Danafloat™ 245N

Version	Revision Date:	SDS Number:	Date of last issue: 01.09.2020
1.2	21.02.2024	50001992	Date of first issue: 01.03.2020

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

1.1 Product identifier

Product name Danafloat™ 245N

Other means of identification

Product code 50001992

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

Use of the Substance/Mixture : Flotation agents

Recommended restrictions on use : Use as recommended by the label.
For professional users only.

1.3 Details of the supplier of the safety data sheet

Supplier Address

FMC Agricultural Solutions A/S
Thyborønvej 78
DK-7673 Harboøre
Denmark

Telephone: +45 9690 9690
Telefax: +45 9690 9691
E-mail address: SDS-Info@fmc.com .

1.4 Emergency telephone number

For leak, fire, spill or accident emergencies, call:
Denmark: +45-69918573 (CHEMTREC)

Medical emergency:
Denmark: +45 82 12 12 12

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Skin corrosion, Sub-category 1C	H314: Causes severe skin burns and eye damage.
Serious eye damage, Category 1	H318: Causes serious eye damage.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.

Precautionary statements :

Prevention:

P280 Wear protective gloves/protective clothing/goggles/face shield.

Response:

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.

Disposal:

P501 Dispose of contents and/or container in accordance with hazardous waste regulations.

Hazardous components which must be listed on the label:

sodium O,O-diisobutyl dithiophosphate
sodium hydroxide

Additional Labelling

EUH401 To avoid risks to human health and the environment, comply with the instructions for use.

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.

Ecological information: 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.

Toxicological information: 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.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
sodium O,O-diisobutyl dithiophosphate	53378-51-1 258-508-5 01-2119982402-38-0000	Skin Corr. 1C; H314 Eye Dam. 1; H318	>= 30 - < 50
sodium hydroxide	1310-73-2 215-185-5 011-002-00-6	Met. Corr. 1; H290 Skin Corr. 1A; H314 Eye Dam. 1; H318 --- specific concentration limit Skin Corr. 1A; H314 >= 5 % Skin Corr. 1B; H314 2 - < 5 % Skin Irrit. 2; H315 0,5 - < 2 % Eye Irrit. 2; H319 0,5 - < 2 %	>= 2 - < 3

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 : First Aid responders should pay attention to self-protection and use the recommended protective clothing
Avoid inhalation, ingestion and contact with skin and eyes.
If potential for exposure exists refer to Section 8 for specific personal protective equipment.

If inhaled : Move to fresh air.
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	:	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 severe skin burns and eye damage. Causes serious eye damage.

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	:	High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Fire may produce irritating, corrosive and/or toxic gases.

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

Further information	:	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	:	Use personal protective equipment. 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	:	Neutralise with acid. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). 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 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 : 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. 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) : Flotation agents

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
sodium hydroxide	1310-73-2	L	2 mg/m3	DK OEL

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
sodium O,O-diisobutyl dithiophosphate	Workers	Inhalation	Long-term systemic effects	2,35 mg/m3
	Workers	Dermal	Long-term systemic effects	0,66 mg/kg

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
sodium O,O-diisobutyl dithiophosphate	Fresh water	0,261 mg/l
	Marine water	0,026 mg/l
	Fresh water sediment	
	Marine sediment	
	Soil	

8.2 Exposure controls

Personal protective equipment

Eye/face protection : Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

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.
Respiratory protection	:	No personal respiratory protective equipment normally required.
Protective measures	:	Plan first aid action before beginning work with this product. Always have on hand a first-aid kit, together with proper instructions. Ensure that eye flushing systems and safety showers are located close to the working place. Wear suitable protective equipment.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Form	:	Aqueous solution
Colour	:	light tan
Odour	:	sulphurous
Odour Threshold	:	No data available
Melting point/freezing point	:	< -25 °C
Boiling point/boiling range	:	102 - 104 °C
Flammability	:	The product is not flammable.
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available

Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
pH	:	> 12
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Solubility(ies)		
Water solubility	:	> 1.000 g/l (20 °C) pH: 4,0 > 1.000 g/l (20 °C) pH: 7,0 > 1.000 g/l (20 °C) pH: 9,0
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Vapour pressure	:	< 10 Pa (21,2 °C) < 10 Pa (34,4 °C) < 10 Pa (46,2 °C)
Relative density	:	1,12
Density	:	No data available

Bulk density	:	No data available
Relative vapour density	:	No data available
Particle characteristics		
Particle size	:	No data available

9.2 Other information

Explosives	:	Not explosive
Oxidizing properties	:	Non-oxidizing
Self-ignition	:	not auto-flammable

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
Heat, flames and sparks.

10.5 Incompatible materials

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

10.6 Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Not classified based on available information.

Product:

Acute oral toxicity	:	LD50 Oral (Rat): > 2.000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 5 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 Dermal (Rat): > 2.000 mg/kg

Skin corrosion/irritation

Causes severe skin burns and eye damage.

Product:

Assessment	:	Causes severe burns.
Result	:	Severe skin irritation
Remarks	:	Extremely corrosive and destructive to tissue.

Components:

sodium hydroxide:

Result	:	Corrosive after 3 minutes or less of exposure

Serious eye damage/eye irritation

Causes serious eye damage.

Product:

Result	:	Severe eye irritation
Remarks	:	Extremely corrosive and destructive to tissue.
Remarks	:	May cause irreversible eye damage.

Components:

sodium hydroxide:

Result	:	Irreversible effects on the eye

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Product:

Result	:	Does not cause skin sensitisation.
Result	:	Does not cause respiratory sensitisation.

Components:

sodium hydroxide:

Remarks : substance is corrosive

Germ cell mutagenicity

Not classified based on available information.

Components:

sodium O,O-diisobutyl dithiophosphate:

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

sodium hydroxide:

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

Carcinogenicity

Not classified based on available information.

Components:

sodium hydroxide:

Carcinogenicity - Assessment : Weight of evidence does not support classification as a carcinogen

Reproductive toxicity

Not classified based on available information.

Components:

sodium O,O-diisobutyl dithiophosphate:

Effects on fertility : Test Type: reproductive and developmental toxicity study
Species: Rat, male and female
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative

Effects on foetal development : Test Type: Pre-natal
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 414
Result: negative

sodium hydroxide:

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

STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

Not classified based on available information.

Repeated dose toxicity

Components:

sodium O,O-diisobutyl dithiophosphate:

Species	:	Rat, male and female
NOAEL	:	200 mg/kg
Application Route	:	Oral - gavage
Exposure time	:	28 d
Method	:	OECD Test Guideline 422

Aspiration toxicity

Not classified based on available information.

11.2 Information on other hazards

Endocrine disrupting properties

Product:

Assessment	:	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.

Experience with human exposure

Components:

sodium hydroxide:

General Information	:	Symptoms: corrosive effects
Inhalation	:	Target Organs: Respiratory Tract Symptoms: corrosive effects
Skin contact	:	Target Organs: Skin Symptoms: corrosive effects
Eye contact	:	Target Organs: Eyes Symptoms: corrosive effects
Ingestion	:	Target Organs: Gastrointestinal tract Symptoms: corrosive effects

Further information

Product:

Remarks : No data available

SECTION 12: Ecological information

12.1 Toxicity

Components:

sodium O,O-diisobutyl dithiophosphate:

Toxicity to fish	:	LC50 (Danio rerio (zebra fish)): > 791 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 1.020 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 261 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Toxicity to microorganisms	:	(activated sludge): Exposure time: 28 h Method: OECD Test Guideline 301D

12.2 Persistence and degradability

Product:

Biodegradability : Remarks: Expected to be biodegradable

Components:

sodium O,O-diisobutyl dithiophosphate:

Biodegradability : Result: Not biodegradable
Biodegradation: 0,4 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

12.3 Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Bioaccumulation is unlikely.

Components:

sodium O,O-diisobutyl dithiophosphate:

Partition coefficient: n-octanol/water : log Pow: 1,67 (22 °C)

12.4 Mobility in soil

Product:

Distribution among environmental compartments : Remarks: medium mobility in soil

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 Endocrine disrupting properties

Product:

Assessment : 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.

12.7 Other adverse effects

Product:

Additional ecological information : No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : According to the Waste Framework Directive (2008/98/EC), possibilities for reuse or reprocessing should first be considered. If this is not possible, the material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing.

Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

It is recommended to consider possible ways of disposal in the following order:
1. Reuse or recycling should first be considered. If offered for recycling, containers must be emptied and triply rinsed (or equivalent). Do not discharge rinsing water to sewer systems.
2. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.
3. Delivery of the packaging to a licensed service for disposal of hazardous waste.
4. Disposal in a landfill or burning in open air should only occur as a last resort. For disposal in a landfill, containers should be emptied completely, rinsed and punctured to make them unusable for other purposes. If burned, stay out of smoke.

SECTION 14: Transport information

14.1 UN number or ID number

ADN	:	UN 1719
ADR	:	UN 1719
RID	:	UN 1719
IMDG	:	UN 1719
IATA	:	UN 1719

14.2 UN proper shipping name

ADN	:	CAUSTIC ALKALI LIQUID, N.O.S. (Sodium hydroxide, sodium O,O-diisobutyl dithiophosphate)
ADR	:	CAUSTIC ALKALI LIQUID, N.O.S. (Sodium hydroxide, sodium O,O-diisobutyl dithiophosphate)
RID	:	CAUSTIC ALKALI LIQUID, N.O.S. (Sodium hydroxide, sodium O,O-diisobutyl dithiophosphate)
IMDG	:	CAUSTIC ALKALI LIQUID, N.O.S. (Sodium hydroxide, sodium O,O-diisobutyl dithiophosphate)
IATA	:	Caustic alkali liquid, n.o.s. (Sodium hydroxide, sodium O,O-diisobutyl dithiophosphate)

14.3 Transport hazard class(es)

		Class	Subsidiary risks
ADN	:	8	
ADR	:	8	
RID	:	8	
IMDG	:	8	
IATA	:	8	

14.4 Packing group

ADN

Packing group	:	III
Classification Code	:	C5
Hazard Identification Number	:	80
Labels	:	8

ADR

Packing group	:	III
Classification Code	:	C5
Hazard Identification Number	:	80
Labels	:	8
Tunnel restriction code	:	(E)

RID

Packing group	:	III
Classification Code	:	C5
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 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Conditions of restriction for the following entries should be considered: Number on list 3
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	Not applicable
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	:	Not applicable
Regulation (EU) 2019/1021 on persistent organic pollutants (recast)	:	Not applicable
Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals	:	Not applicable
REACH - List of substances subject to authorisation (Annex XIV)	:	Not applicable
Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.		Not applicable

Other regulations:

Young people under the age of 18 are not allowed to use or be exposed to the product professionally. Young people above the age of 15 are, however, except from this rule if the product is a necessary part of their education.

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

TCSI	:	Not in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory
AIIC	:	On the inventory, or in compliance with the inventory

DSL	:	All components of this product are on the Canadian DSL
ENCS	:	On the inventory, or in compliance with the inventory
ISHL	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
NZIoC	:	Not in compliance with the inventory
TECI	:	On the inventory, or in compliance with the inventory

15.2 Chemical safety assessment

A chemical safety assessment has been performed. The results are attached.

SECTION 16: Other information

Full text of H-Statements

H290	:	May be corrosive to metals.
H314	:	Causes severe skin burns and eye damage.
H318	:	Causes serious eye damage.

Full text of other abbreviations

Eye Dam.	:	Serious eye damage
Met. Corr.	:	Corrosive to metals
Skin Corr.	:	Skin corrosion
DK OEL	:	Denmark. Occupational Exposure Limits
DK OEL / L	:	Ceiling

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 popula-

tion; 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; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Classification of the mixture:		**Classification procedure:**
Skin Corr. 1C	H314	Based on product data or assessment
Eye Dam. 1	H318	Based on product data or assessment

Disclaimer
FMC Corporation believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. You can contact FMC Corporation to ensure that this document is the most current available from FMC Corporation. No warranty of fitness for any particular purpose, warranty of merchantability or any other warranty, expressed or implied, is made concerning the information provided herein. The information provided herein relates only to the specified product designated and may not be applicable where such product is used in combination with any other materials or in any process. The user is responsible for determining whether the product is fit for a particular purpose and suitable for the user's conditions and methods of use. Since the conditions and methods of use are beyond the control of FMC Corporation, FMC Corporation expressly disclaims any and all liability as to any results obtained or arising from any use of the products or reliance on such information.

Prepared by

FMC Corporation

DK / 6N

FMC Agricultural Solutions A/S
Thyborønvej 78
DK-7673 Harboøre
Denmark
+45 9690 9690
www.fmc.com
CVR No. DK 12 76 00 43

ANNEX: Exposure assessment and related risk characterisation

1. Introduction

1.1. Overview of uses and exposure scenarios

The following table lists all the exposure scenarios (ES).

Table 1. Overview of exposure scenarios and contributing scenarios

Identifiers	Titles of exposure scenarios and the related contributing scenarios	Tonnage (tonnes per year)
ES - IW	Use at industrial site - Use at industrial site - Use at industrial site (ERC 6b) - Worker. Flotation batch process with exposure possible (PROC 5) - Worker. Transfer of substance to flotation process, outdoors (PROC 8b) - Worker. Laboratory analytical work on flotation process (PROC 15)	999.0
IW: Industrial end use at site		

1.2. Introduction to the assessment

1.2.1. Environment

Scope and type of assessment

The scope of exposure assessment and type of risk characterisation required for the environment are described in the following table based on the hazard conclusions presented in the CSR.

Table 2. Type of risk characterisation required for the environment

Protection target	Type of risk characterisation	Hazard conclusion
Freshwater	Quantitative	PNEC aqua (freshwater) = 0.261 mg/L
Sediment (freshwater)	Qualitative	No exposure of sediment expected
Marine water	Quantitative	PNEC aqua (marine water) = 0.026 mg/L
Sediment (marine water)	Qualitative	No exposure of sediment expected
Sewage treatment plant	Not needed	No hazard identified
Air	Not needed	No hazard identified
Agricultural soil	Qualitative	No exposure of soil expected
Predator	Not needed	No potential for bioaccumulation

Comments on assessment approach:

The regional concentrations are reported in the CSR in section 10.2.1.2 (see Table 55, “Predicted regional exposure concentrations (Regional PEC)”). The local Predicted Exposure Concentrations (PECs) reported for each contributing scenario correspond to the sum of the local concentrations (Clocal) and the regional concentrations (PEC regional).

FMC Agricultural Solutions A/S
Thyborønvej 78
DK-7673 Harboøre
Denmark
+45 9690 9690
www.fmc.com
CVR No. DK 12 76 00 43

1.2.2. Man via environment

Scope and type of assessment

The scope of exposure assessment and type of risk characterisation required for man via the environment are described in the following table based on the hazard conclusions reported and justified in the CSR.

Table 3. Type of risk characterisation required for man via the environment

Route of exposure and type of effects	Type of risk characterisation	Hazard conclusion
Inhalation: systemic long-term	Quantitative	DNEL = 0.58 mg/m³
Oral: systemic long-term	Quantitative	DNEL = 0.33 mg/kg bw/day

1.2.3. Workers

Scope and type of assessment

The scope of exposure assessment and type of risk characterisation required for workers are described in the following table based on the hazard conclusions presented in the CSR.

Table 4. Type of risk characterisation required for workers

Route	Type of effect	Type of risk characterisation	Hazard conclusion
Inhalation	Systemic long-term	Quantitative	DNEL = 2.35 mg/m³
	Systemic acute	Not needed	No hazard identified
	Local long-term	Qualitative	Medium hazard (no threshold derived)
	Local acute	Qualitative	Medium hazard (no threshold derived)
Dermal	Systemic long-term	Quantitative	DNEL = 0.66 mg/kg bw/day
	Systemic acute	Not needed	No hazard identified
	Local long-term	Qualitative	Medium hazard (no threshold derived)
	Local acute	Qualitative	Medium hazard (no threshold derived)
Eye	Local	Qualitative	Medium hazard (no threshold derived)

FMC Agricultural Solutions A/S
Thyborønvej 78
DK-7673 Harboøre
Denmark
+45 9690 9690
www.fmc.com
CVR No. DK 12 76 00 43

2. Exposure scenario: Use at industrial site

Sector of use: SU 2a, Mining, (without offshore industries)

Environment contributing scenario(s):	
Use at industrial site	ERC 6b
Worker contributing scenario(s):	
Worker. Flotation batch process with exposure possible	PROC 5
Worker. Transfer of substance to flotation process, outdoors	PROC 8b
Worker. Laboratory analytical work on floatation process	PROC 15

2.1. Environmental contributing scenario 1: Use at industrial site

2.1.1. Conditions of use

Amount used, frequency and duration of use (or from service life)
• Daily use at site: ≤ 3 tonnes/day
• Annual use at a site: ≤ 999 tonnes/year
• Percentage of tonnage used at regional scale: = 100 %
Conditions and measures related to sewage treatment plant
• Municipal STP: no [effectiveness water: 0%] *No discharge to waste water treatment plant, all waste are either incinerated or led to holding ponds.*
Conditions and measures related to treatment of waste (including article waste)
• Particular considerations on the waste treatment operations: no (low risk) (ERC based assessment demonstrating control of risk with default conditions. Low risk assumed for waste life stage. Waste disposal according to national/local legislation is sufficient.)
Other conditions affecting environmental exposure
• Discharge rate of effluent: ≥ 0 m^3/d
• Receiving surface water flow rate: ≥ 0 m^3/d

2.1.2. Releases

The local releases to the environment are reported in the following table.

Table 5. Local releases to the environment

Release	Release factor estimation method	Explanation / Justification
Water	Release factor	**Initial release factor:** 0% **Final release factor:** 0% **Local release rate:** 0 kg/day

FMC Agricultural Solutions A/S
Thyborønvej 78
DK-7673 Harboøre
Denmark
+45 9690 9690
www.fmc.com
CVR No. DK 12 76 00 43

Release	Release factor estimation method	Explanation / Justification
Air	Release factor	**Initial release factor:** 0% **Final release factor:** 0% **Local release rate:** 0 kg/day
Soil	Release factor	**Final release factor:** 0%

2.1.3. Exposure and risks for the environment and man via the environment

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 6. Exposure concentrations and risks for the environment

Protection target	Exposure concentration	Risk characterisation
Freshwater	**Local PEC:** 6.534E-7 mg/L	RCR < 0.01
Sediment (freshwater)		Qualitative risk characterisation (see below)
Marine water	**Local PEC:** 6.329E-8 mg/L	RCR < 0.01
Sediment (marine water)		Qualitative risk characterisation (see below)
Agricultural soil		Qualitative risk characterisation (see below)
Man via environment - inhalation	**Local PEC:** 1.071E-12 mg/m³	RCR < 0.01
Man via environment - oral	**Exposure via food consumption:**	
Man via environment - combined routes		RCR < 0.01

Table 7. Contribution to oral intake for man via the environment from local contribution

Type of food	Estimated daily dose	Concentration in food
Drinking water	9.22E-11 mg/kg bw/day	3.227E-9 mg/L
Fish		
Leaf crops	2.15E-10 mg/kg bw/day	1.254E-8 mg/kg ww
Root crops	2.62E-11 mg/kg bw/day	4.776E-9 mg/kg ww
Meat	5.191E-15 mg/kg bw/day	1.207E-12 mg/kg ww
Milk	6.541E-14 mg/kg bw/day	8.162E-12 mg/kg ww

Conclusion on risk characterisation

There is no exposure to sediment (fresh- and marine water), sewage treatment plant or agricultural soil. Use, transfer and laboratory work does not produce any waste intended to be released into the environment.

FMC Agricultural Solutions A/S
Thyborønvej 78
DK-7673 Harboøre
Denmark
+45 9690 9690
www.fmc.com
CVR No. DK 12 76 00 43

2.2. Worker contributing scenario 1: Worker. Flotation batch process with exposure possible (PROC 5)

2.2.1. Conditions of use

	Method
Amount used (or contained in articles), frequency and duration of use/exposure	
• Concentration of substance in a mixture: < 0.01 % w/w *Used as 100 g pr ton ore.*	External tool (easyTRA)
• Duration of activity: < 8 hours (avoid carrying out activities involving exposure for more than 8 hours.)	External tool (easyTRA)
Conditions and measures related to personal protection, hygiene and health evaluation	
• Dermal protection: yes (chemically resistant gloves conforming to EN374 with specific activity training) [effectiveness dermal: 95%]	External tool (easyTRA)
Other conditions affecting workers exposure	
• Place of use: outdoor	External tool (easyTRA)

2.2.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 8. Exposure concentrations and risks for workers

Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation**
Inhalation, systemic, long-term	**0.004 mg/m³** (external tool (easyTRA))	RCR < 0.01
Inhalation, local, long-term		Qualitative (see below)
Inhalation, local, acute		Qualitative (see below)
Dermal, systemic, long-term	**6.9E-5 mg/kg bw/day** (external tool (easyTRA))	RCR < 0.01
Dermal, local, long-term		Qualitative (see below)
Dermal, local, acute		Qualitative (see below)
Eye, local		Qualitative (see below)
Combined routes, systemic, long-term		RCR < 0.01

Conclusion on risk characterisation

The available data material suggests that the dominating local effect upon exposure to the substance, both long- and short term, will be corrosion.

Dermal corrosion is prevented by workers wearing gloves at all times when working with the substance.

Eye corrosion is prevented by workers wearing a face mask/googles/safety glasses at all times when working with the substance.

FMC Agricultural Solutions A/S
Thyborønvej 78
DK-7673 Harboøre
Denmark
+45 9690 9690
www.fmc.com
CVR No. DK 12 76 00 43

Inhalative corrosion is prevented by working under effective local area ventilation systems. The solid substance has a low vapour pressure (below 10 Pa). Furthermore the substance is a salt and additionally it is produced in an aqueous solution. Hence it exists as ions in the solution which further lowers any inhalative exposure below a level, which could give local inhalative corrosion.

The risk management measures mentioned above (gloves, eye protection and LEV) effectively eliminates local effects. Therefore any long- or short-term risks for local effects upon exposure of the substance are controlled.

2.3. Worker contributing scenario 2: Worker. Transfer of substance to flotation process, outdoors (PROC 8b)

2.3.1. Conditions of use

	Method
Amount used (or contained in articles), frequency and duration of use/exposure	
• Concentration of substance in a mixture: 50%	External tool (easyTRA)
• Duration of activity: < 25 minutes	External tool (easyTRA)
Conditions and measures related to personal protection, hygiene and health evaluation	
• Dermal protection: yes (chemically resistant gloves conforming to EN374 with specific activity training) [effectiveness dermal: 95%]	External tool (easyTRA)
Other conditions affecting workers exposure	
• Place of use: outdoor	External tool (easyTRA)

2.3.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 9. Exposure concentrations and risks for workers

Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation**
Inhalation, systemic, long-term	**1.003 mg/m³** (external tool (easyTRA))	RCR = 0.427
Inhalation, local, long-term		Qualitative (see below)
Inhalation, local, acute		Qualitative (see below)
Dermal, systemic, long-term	**0.018 mg/kg bw/day** (external tool (easyTRA))	RCR = 0.027
Dermal, local, long-term		Qualitative (see below)
Dermal, local, acute		Qualitative (see below)
Eye, local		Qualitative (see below)
Combined routes, systemic, long-term		RCR = 0.454

FMC Agricultural Solutions A/S
Thyborønvej 78
DK-7673 Harboøre
Denmark
+45 9690 9690
www.fmc.com
CVR No. DK 12 76 00 43

Conclusion on risk characterisation

The available data material suggests that the dominating local effect upon exposure to the substance, both long- and short term, will be corrosion.

Dermal corrosion is prevented by workers wearing gloves at all times when working with the substance.

Eye corrosion is prevented by workers wearing a face mask/googles/safety glasses at all times when working with the substance.

Inhalative corrosion is prevented by working under effective local area ventilation systems. The solid substance has a low vapour pressure (below 10 Pa). Furthermore the substance is a salt and additionally it is produced in an aqueous solution. Hence it exists as ions in the solution which further lowers any inhalative exposure below a level, which could give local inhalative corrosion.

The risk management measures mentioned above (gloves, eye protection and LEV) effectively eliminates local effects. Therefore any long- or short-term risks for local effects upon exposure of the substance are controlled.

2.4. Worker contributing scenario 3: Worker. Laboratory analytical work on floatation process (PROC 15)

2.4.1. Conditions of use

	Method
Amount used (or contained in articles), frequency and duration of use/exposure	
• Concentration of substance in a mixture: < 0.01 % w/w	External tool (easyTRA)
• Duration of activity: < 8 hours (avoid carrying out activities involving exposure for more than 8 hours.)	External tool (easyTRA)
Technical and organisational conditions and measures	
• Laboratory work under fume hood: yes [effectiveness inhalation: 99.99%]	External tool (easyTRA)
Conditions and measures related to personal protection, hygiene and health evaluation	
• Dermal protection: yes (chemically resistant gloves conforming to EN374 with specific activity training) [effectiveness dermal: 95%]	External tool (easyTRA)

2.4.2. Exposure and risks for workers

The exposure concentrations and risk characterisation ratios (RCR) are reported in the following table.

Table 10. Exposure concentrations and risks for workers

Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation**
Inhalation, systemic, long-term	**5.5E-7 mg/m³** (external tool (easyTRA))	RCR < 0.01
Inhalation, local, long-term		Qualitative (see below)
Inhalation, local, acute		Qualitative (see below)

FMC Agricultural Solutions A/S
Thyborønvej 78
DK-7673 Harboøre
Denmark
+45 9690 9690
www.fmc.com
CVR No. DK 12 76 00 43

Route of exposure and type of effects	**Exposure concentration**	**Risk characterisation**
Dermal, systemic, long-term	**1.71E-6 mg/kg bw/day** (external tool (easyTRA))	RCR < 0.01
Dermal, local, long-term		Qualitative (see below)
Dermal, local, acute		Qualitative (see below)
Eye, local		Qualitative (see below)
Combined routes, systemic, long-term		RCR < 0.01

Conclusion on risk characterisation

The available data material suggests that the dominating local effect upon exposure to the substance, both long- and short term, will be corrosion.

Dermal corrosion is prevented by workers wearing gloves at all times when working with the substance.

Eye corrosion is prevented by workers wearing a face mask/googles/safety glasses at all times when working with the substance.

Inhalative corrosion is prevented by working under effective local area ventilation systems. The solid substance has a low vapour pressure (below 10 Pa). Furthermore the substance is a salt and additionally it is produced in an aqueous solution. Hence it exists as ions in the solution which further lowers any inhalative exposure below a level, which could give local inhalative corrosion.

The risk management measures mentioned above (gloves, eye protection and LEV) effectively eliminates local effects. Therefore any long- or short-term risks for local effects upon exposure of the substance are controlled.