

Manganous Oxide

Version number: 2.0

SECTION 1: Identification

1.1 Product identifier

Trade name **Manganous Oxide**

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses
Nutritional Additive – E5
Agrochemical Intermediate
Welding Industry
Zinc Electrolysis

1.3 Details of the supplier of the safety data sheet

Valudor Products, LLC
179 Calle Magdalena Suite 100
Encinitas, California CA 92024
United States

Telephone: +1 (760) 635 8500
e-mail: info@valudor.com
Website: www.valudor.com

1.4 Emergency telephone number

Emergency information 800-535-5053 (Infotrac)
As above or nearest toxicological information center.

SECTION 2: Hazard(s) identification

2.1 Classification of the substance or mixture

Classification acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

Classification				
Section	Hazard class	Category	Hazard class and category	Hazard statement
A.6	carcinogenicity	1A	Carc. 1A	H350

For full text of abbreviations: see SECTION 16

2.2 Label elements

Labelling acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

Signal word danger

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Pictograms

GHS08



Hazard statements

H350 May cause cancer.

Precautionary statements

P201 Obtain special instructions before use.

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 an authorized waste treatment facility.

Hazardous ingredients for labelling manganese oxide

2.3 Other hazards

Results of PBT and vPvB assessment

Does not contain a PBT-/vPvB-substance at a concentration of $\geq 0.1\%$.

SECTION 3: Composition/information on ingredients

3.1 Substances

Not relevant (mixture).

3.2 Mixtures

Description of the mixture

Hazardous ingredients						
Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes	Specific Conc. Limits
manganese oxide	CAS No 1344-43-0	75 – < 90	Carc. 1A / H350		IARC: 1	-
diiron trioxide	CAS No 1309-37-1 RTECS No NO7400000	5 – < 10	-	-	-	-
aluminium oxide	CAS No 1344-28-1 RTECS No BD1200000	5 – < 10	-	-	-	-
silicon dioxide,	CAS No	5 – < 10	-	-	-	-

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Hazardous ingredients						
Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes	Specific Conc. Limits
amorphous	7631-86-9					

Notes

IARC: 1: IARC group 1: carcinogenic to humans (International Agency for Research on Cancer)

Remarks

For full text of H-phrases: see SECTION 16

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4: First-aid measures

4.1 Description of first-aid measures

General notes

Self-protection of the first aider.

Remove affected person from the danger area and lay down.

Do not leave affected person unattended.

Take off immediately all contaminated clothing.

In all cases of doubt, or when symptoms persist, seek medical advice.

Following inhalation

Provide fresh air.

If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions.

Following skin contact

Wash with plenty of soap and water.

Following eye contact

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.

Following ingestion

Rinse mouth. Do not induce vomiting.

Get medical advice/attention if you feel unwell.

Notes for the doctor

None.

4.2 Most important symptoms and effects, both acute and delayed

This information is not available.

4.3 Indication of any immediate medical attention and special treatment needed

None.

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SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

water, foam, alcohol resistant foam, fire extinguishing powder,
coordinate firefighting measures to the fire surroundings

Unsuitable extinguishing media

none

5.2 Special hazards arising from the substance or mixture

Metal oxides.

Hazardous decomposition products: Section 10.

5.3 Advice for firefighters

Non-combustible.

Keep containers cool with water spray.

In case of fire and/or explosion do not breathe fumes.

Coordinate firefighting measures to the fire surroundings.

Do not allow firefighting water to enter drains or water courses.

Collect contaminated firefighting water separately.

Fight fire with normal precautions from a reasonable distance.

Special protective equipment for firefighters

self-contained breathing apparatus (SCBA)

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Remove persons to safety.

Ventilate affected area.

Control of dust.

Do not breathe dust.

Avoid contact with skin and eyes.

Wearing of suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing.

For emergency responders

Wear breathing apparatus if exposed to vapors/dust/aerosols/gases.

6.2 Environmental precautions

Keep away from drains, surface and ground water.

Retain contaminated washing water and dispose of it.

If substance has entered a water course or sewer, inform the responsible authority.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains.

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Take up mechanically.

Advice on how to clean up a spill

Take up mechanically.

Collect spillage.

Other information relating to spills and releases

Place in appropriate containers for disposal.

Ventilate affected area.

6.4 Reference to other sections

Personal protective equipment: see section 8.

Incompatible materials: see section 10.

Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes.

Do not breathe dust.

Measures to prevent fire as well as aerosol and dust generation

Use local and general ventilation.

Removal of dust deposits.

Measures to protect the environment

Avoid release to the environment.

Do not empty into drains; dispose of this material and its container at hazardous or special waste collection point.

Advice on general occupational hygiene

Do not eat, drink and smoke in work areas.

Remove contaminated clothing and protective equipment before entering eating areas.

Do not breathe dust.

Avoid contact with skin and eyes.

Wash hands after use.

Preventive skin protection (barrier creams/ointments) is recommended.

7.2 Conditions for safe storage, including any incompatibilities

Flammability hazards

None.

Incompatible substances or mixtures

Incompatible materials: see section 10.

Protect against external exposure, such as

humidity, direct light irradiation, sunlight

Consideration of other advice

These information are not available.

Ventilation requirements

Provision of sufficient ventilation.

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Specific designs for storage rooms or vessels

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

Keep cool.

Store in a dry place.

Packaging compatibilities

Keep only in original container.

7.3 Specific end use(s)

No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

The following constituents are the only constituents of the product which have a PEL, a TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

Occupational exposure limit values (Workplace Exposure Limits)									
Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m ³]	STEL [ppm]	STEL [mg/m ³]	Notation	Source
US	Particulates not otherwise regulated	-	PEL (CA)	-	10	-	-	dust	Cal/OSHA PEL
US	Particulates not otherwise regulated	-	PEL (CA)	-	5	-	-	r	Cal/OSHA PEL
US	particulates not otherwise classified (PNOC)	-	PEL	-	15	-	-	dust	29 CFR 1910.1000
US	particulates not otherwise classified (PNOC)	-	PEL	1,765	-	-	-	partml, dust	29 CFR 1910.1000
US	particulates not otherwise classified (PNOC)	-	PEL	529.5	-	-	-	partml, r, dust	29 CFR 1910.1000
US	particulates not otherwise classified (PNOC)	-	PEL	-	5	-	-	r	29 CFR 1910.1000
US	particulate not otherwise regulated	-	REL	-	-	-	-	appx-D	NIOSH REL
US	diiron trioxide (iron(III) oxide)	1309-37-1	TLV®	-	5	-	-	r	ACGIH® 2024
US	iron(III) oxide	1309-37-1	PEL (CA)	-	5	-	-	fume	Cal/OSHA PEL
US	iron(III) oxide	1309-37-	PEL	-	10	-	-	fume	29 CFR

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Occupational exposure limit values (Workplace Exposure Limits)									
Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Notation	Source
		1							1910.1000
US	iron(III) oxide (diiron trioxide)	1309-37-1	REL	-	5 (10 h)	-	-	df, Fe	NIOSH REL
US	rouge	1309-37-1	REL	-	-	-	-	appx-D	NIOSH REL
US	rouge	1309-37-1	PEL	-	15	-	-	dust	29 CFR 1910.1000
US	rouge	1309-37-1	PEL	-	5	-	-	r	29 CFR 1910.1000
US	alpha-alumina	1344-28-1	REL	-	-	-	-	appx-D	NIOSH REL
US	alpha-alumina	1344-28-1	PEL	-	15	-	-	dust	29 CFR 1910.1000
US	alpha-alumina	1344-28-1	PEL	-	5	-	-	r	29 CFR 1910.1000
US	aluminium, insoluble compounds	1344-28-1	TLV®	-	1	-	-	r	ACGIH® 2024
US	aluminium oxide	1344-28-1	PEL (CA)	-	10	-	-	dust	Cal/OSHA PEL
US	aluminium oxide	1344-28-1	PEL (CA)	-	5	-	-	r	Cal/OSHA PEL
US	manganese, inorganic compounds	1344-43-0	TLV®	-	0.1	-	-	i, Mn	ACGIH® 2024
US	manganese, inorganic compounds	1344-43-0	TLV®	-	0.02	-	-	r, Mn	ACGIH® 2024
US	manganese compounds	1344-43-0	PEL (CA)	-	0.2	-	-	Mn	Cal/OSHA PEL
US	manganese compounds	1344-43-0	REL	-	1 (10 h)	-	3	Mn	NIOSH REL
US	manganese compounds	1344-43-0	PEL	-	-	-	-	Mn	29 CFR 1910.1000
US	silica, amorphous	7631-86-9	REL	-	6 (10 h)	-	-	-	NIOSH REL

Notation

appx-D see Appendix D - Substances with No Established RELs
df as dust and fumes
dust as dust
Fe calculated as Fe (iron)

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Notation

fume	as fume
i	inhalable fraction
Mn	calculated as Mn (manganese)
partml	particles/ml
r	respirable fraction
STEL	short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
TWA	time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

8.2 Exposure controls

Appropriate engineering controls

Use local and general ventilation.

Individual protection measures (personal protective equipment)

Eye/face protection

Wear eye/face protection.

Hand protection

Protective gloves		
Material	Material thickness	Breakthrough times of the glove material
no information available	no information available	no information available

Wear suitable gloves.

Chemical protection gloves are suitable, which are tested according to EN 374.

Check leak-tightness/impermeability prior to use.

For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

Body protection

Protective clothing for use against solid particulates.

Respiratory protection

In case of inadequate ventilation wear respiratory protection.

Particle filter device (DIN EN 143).

Thermal hazards

Wear protective gloves against thermal risks (heat and/or fire).

Environmental exposure controls

Use appropriate container to avoid environmental contamination.

Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

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Appearance

Physical state

solid
powder
granules

Color

green - brown

Odor

odorless

Odor threshold

not determined

Other safety parameters

pH (value)

not applicable

Melting point/freezing point

not determined

Boiling point or initial boiling point and boiling range

not determined

Flash point

not applicable

Evaporation rate

not determined

Flammability (solid, gas)

non-combustible

Explosive limits

not determined

Explosion limits of dust clouds

not determined

Vapor pressure

not determined

Density and/or relative density

Density

5.43 g/cm³ at 25 °C

Relative vapour density

not relevant (solid)

Solubility(ies)

Water solubility

insoluble

Partition coefficient

n-octanol/water (log KOW)

not relevant
(inorganic)

Auto-ignition temperature

not determined

Decomposition temperature

not relevant

Viscosity

not relevant
(solid)

Explosive properties

none

Oxidizing properties

none

Information for relevant hazard classes

hazard classes acc. to GHS (physical hazards):

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according to GHS

not relevant

9.2 Other information

there is no additional information

SECTION 10: Stability and reactivity

10.1 Reactivity

This material is not reactive under normal ambient conditions.

10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

See below "Conditions to avoid".

10.3 Possibility of hazardous reactions

No known hazardous reactions.

10.4 Conditions to avoid

Control of dust.

10.5 Incompatible materials

oxidizers

10.6 Hazardous decomposition products

Metal oxides.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Classification procedure

If not otherwise specified the classification is based on:

Ingredients of the mixture (additivity formula).

Classification acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

Acute toxicity

Test data are not available for the complete mixture.

Acute toxicity of components

Acute toxicity estimate (ATE) of components			
Name of substance	CAS No	Exposure route	ATE
manganese oxide	1344-43-0	oral	>2,000 mg/kg
manganese oxide	1344-43-0	inhalation: dust/mist	>5.35 mg/l/4h
diiron trioxide	1309-37-1	inhalation: dust/mist	>5.05 mg/l/4h

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Acute toxicity of components							
Name of substance	CAS No	Exposure route	End-point	Value	Species	Method	Source
manganese oxide	1344-43-0	oral	LD0	>2,000 mg/kg	rat, female	OECD Guideline 420	ECHA
manganese oxide	1344-43-0	inhalation: dust/mist	LC0	>5,35 mg/l/4h	rat	OECD Guideline 403	ECHA
silicon dioxide, amorphous	7631-86-9	oral	LD50	>5,110 mg/kg	rat	OECD Guideline 401	ECHA
silicon dioxide, amorphous	7631-86-9	inhalation: dust/mist	LC0	5.01 mg/l/4h	rat	OECD Guideline 436	ECHA
silicon dioxide, amorphous	7631-86-9	dermal	LD0	>5,000 mg/kg	rabbit	-	ECHA
aluminium oxide	1344-28-1	oral	LD0	>10,000 mg/kg	rat	OECD Guideline 401	ECHA
diiron trioxide	1309-37-1	oral	LD0	>5,000 mg/kg	rat	EU method B.1	ECHA
diiron trioxide	1309-37-1	inhalation: dust/mist	LC0	>5.05 mg/l/4h	rat	OECD Guideline 403	ECHA

Skin corrosion/irritation

Classification could not be established because:

Data are lacking, inconclusive, or conclusive but not sufficient for classification.

Serious eye damage/eye irritation

Classification could not be established because:

Data are lacking, inconclusive, or conclusive but not sufficient for classification.

Respiratory or skin sensitization

Skin sensitization

Classification could not be established because:

Data are lacking, inconclusive, or conclusive but not sufficient for classification.

Respiratory sensitization

Classification could not be established because:

Data are lacking, inconclusive, or conclusive but not sufficient for classification.

Germ cell mutagenicity

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Classification could not be established because:

Data are lacking, inconclusive, or conclusive but not sufficient for classification.

Carcinogenicity

May cause cancer.

IARC Monographs

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans			
Name of substance	CAS No	Classification	Number
diiron trioxide	1309-37-1	3	-
manganese oxide		1	-
silicon dioxide, amorphous	7631-86-9	3	-

Legend

- 1 Carcinogenic to humans
- 3 Not classifiable as to carcinogenicity in humans

National Toxicology Program (United States)

None of the ingredients are listed.

OSHA Carcinogens

None of the ingredients are listed.

Reproductive toxicity

Classification could not be established because:

Data are lacking, inconclusive, or conclusive but not sufficient for classification.

Specific target organ toxicity - single exposure

Classification could not be established because:

Data are lacking, inconclusive, or conclusive but not sufficient for classification.

Specific target organ toxicity - repeated exposure

Classification could not be established because:

Data are lacking, inconclusive, or conclusive but not sufficient for classification.

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

11.2 Other information

There is no additional information.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity (acute)

Based on available data, the classification criteria are not met.

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Aquatic toxicity (acute) of components

Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
manganese oxide	1344-43-0	EC50	48 h	>4 mg/l	daphnia magna	OECD Guideline 202	ECHA Chem
manganese oxide	1344-43-0	LC50	96 h	>1.2 mg/l	rainbow trout (Oncorhynchus mykiss)	OECD Guideline 203	ECHA
silicon dioxide, amorphous	7631-86-9	EL50	72 h	>1,000 mg/l	green algae	OECD Guideline 201	ECHA Chem
silicon dioxide, amorphous	7631-86-9	LC50	96 h	>5,000 mg/l	fathead minnow (Pimephales promelas)	OECD Guideline 203	ECHA Chem
silicon dioxide, amorphous	7631-86-9	EC50	72 h	>173.1 mg/l	green algae (Desmodesmus subspicatus)	OECD Guideline 201	ECHA Chem
silicon dioxide, amorphous	7631-86-9	EC50	48 h	>5,000 mg/l	daphnia magna	OECD Guideline 202	ECHA Chem
diiron trioxide	1309-37-1	EC50	48 h	>100 mg/l	daphnia magna	OECD Guideline 202	ECHA
diiron trioxide	1309-37-1	LC0	96 h	≥50,000 mg/l	zebra fish (Danio rerio)	-	ECHA
diiron trioxide	1309-37-1	ErC50	72 h	>20 mg/l	algae (raphidocelis subcapitata)	OECD Guideline 201	ECHA

Aquatic toxicity (chronic)

Based on available data, the classification criteria are not met.

Aquatic toxicity (chronic) of components

Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
manganese oxide	1344-43-0	EC50	8 d	2.5 mg/l	water flea (Daphnia)	OECD Guideline 211	ECHA Chem
manganese oxide	1344-43-0	EC50	3 h	>1,000 mg/l	microorganisms	OECD Guideline 209	ECHA Chem
manganese oxide	1344-43-0	NOEC	8 d	1.3 mg/l	water flea	OECD	ECHA Chem

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Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
ide					(Daphnia)	Guideline 211	
manganese oxide	1344-43-0	NOEC	3 h	1,000 mg/l	microorganisms	OECD Guideline 209	ECHA Chem
manganese oxide	1344-43-0	LOEC	8 d	4.1 mg/l	water flea (Daphnia)	OECD Guideline 211	ECHA Chem
silicon dioxide, amorphous	7631-86-9	EC50	3 h	>1,000 mg/l	microorganisms	OECD Guideline 209	ECHA
silicon dioxide, amorphous	7631-86-9	NOEC	21 d	68 mg/l	daphnia magna	OECD Guideline 211	ECHA Chem
silicon dioxide, amorphous	7631-86-9	LOEC	21 d	149.2 mg/l	daphnia magna	OECD Guideline 211	ECHA Chem
silicon dioxide, amorphous	7631-86-9	growth (Eb-Cx) 10%	3 h	>1,000 mg/l	microorganisms	OECD Guideline 209	ECHA Chem
aluminium oxide	1344-28-1	EC50	8 d	45 mg/l	Ceriodaphnia dubia (water flea)	EPA Method 1002	ECHA
aluminium oxide	1344-28-1	growth (Eb-Cx) 10%	3 h	1,000 mg/l	A mixed population of active sewage sludge microorganisms	OECD Guideline 209	ECHA
diiron trioxide	1309-37-1	EC50	3 h	>10,000 mg/l	activated sludge of a predominantly domestic sewage	DIN EN ISO 8192	ECHA
diiron trioxide	1309-37-1	NOEC	21 d	≥20 mg/l	daphnia magna	OECD Guideline 211	ECHA
diiron trioxide	1309-37-1	NOEC	72 h	≥20 mg/l	algae (raphidocelis subcapitata)	OECD Guideline 201	ECHA

12.2 Persistence and degradability

Biodegradation

No data available.

Persistence

No data available.

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12.3 Bioaccumulative potential

n-octanol/water (log KOW)

not relevant
(inorganic)

12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

Does not contain a PBT-/vPvB-substance at a concentration of $\geq 0.1\%$.

12.6 Other adverse effects

Data are not available.

Remarks

Keep away from drains, surface and ground water.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information

Do not empty into drains.

Waste treatment of containers/packages

Completely emptied packages can be recycled.

Handle contaminated packages in the same way as the substance itself.

Remarks

Please consider the relevant national or regional provisions.

SECTION 14: Transport information

14.1 UN number

not subject to transport regulations

14.2 UN proper shipping name

-

14.3 Transport hazard class(es)

-

14.4 Packing group

-

14.5 Environmental hazards

-

14.6 Special precautions for user

-

14.7 Transport in bulk according to IMO instruments

-

14.8 Information for each of the UN Model Regulations

Transport of dangerous goods by road or rail (49 CFR US DOT) Additional information

Not subject to transport regulations.

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SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

National regulations (United States)

Toxic Substance Control Act (TSCA)

All ingredients are listed (ACTIVE) or exempt from listing

Superfund Amendment and Reauthorization Act (SARA TITLE III)

The List of Extremely Hazardous Substances and Their Threshold Planning Quantities (EPCRA Section 302, 304)

None of the ingredients are listed

Specific Toxic Chemical Listings (EPCRA Section 313)

Toxics Release Inventory: Specific Toxic Chemical Listings				
Name of substance	Name acc. to inventory	CAS No	Remarks	Effective date
aluminium oxide	aluminium oxide	1344-28-1	fibrous forms	1987-01-01
manganese oxide	manganese compounds		-	1987-01-01

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

List of Hazardous Substances and Reportable Quantities (CERCLA section 102a) (40 CFR 302.4)

None of the ingredients are listed

Clean Air Act

None of the ingredients are listed

Right to Know Hazardous Substance List

Toxic or Hazardous Substance List (MA-TURA)

Name of substance	Name acc. to inventory	CAS No	DEP CODE	PBT / HHS / LHS	PBT / HHS Thres hold	De Minimis Concentration Threshold
aluminium oxide	Aluminum oxide (fibrous forms)	1344-28-1	-	-	-	1.0 %
manganese oxide	Manganese Compounds	-	1027	-	-	1.0 %

Hazardous Substances List (MN-ERTK)

Name of substance	Name acc. to inventory	CAS No	References	Remarks
Manganous Oxide	Dust, Inert or Nuisance (When toxic impurities are not present, for example, quartz less than 1 percent.)	-	A	dust

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Name of substance	Name acc. to inventory	CAS No	References	Remarks
diiron trioxide	Iron oxide (Fe ₂ O ₃), as Fe	1309-37-1	A, O	fume
diiron trioxide	Rouge	1309-37-1	A	-
aluminium oxide	a-Alumina	1344-28-1	A	-
aluminium oxide	Aluminum oxide	1344-28-1	A	-
manganese oxide	Manganese, elemental and compounds, as Mn	-	A, O	-
manganese oxide	Welding fumes	-	A	fume
silicon dioxide, amorphous	Silica (SiO ₂)	7631-86-9	A, N, O, R, *	-

Legend

- * Substances which are regulated by OSHA as carcinogens; have been categorized by the ACGIH as either "human carcinogens" or "suspect of carcinogenic potential for man"; have been evaluated by the International Agency for Research on Cancer (IARC) and found to be carcinogens or potential carcinogens; or have been listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP).
- A American Conference of Governmental Industrial Hygienists (ACGIH), "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices for 1992-93", available from ACGIH
- dust If the substance poses an airborne particulate exposure hazard, the substance is followed by the word "dust."
- fume Small solid particles formed by the condensation of vapors of solid materials.
- N National Institute for Occupational Safety and Health (NIOSH), "Recommendations for Occupational Safety and Health Standards," August 1988, available from NIOSH, Publications Dissemination Office, Division of Standards Development and Technology Transfer
- O Occupational Safety and Health Administration (OSHA), Safety and Health Standards, Code of Federal Regulations, title 29, part 1910, subpart Z, "Toxic and Hazardous Substances, 1990." General information: Minnesota Department of Labor and Industry, Occupational Safety and Health Division
- R International Agency for Research on Cancer (IARC) Monographs on the Evaluation of the Carcinogenic Risks to Humans; Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1 to 42, Supplement 7 (1987). Available from: WHO Publications Centre USA

Hazardous Substance List (NJ-RTK)

Name of substance	Name acc. to inventory	CAS No	Remarks	Classifications	Listed in	Substance number	DOT number
diiron trioxide	IRON OXIDE (IRON OXIDE (Fe ₂ O ₃), FERRIC OXIDE)	1309-37-1	-		1 2 4 7	1036	-
aluminium oxide	ALUMINUM OXIDE (ALUMINUM OXIDE (Al ₂ O ₃), alpha-ALUMINA)	1344-28-1	-		1 2 4 6 18	2891	-
manganese oxide	manganese com-	-	-		1	2324	-

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Name of substance	Name acc. to inventory	CAS No	Remarks	Classifications	Listed in	Substance number	DOT number
	pounds				2 4 6 18 20		

Legend

- 1 Occupational Safety and Health Administration, 29 CFR 1910-Occupational Safety and Health Standards, Subpart Z-Toxic and Hazardous Substances, July 1, 2008.
- 18 List of Toxics Release Inventory Chemicals, Section 313, Emergency Planning and Community Right to Know Act (EPCRA), Toxics Release Inventory (TRI) Program, U.S. Environmental Protection Agency, 40 CFR 372.65, July 1, 2008.
- 2 "2009 TLVs® and BEIs®, Threshold Limit Values and Biological Exposure Indices," American Conference of Governmental Industrial Hygienists (ACGIH), 2009.
- 20 List of Hazardous Substances and Reportable Quantities (RQ), Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), U.S. Environmental Protection Agency, 40 CFR 302, Table 302.4, July 1, 2008.
- 4 "NIOSH Pocket Guide to Chemical Hazards," National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health and Human Services, No. 2005-149, September 2005.
- 6 "Environmental Hazardous Substance List," New Jersey Department of Environmental Protection, N.J.A.C. 7:1G-2, as printed in the Community Right to Know Survey Instruction Book, 2008.
- 7 IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, "All Supplements, All Volumes, Groups 1, 2A, 2B, and 3, International Agency for Research on Cancer (IARC), World Health Organization, 2008.

Hazardous Substance List (Chapter 323) (PA-RTK)

Name acc. to inventory	CAS No	Classification
IRON OXIDE (FE2O3)	1309-37-1	-
ALUMINUM OXIDE (AL2O3)	1344-28-1	E
MANGANESE	7439-96-5	*, E
WELDING FUMES	-	-
SILICA	7631-86-9	-

Legend

- * Any compound of this substance is also an environmental hazard
- E Environmental hazard

Hazardous Substance List (RI-RTK)

Name of substance	Name acc. to inventory	CAS No	References
diiron trioxide	Iron oxide fume, as Fe.	1309-37-1	T
diiron trioxide	Rouge	1309-37-1	T

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Name of substance	Name acc. to inventory	CAS No	References
aluminium oxide	Aluminum oxide - "inert" particulate	1344-28-1	T
aluminium oxide	alpha-Alumina	1344-28-1	T
manganese oxide	Welding fumes (NOC)	-	T

Legend

T Toxicity (ACGIH®)

California Environmental Protection Agency (Cal/EPA): Proposition 65 - Safe Drinking Water and Toxic Enforcement Act of 1987

None of the ingredients are listed

Drug precursors, Chemicals designated within the Controlled Substances Act, 21 U.S.C. § 802, paragraphs 34 (list I) and 35 (list II)

None of the ingredients are listed

SECTION 16: Other information, including date of preparation or last revision

Date of preparation: 2022-10-05

Date of last revision: 2025-07-14.

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
29 CFR 1910.1000	29 CFR 1910.1000, Tables Z-1, Z-2, Z-3 - Occupational Safety and Health Standards: Toxic and Hazardous Substances (permissible exposure limits)
49 CFR US DOT	49 CFR U.S. Department of Transportation
ACGIH®	American Conference of Governmental Industrial Hygienists
ACGIH® 2024	From ACGIH®, 2024 TLVs® and BEIs® Book. Copyright 2024. Reprinted with permission. Information on the proper use of the TLVs® and BEIs®: http://www.acgih.org/tlv-bei-guidelines/policies-procedures-presentations/tlv-bei-position-statement
ATE	Acute Toxicity Estimate
Cal/OSHA PEL	California Division of Occupational Safety and Health (Cal/OSHA): Permissible Exposure Limits (PELs)
Carc.	Carcinogenicity
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
DEP CODE	Department of Environmental Protection Code
DGR	Dangerous Goods Regulations (see IATA/DGR)
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
EL50	Effective Loading 50 %: the EL50 corresponds to the loading rate required to produce a response in 50% of the test organisms
ErC50	≡ EC50: in this method, that concentration of test substance which results in a 50 % reduction in

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Abbr.	Descriptions of used abbreviations
	either growth (EbC50) or growth rate (ErC50) relative to the control
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
HHS	Higher hazard substance
IARC	International Agency for Research on Cancer
IARC Mono-graphs	IARC Monographs on the Evaluation of Carcinogenic Risks to Humans
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
IMDG	International Maritime Dangerous Goods Code
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
LHS	Lower hazard substance
LOEC	Lowest Observed Effect Concentration
NIOSH REL	National Institute for Occupational Safety and Health (NIOSH): Recommended Exposure Limits (RELs)
NOEC	No Observed Effect Concentration
OSHA	Occupational Safety and Health Administration (United States)
PBT	Persistent, Bioaccumulative and Toxic
PEL	Permissible exposure limit
ppm	Parts per million
RTECS	Registry of Toxic Effects of Chemical Substances (database of NIOSH with toxicological information)
STEL	Short-term exposure limit
TLV®	Threshold Limit Values
TWA	Time-weighted average
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

OSHA Hazard Communication Standard (HCS), 29 CFR 1910.1200 (May 20, 2024 eff. July 19, 2024).

Transport of dangerous goods by road or rail (49 CFR US DOT).

International Maritime Dangerous Goods Code (IMDG).

Dangerous Goods Regulations (DGR) for the air transport (IATA).

Classification procedure

Physical and chemical properties.

Health hazards.

Environmental hazards.

The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

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List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H350	May cause cancer.

Responsible for the safety data sheet

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Jasper, GA Website: www.crc-us.com
USA

Disclaimer

This information is based upon the present state of our knowledge.
This SDS has been compiled and is solely intended for this product.