

MicroSync Complete

Version number: 1.0

SECTION 1: Identification

1.1 Product identifier

Trade name MicroSync Complete
CAS number Not relevant (mixture)

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

Relevant identified uses Fertilizer
Industrial and commercial applications

1.3 Details of the supplier of the safety data sheet

Verdesian Life Sciences, U.S., LLC. Telephone: (800) 868-6446
1001 Winstead Drive, Suite 480 Telefax: (919) 535-3652
Cary, NC 27513
United States

1.4 Emergency telephone number

Poison center		
Country	Name	Telephone
United States	INFOTRAC (North America)	1-800-535-5053

As above or nearest toxicological information centre.

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.2	skin corrosion/irritation	2	Skin Irrit. 2	H315
A.3	serious eye damage/eye irritation	1	Eye Dam. 1	H318
A.6	carcinogenicity	1A	Carc. 1A	H350i
A.7	reproductive toxicity	1B	Repr. 1B	H360FD

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Classification				
Section	Hazard class	Category	Hazard class and category	Hazard statement
A.9	specific target organ toxicity - repeated exposure	1	STOT RE 1	H372

For full text of abbreviations: see SECTION 16

The most important adverse physicochemical, human health and environmental effects

Delayed or immediate effects can be expected after short or long-term exposure.

2.2 Label elements

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

Signal word Danger

Pictograms

GHS05, GHS08



Hazard statements

H315 Causes skin irritation.

H318 Causes serious eye damage.

H350i May cause cancer by inhalation.

H360FD May damage fertility. May damage the unborn child.

H372 Causes damage to organs (lung) through prolonged or repeated exposure (if inhaled).

Precautionary statements

P201 Obtain special instructions before use.

P260 Do not breathe dust.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P302+P352 IF ON SKIN: Wash with plenty of soap and water.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308+P313 If exposed or concerned: Get medical advice/attention.

P310 Immediately call a poison center/doctor.

P362 Take off contaminated clothing and wash it before reuse.

P405 Store locked up.

P501 Dispose of contents/container to hazardous or special waste collection point.

Hazardous ingredients for labelling

disodium tetraborate pentahydrate
quartz
zinc sulphate, mono hydrate
Crystalline silica (cristobalite)

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2.3 Other hazards

Results of PBT and vPvB assessment

Does not contain a PBT-/vPvB-substance in 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
Calcium sulfate di-hydrate	CAS No 10101-41-4	10 – < 25	-	-	-
Iron(II) sulfate mono-hydrate	CAS No 17375-41-6	10 – < 25	Acute Tox. 4 / H302 Skin Irrit. 2 / H315 Eye Irrit. 2 / H319		-
Disodium tetraborate pentahydrate	CAS No 12179-04-3	5 – < 10	Eye Irrit. 2 / H319 Repr. 1B / H360FD		-
Zinc sulphate, mono hydrate	CAS No 7446-19-7	5 – < 10	Acute Tox. 4 / H302 Eye Dam. 1 / H318		-
Manganese oxide	CAS No 1344-43-0	5 – < 10	-	-	-
Manganese sulphate monohydrate	CAS No 10034-96-5	5 – < 10	STOT RE 2 / H373		-
Zinc oxide	CAS No 1314-13-2	3 – < 5	-	-	-
Paraffin waxes and hydrocarbon waxes	CAS No 8002-74-2 RTECS No RV0350000	3 – < 5	CD / OSHA003	-	-
Quartz	CAS No 14808-60-7	1 – < 3	Carc. 1A / H350i STOT RE 1 / H372		IARC: 1
Copper (II) oxide	CAS No 1317-38-0 RTECS No GL7900000	1 – < 3	-	-	-

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Hazardous ingredients					
Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes
Citric acid	CAS No 77-92-9	0.3 – < 1	Eye Irrit. 2A / H319 STOT SE 3 / H335 CD / OSHA003		-
Copper sulphate	CAS No 7758-99-8	0.3 – < 1	Acute Tox. 4 / H302 Eye Dam. 1 / H318		-
Starch	CAS No 9005-25-8	0.3 – < 1	CD / OSHA003	-	-
Crystalline silica (cris- tobalite)	CAS No 14464-46-1	0.3 – < 1	Carc. 1A / H350i STOT RE 1 / H372		IARC: 1 RoC "Known"
Zinc chloride	CAS No 7646-85-7	0.1 – < 0.3	Acute Tox. 4 / H302 Skin Corr. 1B / H314 Eye Dam. 1 / H318 STOT SE 3 / H335		-

Notes

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

RoC NTP-RoC: Known To Be A Human Carcinogen

"Known"

":

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

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

Rinse skin with water/shower.

If skin irritation occurs: Get medical advice/attention.

Following eye contact

Irrigate copiously with clean, fresh water, holding the eyelids apart.

Remove contact lenses, if present and easy to do. Continue rinsing.

Immediately call a doctor.

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

Following eye contact: Risk of blindness.
Repeated uptake or uptake of large quantities may lead to chronic effects (see section 11).
The product contains crystalline silicic acids in the form of cristobalite and quartz which, if inhaled, are harmful to health. However, the evaluation of scientific findings is controversial. Recent diagnostic possibilities have provided the certainty that silicosis (pneumoconiosis) is a consequence of heavy exposure to quartz dust. There is also evidence that silicotic people have an increased lung cancer risk. Long term exposure to respirable crystalline silica has been known to cause cancer and adverse effects on the lungs, immune system, and kidneys.

4.3 Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

water, foam, alcohol resistant foam, fire extinguishing powder

Unsuitable extinguishing media

water jet

5.2 Special hazards arising from the substance or mixture

Hazardous decomposition products: Section 10.

Hazardous combustion products

nitrogen oxides (NO_x), sulfur oxides (SO_x), oxides of boron, metal oxide smoke

5.3 Advice for firefighters

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

Wear self-contained breathing apparatus

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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.

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 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

Hazardous combustion products: see section 5.

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

Measures to prevent fire as well as aerosol and dust generation

Use local and general ventilation.

Specific notes/details

Dust deposits may accumulate on all deposition surfaces in a technical room.

Measures to protect the environment

Avoid release to the environment.

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Advice on general occupational hygiene

Do not eat, drink and smoke in work areas.

Wash hands after use.

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

Remove contaminated clothing and protective equipment before entering eating areas.

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

high temperatures, humidity

Consideration of other advice

Keep away from food, drink and animal feedingstuffs.

Ventilation requirements

Provision of sufficient ventilation.

Packaging compatibilities

Only packagings which are approved (e.g. acc. to DOT) may be used.

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	Copper salts	-	PEL (CA)	-	1	-	-	Dm, Cu	Cal/OSHA PEL
US	Iron, soluble salts	-	REL	-	1 (10 h)	-	-	Fe	NIOSH REL
US	Iron salts, soluble	-	PEL (CA)	-	1	-	-	Fe	Cal/OSHA PEL
US	Iron salts, soluble	-	TLV®	-	1	-	-	Fe	ACGIH® 2023

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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
US	Copper compounds	-	REL	-	1 (10 h)	-	-	Dm, Cu	NIOSH REL
US	Manganese, inorganic compounds	-	TLV®	-	0.1	-	-	I, Mn	ACGIH® 2023
US	Manganese, inorganic compounds	-	TLV®	-	0.02	-	-	R, Mn	ACGIH® 2023
US	Manganese compounds	-	PEL (CA)	-	0.2	-	-	Mn	Cal/OSHA PEL
US	Manganese compounds	-	REL	-	1 (10 h)	-	3	Mn	NIOSH REL
US	Manganese compounds	-	PEL	-	-	-	-	Mn	29 CFR 1910.1000
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	-	REL	-	-	-	-	Appx-D	NIOSH REL
US	Particulates not otherwise classified (PNOC)	-	PEL	1,766	15	-	-	Partml, i, dust	29 CFR 1910.1000
US	Particulates not otherwise classified (PNOC)	-	PEL	529.5	5	-	-	Partml, r, dust	29 CFR 1910.1000
US	Calcium sulfate dihydrate	10101-41-4	TLV®	-	10	-	-	I	ACGIH® 2023
US	Disodium tetraborate pentahydrate	12179-04-3	PEL (CA)	-	5	-	-	-	Cal/OSHA PEL
US	Disodium tetraborate pentahydrate	12179-04-3	REL	-	1 (10 h)	-	-	-	NIOSH REL
US	Sodium tetraborate pentahydrate	12179-04-3	TLV®	-	2	-	6	I	ACGIH® 2023
US	Zinc oxide	1314-13-2	REL	-	5 (10 h)	-	-	Dust	NIOSH REL

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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	Zinc oxide	1314-13-2	PEL (CA)	-	5	-	10	Fume	Cal/OSHA PEL
US	Zinc oxide	1314-13-2	REL	-	5 (10 h)	-	10	Fume	NIOSH REL
US	Zinc oxide	1314-13-2	PEL	-	5	-	-	Fume	29 CFR 1910.1000
US	Zinc oxide	1314-13-2	PEL	-	15	-	-	I, dust	29 CFR 1910.1000
US	Zinc oxide	1314-13-2	TLV®	-	2	-	10	R	ACGIH® 2023
US	Zinc oxide	1314-13-2	PEL	-	5	-	-	R, dust	29 CFR 1910.1000
US	Copper oxide	1317-38-0	REL	-	0.1 (10 h)	-	-	Fume, Cu	NIOSH REL
US	Calcium sulfate monohydrate	13397-24-5	TLV®	-	10	-	-	I	ACGIH® 2023
US	Gypsum	13397-24-5	REL	-	10 (10 h)	-	-	I	NIOSH REL
US	Gypsum	13397-24-5	PEL	-	15	-	-	I, dust	29 CFR 1910.1000
US	Gypsum	13397-24-5	REL	-	5 (10 h)	-	-	R	NIOSH REL
US	Gypsum	13397-24-5	PEL	-	5	-	-	R, dust	29 CFR 1910.1000
US	Cristobalite	14464-46-1	PEL (CA)	-	0.05	-	-	R	Cal/OSHA PEL
US	Silica, crystalline - cristobalite	14464-46-1	PEL	-	0.05	-	-	R	29 CFR 1910.1000
US	Quartz	14808-60-7	PEL (CA)	-	0.05	-	-	R	Cal/OSHA PEL
US	Silica, crystalline - quartz	14808-60-7	PEL	-	0.05	-	-	R	29 CFR 1910.1000
US	Silica, crystalline - quartz	14808-60-7	REL	-	0.05 (10 h)	-	-	R, appx-A	NIOSH REL
US	Zinc chloride	7646-85-7	PEL (CA)	-	1	-	2	Fume	Cal/OSHA PEL
US	Zinc chloride	7646-85-7	REL	-	1 (10 h)	-	2	Fume	NIOSH REL

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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	Zinc chloride	7646-85-7	TLV®	-	1	-	2	Fume	ACGIH® 2023
US	Zinc chloride	7646-85-7	PEL	-	1	-	-	Fume	29 CFR 1910.1000
US	Paraffin wax	8002-74-2	PEL (CA)	-	2	-	-	Fume	Cal/OSHA PEL
US	Paraffin wax	8002-74-2	REL	-	2 (10 h)	-	-	Fume	NIOSH REL
US	Paraffin wax	8002-74-2	TLV®	-	2	-	-	Fume	ACGIH® 2023
US	Starch	9005-25-8	TLV®	-	10	-	-	-	ACGIH® 2023
US	Starch	9005-25-8	REL	-	10 (10 h)	-	-	I	NIOSH REL
US	Starch	9005-25-8	PEL	-	15	-	-	I, dust	29 CFR 1910.1000
US	Starch	9005-25-8	REL	-	5 (10 h)	-	-	R	NIOSH REL
US	Starch	9005-25-8	PEL	-	5	-	-	R, dust	29 CFR 1910.1000

Notation

appx-A	NIOSH Potential Occupational Carcinogen (Appendix A)
appx-D	see Appendix D - Substances with No Established RELs
Cu	calculated as Cu (copper)
dm	as dusts and mists
dust	as dust
Fe	calculated as Fe (iron)
fume	as fume
i	inhalable fraction
Mn	calculated as Mn (manganese)
part/ml	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.

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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
NBR: acrylonitrile-butadiene rubber	≥ 0,4 mm	>30 minutes (permeation: level 2)

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.

Respiratory protection

In case of inadequate ventilation wear respiratory protection.

Particle filter device (DIN EN 143).

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

Appearance

Physical state	Solid
Color	Grey
Odor	Characteristic
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

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Explosive limits	Not determined
Explosion limits of dust clouds	Not determined
Vapor pressure	Not determined
Density	Not determined
Relative vapour density	Not applicable
Solubility(ies)	
Water solubility	Not determined
Partition coefficient	
n-octanol/water (log KOW)	Not determined
Auto-ignition temperature	Not determined
Decomposition temperature	Not relevant
Viscosity	Not relevant (solid)
Explosive properties	None
Oxidizing properties	None
Information for relevant hazard classes according to GHS	Hazard classes acc. to GHS (Physical hazards): 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

There are no specific conditions known which have to be avoided.

The product in the delivered form is not dust explosion capable; the enrichment of fine dust however leads to the danger of dust explosion.

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10.5 Incompatible materials

There is no additional information.

10.6 Hazardous decomposition products

Reasonably anticipated hazardous decomposition products produced as a result of use, storage, spill and heating are not known.

Hazardous combustion products: see section 5.

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

The classification criteria for this hazard class are not met.

Acute toxicity of components of the mixture

Name of substance	CAS No	Exposure route	End-point	Value	Species	Method	Source
Calcium sulfate dihydrate	10101-41-4	Oral	LD50	>2,000 mg/kg	Rat, female	OECD Guideline 420	ECHA
Calcium sulfate dihydrate	10101-41-4	Inhalation: dust/mist	LC0	>3.26 mg/l/4h	Rat	OECD Guideline 403	ECHA
Iron(II) sulfate monohydrate	17375-41-6	Oral	LD50	319 mg/kg	Rat	-	GESTIS
Iron(II) sulfate monohydrate	17375-41-6	Dermal	LD0	>2,000 mg/kg	Rat	OECD Guideline 402	ECHA
Disodium tetraborate pentahydrate	12179-04-3	Oral	LD50	>2,500 mg/kg	Rat, male	OECD Guideline 401	ECHA
Disodium tetraborate pentahydrate	12179-04-3	Inhalation: dust/mist	LC50	>2.04 mg/l/4h	Rat	OECD Guideline 403	ECHA
Disodium tetraborate pentahydrate	12179-04-3	Dermal	LD50	>2,000 mg/kg	Rabbit	-	ECHA

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Name of substance	CAS No	Exposure route	End-point	Value	Species	Method	Source
Zinc sulphate, mono hydrate	7446-19-7	Oral	LD50	1,260 – 2,330 mg/kg	Rat, male	OECD Guideline 401	ECHA
Zinc sulphate, mono hydrate	7446-19-7	Dermal	LD0	>2,000 mg/kg	Rat	OECD Guideline 402	ECHA
Manganese oxide	1344-43-0	Oral	LD50	>2,000 mg/kg	Rat	OECD Guideline 420	ECHA
Manganese oxide	1344-43-0	Inhalation: dust/mist	LC50	>5.35 mg/l/4h	Rat	OECD Guideline 403	ECHA
Manganese sulphate monohydrate	10034-96-5	Oral	LD50	2,150 mg/kg	Rat	-	ECHA
Zinc oxide	1314-13-2	Inhalation: dust/mist	LC50	>5,700 mg/m ³ /4h	Rat	OECD Guideline 403	ECHA
Zinc oxide	1314-13-2	Oral	LD50	>2,000 mg/kg	Rat	OECD Guideline 423	ECHA
Zinc oxide	1314-13-2	Dermal	LD50	>2,000 mg/kg	Rat	OECD Guideline 402	ECHA
Paraffin waxes and hydrocarbon waxes	8002-74-2	Oral	LD0	>5,000 mg/kg	Rat	OECD Guideline 401	ECHA
Paraffin waxes and hydrocarbon waxes	8002-74-2	Dermal	LD0	>2,000 mg/kg	Rat	OECD Guideline 402	ECHA
Copper (II) oxide	1317-38-0	Oral	LD50	>2,500 mg/kg	Rat, male	OECD Guideline 423	ECHA
Copper (II) oxide	1317-38-0	Dermal	LD50	>2,000 mg/kg	Rat	OECD Guideline 402	ECHA
Citric acid	77-92-9	Oral	LD50	5,400 mg/kg	Mouse	OECD Guideline 401	ECHA
Citric acid	77-92-9	Dermal	LD0	>2,000 mg/kg	Rat	OECD Guideline 402	ECHA

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Name of substance	CAS No	Exposure route	End-point	Value	Species	Method	Source
Copper sulphate	7758-99-8	Oral	LD50	481 mg/kg	Rat	OECD Guideline 401	ECHA
Copper sulphate	7758-99-8	Dermal	LD0	>2,000 mg/kg	Rat	OECD Guideline 402	ECHA
Zinc chloride	7646-85-7	Oral	LD50	1,100 mg/kg	Rat, male	OECD Guideline 401	ECHA
Zinc chloride	7646-85-7	Dermal	LD0	>2,000 mg/kg	Rat	OECD Guideline 402	ECHA

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Causes serious eye damage.

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

Classification could not be established because:

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

Carcinogenicity

May cause cancer by inhalation.

IARC Monographs

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans			
Name of substance	CAS No	Classification	Number
Quartz	14808-60-7	1	-
Crystalline silica (cristobalite)	14808-60-7	1	-

Legend

1 Carcinogenic to humans

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National Toxicology Program (United States)

National Toxicology Program (United States): Report on Carcinogens			
Name of substance	CAS No	Classification	Number
Crystalline silica (cristobalite)		Known to be a human carcinogen	6th Report on Carcinogens

OSHA Carcinogens

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

May damage the unborn child.
May damage fertility.

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

Causes damage to organs (lung) through prolonged or repeated exposure (if inhaled).

Hazard category	Target organ	Exposure route
1	Lung	If inhaled

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)

Very toxic to aquatic organisms.

Aquatic toxicity (acute) of components of the mixture

Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
Calcium sulfate dihydrate	10101-41-4	LC50	96 h	>100 mg/l	Japanese rice-fish/medaka (Oryzias latipes)	OECD Guideline 203	ECHA

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Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
Calcium sulfate dihydrate	10101-41-4	LC50	48 h	>100 mg/l	Daphnia magna	OECD Guideline 202	ECHA
Calcium sulfate dihydrate	10101-41-4	EC50	72 h	>100 mg/l	Algae (pseudokirchneriella subcapitata)	OECD Guideline 201	ECHA
Disodium tetraborate pentahydrate	12179-04-3	LC50	96 h	537 mg/l	Fathead minnow (pimephales promelas)	EPA OPPTS 850.1075	ECHA
Disodium tetraborate pentahydrate	12179-04-3	EC50	48 h	896 mg/l	Daphnia magna	-	-
Disodium tetraborate pentahydrate	12179-04-3	EC50	72 h	270 mg/l	Algae (pseudokirchneriella subcapitata)	-	-
Zinc sulphate, mono hydrate	7446-19-7	LC50	48 h	0.9 mg/l	(Top) predators	-	-
Zinc sulphate, mono hydrate	7446-19-7	LC50	48 h	95 µg/l	Ceriodaphnia dubia (water flea)	-	ECHA
Zinc sulphate, mono hydrate	7446-19-7	LC50	96 h	330 µg/l	Fathead minnow (pimephales promelas)	-	ECHA
Zinc sulphate, mono hydrate	7446-19-7	EC50	48 h	1.4 mg/l	Daphnia magna	OECD Guideline 202	ECHA
Manganese oxide	1344-43-0	EC50	48 h	>4 mg/l	Daphnia magna	OECD Guideline 202	ECHA
Manganese oxide	1344-43-0	LC50	96 h	>1.2 mg/l	Rainbow trout (Oncorhynchus mykiss)	OECD Guideline 203	ECHA
Manganese sulphate monohydrate	10034-96-5	ErC50	72 h	61 mg/l	Algae (Scenedesmus subspicatus)	OECD Guideline 201	ECHA
Zinc oxide	1314-13-2	EC50	48 h	135 µg/l	Daphnia magna	-	ECHA
Zinc oxide	1314-13-2	EC50	24 h	7.1 mg/l	Tetrahymena sp.	-	ECHA

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Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
Zinc oxide	1314-13-2	LC50	96 h	102 mg/l	Rainbow trout (Oncorhynchus mykiss)	-	ECHA
Zinc oxide	1314-13-2	LC50	48 h	100 µg/l	Daphnia magna	-	ECHA
Zinc oxide	1314-13-2	ErC50	72 h	185 µg/l	Algae (raphidocelis subcapitata)	OECD Guideline 201	ECHA
Paraffin waxes and hydrocarbon waxes	8002-74-2	LL50	96 h	>100 mg/l	Fathead minnow (Pimephales promelas)	OECD Guideline 203	ECHA
Paraffin waxes and hydrocarbon waxes	8002-74-2	LL50	48 h	>10,000 mg/l	Daphnia magna	OECD Guideline 202	ECHA
Paraffin waxes and hydrocarbon waxes	8002-74-2	EL50	48 h	>10,000 mg/l	Daphnia magna	OECD Guideline 202	ECHA
Copper sulphate	7758-99-8	LC50	96 h	38.4 µg/l	Fathead minnow (Pimephales promelas)	-	ECHA
Zinc chloride	7646-85-7	LC50	96 h	112 µg/l	Thymallus arcticus	-	ECHA
Zinc chloride	7646-85-7	LC50	48 h	100 µg/l	Daphnia magna	-	ECHA
Zinc chloride	7646-85-7	EC50	48 h	670 µg/l	Ceriodaphnia dubia (water flea)	-	ECHA
copper(II) oxide: Acute reference L(E)C50 34.4 µg Cu/l (across pHs)							

Aquatic toxicity (chronic)

Toxic to aquatic life with long lasting effects.

Aquatic toxicity (chronic) of components of the mixture

Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
Disodium tetraborate pentahydrate	12179-04-3	NOEC	3 d	118 mg/l	Algae (pseudokirchneriella subcapitata)	OECD Guideline 201	ECHA

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Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
Zinc sulphate, mono hydrate	7446-19-7	EC50	3 h	5.2 mg/l	Activated sludge of a predominantly domestic sewage	OECD Guideline 209	ECHA
Zinc sulphate, mono hydrate	7446-19-7	NOEC	D	0.9 mg/l	(Top) predators	-	-
Zinc sulphate, mono hydrate	7446-19-7	NOEC	25 d	25 µg/l	Rainbow trout (<i>Oncorhynchus mykiss</i>)	-	ECHA
Zinc sulphate, mono hydrate	7446-19-7	NOEC	3 d	20 µg/l	Algae (<i>Skeletonema costatum</i>)	-	ECHA
Zinc sulphate, mono hydrate	7446-19-7	NOEC	3 d	0.1 mg/l	Activated sludge of a predominantly domestic sewage	DIN EN ISO 9509	ECHA
Zinc sulphate, mono hydrate	7446-19-7	NOEC	10 d	10 µg/l	<i>Haliotis rufescens</i> , Red Abalone, Haliotidae	-	ECHA
Zinc sulphate, mono hydrate	7446-19-7	LOEC	30 d	51 µg/l	Flagfish (<i>Jordanella floridae</i>)	-	ECHA
Zinc sulphate, mono hydrate	7446-19-7	LOEC	3 d	20 µg/l	Alge (<i>Chaetoceros compressum</i> , Diatom, Chaetocerataceae)	-	ECHA
Zinc sulphate, mono hydrate	7446-19-7	Growth rate (ErCx) 10%	48 h	5.9 µg/l	Alge (<i>Chlorella pyrenoidosa</i>)	-	ECHA
Zinc sulphate, mono hydrate	7446-19-7	Growth rate (ErCx) 26%	72 h	20 µg/l	Alge (<i>Asterionella japonica</i> , Diatom, Fragilariaceae)	-	ECHA
Manganese oxide	1344-43-0	EC50	8 d	2.5 mg/l	<i>Ceriodaphnia dubia</i> (water flea)	OECD Guideline 211	ECHA
Manganese oxide	1344-43-0	NOEC	8 d	1.3 mg/l	<i>Ceriodaphnia dubia</i> (water flea)	OECD Guideline 211	ECHA
Manganese oxide	1344-43-0	LOEC	8 d	4.1 mg/l	<i>Ceriodaphnia dubia</i> (water flea)	OECD Guideline 211	ECHA

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Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
Manganese sulphate monohydrate	10034-96-5	EC50	3 h	>1,000 mg/l	Activated sludge of a predominantly domestic sewage	OECD Guideline 209	ECHA
Manganese sulphate monohydrate	10034-96-5	NOEC	20 d	20 µg/l	Invertebrate marine organisms	-	ECHA
Manganese sulphate monohydrate	10034-96-5	NOEC	72 h	1 mg/l	Algae (<i>Scenedesmus subspicatus</i>)	OECD Guideline 201	ECHA
Manganese sulphate monohydrate	10034-96-5	NOEC	3 h	560 mg/l	Activated sludge of a predominantly domestic sewage	OECD Guideline 209	ECHA
Manganese sulphate monohydrate	10034-96-5	LOEC	72 h	3.2 mg/l	Algae (<i>Scenedesmus subspicatus</i>)	OECD Guideline 201	ECHA
Zinc oxide	1314-13-2	LC50	30 d	32 µg/l	<i>Cottus bairdi</i>	-	ECHA
Zinc oxide	1314-13-2	LC50	14 d	44.6 µg/l	<i>Daphnia lumholtzi</i>	-	ECHA
Zinc oxide	1314-13-2	EC50	7 d	22 µg/l	<i>Ceriodaphnia dubia</i> (water flea)	-	ECHA
Zinc oxide	1314-13-2	EC50	28 d	75 µg/l	<i>Cottus bairdi</i>	-	ECHA
Zinc oxide	1314-13-2	EC50	3 h	5.2 mg/l	Activated sludge of a predominantly domestic sewage	OECD Guideline 209	ECHA
Zinc oxide	1314-13-2	ErC50	10 d	410 µg/l	Alge (<i>Phaeocystis antarctica</i>)	-	ECHA
Zinc oxide	1314-13-2	NOEC	24 d	7.1 µg/l	<i>Holmesimysis costata</i> , Mysid shrimp, Mysididae	-	ECHA
Zinc oxide	1314-13-2	NOEC	72 h	7.4 µg/l	Algae (<i>Raphidocelis subcapitata</i>)	OECD Guideline 201	ECHA
Zinc oxide	1314-13-2	NOEC	30 d	26 µg/l	<i>Jordanella floridae</i>	-	ECHA

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Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
Zinc oxide	1314-13-2	NOEC	4 h	0.1 mg/l	Activated sludge of a predominantly domestic sewage	DIN EN ISO 9509	ECHA
Zinc oxide	1314-13-2	LOEC	30 d	51 µg/l	Jordanella floridae	-	ECHA
Zinc oxide	1314-13-2	LOEC	28 d	87 µg/l	Lampsilis siliquoidea	-	ECHA
Zinc oxide	1314-13-2	Growth rate (ErCx) 10%	72 h	4.9 µg/l	Algae (raphidocelis subcapitata)	OECD Guideline 201	ECHA
Zinc oxide	1314-13-2	Growth rate (ErCx) 10%	21 d	0.014 mg/l	Daphnia magna	OECD Guideline 211	ECHA
Zinc oxide	1314-13-2	Growth rate (ErCx) 10%	53 d	53 µg/l	Acipenser transmontanus	-	ECHA
Zinc oxide	1314-13-2	Growth rate (ErCx) 10%	180 min	720 mg/l	Activated sludge of a predominantly domestic sewage	OECD Guideline 209	ECHA
Citric acid	77-92-9	NOEC	8 d	425 mg/l	Alge (Scenedesmus quadricauda)	-	ECHA
Copper sulphate	7758-99-8	NOEC	60 d	2.2 µg/l	Rainbow trout (Oncorhynchus mykiss)	OECD Guideline 204	ECHA
Zinc chloride	7646-85-7	LOEC	3 d	20 µg/l	Algae (Sceletonema costatum)	-	ECHA
Zinc chloride	7646-85-7	LOEC	27 d	50 µg/l	Herring (Clupea harengus)	-	ECHA
Zinc chloride	7646-85-7	NOEC	30 d	39 µg/l	Rainbow trout (Oncorhynchus mykiss)	OECD Guideline 215	ECHA
Zinc chloride	7646-85-7	NOEC	35 d	33.3 µg/l	Ophryotrocha diadema, Annelida, Polychaeta, Dorvilleidae	-	ECHA
Zinc chloride	7646-85-7	Growth (Eb-Cx) 10%	23 d	80 µg/l	Sterechinus neumayeri, Antarctic Sea Urchin, Echinidae	-	ECHA

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Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
Zinc chloride	7646-85-7	Growth (Eb-Cx) 10%	10 d	488 µg/l	Alge (Fucus serratus, Toothed wrack, Brown Macroalga, Fucaaceae)	-	ECHA
copper(II) oxide: Chronic reference NOEC 14.9 µg Cu/l (across pHs)							

12.2 Persistence and degradability

Biodegradation

The study does not need to be conducted, the relevant substances in the mixture are inorganic.

Degradability of components of the mixture

Name of substance	CAS No	Process	Degradation rate	Time	Method	Source
Citric acid	77-92-9	Carbon dioxide generation	97 %	28 d	OECD Guideline 301 B	ECHA
Citric acid	77-92-9	DOC removal	85 %	14 d	OECD Guideline 302B	ECHA
Citric acid	77-92-9	DOC removal	100 %	19 d	OECD Guideline 301 E	ECHA

Persistence

No data available.

12.3 Bioaccumulative potential

Test data are not available for the complete mixture.

Bioaccumulative potential of components of the mixture

Name of substance	CAS No	BCF	Log KOW
Disodium tetraborate pentahydrate	12179-04-3	-	-1.53 (pH value: 7.5, 22 °C)
Zinc sulphate, mono hydrate	7446-19-7	69.48	-
Zinc oxide	1314-13-2	1,050	-
Paraffin waxes and hydrocarbon waxes	8002-74-2	-	>6
Citric acid	77-92-9	-	-1.55

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12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

Does not contain a PBT-/vPvB-substance in a concentration of $\geq 0,1\%$.

12.6 Endocrine disrupting properties Other adverse effects

Does not contain an endocrine disruptor (EDC) in a concentration of $\geq 0,1\%$.

Remarks

None.

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

DOT UN3077

IMDG-Code UN3077

ICAO-TI UN3077

14.2 UN proper shipping name

DOT Environmentally hazardous substance, solid,
n.o.s.

IMDG-Code ENVIRONMENTALLY HAZARDOUS SUBSTANCE,
SOLID, N.O.S.



ICAO-TI Environmentally hazardous substance, solid,
n.o.s.

Technical name (hazardous ingredients) copper(II) oxide, zinc oxide

14.3 Transport hazard class(es)

DOT 9

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	IMDG-Code	9
	ICAO-TI	9
14.4	Packing group	
	DOT	III
	IMDG-Code	III
	ICAO-TI	III
14.5	Environmental hazards	Hazardous to the aquatic environment
	Environmentally hazardous substance (aquatic environment)	copper(II) oxide, zinc oxide
14.6	Special precautions for user	-
14.7	Transport in bulk according to IMO instruments	-
14.8	<u>Information for each of the UN Model Regulations</u>	
	Transport of dangerous goods by road or rail (49 CFR US DOT) Additional information	
	Particulars in the shipper's declaration	UN3077, Environmentally hazardous substance, solid, n.o.s., (copper(II) oxide, zinc oxide), 9, III
	Reportable quantity (RQ)	2,000 lbs (908 kg) (copper sulphate) (zinc sulfate)
	Danger label(s)	9, fish and tree
		
	Environmental hazards	Yes (hazardous to the aquatic environment)
	Special provisions (SP)	8, 146, 335, 384, 441, A112, B54, B120, IB8, IP3, N20, N91, T1, TP33
	ERG No	171
	International Maritime Dangerous Goods Code (IMDG) Additional information	
	Marine pollutant	Yes (hazardous to the aquatic environment) (zinc sulfate)
	Danger label(s)	9, fish and tree
		

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Special provisions (SP)	274, 335, 966, 967, 969
Excepted quantities (EQ)	E1
Limited quantities (LQ)	5 kg
EmS	F-A, S-F
Stowage category	A

International Civil Aviation Organization (ICAO-IATA/DGR) Additional information

Environmental hazards	Yes (hazardous to the aquatic environment)
Danger label(s)	9, fish and tree



Special provisions (SP)	A97, A158, A179, A197, A215
Excepted quantities (EQ)	E1
Limited quantities (LQ)	30 kg

SECTION 15: Regulatory information

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

National regulations (United States)

Clean Air Act

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

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this mixture by the supplier.

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

Date of preparation: 2023-03-27

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
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Abbr.	Descriptions of used abbreviations
Acute Tox.	Acute toxicity
BCF	Bioconcentration factor
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)
CD	Combustible dust
DGR	Dangerous Goods Regulations (see IATA/DGR)
DOT	Department of Transportation (USA)
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
EmS	Emergency Schedule
ErC50	≡ EC50: in this method, that concentration of test substance which results in a 50 % reduction in either growth (EbC50) or growth rate (ErC50) relative to the control
ERG No	Emergency Response Guidebook - Number
Eye Dam.	Seriously damaging to the eye
Eye Irrit.	Irritant to the eye
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
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)
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	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
LL50	Lethal Loading 50 %: the LL50 corresponds to the loading rate causing 50 % lethality

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Abbr.	Descriptions of used abbreviations
LOEC	Lowest Observed Effect Concentration
Log KOW	n-Octanol/water
NIOSH REL	National Institute for Occupational Safety and Health (NIOSH): Recommended Exposure Limits (RELs)
NOEC	No Observed Effect Concentration
NTP-RoC	National Toxicology Program (United States): Report on Carcinogens
OSHA	Occupational Safety and Health Administration (United States)
PBT	Persistent, Bioaccumulative and Toxic
PEL	Permissible exposure limit
Ppm	Parts per million
Repr.	Reproductive toxicity
RTECS	Registry of Toxic Effects of Chemical Substances (database of NIOSH with toxicological information)
Skin Corr.	Corrosive to skin
Skin Irrit.	Irritant to skin
STEL	Short-term exposure limit
STOT RE	Specific target organ toxicity - repeated exposure
STOT SE	Specific target organ toxicity - single exposure
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.

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
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H350i	May cause cancer by inhalation.
H360FD	May damage fertility. May damage the unborn child.
H372	Causes damage to organs (lung) through prolonged or repeated exposure (if inhaled).
H373	May cause damage to organs (lung) through prolonged or repeated exposure (if inhaled).
OSHA003	May form combustible dust concentrations in air.

Responsible for the safety data sheet

Chemical Regulatory Compliance Company Telephone: +1 (630) 410-1660
Jasper, GA e-Mail: GHS@crc-us.com
USA Website: www.crc-us.com

Disclaimer

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