Calcium oxide (1305-78-8)	
pH	12.5 (saturated solution)

Serious eye damage/irritation : Not classified.

Calcium oxide (1305-78-8)	
pH	12.5 (saturated solution)

Respiratory or skin sensitization : Not classified.

Germ cell mutagenicity : Not classified.

Carcinogenicity : May cause cancer.

Iron oxide (Fe2O3) (1309-37-1)	
IARC group	3 - Not classifiable

Quartz (14808-60-7)	
IARC group	1 - Carcinogenic to humans
National Toxicology Program (NTP) Status	Known Human Carcinogens

Reproductive toxicity : Not classified.

STOT-single exposure : Not classified.

Calcium oxide (1305-78-8)	
STOT-single exposure	May cause respiratory irritation.

STOT-repeated exposure : Not classified.

Calcium oxide (1305-78-8)	
LOAEL (oral, rat, 90 days)	300 mg/kg bodyweight Animal: rat, Animal sex: male, Guideline: OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)

Calcium oxide (1305-78-8)	
NOAEL (oral, rat, 90 days)	1000 mg/kg bodyweight Animal: rat, Guideline: OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)
NOAEC (inhalation, rat, dust/mist/fume, 90 days)	0.413 mg/l air Animal: rat, Animal sex: male, Guideline: OECD Guideline 412 (Subacute Inhalation Toxicity: 28-Day Study)

Iron oxide (Fe2O3) (1309-37-1)	
LOAEC (inhalation, rat,dust/mist/fume, 90 days)	0.2102 mg/l air Animal: rat, Animal sex: male, Guideline: OECD Guideline 412 (Subacute Inhalation Toxicity: 28-Day Study)
NOAEC (inhalation, rat, dust/mist/fume, 90 days)	≥ 0.03 mg/l air Animal: rat, Animal sex: male

Quartz (14808-60-7)	
STOT-repeated exposure	Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard : Not classified.

Symptoms/effects after inhalation : May cause irritation to the respiratory tract.

Symptoms/effects after skin contact : May cause skin irritation. Repeated exposure may cause skin dryness or cracking. Skin contact with metallic dusts may cause physical abrasion.

Symptoms/effects after eye contact : May cause eye irritation. Particles of iron or iron compounds may become imbedded in the eye. Symptoms may include discomfort or pain, excess blinking and tear production, with possible redness and swelling.

Symptoms/effects after ingestion : May be harmful if swallowed. May cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Chronic symptoms : May cause cancer.

Other information : Likely routes of exposure: ingestion, inhalation, skin and eye.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : May cause long-term adverse effects in the aquatic environment.

Hazardous to the aquatic environment, short–term (acute) : Not classified.

Hazardous to the aquatic environment, long–term (chronic) : Not classified.

Calcium oxide (1305-78-8)	
LC50 - Fish [1]	1070 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [static])
EC50 - Crustacea [1]	49.1 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algae [1]	> 100 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
EC50 96h - Algae [1]	1130.3 mg/l Test organisms (species): Navicula seminulum
NOEC chronic fish	100 mg/l Test organisms (species): other:Tilapia nilotica Duration: '46 d'
NOEC (chronic)	32 mg/l Test organisms (species): Crangon septemspinosa Duration: '14 d'

Manganese oxide (MnO) (1344-43-0)	
EC50 - Crustacea [1]	> 4 mg/l Test organisms (species): Daphnia magna
NOEC (chronic)	1.3 mg/l Test organisms (species): Ceriodaphnia dubia Duration: '8 d'
LOEC (chronic)	4.1 mg/l Test organisms (species): Ceriodaphnia dubia Duration: '8 d'

Iron (7439-89-6)	
EC50 - Crustacea [1]	> 100 mg/l Test organisms (species): Daphnia magna
EC50 - Crustacea [2]	> 10000 mg/l Test organisms (species): Daphnia magna

Iron oxide (Fe2O3) (1309-37-1)	
LC50 - Fish [1]	100000 mg/l (Exposure time: 96 h - Species: Danio rerio [static])
EC50 - Crustacea [1]	> 100 mg/l Test organisms (species): Daphnia magna
EC50 - Other aquatic organisms [1]	> 100 mg/l Test organisms (species):
EC50 72h - Algae [1]	> 20 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)

12.2. Persistence and degradability

Mill Scale (65996-74-9)	
Persistence and degradability	Not established.

12.3. Bioaccumulative potential

Mill Scale (65996-74-9)	
Bioaccumulative potential	Not established.

Calcium oxide (1305-78-8)	
BCF - Fish [1]	(no bioaccumulation)

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Ozone : Not classified.
Other information : No other effects known.

SECTION 13: Disposal considerations

13.1. Disposal methods

Product/Packaging disposal recommendations : Recycle the material as far as possible. Dispose in a safe manner in accordance with local/national regulations.

SECTION 14: Transport information

In accordance with TDG

14.1. UN number

Not regulated for transport

14.2. UN proper shipping name

Proper Shipping Name (TDG) : Not applicable

14.3. Transport hazard class(es)

TDG
Transport hazard class(es) (TDG) : Not applicable

14.4. Packing group

Packing group (TDG) : Not applicable

14.5. Environmental hazards

Other information : No supplementary information available.

14.6. Special precautions for user

Special transport precautions : Do not handle until all safety precautions have been read and understood.

TDG
No data available

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. National regulations

All components of this product are listed, or excluded from listing, on the Canadian DSL (Domestic Substances List) and NDSL (Non-Domestic Substances List) inventories.

Mill Scale (65996-74-9)
Listed on the Canadian DSL (Domestic Substances List)

15.2. International regulations

No additional information available

SECTION 16: Other information

Issue date : 11-23-2022
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Other information : Refer to NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, for safe handling.

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Safety Data Sheet (SDS), Canada - Nexreg 2022

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