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CVR No. DK 12 76 00 43

SAFETY DATA SHEET

ACEPHATE TECHNICAL

Revision: Sections containing a revision or new information are marked with a ♣.

♣ SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. **Product identifier** ..... **Acephate Technical**
CAS no. 30560-19-1

1.2. **Relevant identified uses of the substance or mixture and uses advised against** ..... Can be used as active ingredient in insecticides only.

1.3. **Details of the supplier of the safety data sheet**

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Thyborønvej 78
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SDS.Ronland@fmc.com

1.4. **Emergency telephone number**
Company ..... +45 97 83 53 53 (24 h; for emergencies only)

Medical emergencies:
Austria: +43 1 406 43 43
Belgium: +32 70 245 245
Bulgaria: +359 2 9154 409
Cyprus: 1401
Czech Republic: +420 224 919 293
+420 224 915 402
Denmark: +45 82 12 12 12
England and Wales: 111
Estonia: +372 7943500
France: +33 (0) 1 45 42 59 59
Finland: +358 9 471 977
Greece: 30 210 77 93 777
Hungary: +36 80 20 11 99
Ireland (Republic): +353 1 837 9964
Italy: +39 02 6610 1029
Latvia: +371 670 42 473
112
Lithuania: +370 523 62052
+370 687 53378
Luxembourg: +352 8002 5500
Netherlands: +31 30 274 88 88
Norway: +47 22 591300
Poland: +48 22 619 66 54
+48 22 619 08 97
Portugal: 800 250 250 (in Portugal only)
+351 21 330 3284
Romania: +40 21318 3606
Scotland: +8454 24 24 24
Slovakia: +421 2 54 77 4 166
Slovenia: +386 41 650 500
South Africa: +27 83 123 3911 (Bateleur Emergency Response Co.)
Spain: +34 91 562 04 20
Sweden: +46 08-331231
112
Switzerland: 145
Turkey: 114
U.S.A. & Canada: +1 800 / 331 3148
All other countries: +1 651 / 632 6793 (Collect)

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♣ SECTION 2: HAZARDS IDENTIFICATION

2.1. **Classification of the substance or mixture**

* = Harmonised classification
Acute oral toxicity: Category 4 (H302) *
Hazards to the aquatic environment, chronic: Category 1 (H410)

WHO classification ..... Class II: Moderately hazardous

Health hazards ..... Acephate is harmful (cholinesterase inhibitor). It enters the body on contact with all skin surfaces and eyes.

Repeated exposures to cholinesterase inhibitors such as acephate may, without warning, cause increased susceptibility to doses of any cholinesterase inhibitor.

Environmental hazards ..... The substance is toxic to aquatic organisms.

2.2. **Label elements**

According to EU Reg. 1272/2008 as amended

Product identifier ..... Acephate Technical
CAS no. 30560-19-1

Hazard pictograms (GHS07, GHS09)

Signal word ..... Warning

Hazard statements
H302 ..... Harmful if swallowed.
H410 ..... Very toxic to aquatic life with long lasting effects.

Supplementary hazard statement
EUH401 ..... To avoid risks to human health and the environment, comply with the instructions of use.

Precautionary statements
P264 ..... Wash hands thoroughly after handling.
P270 ..... Do not eat, drink or smoke when using this product.
P273 ..... Avoid release to the environment.
P301+P312 ..... IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell.
P330 ..... Rinse mouth
P501 ..... Dispose of contents and container as hazardous waste.

2.3. **Other hazards** ..... The substance does not meet the criteria for being PBT or vPvB.

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♣ SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. **Substances**

Acephate

CAS name	Phosphoroamidothioic acid, acetyl-, O,S-dimethyl ester
CAS no.	30560-19-1
IUPAC name	O,S-Dimethyl acetylphosphoramidothioate
ISO name/EU name	Acephate
EC no. (EINECS no.)	250-241-2
EU index no.	015-079-00-7
Molecular weight	183.17

3.2. **Mixtures** ..... The product is a substance, not a mixture.

♣ SECTION 4: FIRST AID MEASURES

4.1. **Description of first aid measures**

Inhalation ..... If experiencing any discomfort, immediately remove from exposure. Light cases: Keep person under surveillance. Get medical attention immediately if symptoms develop. Serious cases: Get medical attention immediately or call for an ambulance.

Skin contact ..... Immediately remove contaminated clothing and footwear. Flush skin with water. Wash with water and soap. See physician immediately if any symptom develops.

Eye contact ..... Immediately rinse eyes with much water or eyewash solution, occasionally opening eyelids, until no evidence of chemical remains. Remove contact lenses after a few minutes and rinse again. Obtain medical advice. See physician immediately if any discomfort develops.

Ingestion ..... Let the exposed person rinse mouth with water and let him/her drink several glasses of water or milk, but not induce vomiting. If vomiting does occur, let him/her rinse mouth and drink fluids again. Never give anything by mouth to an unconscious person. Get medical attention immediately.

4.2. **Most important symptoms and effects, both acute and delayed** — Symptoms of cholinesterase inhibition: nausea, headache, vomiting, cramps, weakness, blurred vision, pin-point pupils, tightness in chest, laboured breathing, nervousness, sweating, watering of eyes, drooling or frothing of mouth and nose, muscle spasms and coma.

4.3. **Indication of any immediate medical attention and special treatment needed** — Get medical attention immediately if symptoms of cholinesterase inhibition (see above) develop. Explain that the victim has been exposed to **acephate**, an organophosphorus insecticide, and describe his/her condition and the extent of exposure.

In an industrial setting, the antidote atropine sulphate should be available at the workplace.

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It may be helpful to show this safety data sheet to physician.

Notes to physician ..... **Acephate** is a cholinesterase inhibitor affecting the central and peripheral nervous systems producing respiratory depression.

Cholinesterase inhibition – treatment

Much information on (acetyl)cholinesterase inhibition by organophosphate insecticides and its treatment can be found on the internet.

Decontamination procedures such as whole body washing, gastric lavage and administration of activated charcoal are often required.

Antidote: If symptoms (see subsection 4.2.) are present, administer atropine sulphate, which often is a lifesaving antidote, in large doses, TWO to FOUR mg intravenously or intramuscularly as soon as possible. Repeat at 5 to 10 minute intervals until signs of atropinisation appear and maintain full atropinisation until all organophosphate is metabolised.

Obidoxime chloride (Toxogonin), alternatively pralidoxime chloride (2-PAM), may be administered as an adjunct to, but not a substitute for atropine sulphate. Treatment with oxime should be maintained as long as atropine sulphate is administered.

At first sign of pulmonary oedema the patient should be given supplementary oxygen and treated symptomatically.

Relapse can occur after initial improvement.
VERY CLOSE SUPERVISION OF THE PATIENT IS INDICATED FOR AT LEAST 48 HOURS, DEPENDING ON THE SEVERITY OF POISONING.

♣ SECTION 5: FIRE-FIGHTING MEASURES

5.1. **Extinguishing media** ..... Dry chemical or carbon dioxide for small fires, water spray or foam for large fires. Avoid heavy hose streams.

5.2. **Special hazards arising from the substance or mixture** The essential breakdown products are volatile, malodorous, toxic, irritant and inflammable compounds such as hydrogen sulphide, dimethyl sulphide, methyl mercaptan, sulphur dioxide, carbon monoxide, carbon dioxide, nitrogen oxides and phosphorus pentoxide.

5.3. **Advice for firefighters** ..... Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapours and toxic decomposition products. Fight fire from protected location or maximum possible distance. Dike area to prevent water runoff. Firemen should wear self-contained breathing apparatus and protective clothing.

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♣ SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. **Personal precautions, protective equipment and emergency procedures**

It is recommended to have a predetermined plan for the handling of spills. Empty, sealable vessels for the collection of spills should be available.

In case of large spill (involving 10 tonnes of the product or more):
1. use personal protection equipment; see section 8
2. call emergency telephone no.; see section 1
3. alert authorities.

Observe all safety precautions when cleaning up spills. Use personal protection equipment. Depending on the magnitude of the spill this may mean wearing respirator, face mask or eye protection, chemical resistant clothing, gloves and boots.

Stop the source of the spill immediately if safe to do so. Keep unprotected persons away from the spill area. Remove sources of ignition. Avoid and reduce formation of airborne dust as much as possible.

6.2. **Environmental precautions** .....

Contain the spill to prevent any further contamination of surface, soil or water. Wash waters must be prevented from entering surface water drains. Uncontrolled discharge into water courses must be alerted to the appropriate regulatory body.

6.3. **Methods and materials for containment and cleaning up**

It is recommended to consider possibilities to prevent damaging effects of spills, such as bunding or capping. See GHS (Annex 4, Section 6).

Use non-sparking tools and equipment. If appropriate, surface water drains should be covered. Minor spills on the floor or other impervious surface should immediately be swept up or preferably vacuumed up using equipment with high efficiency final filter. Transfer to suitable containers. Clean area with soda lye and much water. Absorb wash liquid onto absorbent material such as hydrated lime, universal binder, Fuller's earth, bentonite or other absorbent clay and transfer contaminated absorbent to suitable containers. The used containers should be properly closed and labelled.

Large spills which soak into the ground should be dug up and transferred to suitable containers.

Spills in water should be contained as much as possible by isolation of the contaminated water. The contaminated water must be collected and removed for treatment or disposal.

6.4. **Reference to other sections** .....

See subsection 8.2. for personal protection.
See section 13 for disposal.

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♣ SECTION 7: HANDLING AND STORAGE

7.1. **Precautions for safe handling** ....

Like most organic powders, the substance can form explosive mixtures with air. Avoid dust formation and take precautionary measures against static discharge. Use explosion protected equipment. Keep away from sources of ignition and protect from exposure to fire and heat.

In an industrial environment, it is recommended to avoid all personal contact with the product, if possible by using closed systems with remote system control. The material should be handled by mechanical means as much as possible. Adequate ventilation or local exhaust ventilation is required. The exhaust gases should be filtered or treated otherwise. For personal protection in this situation, see section 8.

For its use as a pesticide, first look for precautions and personal protection measures on the officially approved label on the packaging or for other official guidance or policy in force. If these are lacking, see section 8.

Remove contaminated clothing immediately. Wash thoroughly after handling. Before removing gloves, wash them with water and soap. After work, take off all work clothes and footwear. Take a shower, using water and soap. Wear only clean clothes when leaving job. Wash protective clothing and protective equipment with water and soap after each use.

Do not discharge to the environment. Do not contaminate water when disposing of equipment wash waters. Collect all waste material and remains from cleaning equipment, etc., and dispose of as hazardous waste. See section 13 for disposal.

7.2. **Conditions for safe storage, including any incompatibilities**

The product is stable when stored in coated, unopened drums. Protect from moisture and temperatures over 30°C.

Store in closed, labelled containers. The storage room should be constructed of incombustible material, closed, dry, ventilated and with impermeable floor, without access of unauthorised persons or children. A warning sign reading “POISON” is recommended. The room should only be used for storage of chemicals. Food, drink, feed and seed should not be present. A hand wash station should be available.

7.3. **Specific end use(s)** .....

The product is an active ingredient for the production of registered pesticides which may only be used for the applications they are registered for.

♣ SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. **Control parameters**

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Personal exposure limits

		Year	
Acephate	ACGIH (USA) TLV	2015	Not established; BEI
	OSHA (USA) PEL	2015	Not established
	EU, 2000/39/EC as amended	2017	Not established
	Germany, MAK	2014	Not established; BAT
	HSE (UK) WEL	2011	Not established

However, other personal exposure limits defined by local regulations may exist and must be observed.

Monitoring methods ..... Persons working with this product for a longer period should have frequent blood tests of their cholinesterase levels. If the cholinesterase level falls below a critical point, no further exposure should be allowed until it has been determined by means of blood tests that the cholinesterase level has returned to normal.

DNEL, PNEC ..... Chemical safety report is not available.

8.2. **Exposure controls** ..... When used in a closed system, personal protection equipment will not be required. The following is meant for other situations, when the use of a closed system is not possible, or when it is necessary to open the system. Consider the need to render equipment or piping systems non-hazardous before opening.

Respiratory protection — In the event of an accidental discharge of the material which produces a heavy vapour or dust, workers must put on officially approved respiratory protection equipment with a universal filter type including particle filter.

Protective gloves ..... Wear chemical resistant gloves, such as barrier laminate, butyl rubber or nitrile rubber. The breakthrough times of these materials for the product are unknown. Generally, however, the use of protective gloves will give only partial protection against dermal exposure. Small tears in the gloves and cross-contamination can easily occur. It is recommended to shift the gloves frequently and to limit the work to be done manually. Wash hands with water and soap immediately after work is finished.

Eye protection ..... Wear safety glasses. It is recommended to have an eye wash fountain immediately available in the workplace when there is a potential for eye contact.

Other skin protection — Wear appropriate chemical resistant clothing to prevent skin contact depending on the extent of exposure. During most normal work situations where exposure to the material cannot be avoided for a limited time span, waterproof pants and apron of chemical resistant material or coveralls of polyethylene (PE) will be sufficient. Coveralls of PE must be discarded after use if contaminated. In cases of

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excessive or prolonged exposure, coveralls of barrier laminate may be required.

♣ SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. **Information on physical and chemical properties**

Appearance	White to light grey solid (powder)
Odour	Cabbage-like odour
Odour threshold	Not determined
pH	1% solution in water: 4.21 at 25°C
Melting point/freezing point	83 - 90°C
Initial boiling point and boiling range	Decomposes
Flash point	> 61°C
Evaporation rate	Not determined
Flammability (solid/gas)	Not highly flammable
Upper/lower flammability or explosive limits	Not determined
Vapour pressure	0.83 mPa at 25°C
Vapour density	Not determined
Relative density	Not determined
	Density: 1.39 g/cm^3 at 20°C
Solubility(ies)	Soluble in polar organic solvents such as acetone, ethanol, etc. Solubility of acephate in water: 803 g/l at pH 7
Partition coefficient n-octanol/water	Log K_{ow} = -0.8
Autoignition temperature	Not available
Decomposition temperature	Not available
Viscosity	Not determined
Explosive properties	Not explosive
Oxidising properties	Not oxidising

9.2. **Other information** ..... No more relevant information is available.

♣ SECTION 10: STABILITY AND REACTIVITY

10.1. **Reactivity** ..... To our knowledge, the product has no special reactivities.

10.2. **Chemical stability** ..... Considering the available thermodynamic data, it can be concluded with reasonable certainty that the product is not capable of exothermic reactions.

10.3. **Possibility of hazardous reactions** None known.

10.4. **Conditions to avoid** ..... Heating of the product will produce harmful and irritant vapours.

10.5. **Incompatible materials** ..... Strong alkalis. The product can corrode metals (but does not meet the criteria for classification).

10.6. **Hazardous decomposition products** See subsection 5.2.

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♣ SECTION 11: TOXICOLOGICAL INFORMATION

11.1. **Information on toxicological effects** * = Based on available data, the classification criteria are not met.

Acephate

Acute toxicity ..... The substance is harmful by ingestion. It is considered as less harmful by skin contact and inhalation. The acute toxicity is measured as:

Route(s) of entry - ingestion LD_{50}, oral, rat: 700 mg/kg

- skin LD_{50}, dermal, rat: > 2000 mg/kg *

- inhalation LC_{50}, inhalation, rat: > 61.7 mg/l/4 h *

Skin corrosion/irritation ..... Slightly irritating to skin. *

Serious eye damage/irritation ..... Slightly irritating to eyes. *

Respiratory or skin sensitisation ... Not an allergic sensitizer. *

Germ cell mutagenicity ..... Not mutagenic in in vivo experiments. *

Carcinogenicity ..... US-EPA has classified acephate as a Group C, possible human carcinogen. However, this was concluded to be of no serious concern, based on occurrence of tumours only at toxic doses.

Reproductive toxicity ..... No significant effects on fertility and no significant teratogenic (birth defects causing) effects are found. *

STOT – single exposure ..... To our knowledge, no specific effects after single exposure to acephate have been observed. *

STOT – repeated exposure ..... Target organ: nervous system (cholinesterase inhibition)
LOAEL: 0.15 mg/kg bw/day in a 90-day dietary rat study. At this exposure level, minor cholinesterase inhibition was found, which generally does not result in observable effects or discomfort.

Aspiration hazard ..... The product does not present an aspiration pneumonia hazard. *

Symptoms and effects, acute and delayed: Symptoms of cholinesterase inhibition: nausea, headache, vomiting, cramps, weakness, blurred vision, pin-point pupils, tightness in chest, laboured breathing, nervousness, sweating, watering of eyes, drooling or frothing of mouth and nose, muscle spasms and coma.

♣ SECTION 12: ECOLOGICAL INFORMATION

12.1. **Toxicity** ..... The product is toxic to insects and harmful to aquatic invertebrates and birds. It is considered as less harmful to fish, soil micro- and macroorganisms and aquatic plants. The measured ecotoxicity is:

- Fish Zebrafish (*Brachiodanio rerio*) ..... 96-h LC_{50}: > 120 mg/l
7-day NOEC: > 100 mg/l

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- Invertebrates	Daphnids (*Daphnia similis*)	48-h EC_{50}: 214.7 mg/l
	(*Ceriodaphnia dubia*)	7-day NOEC: < 0.004 mg/l
- Algae	Green algae (*Selenastrum capricornutum*)	96-h IC_{50}: ≥ 200 mg/l
- Birds	Japanese quail (*Coturnix coturnix japonica*)	LD_{50}: 170 mg/kg
- Earthworms	*Eisenia foetida foetida*	14-day LC_{50}: > 10000 mg/kg soil
- Bees	Honeybee (*Apis mellifera*)	LD_{50}, contact: 0.19 µg/bee

12.2. **Persistence and degradability** .... Acephate is biodegradable, but it does not meet the criteria for being readily biodegradable. It undergoes degradation in the environment and in waste water treatment plants. No adverse effects are found at concentrations up to 100 mg/l in waste water treatment plants. Degradation occurs both aerobically and anaerobically, biologically as well as abiologically.

Primary degradation half-lives for acephate vary with circumstances, but are usually around 1 to 3 months in aerobic soil and water.

12.3. **Bioaccumulative potential** ..... See section 9 for octanol-water partition coefficient.

Acephate is not expected to bioaccumulate.

12.4. **Mobility in soil** ..... Acephate has low mobility in soil. It absorbs strongly to soil.

12.5. **Results of PBT and vPvB assessment** ..... The substance does not meet the criteria for being PBT or vPvB.

12.6. **Other adverse effects** ..... Other relevant hazardous effects in the environment are not known.

♣ SECTION 13: DISPOSAL CONSIDERATIONS

13.1. **Waste treatment methods** ..... Remaining quantities of the material and empty but unclean packaging should be regarded as hazardous waste.

Disposal of waste and packagings must always be in accordance with all applicable local regulations.

Disposal of 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.

Disposal of packaging ..... It is recommended to consider possible ways of disposal in the following order:

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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

ADR/RID/IMDG/IATA/ICAO classification

14.1.	**UN number**	3077
14.2.	**UN proper shipping name**	Environmentally hazardous substance, solid, n.o.s. (acephate)
14.3.	**Transport hazard class(es)**	9
14.4.	**Packing group**	III
14.5.	**Environmental hazards**	Marine pollutant
14.6.	**Special precautions for user**	Avoid any unnecessary contact with the product. Misuse can result in result in damage to health. Do not discharge to the environment.
14.7.	**Transport in bulk according to Annex II of MARPOL and the IBC code**	The product is not transported in bulk by ship.

♣ SECTION 15: REGULATORY INFORMATION

15.1.	**Safety, health and environmental regulations/legislation specific for the substance or mixture**	Seveso category (Dir. 2012/18/EU): dangerous for the environment
15.2.	**Chemical safety assessment**	A chemical safety assessment is not required to be included for this product.

♣ SECTION 16: OTHER INFORMATION

Relevant changes in the safety data sheet		Numerous changes have been made to adapt the format of the safety data sheet, but these do not involve new information on hazardous properties.
List of abbreviations	ACGIH	American Conference of Governmental Industrial Hygienists

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AOEL	Acceptable Operator Exposure Level
BAT	Biologische Arbeitsstoff-Toleranzwert
BEI	Biological Exposure Index
CAS	Chemical Abstracts Service
Dir.	Directive
DNEL	Derived No Effect Level
EC	European Community
EC_{50}	50% Effect Concentration
EFSA	European Food Safety Authority
EINECS	European INventory of Existing Commercial Chemical Substances
GHS	Globally Harmonized classification and labelling System of chemicals, Fifth revised edition 2013
HSE	Health & Safety Executive, UK
IBC	International Bulk Chemical code
IC_{50}	50% Inhibition Concentration
ISO	International Organisation for Standardization
IUPAC	International Union of Pure and Applied Chemistry
LC_{50}	50% Lethal Concentration
LD_{50}	50% Lethal Dose
LOAEL	Lowest Observed Adverse Effect Level
MAK	Maximale Arbeitspaltz-Konzentration
MARPOL	Set of rules from the International Maritime Organisation (IMO) for prevention of sea pollution
NOEC	No Observed Effect Concentration
n.o.s.	Not otherwise specified
OSHA	Occupational Safety and Health Administration
PBT	Persistent, Bioaccumulative, Toxic
PEL	Personal Exposure Limit
PNEC	Predicted No Effect Concentration
Reg.	Regulation
STOT	Specific Target Organ Toxicity
TLV	Threshold Limit Value
US-EPA	Environmental Protection Agency, USA
vPvB	very Persistent, very Bioaccumulative
WEL	Workplace Exposure Limit
WHO	World Health Organisation

References ..... Data are available from published literature and can be found several places.

Method for classification ..... Acute oral toxicity: harmonised classification
Hazards to the aquatic environment: test data

Used hazard statements .....

H302	Harmful if swallowed.
H410	Very toxic to aquatic life with long lasting effects.
EUH401	To avoid risks to human health and the environment, comply with the instructions of use.

Advice on training ..... This material should only be used by persons who are made aware of

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its hazardous properties and have been instructed in the required safety precautions.

The information provided in this safety data sheet is believed to be accurate and reliable, but uses of the product vary and situations unforeseen by FMC Corporation may exist. The user has to check the validity of the information under local circumstances.

Prepared by: FMC Agricultural Solutions A/S / GHB