Safety Data Sheet

29 CFR 1910.1200 App D

MicroSync Pro

Version number: 1.0

SECTION 1: Identification

1.1 Product identifier

Trade name **MicroSync Pro**

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.
1001 Winstead Drive, Suite 480
Cary, NC 27513
United States

Telephone: (800) 868-6446
Telefax: (919) 535-3652

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.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
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

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.
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.
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)

2.3 Other hazards

Results of PBT and vPvB assessment

Does not contain a PBT-/vPvB-substance in a concentration of ≥ 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	-	-	-
Zinc sulphate, mono hydrate	CAS No 7446-19-7	10 – < 25	Acute Tox. 4 / H302 Eye Dam. 1 / H318		-
Disodium tetrabor-ate pentahydrate	CAS No 12179-04-3	5 – < 10	Eye Irrit. 2 / H319 Repr. 1B / H360FD		-
Manganese sulphate monohydrate	CAS No 10034-96-5	5 – < 10	STOT RE 2 / H373		-
Paraffin waxes and hydrocarbon waxes	CAS No 8002-74-2 RTECS No RV0350000	3 – < 5	CD / OSHA003	-	-
Zinc oxide	CAS No 1314-13-2	3 – < 5	-	-	-
Manganese	CAS No 7439-96-5	3 – < 5	-	-	-
Quartz	CAS No 14808-60-7	1 – < 3	Carc. 1A / H350i STOT RE 1 / H372		IARC: 1
Citric acid	CAS No 77-92-9	0.3 – < 1	Eye Irrit. 2A / H319 STOT SE 3 / H335 CD / OSHA003		-
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"

Notes

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

RoC "Known": NTP-RoC: Known To Be A Human Carcinogen

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

Wash with plenty of soap and water.

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 (NOx), carbon monoxide (CO), carbon dioxide (CO2), sulfur oxides (SOx), 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

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.

Measures to protect the environment

Avoid release to the environment.

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/m³]	STEL [ppm]	STEL [mg/m³]	Notation	Source
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
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	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

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	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, ap-px-A	NIOSH REL
US	Manganese	7439-96-5	PEL (CA)	-	0.2	-	3	Fume, Mn	Cal/OSHA PEL
US	Manganese	7439-96-5	REL	-	1 (10 h)	-	3	Fume, Mn	NIOSH REL
US	Manganese	7439-96-5	TLV®	-	0.1	-	-	I, Mn	ACGIH® 2023
US	Manganese	7439-96-5	PEL (CA)	-	0.2	-	-	Mn	Cal/OSHA PEL
US	Manganese	7439-96-5	PEL	-	-	-	-	Mn, fume	29 CFR 1910.1000
US	Manganese	7439-96-5	TLV®	-	0.02	-	-	R, Mn	ACGIH® 2023
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

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	Starch	9005-25-8	PEL	-	5	-	-	R, dust	29 CFR 1910.1000

Notation

appx-A	NIOSH Potential Occupational Carcinogen (Appendix A)
dust	as dust
fume	as fume
i	inhalable fraction
Mn	calculated as Mn (manganese)
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**
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 (granulate)
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
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 miscible in any proportion
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 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.

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

Test data are not available for the complete mixture.

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
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
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
Manganese sulphate monohydrate	10034-96-5	Oral	LD50	2,150 $^{mg}/_{kg}$	Rat	-	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
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
Manganese	7439-96-5	Oral	LD50	>2,000 $^{mg}/_{kg}$	Rat	-	ECHA

Name of substance	CAS No	Exposure route	End-point	Value	Species	Method	Source
Manganese	7439-96-5	Inhalation: dust/ mist	LC50	>5.14 $^{mg}/_{l}$/4h	Rat	-	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

Skin corrosion/irritation

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

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

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

None of the ingredients are listed.

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)

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
Calcium sulfate dihydrate	10101-41-4	LC50	48 h	>100 $^{mg}/_{l}$	Daphnia magna	OECD Guideline 202	ECHA

Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
Calcium sulfate dihydrate	10101-41-4	EC50	72 h	>100 mg/l	Algae (pseudokirchneriella subcapitata)	OECD Guideline 201	ECHA
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
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)	-	-
Manganese sulphate monohydrate	10034-96-5	ErC50	72 h	61 mg/l	Algae (Scenedesmus subspicatus)	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
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

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

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
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 (Oncorhynchus mykiss)	-	ECHA
Zinc sulphate, mono hydrate	7446-19-7	NOEC	3 d	20 µg/l	Algae (Sceletonema costatum)	-	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	Haliotis rufescens, Red Abalone, Haliotidae	-	ECHA
Zinc sulphate, mono hydrate	7446-19-7	LOEC	30 d	51 µg/l	Flagfish (Jordanella floridae)	-	ECHA
Zinc sulphate, mono hydrate	7446-19-7	LOEC	3 d	20 µg/l	Alge (Chaetoceros compressum, Diatom, Chaetocerotaceae)	-	ECHA

Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
Zinc sulphate, mono hydrate	7446-19-7	Growth rate (ErCx) 10%	48 h	5.9 µg/l	Alge (Chlorella pyrenoidosa)	-	ECHA
Zinc sulphate, mono hydrate	7446-19-7	Growth rate (ErCx) 26%	72 h	20 µg/l	Alge (Asterionella japonica, Diatom, Fragilariaceae)	-	ECHA
Disodium tetraborate pentahydrate	12179-04-3	NOEC	3 d	118 mg/l	Algae (pseudokirchneriella subcapitata)	OECD Guideline 201	ECHA
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 (Scenedesmus subspicatus)	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 (Scenedesmus subspicatus)	OECD Guideline 201	ECHA
Zinc oxide	1314-13-2	LC50	30 d	32 µg/l	Cottus bairdi	-	ECHA
Zinc oxide	1314-13-2	LC50	14 d	44.6 µg/l	Daphnia lumholtzi	-	ECHA
Zinc oxide	1314-13-2	EC50	7 d	22 µg/l	Ceriodaphnia dubia (water flea)	-	ECHA
Zinc oxide	1314-13-2	EC50	28 d	75 µg/l	Cottus bairdi	-	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 (Phaeocystis antarctica)	-	ECHA

Name of substance	CAS No	Endpoint	Exposure time	Value	Species	Method	Source
Zinc oxide	1314-13-2	NOEC	24 d	7.1 µg/l	Holmesimysis costata, Mysid shrimp, Mysidae	-	ECHA
Zinc oxide	1314-13-2	NOEC	72 h	7.4 µg/l	Algae (raphidocelis subcapitata)	OECD Guideline 201	ECHA
Zinc oxide	1314-13-2	NOEC	30 d	26 µg/l	Jordanella floridae	-	ECHA
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

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.

n-octanol/water (log KOW) Not relevant
(inorganic)

Bioaccumulative potential of components of the mixture

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

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 ≥ 0,1%.

12.6 Endocrine disrupting properties Other adverse effects

Does not contain an endocrine disruptor (EDC) in a concentration of ≥ 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)	zinc oxide, zinc sulfate

14.3 Transport hazard class(es)

DOT	9
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)	zinc oxide, zinc sulfate
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

Particulars in the shipper's declaration	UN3077, Environmentally hazardous substance, solid, n.o.s., (zinc oxide, zinc sulfate), 9, III
Reportable quantity (RQ)	7,467 lbs (3,390 kg) (zinc sulfate) (sodium hydroxide)
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

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
ACGIH® 2023	From ACGIH®, 2023 TLVs® and BEIs® Book. Copyright 2023. 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
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)

Abbr.	Descriptions of used abbreviations
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 Monographs	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
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

Abbr.	Descriptions of used abbreviations
Ppm	Parts per million
Repr.	Reproductive toxicity
RTECS	Registry of Toxic Effects of Chemical Substances (database of NIOSH with toxicological information)
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).

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

Code	Text
H302	Harmful if swallowed.
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

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