



TECHNICAL DATA SHEET

according to 1907/2006/EC, Article 31

Printing date 14.05.2021

Revision: 06.02.2021

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

- **1.1 Product identifier** For Industrial, professional and consumer only
- **Trade name:** Hardener 9018
- **Article number:** 9018
- **1.2 Relevant identified uses of the substance or mixture and uses advised against** Surface Coating
- **Application of the substance / the mixture** Surface Coating
- **1.3 Details of the supplier of the safety data sheet**
- **Supplier:**
HMG PAINTS LIMITED
Riverside Works,
Collyhurst Road,
Collyhurst,
Manchester,
M40 7RU
UNITED KINGDOM
TEL: +44 (0)161 205 7631
EMAIL: sales@hmgpaint.com
- **Further information obtainable from:** sales@hmgpaint.com
- **1.4 Emergency telephone number:** +44 (0)161 205 7631 (business hours)

SECTION 2: Hazards identification

- **2.1 Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**

Flam. Liq. 3	H226 Flammable liquid and vapour.
Acute Tox. 4	H332 Harmful if inhaled.
Skin Irrit. 2	H315 Causes skin irritation.
Eye Irrit. 2	H319 Causes serious eye irritation.
Skin Sens. 1	H317 May cause an allergic skin reaction.
STOT SE 3	H335 May cause respiratory irritation.
STOT RE 2	H373 May cause damage to the hearing organs through prolonged or repeated exposure.
Asp. Tox. 1	H304 May be fatal if swallowed and enters airways.
Aquatic Chronic 3	H412 Harmful to aquatic life with long lasting effects.

- **2.2 Label elements**
- **Labelling according to Regulation (EC) No 1272/2008**
The product is classified and labelled according to the CLP regulation.
- **Hazard pictograms**



GHS02 GHS07 GHS08

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GB

Trade name: Hardener 9018

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Signal word *Danger*
Hazard-determining components of labelling:

Xylene (mix)
Hexamethylene-1,6-diisocyanate Homopolymer ethylbenzene
Solvent naphtha (petroleum), light aromatic hexamethylene-1,6 diisocyanate

Hazard statements

H226 Flammable liquid and vapour.
H332 Harmful if inhaled.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H335 May cause respiratory irritation.
H373 May cause damage to the hearing organs through prolonged or repeated exposure.
H304 May be fatal if swallowed and enters airways.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P321 Specific treatment (see on this label).
P331 Do NOT induce vomiting.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P362+P364 Take off contaminated clothing and wash it before reuse.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Additional information:

Contains isocyanates. May produce an allergic reaction.

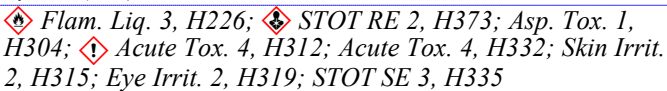
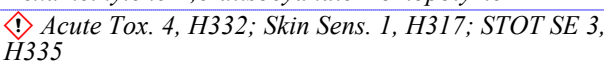
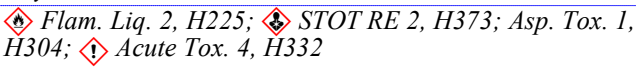
2.3 Other hazards
Results of PBT and vPvB assessment

PBT: Not applicable.
vPvB: Not applicable.

SECTION 3: Composition/information on ingredients
3.2 Chemical characterisation: Mixtures

Description: Mixture of substances listed below with nonhazardous additions.

Dangerous components:

CAS: 1330-20-7 EINECS: 215-535-7 Reg.nr.: 01-2119488216-32-xxxx	<i>Xylene (mix)</i> 	>50-≤100%
CAS: 28182-81-2 NLP: 500-060-2 Reg.nr.: 01-2119970543-34-0001	<i>Hexamethylene-1,6-diisocyanate Homopolymer</i> 	>25-≤50%
CAS: 100-41-4 EINECS: 202-849-4 Reg.nr.: 01-2119489370-35	<i>ethylbenzene</i> 	>2.5-≤10%

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GB

Trade name: Hardener 9018

CAS: 108-65-6 EINECS: 203-603-9 Reg.nr.: 01-2119475791-29	2-methoxy-1-methylethyl acetate ⚠ Flam. Liq. 3, H226; ⚠ STOT SE 3, H336	(Contd. of page 2) >2.5-≤10%
EC number: 918-668-5 Reg.nr.: 01-2119455851-35-xxxx	Solvent naphtha (petroleum), light aromatic ⚠ Flam. Liq. 3, H226; ⚠ Asp. Tox. 1, H304; ⚠ Aquatic Chronic 2, H411; ⚠ STOT SE 3, H335-H336	>2.5-≤10%
CAS: 822-06-0 EINECS: 212-485-8 Reg.nr.: 01-2119457571-37-0000/5/6	hexamethylene-1,6 diisocyanate ⚠ Acute Tox. 2, H330; ⚠ Resp. Sens. 1, H334; ⚠ Acute Tox. 4, H302; ⚠ Skin Irrit. 2, H315; ⚠ Eye Irrit. 2, H319; ⚠ Skin Sens. 1, H317; ⚠ STOT SE 3, H335	≤1%

· **Additional information:** For the wording of the listed hazard phrases refer to section 16.

SECTION 4: First aid measures

· **4.1 Description of first aid measures**

· **General information:**

Immediately remove any clothing soiled by the product.

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

· **After inhalation:**

Supply fresh air and call for a doctor.

In case of unconsciousness place patient stably in side position for transportation.

Supply fresh air; consult doctor in case of complaints.

· **After skin contact:**

Immediately wash with water and soap and rinse thoroughly. Remove contaminated clothing.

Immediately rinse with water.

· **After eye contact:**

Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

· **After swallowing:** Do not induce vomiting; call for medical help immediately and show safety datasheet or label.

· **4.2 Most important symptoms and effects, both acute and delayed** No further relevant information available.

· **4.3 Indication of any immediate medical attention and special treatment needed** Treat symptomatically.

SECTION 5: Firefighting measures

· **5.1 Extinguishing media**

· **Suitable extinguishing agents:**

CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

· **For safety reasons unsuitable extinguishing agents:** Water with full jet

· **5.2 Special hazards arising from the substance or mixture**

During heating or in case of fire poisonous gases are produced.

· **5.3 Advice for firefighters**

· **Protective equipment:** Mount respiratory protective device.

SECTION 6: Accidental release measures

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

Mount respiratory protective device.

Wear protective equipment. Keep unprotected persons away.

· **6.2 Environmental precautions:**

Do not allow product to reach sewage system or any water course.

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- Prevent seepage into sewage system, workpits and cellars.
- Inform respective authorities in case of seepage into water course or sewage system.
- Do not allow to enter sewers/ surface or ground water.
- **6.3 Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
- **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

- **7.1 Precautions for safe handling**
Keep receptacles tightly sealed.
Ensure good ventilation/extraction at the workplace.
Prevent formation of aerosols.
Hygiene measures:
Wash hands before breaks and at the end of workday.
- **Information about fire - and explosion protection:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Keep respiratory protective device available.
- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**
Keep receptacle tightly sealed and in a well-ventilated place.
Keep away from heat.
- **7.3 Specific end use(s)** No further relevant information available.

SECTION 8: Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **8.1 Control parameters**

· **Ingredients with limit values that require monitoring at the workplace:**

1330-20-7 Xylene (mix)	
WEL	Short-term value: 441 mg/m ³ , 100 ppm Long-term value: 220 mg/m ³ , 50 ppm Sk; BMGV
28182-81-2 Hexamethylene-1,6-diisocyanate Homopolymer	
EH40 WEL	Short-term value: 0.07 mg/m ³ Long-term value: 0.02 mg/m ³
100-41-4 ethylbenzene	
WEL	Short-term value: 552 mg/m ³ , 125 ppm Long-term value: 441 mg/m ³ , 100 ppm Sk

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108-65-6 2-methoxy-1-methylethyl acetate		
<i>WEL</i>	Short-term value: 548 mg/m ³ , 100 ppm Long-term value: 274 mg/m ³ , 50 ppm <i>Sk</i>	
Solvent naphtha (petroleum), light aromatic		
<i>OEL</i>	Long-term value: 100 mg/m ³	
822-06-0 hexamethylene-1,6 diisocyanate		
<i>WEL</i>	Short-term value: 0.07 mg/m ³ Long-term value: 0.02 mg/m ³ <i>Sen; as -NCO</i>	
· DNELs		
1330-20-7 Xylene (mix)		
<i>Dermal</i>	<i>DNEL</i>	108 mg/day (<i>Con</i>) 180 mg/day (<i>Ind</i>)
<i>Inhalative</i>	<i>DNEL</i>	14.8 mg/m ³ (<i>Con</i>) 77 mg/m ³ (<i>Ind</i>)
28182-81-2 Hexamethylene-1,6-diisocyanate Homopolymer		
<i>Inhalative</i>	<i>DNEL</i>	0.5 mg/m ³ (<i>Ind</i>)
108-65-6 2-methoxy-1-methylethyl acetate		
<i>Oral</i>	<i>DNEL</i>	1.67 mg/day (<i>Con</i>)
<i>Dermal</i>	<i>DNEL</i>	54.8 mg/day (<i>Con</i>) 153.5 mg/day (<i>Ind</i>)
<i>Inhalative</i>	<i>DNEL</i>	33 mg/m ³ (<i>Con</i>) 275 mg/m ³ (<i>Ind</i>)
Solvent naphtha (petroleum), light aromatic		
<i>Oral</i>	<i>DNEL</i>	11 mg/day (<i>Con</i>)
<i>Dermal</i>	<i>DNEL</i>	11 mg/day (<i>Con</i>) 25 mg/day (<i>Ind</i>)
<i>Inhalative</i>	<i>DNEL</i>	32 mg/m ³ (<i>Con</i>) 150 mg/m ³ (<i>Ind</i>)
822-06-0 hexamethylene-1,6 diisocyanate		
<i>Inhalative</i>	<i>DNEL</i>	0.035 mg/m ³ (<i>Ind</i>)

· PNECs

CAS No. 1330-20-7 Xylene mixed isomers

- Fresh water; 0.327 mg/l
- Marine water; 0.327 mg/l
- Intermittent release; 0.327 mg/l
- STP; 6.58 mg/l
- Sediment (Freshwater); 12.46 mg/kg
- Sediment (Marinewater); 12.46 mg/kg
- Soil; 2.31 mg/kg

CAS No. 28182-81-2 Hexamethylene-1,6-diisocyanate Homopolymer

- Freshwater: 0.127 mg/l
- Marine water: 0.0127 mg/l
- Water: Intermittent release: 1.27 mg/l
- Fresh water sediment: 266700 mg/kg dry weight
- Marine sediment: 26670 mg/kg dry weight
- STP (sewage-treatment plant): 38.3 mg/l

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Soil: 53182 mg/kg dry weight
 Air: No hazard identified
 Secondary poisoning: Does not bioaccumulate.

· Ingredients with biological limit values:

1330-20-7 Xylene (mix)

BMGV 650 mmol/mol creatinine
 Medium: urine
 Sampling time: post shift
 Parameter: methyl hippuric acid

822-06-0 hexamethylene-1,6 diisocyanate

BMGV 1 µmol creatinine/mol
 Medium: urine
 Sampling time: At the end of the period of exposure
 Parameter: isocyanate-derived diamine

· **Additional information:** The lists valid during the making were used as basis.

· 8.2 Exposure controls

· Personal protective equipment:

· General protective and hygienic measures:

Keep away from foodstuffs, beverages and feed.
 Immediately remove all soiled and contaminated clothing
 Wash hands before breaks and at the end of work.
 Store protective clothing separately.
 Avoid contact with the eyes and skin.

· **Respiratory protection:** When spraying the product, use a respiratory protective device.

· Protection of hands:



Protective gloves

· Eye protection:



Tightly sealed goggles

SECTION 9: Physical and chemical properties

· 9.1 Information on basic physical and chemical properties

· General Information

· Appearance:

Form:	Liquid
Colour:	Clear
· Odour:	Characteristic
· Odour threshold:	Not determined.

· pH-value: Not determined.

· Change in condition

Melting point/freezing point: Undetermined.
Initial boiling point and boiling range: >120 °C

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GB

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· Flash point:	24 °C
· Flammability (solid, gas):	Not applicable.
· Ignition temperature:	315 °C
· Decomposition temperature:	Not determined.
· Auto-ignition temperature:	Product is not selfigniting.
· Explosive properties:	Product is not explosive. However, formation of explosive air/vapour mixtures are possible.
· Explosion limits:	
Lower:	1.1 Vol %
Upper:	7 Vol %
· Vapour pressure at 20 °C:	6.7-8.2 hPa
· Density at 20 °C:	0.94 g/cm ³
· Relative density	Not determined.
· Vapour density	Not determined.
· Evaporation rate	Not determined.
· Solubility in / Miscibility with water:	NOT MISCIBLE
· Partition coefficient: n-octanol/water:	Not determined.
· Viscosity:	
Dynamic:	Not determined.
Kinematic at 20 °C:	15 s (DIN 53211/4)
· Solvent content:	
Organic solvents:	70.0 %
Solids content:	30.0 %
· 9.2 Other information	No further relevant information available.

SECTION 10: Stability and reactivity

- **10.1 Reactivity** No further relevant information available.
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **10.3 Possibility of hazardous reactions** No dangerous reactions known.
- **10.4 Conditions to avoid** No further relevant information available.
- **10.5 Incompatible materials:** No further relevant information available.
- **10.6 Hazardous decomposition products:**
No dangerous decomposition products when stored and handled correctly

SECTION 11: Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity**
Harmful if inhaled.

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Trade name: Hardener 9018

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· LD/LC50 values relevant for classification:		
1330-20-7 Xylene (mix)		
Oral	LD50	5,000 mg/kg (Rat)
Dermal	LD50	2,000 mg/kg (rbt)
Inhalative	LC50/4 h	11 mg/l (Rat)
28182-81-2 Hexamethylene-1,6-diisocyanate Homopolymer		
Oral	LD50	>2,500 mg/kg (rat) (OECD Test Guideline 423)
Dermal	LD50	>2,000 mg/kg (rat) (OECD Test Guideline 402)
Inhalative	LC50/4 h	0.39 mg/l (rat) (Method: OECD Test Guideline 403)
100-41-4 ethylbenzene		
Oral	LD50	3,500 mg/kg (rat)
Dermal	LD50	17,800 mg/kg (rbt)
108-65-6 2-methoxy-1-methylethyl acetate		
Oral	LD50	>5,000 mg/kg (rat)
Dermal	LD50	5,000 mg/kg (Rat)
Inhalative	LC50/4 h	>10.8 mg/l (Rat)
Solvent naphtha (petroleum), light aromatic		
Oral	LD50	3,492 mg/kg (rat)
Dermal	LD50	3,160 mg/kg (Rab)
Inhalative	LC50/4 h	>6.193 mg/l (rat)
822-06-0 hexamethylene-1,6 diisocyanate		
Oral	LD50	746 mg/kg (Rat)
Dermal	LD50	>7,000 mg/kg (Rat)
Inhalative	LC50/4 h	0.124 mg/l (Rat)

- **Primary irritant effect:**
- **Skin corrosion/irritation**
Causes skin irritation.
- **Serious eye damage/irritation**
Causes serious eye irritation.
- **Respiratory or skin sensitisation**
May cause an allergic skin reaction.
- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**
- **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
- **Carcinogenicity** Based on available data, the classification criteria are not met.
- **Reproductive toxicity** Based on available data, the classification criteria are not met.
- **STOT-single exposure**
May cause respiratory irritation.
- **STOT-repeated exposure**
May cause damage to the hearing organs through prolonged or repeated exposure.
- **Aspiration hazard**
May be fatal if swallowed and enters airways.

SECTION 12: Ecological information

- **12.1 Toxicity**
- **Aquatic toxicity:**
Acute Fish toxicity
Hexamethylene-1,6-diisocyanate Homopolymer

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Trade name: Hardener 9018

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LC50 > 100 mg/l
Test type: Acute Fish toxicity
Species: *Danio rerio* (zebra fish)
Exposure duration: 96 h
Method: Directive 67/548/EEC, Annex V, C.1.

Acute toxicity for daphnia
Hexamethylene-1,6-diisocyanate Homopolymer
EC50 > 100 mg/l
Species: *Daphnia magna* (Water flea)
Exposure duration: 48 h
Method: Directive 67/548/EEC, Annex V, C.2.

Acute toxicity for algae
Hexamethylene-1,6-diisocyanate Homopolymer
ErC50 > 1,000 mg/l
Test type: Growth inhibition
Species: *scenedesmus subspicatus*
Exposure duration: 72 h
Method: DIN 38412

Acute bacterial toxicity
Hexamethylene-1,6-diisocyanate Homopolymer
EC50 3,828 mg/l
Test type: Respiration inhibition
Species: activated sludge
Exposure duration: 3 h
Method: OECD Test Guideline 209

Ecotoxicology Assessment
Hexamethylene-1,6-diisocyanate Homopolymer
Acute aquatic toxicity: Based on available data, the classification criteria are not met.
Chronic aquatic toxicity: There is no evidence of a chronic aquatic toxicity.
Impact on Sewage Treatment: Because of the low bacterial toxicity, there is no risk of an adverse effect on the performance of biological waste water treatment plants.

Acute Fish toxicity
Solvent naphtha (petroleum), light arom. (content of benzene less than 0,1 %)
LC50 9.22 mg/l
Species: *Oncorhynchus mykiss* (rainbow trout)
Exposure duration: 96 h

Acute toxicity for daphnia
Solvent naphtha (petroleum), light arom. (content of benzene less than 0,1 %)
EC50 6.14 mg/l
Species: *Daphnia magna* (Water flea)
Exposure duration: 48 h

Acute toxicity for algae
Solvent naphtha (petroleum), light arom. (content of benzene less than 0,1 %)
ErC50 2.9 mg/l
Species: *Pseudokirchneriella subcapitata* (green algae)
Exposure duration: 72 h

Acute bacterial toxicity
Solvent naphtha (petroleum), light arom. (content of benzene less than 0,1 %)
EC50 1 - 10 mg/l

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Ecotoxicology Assessment

Solvent naphtha (petroleum), light arom. (content of benzene less than 0,1 %)

Chronic aquatic toxicity: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Data based on the safety data sheet (SDS) by the supplier.

· **12.2 Persistence and degradability** No further relevant information available.

· **12.3 Bioaccumulative potential** No further relevant information available.

· **12.4 Mobility in soil** No further relevant information available.

· **Ecotoxicological effects:**

· **Remark:** Harmful to fish

· **Additional ecological information:**

· **General notes:**

Water danger class 3 (German Regulation) (Self-assessment): extremely hazardous for water

Do not allow product to reach ground water, water course or sewage system, even in small quantities.

Danger to drinking water if even extremely small quantities leak into the ground.

Harmful to aquatic organisms

· **12.5 Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **12.6 Other adverse effects** No further relevant information available.

SECTION 13: Disposal considerations

· **13.1 Waste treatment methods**

· **Recommendation**

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packaging:**

· **Recommendation:** Disposal must be made according to official regulations.

SECTION 14: Transport information

· **14.1 UN-Number**

· **ADR, IMDG, IATA** UNI263

· **14.2 UN proper shipping name**

· **ADR** 1263 PAINT RELATED MATERIAL

· **IMDG, IATA** PAINT RELATED MATERIAL

· **14.3 Transport hazard class(es)**

· **ADR, IMDG, IATA**



· **Class** 3 Flammable liquids.

· **Label** 3

· **14.4 Packing group**

· **ADR, IMDG, IATA** III

· **14.5 Environmental hazards:** Not applicable.

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Trade name: Hardener 9018

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- | | |
|--|---|
| <ul style="list-style-type: none"> · 14.6 Special precautions for user · Hazard identification number (Kemler code): · EMS Number: · Stowage Category | <p>Warning: Flammable liquids.</p> <p>30</p> <p>F-E, S-E</p> <p>A</p> |
| <ul style="list-style-type: none"> · 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code | <p>Not applicable.</p> |
| <ul style="list-style-type: none"> · Transport/Additional information: | |
| <ul style="list-style-type: none"> · ADR · Limited quantities (LQ) · Excepted quantities (EQ) · Transport category · Tunnel restriction code | <p>5L</p> <p>Code: E1</p> <p>Maximum net quantity per inner packaging: 30 ml</p> <p>Maximum net quantity per outer packaging: 1000 ml</p> <p>3</p> <p>D/E</p> |
| <ul style="list-style-type: none"> · IMDG · Limited quantities (LQ) · Excepted quantities (EQ) | <p>5L</p> <p>Code: E1</p> <p>Maximum net quantity per inner packaging: 30 ml</p> <p>Maximum net quantity per outer packaging: 1000 ml</p> |
| <ul style="list-style-type: none"> · UN "Model Regulation": | <p>UN 1263 PAINT RELATED MATERIAL, 3, III</p> |

SECTION 15: Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Directive 2012/18/EU**
- **Named dangerous substances - ANNEX I** None of the ingredients is listed.
- **Seveso category P5c** FLAMMABLE LIQUIDS
- **Qualifying quantity (tonnes) for the application of lower-tier requirements** 5,000 t
- **Qualifying quantity (tonnes) for the application of upper-tier requirements** 50,000 t
- **REGULATION (EC) No 1907/2006 ANNEX XVII** Conditions of restriction: 3, 74

· **DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment – Annex II**

None of the ingredients is listed.

- **National regulations:**
- **Technical instructions (air):**

Class	Share in %
I	0.2
NK	70.0

- **Waterhazard class:** Water danger class 3 (Self-assessment): extremely hazardous for water.
- **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

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· **Full text of H-Statements referred to under sections 2 and 3:**

- H225 Highly flammable liquid and vapour.*
- H226 Flammable liquid and vapour.*
- H302 Harmful if swallowed.*
- H304 May be fatal if swallowed and enters airways.*
- H312 Harmful in contact with skin.*
- H315 Causes skin irritation.*
- H317 May cause an allergic skin reaction.*
- H319 Causes serious eye irritation.*
- H330 Fatal if inhaled.*
- H332 Harmful if inhaled.*
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.*
- H335 May cause respiratory irritation.*
- H336 May cause drowsiness or dizziness.*
- H373 May cause damage to organs through prolonged or repeated exposure.*
- H411 Toxic to aquatic life with long lasting effects.*

· **Department issuing SDS: Product safety department: LABORATORY**

· **Abbreviations and acronyms:**

- ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)*
- IMDG: International Maritime Code for Dangerous Goods*
- IATA: International Air Transport Association*
- GHS: Globally Harmonised System of Classification and Labelling of Chemicals*
- EINECS: European Inventory of Existing Commercial Chemical Substances*
- ELINCS: European List of Notified Chemical Substances*
- CAS: Chemical Abstracts Service (division of the American Chemical Society)*
- DNEL: Derived No-Effect Level (REACH)*
- PNEC: Predicted No-Effect Concentration (REACH)*
- LC50: Lethal concentration, 50 percent*
- LD50: Lethal dose, 50 percent*
- PBT: Persistent, Bioaccumulative and Toxic*
- vPvB: very Persistent and very Bioaccumulative*
- Flam. Liq. 2: Flammable liquids – Category 2*
- Flam. Liq. 3: Flammable liquids – Category 3*
- Acute Tox. 4: Acute toxicity - dermal – Category 4*
- Acute Tox. 2: Acute toxicity - inhalation – Category 2*
- Skin Irrit. 2: Skin corrosion/irritation – Category 2*
- Eye Irrit. 2: Serious eye damage/eye irritation – Category 2*
- Resp. Sens. 1: Respiratory sensitisation – Category 1*
- Skin Sens. 1: Skin sensitisation – Category 1*
- STOT SE 3: Specific target organ toxicity (single exposure) – Category 3*
- STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2*
- Asp. Tox. 1: Aspiration hazard – Category 1*
- Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2*
- Aquatic Chronic 3: Hazardous to the aquatic environment - long-term aquatic hazard – Category 3*

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