SAFETY DATA SHEET

According to REACH Regulation (EC) No 1907/2006, as amended by UK REACH Regulations SI 2019/758

HA213

Version	Revision Date:	SDS Number:	Date of last issue: 14.09.2023
1.0	14.09.2023	50001957	Date of first issue: 08.11.2018

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name HA213

Other means of identification

Product code 50001957

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

Use of the Substance/Mixture : A fertilizer with micronutrients for use in agriculture and horticulture

Recommended restrictions on use : Use as recommended by the label.

1.3 Details of the supplier of the safety data sheet

Supplier Address

FMC Agro Limited
Rectors Lane, Pentre
Flintshire
CH5 2DH
United Kingdom

Telephone: + 44 1244 537370
E-mail address: SDS-Info@fmc.com .

1.4 Emergency telephone number

For leak, fire, spill or accident emergencies, call:
England and Wales: 44-870-8200418 (CHEMTREC)

Medical emergency:
England and Wales: 111
Scotland: 84 54 24 2424

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

Serious eye damage/eye irritation, Category 2	H319: Causes serious eye irritation.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

Hazard pictograms :

Signal word : Warning

Hazard statements : H319 Causes serious eye irritation.

Precautionary statements :

Prevention:

P264 Wash hands thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/ attention.

Additional Labelling

EUH208 Contains 1,2-benzisothiazol-3(2H)-one.
May produce an allergic reaction.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
Substances with a workplace exposure limit :			
phosphoric acid	7664-38-2 231-633-2 015-011-00-6	Met. Corr. 1; H290 Acute Tox. 4; H302 Skin Corr. 1B; H314	>= 1 - < 10

		Eye Dam. 1; H318 Aquatic Chronic 3; H412 ——————— specific concentration limit Skin Corr. 1B; H314 >= 25 % Skin Irrit. 2; H315 10 - < 25 % Eye Irrit. 2; H319 10 - < 25 %	
boric acid	10043-35-3 233-139-2 005-007-00-2	Repr. 1B; H360FD	>= 0.1 - <= 1
Zinc sulphate, monohydrate	7446-19-7	Acute Tox. 4; H302 Eye Dam. 1; H318 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 ——————— M-Factor (Acute aquatic toxicity): 1 M-Factor (Chronic aquatic toxicity): 10	>= 0.1 - <= 1
Manganese sulfate, monohydrate	10034-96-5	1; H318 STOT RE 2; H373 Aquatic Chronic 2; H411	>= 0.1 - <= 1
1,2-benzisothiazol-3(2H)-one	2634-33-5 220-120-9 613-088-00-6	Acute Tox. 4; H302 Skin Irrit. 2; H315 Eye Dam. 1; H318 Skin Sens. 1; H317 Aquatic Acute 1; H400 Aquatic Chronic 2; H411 ——————— M-Factor (Acute aquatic toxicity): 10 ——————— specific concentration limit Skin Sens. 1; H317 >= 0.05 %	>= 0.0025 - <= 0.025
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). :			
boric acid	10043-35-3 233-139-2 005-007-00-2	Repr. 1B; H360FD	>= 0.1 - < 1

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

Protection of first-aiders : Avoid inhalation, ingestion and contact with skin and eyes.

If inhaled : If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.

In case of skin contact : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Gently wipe or rinse the inside of the mouth with water.
Keep respiratory tract clear.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

Risks : Causes serious eye irritation.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Dry chemical, CO2, water spray or regular foam.
Unsuitable extinguishing media	:	Do not spread spilled material with high-pressure water streams.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Sulphur oxides Metal oxides Oxides of phosphorus metal fumes

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Firefighters should wear protective clothing and self-contained breathing apparatus.
Specific extinguishing methods	:	Remove undamaged containers from fire area if it is safe to do so. Use a water spray to cool fully closed containers.
Further information	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Evacuate personnel to safe areas. Use personal protective equipment. If it can be safely done, stop the leak. Do not touch or walk through the spilled material. Never return spills in original containers for re-use. Mark the contaminated area with signs and prevent access to unauthorized personnel. Only qualified personnel equipped with suitable protective equipment may intervene. For disposal considerations see section 13.

6.2 Environmental precautions

Environmental precautions	:	Prevent product from entering drains.

Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Never return spills in original containers for re-use.
Collect as much of the spill as possible with a suitable absorbent material.
Pick up and transfer to properly labelled containers.
Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Do not breathe vapours/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
To avoid spills during handling keep bottle on a metal tray.
Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Hygiene measures : Avoid contact with skin, eyes and clothing. Do not inhale aerosol. When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

Further information on storage stability : No decomposition if stored and applied as directed.

7.3 Specific end use(s)

Specific use(s) : Fertilizers

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
phosphoric acid	7664-38-2	TWA	1 mg/m3	GB EH40
		STEL	2 mg/m3	GB EH40
		TWA	1 mg/m3	2000/39/EC
Further information	Indicative			
		STEL	2 mg/m3	2000/39/EC
Further information	Indicative			

8.2 Exposure controls

Personal protective equipment

Eye protection : Tightly fitting safety goggles
Face-shield
Ensure that eyewash stations and safety showers are close to the workstation location.

Hand protection
Material : Wear chemical resistant gloves, such as barrier laminate, butyl rubber or nitrile rubber.

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Protective measures : Plan first aid action before beginning work with this product.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state : liquid

Form : No data available

Colour : dark brown

Odour : characteristic

Odour Threshold : No data available

pH : 3.0 - 5.0
Concentration: 100 %

Melting point/range	:	No data available
Boiling point/boiling range	:	No data available
Flash point	:	No data available
Evaporation rate	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapour pressure	:	No data available
Relative vapour density	:	No data available
Relative density	:	1.21 - 1.25
Density	:	No data available
Solubility(ies)		
Water solubility	:	soluble
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive
Oxidizing properties	:	Non-oxidizing

9.2 Other information

Molecular weight	:	Not applicable
Self-ignition	:	No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No decomposition if stored and applied as directed.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions : No decomposition if stored and applied as directed.

10.4 Conditions to avoid

Conditions to avoid : Avoid extreme temperatures
Avoid formation of aerosol.

10.5 Incompatible materials

Materials to avoid : Avoid strong acids, bases, and oxidizers

10.6 Hazardous decomposition products

Carbon oxides
Nitrogen oxides (NOx)
Toxic fumes
Metal oxides

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Not classified based on available information.

Product:

Acute oral toxicity : Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : Acute toxicity estimate: > 20 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method
Assessment: The substance or mixture has no acute dermal toxicity

Components:

phosphoric acid:

Acute oral toxicity : LD50 (Rat, female): > 300 - < 2,000 mg/kg
Method: OECD Test Guideline 423

boric acid:

Acute oral toxicity : LD50 (Rat, male): > 2,600 mg/kg
Method: OECD Test Guideline 401
Remarks: no mortality

Acute inhalation toxicity : LC0 (Rat, male and female): > 2.03 mg/l
Exposure time: 5 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Remarks: no mortality

Acute dermal toxicity : LD50 (Rabbit, male and female): > 2,000 mg/kg
Remarks: no mortality

Zinc sulphate, monohydrate:

Acute oral toxicity : LD50 (Rat, male): 1,710 mg/kg

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 402
Symptoms: irritating
Remarks: no mortality

Manganese sulfate, monohydrate:

Acute oral toxicity : LD50 (Rat, male and female): 2,150 mg/kg

Acute inhalation toxicity : LC0 (Rat, male and female): > 4.45 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Remarks: no mortality

1,2-benzisothiazol-3(2H)-one:

Acute oral toxicity : LD50 (Rat, male and female): 490 mg/kg
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

boric acid:

Acute oral toxicity : LD50 (Rat, male): > 2,600 mg/kg
Method: OECD Test Guideline 401

Remarks: no mortality

Acute inhalation toxicity : LC0 (Rat, male and female): > 2.03 mg/l
Exposure time: 5 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Remarks: no mortality

Acute dermal toxicity : LD50 (Rabbit, male and female): > 2,000 mg/kg
Remarks: no mortality

Skin corrosion/irritation

Not classified based on available information.

Product:

Remarks : No data available

Components:

phosphoric acid:

Species : Rabbit
Assessment : Corrosive
Result : Corrosive after 3 minutes to 1 hour of exposure

boric acid:

Species : Rabbit
Result : No skin irritation

Zinc sulphate, monohydrate:

Species : Mouse
Result : slight irritation
Remarks : Based on data from similar materials

Species : Rabbit
Result : slight irritation
Remarks : Based on data from similar materials

Species : Guinea pig
Result : slight irritation
Remarks : Based on data from similar materials

Manganese sulfate, monohydrate:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

1,2-benzisothiazol-3(2H)-one:

Species : Rabbit
Exposure time : 72 h

Method : OECD Test Guideline 404
Result : No skin irritation

boric acid:

Species : Rabbit
Result : No skin irritation

Serious eye damage/eye irritation

Causes serious eye irritation.

Product:

Assessment : Irritating to eyes.
Result : Eye irritation
Remarks : Eye irritation

Components:

phosphoric acid:

Result : Irreversible effects on the eye
Remarks : Based on skin corrosivity

boric acid:

Species : Rabbit
Result : slight irritation

Zinc sulphate, monohydrate:

Result : Irreversible effects on the eye

Manganese sulfate, monohydrate:

Species : Rabbit
Exposure time : 72 h
Method : OECD Test Guideline 405
Result : irritating

1,2-benzisothiazol-3(2H)-one:

Species : Bovine cornea
Method : OECD Test Guideline 437
Result : No eye irritation

Species : Rabbit
Method : EPA OPP 81-4
Result : Irreversible effects on the eye

boric acid:

Species : Rabbit
Result : slight irritation

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Product:

Result : No data available
Remarks : Not expected to cause skin sensitisation

Components:

boric acid:

Test Type : Buehler Test
Species : Guinea pig
Method : OECD Test Guideline 406
Result : Does not cause skin sensitisation.

Zinc sulphate, monohydrate:

Exposure routes : Skin contact
Species : Mouse
Result : Not a skin sensitizer.

Manganese sulfate, monohydrate:

Test Type : Patch test
Exposure routes : Dermal
Species : Humans
Result : Not a skin sensitizer.

1,2-benzisothiazol-3(2H)-one:

Test Type : Maximisation Test
Species : Guinea pig
Method : OECD Test Guideline 406
Result : May cause sensitisation by skin contact.

Species : Guinea pig
Method : FIFRA 81.06
Result : May cause sensitisation by skin contact.

boric acid:

Test Type : Buehler Test
Species : Guinea pig
Method : OECD Test Guideline 406
Result : Does not cause skin sensitisation.

Germ cell mutagenicity

Not classified based on available information.

Components:

phosphoric acid:

Genotoxicity in vitro : Test Type: reverse mutation assay
Method: OECD Test Guideline 471
Result: negative

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative

boric acid:

Genotoxicity in vitro : Test Type: reverse mutation assay
Result: negative

Test Type: sister chromatid exchange assay
Result: negative

Test Type: gene mutation test
Result: negative

Genotoxicity in vivo : Test Type: Micronucleus test
Species: Mouse (male and female)
Application Route: Oral
Result: negative

Germ cell mutagenicity- Assessment : Weight of evidence does not support classification as a germ cell mutagen.

Zinc sulphate, monohydrate:

Genotoxicity in vitro : Test Type: gene mutation test
Result: negative

Genotoxicity in vivo : Test Type: Chromosome aberration test in vitro
Result: negative

Manganese sulfate, monohydrate:

Genotoxicity in vitro : Test Type: gene mutation test
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Genotoxicity in vivo : Test Type: Micronucleus test
Species: Mouse (female)
Application Route: Oral
Method: OECD Test Guideline 474
Result: negative

1,2-benzisothiazol-3(2H)-one:

Genotoxicity in vitro : Test Type: gene mutation test

Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Test Type: Ames test
Method: OECD Test Guideline 471
Result: negative

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: positive

Genotoxicity in vivo : Test Type: unscheduled DNA synthesis assay
Species: Rat (male)
Cell type: Liver cells
Application Route: Ingestion
Exposure time: 4 h
Method: OECD Test Guideline 486
Result: negative

Test Type: Micronucleus test
Species: Mouse
Application Route: Oral
Method: OECD Test Guideline 474
Result: negative

Germ cell mutagenicity- Assessment : Weight of evidence does not support classification as a germ cell mutagen.

boric acid:

Genotoxicity in vitro : Test Type: reverse mutation assay
Result: negative

Test Type: sister chromatid exchange assay
Result: negative

Test Type: gene mutation test
Result: negative

Genotoxicity in vivo : Test Type: Micronucleus test
Species: Mouse (male and female)
Application Route: Oral
Result: negative

Germ cell mutagenicity- Assessment : Weight of evidence does not support classification as a germ cell mutagen.

Carcinogenicity

Not classified based on available information.

Components:

boric acid:

Species	:	Mouse, male and female
Application Route	:	Oral
Exposure time	:	103 weeks
Dose	:	0, 446, 1150mg/kg/bw/day
	:	> 1,150 mg/kg bw/day
Result	:	negative
Carcinogenicity - Assessment	:	Weight of evidence does not support classification as a carcinogen

Zinc sulphate, monohydrate:

Remarks	:	No human information is available.

Manganese sulfate, monohydrate:

Species	:	Mouse, male and female
Application Route	:	Ingestion
Result	:	negative

boric acid:

Species	:	Mouse, male and female
Application Route	:	Oral
Exposure time	:	103 weeks
Dose	:	0, 446, 1150mg/kg/bw/day
	:	> 1,150 mg/kg bw/day
Result	:	negative
Carcinogenicity - Assessment	:	Weight of evidence does not support classification as a carcinogen

Reproductive toxicity

Not classified based on available information.

Components:

phosphoric acid:

Effects on fertility	:	Test Type: reproductive and developmental toxicity study Species: Rat, male and female Application Route: Ingestion General Toxicity - Parent: NOAEL: 500 mg/kg body weight General Toxicity F1: NOAEL: 500 mg/kg body weight Method: OECD Test Guideline 422 Result: negative
Effects on foetal development	:	Test Type: Embryo-foetal development Species: Mouse Application Route: Ingestion General Toxicity Maternal: NOAEL: 370 mg/kg body weight

Developmental Toxicity: NOAEL: 370 mg/kg body weight
Result: negative
Remarks: Based on data from similar materials

boric acid:

Effects on fertility : Test Type: Three-generation study
Species: Rat, male and female
Application Route: Oral
Dose: 5.9, 17.5, 58.5(mgb)/kg/bw/d
General Toxicity - Parent: LOAEL: 58.5 mg/kg bw/day
General Toxicity F1: LOAEL: 58.5 mg/kg bw/day
General Toxicity F2: LOAEL: 58.5 mg/kg bw/day
Result: negative

Effects on foetal development : Test Type: reproductive and developmental toxicity study
Species: Rat
Application Route: Oral
Dose: 3.3, 6.3, 9.6, 13.3, 25mgb/kg
General Toxicity Maternal: LOAEL: 13.3 mg/kg bw/day
Embryo-foetal toxicity: NOAEL: >= 12.9 mg/kg bw/day
Method: OECD Test Guideline 414
Result: negative

Reproductive toxicity - Assessment : Clear evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments

Zinc sulphate, monohydrate:

Effects on fertility : Remarks: No data available

Effects on foetal development : Remarks: No data available

Manganese sulfate, monohydrate:

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Method: OECD Test Guideline 416
Result: negative

Effects on foetal development : Species: Rat
Application Route: Inhalation
Method: OECD Test Guideline 414
Result: negative

1,2-benzisothiazol-3(2H)-one:

Effects on fertility : Species: Rat, male
Application Route: Ingestion
General Toxicity - Parent: NOAEL: 18.5 mg/kg body weight
General Toxicity F1: NOAEL: 48 mg/kg body weight
Fertility: NOAEL: 112 mg/kg bw/day
Symptoms: No effects on reproduction parameters

Method: OPPTS 870.3800
Result: negative

Reproductive toxicity - Assessment : Weight of evidence does not support classification for reproductive toxicity

boric acid:

Effects on fertility : Test Type: Three-generation study
Species: Rat, male and female
Application Route: Oral
Dose: 5.9, 17.5, 58.5(mgb)/kg/bw/d
General Toxicity - Parent: LOAEL: 58.5 mg/kg bw/day
General Toxicity F1: LOAEL: 58.5 mg/kg bw/day
General Toxicity F2: LOAEL: 58.5 mg/kg bw/day
Result: negative

Effects on foetal development : Test Type: reproductive and developmental toxicity study
Species: Rat
Application Route: Oral
Dose: 3.3, 6.3, 9.6, 13.3, 25mgb/kg
General Toxicity Maternal: LOAEL: 13.3 mg/kg bw/day
Embryo-foetal toxicity: NOAEL: >= 12.9 mg/kg bw/day
Method: OECD Test Guideline 414
Result: negative

Reproductive toxicity - Assessment : Clear evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments

STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

Not classified based on available information.

Components:

boric acid:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Zinc sulphate, monohydrate:

Remarks : No data available

1,2-benzisothiazol-3(2H)-one:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

boric acid:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Components:

phosphoric acid:

Species	:	Rat, male and female
NOAEL	:	250 mg/kg
Application Route	:	Oral - gavage
Exposure time	:	42 - 54 d
Method	:	OECD Test Guideline 422

boric acid:

Species	:	Rat, male and female
LOAEL	:	58.5 mg/kg bw/day
Application Route	:	Oral - feed
Exposure time	:	2 years
Dose	:	0, 5.9, 17.5, 58.5mg/kg/bw/d

Species	:	Rat, female
NOAEC	:	0.47 mg/l
Application Route	:	inhalation (dust/mist/fume)
Dose	:	.077, .175, .47 mg/l

Manganese sulfate, monohydrate:

Species	:	Rat, male and female
NOAEL	:	2000 mg/kg
Application Route	:	Ingestion
Exposure time	:	13 w

1,2-benzisothiazol-3(2H)-one:

Species	:	Rat, male and female
NOAEL	:	15 mg/kg
Application Route	:	Ingestion
Exposure time	:	28 d
Method	:	OECD Test Guideline 407
Symptoms	:	Irritation

Species	:	Rat, male and female
NOAEL	:	69 mg/kg
Application Route	:	Ingestion
Exposure time	:	90 d
Symptoms	:	Irritation, Reduced body weight

boric acid:

Species	:	Rat, male and female
LOAEL	:	58.5 mg/kg bw/day
Application Route	:	Oral - feed
Exposure time	:	2 years
Dose	:	0, 5.9, 17.5, 58.5mg/kg/bw/d

Species	:	Rat, female
NOAEC	:	0.47 mg/l
Application Route	:	inhalation (dust/mist/fume)
Dose	:	.077, .175, .47 mg/l

Aspiration toxicity

Not classified based on available information.

Further information

Product:

Remarks	:	No data available

SECTION 12: Ecological information

12.1 Toxicity

Components:

phosphoric acid:

Toxicity to fish	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): 3 - 3.25 mg/l
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EC50 (Desmodesmus subspicatus (green algae)): > 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 NOEC (Desmodesmus subspicatus (green algae)): 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Toxicity to microorganisms	:	EC50 (activated sludge): > 1,000 mg/l Exposure time: 3 h Method: OECD Test Guideline 209

boric acid:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 79.7 mg/l Exposure time: 96 h Test Type: static test Remarks: Based on data from similar materials LC50 (Limanda limanda): 74 mg/l Exposure time: 96 h Test Type: flow-through test Remarks: Based on data from similar materials
Toxicity to daphnia and other	:	LC50 (Ceriodaphnia dubia (water flea)): 102 mg/l

aquatic invertebrates		Exposure time: 48 h Test Type: static test
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 40.2 mg/l Exposure time: 74.5 h Method: OECD Test Guideline 201 NOEC (Pseudokirchneriella subcapitata (green algae)): 17.5 mg/l Exposure time: 74.5 h Method: OECD Test Guideline 201 LOEC : 3.6 mg/l Exposure time: 10 d Test Type: semi-static test
Toxicity to microorganisms	:	EC50 (activated sludge): > 175 mg/l Exposure time: 3 h Method: OECD Test Guideline 209 NOEC (activated sludge): 17.5 mg/l Exposure time: 3 h Method: OECD Test Guideline 209
Toxicity to fish (Chronic toxicity)	:	NOEC: 6.4 mg/l Exposure time: 34 d Species: Danio rerio (zebra fish) Method: OECD Test Guideline 210
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 6.4 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: semi-static test
Toxicity to soil dwelling organisms	:	LC50: > 175 mg/kg Exposure time: 14 d Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 207 NOEC: >= 175 mg/kg Exposure time: 14 d Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 207

Zinc sulphate, monohydrate:

Toxicity to fish	:	LC50 (Fish): 0.112 mg/l Exposure time: 96 h LC50 (Oncorhynchus mykiss (rainbow trout)): 0.169 mg/l Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.131 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	NOEC (Pseudokirchneriella subcapitata (microalgae)): 0.0052 mg/l End point: Growth rate Exposure time: 72 h Method: OECD Test Guideline 201
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to fish (Chronic toxicity)	:	EC10:
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 0.0056 mg/l Exposure time: 10 d
M-Factor (Chronic aquatic toxicity)	:	10

Manganese sulfate, monohydrate:

Toxicity to fish	:	LC50 (Salmo trutta (brown trout)): 49.9 mg/l Exposure time: 96 h Test Type: flow-through test
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Crustaceans): 13.7 mg/l Exposure time: 96 h
Toxicity to algae/aquatic plants	:	EC50 (Desmodesmus subspicatus (green algae)): 61 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201
Toxicity to microorganisms	:	EC50 (activated sludge): > 1,000 mg/l Exposure time: 3 h Test Type: Respiration inhibition Method: OECD Test Guideline 209
Toxicity to fish (Chronic toxicity)	:	NOEC: 4.496 mg/l Exposure time: 35 d Species: Danio rerio (zebra fish) Method: OECD Test Guideline 210
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 0.020 mg/l Exposure time: 14 d Species: Crassostrea virginica Test Type: static test

1,2-benzisothiazol-3(2H)-one:

Toxicity to fish	:	LC50 (Cyprinodon variegatus (sheepshead minnow)): 16.7 mg/l Exposure time: 96 h Test Type: static test LC50 (Oncorhynchus mykiss (rainbow trout)): 2.15 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 2.9 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 0.070 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 NOEC (Pseudokirchneriella subcapitata (green algae)): 0.04 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
M-Factor (Acute aquatic toxicity)	:	10
Toxicity to microorganisms	:	EC50 (activated sludge): 24 mg/l Exposure time: 3 h Test Type: Respiration inhibition Method: OECD Test Guideline 209 EC50 (activated sludge): 12.8 mg/l Exposure time: 3 h Test Type: Respiration inhibition Method: OECD Test Guideline 209

boric acid:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 79.7 mg/l Exposure time: 96 h Test Type: static test Remarks: Based on data from similar materials LC50 (Limanda limanda): 74 mg/l Exposure time: 96 h Test Type: flow-through test Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Ceriodaphnia dubia (water flea)): 102 mg/l Exposure time: 48 h Test Type: static test

Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 40.2 mg/l Exposure time: 74.5 h Method: OECD Test Guideline 201 NOEC (Pseudokirchneriella subcapitata (green algae)): 17.5 mg/l Exposure time: 74.5 h Method: OECD Test Guideline 201 LOEC : 3.6 mg/l Exposure time: 10 d Test Type: semi-static test
Toxicity to microorganisms	:	EC50 (activated sludge): > 175 mg/l Exposure time: 3 h Method: OECD Test Guideline 209 NOEC (activated sludge): 17.5 mg/l Exposure time: 3 h Method: OECD Test Guideline 209
Toxicity to fish (Chronic toxicity)	:	NOEC: 6.4 mg/l Exposure time: 34 d Species: Danio rerio (zebra fish) Method: OECD Test Guideline 210
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 6.4 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: semi-static test
Toxicity to soil dwelling organisms	:	LC50: > 175 mg/kg Exposure time: 14 d Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 207 NOEC: >= 175 mg/kg Exposure time: 14 d Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 207

12.2 Persistence and degradability

Components:

phosphoric acid:

Biodegradability	:	Remarks: The methods for determining biodegradability are not applicable to inorganic substances.

Zinc sulphate, monohydrate:

Biodegradability	:	Remarks: No data available

1,2-benzisothiazol-3(2H)-one:

Biodegradability : Result: rapidly biodegradable
Method: OECD Test Guideline 301C

12.3 Bioaccumulative potential

Product:

Bioaccumulation : Remarks: No data available

Components:

boric acid:

Bioaccumulation : Species: Fish
Exposure time: 60 d
Bioconcentration factor (BCF): < 0.1

Partition coefficient: n-octanol/water : log Pow: -1.09 (22 °C)

Zinc sulphate, monohydrate:

Bioaccumulation : Remarks: Not inherently biodegradable.

Partition coefficient: n-octanol/water : Remarks: Not applicable

1,2-benzisothiazol-3(2H)-one:

Bioaccumulation : Species: Lepomis macrochirus (Bluegill sunfish)
Exposure time: 56 d
Bioconcentration factor (BCF): 6.62
Method: OECD Test Guideline 305
Remarks: This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

Partition coefficient: n-octanol/water : log Pow: 0.7 (20 °C)
pH: 7

log Pow: 0.99 (20 °C)
pH: 5

boric acid:

Bioaccumulation : Species: Fish
Exposure time: 60 d
Bioconcentration factor (BCF): < 0.1

Partition coefficient: n-octanol/water : log Pow: -1.09 (22 °C)

12.4 Mobility in soil

Components:

1,2-benzisothiazol-3(2H)-one:

Distribution among environmental compartments : Koc: 9.33 ml/g, log Koc: 0.97
Method: OECD Test Guideline 121
Remarks: Highly mobile in soils

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

Product:

Endocrine disrupting potential : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

Components:

phosphoric acid:

Additional ecological information : Harmful effects on aquatic organisms also due to pH shift.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

SECTION 14: Transport information

14.1 UN number

ADN	:	UN 1805
ADR	:	UN 1805
RID	:	UN 1805
IMDG	:	UN 1805
IATA	:	UN 1805

14.2 UN proper shipping name

ADN	:	PHOSPHORIC ACID SOLUTION
ADR	:	PHOSPHORIC ACID SOLUTION
RID	:	PHOSPHORIC ACID SOLUTION
IMDG	:	PHOSPHORIC ACID SOLUTION
IATA	:	Phosphoric acid, solution

14.3 Transport hazard class(es)

ADN	:	8
ADR	:	8
RID	:	8
IMDG	:	8
IATA	:	8

14.4 Packing group

ADN

Packing group	:	III
Classification Code	:	C1
Hazard Identification Number	:	80
Labels	:	8

ADR

Packing group	:	III
Classification Code	:	C1
Hazard Identification Number	:	80
Labels	:	8
Tunnel restriction code	:	(E)

RID

Packing group	:	III
Classification Code	:	C1
Hazard Identification Number	:	80
Labels	:	8

IMDG

Packing group	:	III
Labels	:	8

EmS Code : F-A, S-B

IATA (Cargo)

Packing instruction (cargo aircraft)	:	856
Packing instruction (LQ)	:	Y841
Packing group	:	III
Labels	:	Corrosive

IATA (Passenger)

Packing instruction (passenger aircraft)	:	852
Packing instruction (LQ)	:	Y841
Packing group	:	III
Labels	:	Corrosive

14.5 Environmental hazards

ADN
Environmentally hazardous : no

ADR
Environmentally hazardous : no

RID
Environmentally hazardous : no

IMDG
Marine pollutant : no

14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable for product as supplied.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Relevant EU provisions transposed through retained EU law

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	:	Not applicable
UK REACH List of substances subject to authorisation (Annex XIV)	:	Not applicable

The components of this product are reported in the following inventories:

TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	Product contains substance(s) not listed on TSCA inventory.

AIIC	:	Not in compliance with the inventory
DSL	:	This product contains the following components listed on the Canadian NDSL. All other components are on the Canadian DSL. Fe 6% EDDHA (Fe 6%) SG
ENCS	:	Not in compliance with the inventory
ISHL	:	Not in compliance with the inventory
KECI	:	Not in compliance with the inventory
PICCS	:	Not in compliance with the inventory
IECSC	:	Not in compliance with the inventory
NZIoC	:	Not in compliance with the inventory
TECI	:	Not in compliance with the inventory

15.2 Chemical safety assessment

A chemical safety assessment is not required for this product (mixture).

SECTION 16: Other information

Full text of H-Statements

H290	:	May be corrosive to metals.
H302	:	Harmful if swallowed.
H314	:	Causes severe skin burns and eye damage.
H315	:	Causes skin irritation.
H317	:	May cause an allergic skin reaction.
H318	:	Causes serious eye damage.
H360FD	:	May damage fertility. May damage the unborn child.
H373	:	May cause damage to organs through prolonged or repeated exposure.
H400	:	Very toxic to aquatic life.
H410	:	Very toxic to aquatic life with long lasting effects.
H411	:	Toxic to aquatic life with long lasting effects.
H412	:	Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	:	Acute toxicity
Aquatic Acute	:	Short-term (acute) aquatic hazard
Aquatic Chronic	:	Long-term (chronic) aquatic hazard
Eye Dam.	:	Serious eye damage
Met. Corr.	:	Corrosive to metals
Repr.	:	Reproductive toxicity
Skin Corr.	:	Skin corrosion
Skin Irrit.	:	Skin irritation

Skin Sens.	:	Skin sensitisation
STOT RE	:	Specific target organ toxicity - repeated exposure
2000/39/EC	:	Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values
GB EH40	:	UK. EH40 WEL - Workplace Exposure Limits
2000/39/EC / TWA	:	Limit Value - eight hours
2000/39/EC / STEL	:	Short term exposure limit
GB EH40 / TWA	:	Long-term exposure limit (8-hour TWA reference period)
GB EH40 / STEL	:	Short-term exposure limit (15-minute reference period)

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of very high concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Classification of the mixture:		**Classification procedure:**
2	H319	Calculation method

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