

SAFETY DATA SHEET Thiourea

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1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Product identifier:

Product form: Substance
Product name: THIOUREA

Chemical name: Thiourea; thiocarbamide

 EC number:
 200-543-5

 CAS number:
 62-56-6

 Formula:
 CH4N2S

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

Relevant identified uses:

Main use category:

Use of the substance/mixture: Ore leaching, Polymer production, Chemical intermediate

Use of the substance/mixture: Chemical intermediate

Company name: Nexchem Ltd

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2. HAZARDS IDENTIFICATION

Classification of the substance or mixture:

Classification according to Regulation (EC) No. 1272/2008 [CLP]:

Carcinogenicity, Category 2 - H351

Reproductive toxicity, Category 2 - H361d

Acute toxicity (oral), Category 4 - H302

Hazardous to the aquatic environment - Chronic Hazard, Category 2 - H411

Full text of H- and EUH-statements: See section 16.

Adverse physicochemical, human health and environmental effects:

Suspected of causing cancer.

Suspected of damaging fertility or the unborn child.

Harmful if swallowed.

Toxic to aquatic life with long lasting effects.

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Label elements:

Labelling according to Regulation (EC) No. 1272/2008 [CLP]:

Hazard pictograms (CLP):



Signal word: Warning

Hazard statements (CLP): H302 Harmful if swallowed.

H351 Suspected of causing cancer.

H361d Suspected of damaging the unborn child.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements (CLP): P101 - If medical advice is needed, have product container or label at hand.

P102 - Keep out of reach of children.

P202 - Do not handle until all safety precautions have been read and understood.

P280 - Wear protective gloves, protective clothing, eye protection, face protection.

P264 - Wash hands thoroughly after handling.

P270 - Do not eat, drink or smoke when using this product.

P273 - Avoid release to the environment.

P330 - Rinse mouth.

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

P301+P312 - IF SWALLOWED: Call a POISON CENTRE or doctor if you feel unwell.

P391 - Collect spillage.

P405 - Store locked up.

P501 - Dispose of contents/container to hazardous or special waste collection point, in

accordance with local, regional, national and/or international regulation.

Other hazards:

Other hazards which do not result in classification: The substance is not included in the list established in accordance with

Article 59(1) of REACH for having endocrine disrupting properties or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII Not classified as PBT or vPvB. This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII Not classified as PBT or vPvB.

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3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances:

Substance type: Mono-constituent

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
thiourea; thiocarbamide	CAS-No.: 62-56-6	99 – 100	Carc. 2, H351
	EC-No.: 200-543-5		Repr. 2, H361d
	EC Index-No.: 612-082-00-0		Acute Tox. 4 (Oral), H302 (ATE=2000 mg/kg
			bodyweight)
			Aquatic Chronic 2, H411

Full text of H- and EUH-statements: See section 16.

Mixtures: Not applicable.

4. FIRST AID MEASURES

Description of first aid measures:

First-aid measures general: Observe (own) safety. If possible, approach victim and check vital functions. In case of injury

and/or intoxication, call the European emergency number 112. Treat symptoms starting with most life-threatening injuries and disorders. Keep victim under observation, possibility of

delayed symptoms.

First-aid measures after inhalation: Remove victim into fresh air. In case of respiratory problems, consult a doctor/medical

service.

First-aid measures after skin contact: If possible, wipe up/dry remove chemical. Then rinse/shower immediately with (lukewarm)

water. If irritation persists, consult a doctor/medical service.

First-aid measures after eye contact: Rinse immediately with (lukewarm) water. Remove contact lenses, if present and easy to

do. Continue rinsing. If irritation persists, consult a doctor/medical service.

First-aid measures after ingestion: Rinse mouth with water. Immediately consult a doctor/medical service. Do not wait for

symptoms to occur to consult Poison Centre.

Most important symptoms and effects, both acute and delayed:

Symptoms/effects: Suspected of causing cancer. Suspected of damaging fertility or the unborn child.

Symptoms/effects after inhalation: AFTER INHALATION OF DUST: Dry/sore throat. Coughing.

Symptoms/effects after skin contact: Red skin. Itching.

Symptoms/effects after eye contact: Redness of the eye tissue.

Symptoms/effects after ingestion: Gastrointestinal complaints. AFTER INGESTION OF HIGH QUANTITIES: Body temperature

rise. Red skin.

Chronic symptoms: Skin rash/inflammation. Photoallergy. Affection of the bone marrow. Change in the

haemogramme/blood composition. Thyroid enlargement/affection.

Indication of any immediate medical attention and special treatment needed:

Treat symptomatically.

Symptoms may be delayed.

Keep under medical supervision for at least 48 hours.

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5. FIRE-FIGHTING MEASURES

Extinguishing media:

Suitable extinguishing media: Quick-acting ABC powder extinguisher. Class A foam extinguisher. Water (quick-acting

extinguisher, reel). Water. Class A foam.

Unsuitable extinguishing media: Quick-acting BC powder extinguisher. Quick-acting CO2 extinguisher.

Special hazards arising from the substance or mixture:

Fire hazard: DIRECT FIRE HAZARD: Not classified as flammable. In finely divided state: increased fire

hazard. INDIRECT FIRE HAZARD: Heating increases the fire hazard.

Explosion hazard: DIRECT EXPLOSION HAZARD: May form explosible dust-air mixture if dispersed. INDIRECT

EXPLOSION HAZARD: Dust cloud can be ignited by a spark.

Hazardous decomposition products in case of fire: On heating/burning: Release of toxic and corrosive gases/vapours (nitrous

vapours, sulphur oxides, carbon monoxide - carbon dioxide).

Advice for firefighters:

Precautionary measures fire: Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to

fire/heat: have neighbourhood close doors and windows.

Firefighting instructions: Dilute toxic gases with water spray. Take account of toxic/corrosive precipitation water. Take

account of environmentally hazardous firefighting water. Use water moderately and if possible,

collect or contain it.

Protection during firefighting: Heat/fire exposure: self-contained breathing apparatus (EN 136 + EN 137).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

General measures: Wear protective clothing as described in Section 8 of this safety data sheet. Avoid any direct

contact with the product.

For non-emergency personnel:

Protective equipment: Gloves (EN 374). Safety glasses (EN 166). Protective clothing (EN 14605 or EN 13034).

Dust cloud production: self-contained breathing apparatus (EN 136 + EN 137).

Emergency procedures: Mark the danger area. Prevent dust cloud formation. No naked flames. Wash contaminated

clothes.

Measures in case of dust release: In case of dust production: keep upwind. Dust production: have neighbourhood close doors

and windows.

For emergency responders:

Protective equipment: Do not attempt to take action without suitable protective equipment. For further information

refer to section 8. "Exposure controls/personal protection".

Environmental precautions: Prevent soil and water pollution. Prevent spreading in sewers.

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Methods and material for containment and cleaning up:

For containment: Contain released product, collect/pump into suitable containers. Plug the leak, cut off the

supply. Dam up the solid spill. Knock down/dilute dust cloud with water spray. Powdered form:

no compressed air for pumping over spills.

Methods for cleaning up: Stop dust cloud by covering with sand/earth. Scoop solid spill into closing containers. Carefully

collect the spill/leftovers. Powdered: do not use compressed air for pumping over spills. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent

authority. Wash clothing and equipment after handling.

Other information: Dispose of materials or solid residues at an authorised site.

Reference to other sections: See Section 7 for information on safe handling. See Section 8 for information on personal

protection equipment. Refer to section 11. Refer to section 12. For further information refer to

section 13.

7. HANDLING AND STORAGE

Precautions for safe handling:

Additional hazards when processed: Substance registered as transported isolated intermediate according to REACH article

18(4). Strictly controlled conditions to be applied.

Precautions for safe handling: Avoid raising dust. Keep away from naked flames/heat. In finely divided state: use spark-

/explosionproof appliances. Finely divided: keep away from ignition sources/sparks. Carry operations in the open/under local exhaust/ventilation or with respiratory protection. Comply with the legal requirements. Clean contaminated clothing. Keep container tightly closed. Do not

discharge the waste into the drain. Powdered form: no compressed air for pumping over.

Hygiene measures: Observe strict hygiene.

Conditions for safe storage, including any incompatibilities:

Technical measures: Provide local exhaust or general room ventilation.

Storage conditions: Store locked up. Keep only in the original container in a cool, well-ventilated place. Keep

away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Take precautionary measures against static discharge.

Incompatible products: Refer to Section 10 on Incompatible Materials.

Heat and ignition sources: KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.

Information on mixed storage: KEEP SUBSTANCE AWAY FROM: oxidizing agents. (strong) acids. (strong) bases.

Storage area: Meet the legal requirements. Store in a dry area.

Special rules on packaging: SPECIAL REQUIREMENTS: closing, correctly labelled, meet the legal requirements.

Secure fragile packaging in solid containers.

Packaging materials: SUITABLE MATERIAL: cardboard. plastics.

Specific end use(s): The identified uses for this product are detailed in Section 1.2.

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters:

National occupational exposure and biological limit values: No additional information available

Recommended monitoring procedures: No additional information available

Air contaminants formed: No additional information available

thiourea; thiocarbamide (62-56-6)

DNEL and PNEC:

DNEL/DMEL (Workers):

Long-term - systemic effects, dermal	3.4 mg/kg bw/day
Long-term - systemic effects, inhalation	1 mg/m ³

DNEL/DMEL (General population):

Long-term - systemic effects, oral	0.1 mg/kg bw/day
Long-term - systemic effects, inhalation	0.2 mg/m ³
Long-term - systemic effects, dermal	1.7 mg/kg bw/day

PNEC (Water):

PNEC aqua (freshwater)	0.01 mg/l
PNEC aqua (marine water)	0.001 mg/l
PNEC aqua (intermittent, freshwater)	0.038 mg/l

PNEC (Sediment):

PNEC sediment (freshwater)	0.072 mg/kg dwt
PNEC sediment (marine water)	0.007 mg/kg dwt

PNEC (Soil):

PNEC (soil)	2.725 mg/kg dwt

PNEC (STP):

PNEC sewage treatment plant	0.38 mg/l

Control banding: No additional information available.

Exposure controls:

Appropriate engineering controls: Ensure good ventilation of the workstation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Personal protective equipment: Wear foot protection. Dust production: dust mask with filter type P2.

Personal protective equipment symbol(s):











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Eye and face protection:

Eye protection: Safety glasses (EN 166). In case of dust production: protective goggles (EN 166)

Skin protection:

Skin and body protection: Protective clothing (EN 14605 or EN 13034)

Hand protection: Protective gloves against chemicals (EN 374)

Other skin protection:

Materials for protective clothing: Excellent resistance: neoprene (chloroprene rubber). Nitrile rubber

Respiratory protection: Dust production: dust mask with filter type P2

Thermal hazards: No additional information available.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they

comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to

reduce emissions to acceptable levels.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties:

Physical state: Solid

Appearance: Crystalline solid. Powder

Molecular mass: 76.12 g/mol
Colour: White

Colour: White

Odour: Almost odourless

Odour threshold:

No data available

PH:

No data available

Relative evaporation rate (butylacetate=1): No data available

Melting point: 178°C (EU Method A.1: Melting/freezing point)

Freezing point: Not applicable

Boiling point: Not applicable (decomposes)

Flash point: 440°C

Auto-ignition temperature: > 240°C (T3) **Decomposition temperature:** > 135°C

Flammability (solid, gas): Non-flammable

Vapour pressure: < 0.01 hPa (20°C)

Relative vapour density at 20°C: Not applicable (solid)

Relative density: 1.4 (25°C)

Density: 1405 kg/m³ (25°C)

Solubility: Moderately soluble in water. Substance sinks in water. Soluble in ethanol. Soluble in acetone.

Water: 14 g/100ml (25°C)

Partition coefficient n-octanol/water (Log Pow): -0.92 (Experimental value, OECD 107: Partition Coefficient (n-octanol/water):

Shake Flask Method, 20°C)

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Viscosity, kinematic:
Not applicable (solid)
Viscosity, dynamic:
Not applicable (solid)
Explosive properties:
No data available
Oxidising properties:
No data available

Explosive limits: Not applicable $\geq 250 \text{ g/m}^3$

Lower explosive limit (LEL): 250 g/m³

Particle size: 482.96 µm (D50, ISO 13320:2009: Particle size analysis - Laser diffraction methods)

Other information:

VOC content: 0%

Other properties: Neutral reaction

10. STABILITY AND REACTIVITY

Reactivity: Reacts violently with (strong) oxidisers and with (some) acids.

Chemical stability: Stable under normal conditions.

Possibility of hazardous reactions: Dust explosion hazard in air.

Conditions to avoid: None under recommended storage and handling conditions (see section 7).

Take precautionary measures against static discharges.

Incompatible materials: Store away from oxidising agents. peroxides. Acids. Bases.

Hazardous decomposition products: Reacts on exposure to temperature rise with (strong) oxidisers: release of (highly) toxic

gases/vapours e.g.: Sulphur Dioxide.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects:

Acute toxicity (oral): Harmful if swallowed

Acute toxicity (dermal): Not classified
Acute toxicity (inhalation): Not classified

Thiourea; thiocarbamide (62-56-6):

LD50 oral rat: 2000 – 2500 mg/kg bodyweight (OECD 423: Acute Oral Toxicity – Acute Toxic Class Method,

Rat, Female, Experimental value, Oral, 14 day(s))

LD50 dermal rat: >6810 mg/kg

LD50 dermal rabbit: >2800 mg/kg (Equivalent or similar to OECD 402, 24 h, Rabbit, Male / female, Experimental

value, Dermal)

LC50 inhalation rat: >0.195 mg/l air (Equivalent or similar to OECD 403, 4 h, Rat, Male / female, Experimental

value, Inhalation (aerosol))

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Skin corrosion/irritation: Not classified. pH: No data available in the literature
Serious eye damage/irritation: Not classified. pH: No data available in the literature

Respiratory or skin sensitisation: Not classified Germ cell mutagenicity: Not classified

Carcinogenicity: Suspected of causing cancer

Thiourea; thiocarbamide (62-56-6):

IARC group: 3 - Not classifiable

Reproductive toxicity: Suspected of damaging the unborn child

NOAEL (animal/male, F0/P): 35 mg/kg bodyweight Animal: rat, Animal sex: male

STOT-single exposure: Not classified STOT-repeated exposure: Not classified

LOAEL (oral, rat, 90 days): 30 mg/kg bodyweight Animal: rat, Guideline: OECD Guideline 407 (Repeated Dose 28-Day

Oral Toxicity Study in Rodents)

Aspiration hazard: Not classified

Viscosity, kinematic: Not applicable (solid)

Potential adverse human health effects and symptoms: Photosensitizing, Harmful if swallowed, Not irritant to skin, Practically

non-toxic in contact with skin (LD50 skin > 2000 mg/kg), Not irritant to eyes, Caution!

Substance is absorbed through the skin.

12. ECOLOGICAL INFORMATION

Toxicity:

Ecology – general: Dangerous for the environment.

Ecology – air: Not included in the list of substances which may contribute to the greenhouse effect (IPCC).

Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 517/2014).

Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).

Ecology – water: Harmful to crustacea (Daphnia). Toxic to crustacea (Daphnia) with long lasting effects.

Not harmful to fishes. Groundwater pollutant. Nitrification of activated sludge is inhibited.

Toxic to algae. Toxic to algae, with long-term consequences. Not harmful to bacteria.

Hazardous to the aquatic environment, short-term (acute): Not classified.

Hazardous to the aquatic environment, long-term (chronic): Toxic to aquatic life with long lasting effects.

Thiourea; thiocarbamide (62-56-6):

LC50 – Fish [1]	>10000 mg/l (DIN 38412: German standard methods for the examination of water, wastewater and	
	sludge, 48 h, Leuciscus idus, Static system, Fresh water, Experimental value, Lethal)	
EC50 – Crustacea [1]	35 mg/l (DIN 38412-11, 48 h, Daphnia magna, Static system, Fresh water, Experimental value,	
	Nominal concentration)	
EC50 96h – Algae [1]	3.8 – 5.4 mg/l Test organisms (species): Desmodesmus subspicatus (previous name:	
	Scenedesmus subspicatus)	
ErC50 algae	4.8 – 10 mg/l (96 h, Desmodesmus subspicatus, Static system, Fresh water, Experimental value,	
	Nominal concentration)	

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Thiourea; thiocarbamide (62-56-6):

Persistence and degradability: Not readily biodegradable in water.

Biochemical oxygen demand (BOD): 0.013 g O₂/g substance

Chemical oxygen demand (COD): $0.84 \text{ g O}_2/g$ substance ThOD: $2.42 \text{ g O}_2/g$ substance

Bioaccumulative potential:

BCF – Fish [1]: <2 (Equivalent or similar to OECD 305, 6 week(s), Cyprinus carpio, Flow-through system,

Fresh water, Experimental value)

Partition coefficient n-octanol/water (Log Pow): -0.92 (Experimental value, OECD 107: Partition Coefficient (n-octanol/water):

Shake Flask Method, 20°C)

Bioaccumulative potential: Low potential for bioaccumulation (BCF < 500)

Mobility in soil:

Ecology - soil:

Surface tension: 65.4 mN/m (20°C, 1 g/l, OECD 115: Surface Tension of Aqueous Solutions)

Organic Carbon Normalized Adsorption Coefficient (Log Koc): 1.42 – 1.56 (log Koc, Calculated value)

Highly mobile in soil

Results of PBT and vPvB assessment:

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII: Not classified as PBT or vPvB.

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII: Not classified as PBT or vPvB.

Other adverse effects: No additional information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods:

Regional waste regulation: Dispose of waste product or used containers according to local regulations.

Waste treatment methods: Dispose of contents/container in accordance with licensed collector's sorting instructions.

Sewage disposal recommendations: Do not allow product to spread into the environment.

Product/Packaging disposal recommendations: Do not discharge into drains or the environment. Dispose of at authorised

waste collection point. Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent

risks of pollution or damage to people or animals.

Additional information: Hazardous waste according to Directive 2008/98/EC, as amended by Regulation (EU) No

1357/2014 and Regulation (EU) No 2017/997.

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14. TRANSPORT INFORMATION

UN number:

UN No. (ADR/RID): 3077 UN No. (IMDG): 3077 UN No. (ICAO): 3077

UN proper shipping name:

Proper shipping name (ADR/RID): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S (THIOUREA)

Proper shipping name (IMDG): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S (THIOUREA)

Proper shipping name (ICAO): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S (THIOUREA)

Proper shipping name (ADN): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S (THIOUREA)

Transport hazard class(es):

ADR/RID class: 9

ADR/RID label: ENVIRONMENTALLY HAZARDOUS SYMBOL

IMDG class: 9
ICAO class/division: 9

Transport labels:



Packing group:

ADR/RID packing group: |||
IMDG packing group: |||
ICAO packing group: |||

Environmental hazards:

Environmentally hazardous substance/marine pollutant: Yes



Special precautions for user:

Hazard Identification Number (ADR/RID): 90 Environmentally hazardous substance; miscellaneous dangerous substances.

Transport in bulk according to Annex II of MARPOL and the IBC Code: Not applicable.

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15. REGULATORY INFORMATION

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

EU-Regulations:

Other information, restriction and prohibition regulations:

REACH Annex XVII (Restriction List): Not listed on REACH Annex XVII.

REACH Annex XIV (Authorisation List): Not listed on REACH Annex XIV (Authorisation List).

REACH Candidate List (SVHC): Not listed on the REACH Candidate List.

PIC Regulation (Prior Informed Consent): Not listed on the PIC list (Regulation EU 649/2012).

POP Regulation (Persistent Organic Pollutants): Not listed on the POP list (Regulation EU 2019/1021).

Ozone Regulation (1005/2009): Not listed on the Ozone Depletion list (Regulation EU 1005/2009).

Dual-Use Regulation (428/2009): Not listed on the COUNCIL REGULATION (EC) No 428/2009 of 5 May 2009 setting up a

Community regime for the control of exports, transfer, brokering and transit of dual-use items.

VOC Directive (2004/42):

VOC content: 0%

Explosives Precursors Regulation (2019/1148): Contains no substance(s) listed on the Explosives Precursors list (Regulation

EU 2019/1148 on the marketing and use of explosives precursors)

Drug Precursors Regulation (273/2004): Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on

the manufacture and the placing on market of certain substances used in the illicit manufacture

of narcotic drugs and psychotropic substances)

National regulations: No additional information available

Chemical safety assessment: No chemical safety assessment has been carried out.

Note: The regulatory information given above only indicates the principal regulations specifically

Applicable to the product described in the safety data sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all

applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

Legal disclaimer: The information contained in this SDS does not constitute a risk assessment, and should not

replace the user's own assessment of risks as required by other health and safety legislation.

This advice is given by Nexchem Ltd who accept no legal liability for it except otherwise provided by law. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.