

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

**HUNTSMAN**

Enriching lives through innovation

## HARDENER 946 US

|         |                |              |                                 |
|---------|----------------|--------------|---------------------------------|
| Version | Revision Date: | SDS Number:  | Date of last issue: 03.10.2017  |
| 2.1     | 14.02.2022     | 400001010584 | Date of first issue: 12.08.2015 |

Print Date 28.06.2022

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

#### 1.1 Product identifier

Trade name : HARDENER 946 US

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

Use of the : Hardener  
Substance/Mixture

#### 1.3 Details of the supplier of the safety data sheet

Company : Huntsman Advanced Materials (Europe)BVBA  
Address : Everslaan 45  
3078 Everberg  
Belgium  
Telephone : +41 61 299 20 41  
Telefax : +41 61 299 20 40  
E-mail address of person : Global\_Product\_EHS\_AdMat@huntsman.com  
responsible for the SDS

#### 1.4 Emergency telephone number

Emergency telephone number : Centres Antipoison et de Toxicovigilance:  
ANGERS: 02 41 48 21 21  
BORDEAUX: 05 56 96 40 80  
LILLE: 0 825 812 822  
LYON: 04 72 11 69 11  
MARSEILLE 04 91 75 25 25  
NANCY: 03 83 32 36 36  
PARIS: 01 40 05 48 48  
RENNES: 02 99 59 22 22  
STRASBOURG: 03 88 37 37 37  
TOULOUSE: 05 61 77 74 47  
EUROPE: +32 35 75 1234  
France ORFILA: +33(0)145425959  
ASIA: +65 6336-6011  
China: +86 20 39377888  
+86 532 83889090  
India: + 91 22 42 87 5333  
Australia: 1800 786 152  
New Zealand: 0800 767 437  
USA: +1/800/424.9300

### SECTION 2: Hazards identification

#### 2.1 Classification of the substance or mixture

**Classification (REGULATION (EC) No 1272/2008)**

Acute toxicity, Category 2 H330: Fatal if inhaled.

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|                                                                                  |                                                        |
|----------------------------------------------------------------------------------|--------------------------------------------------------|
| Acute toxicity, Category 4                                                       | H312: Harmful in contact with skin.                    |
| Skin corrosion, Sub-category 1B                                                  | H314: Causes severe skin burns and eye damage.         |
| Serious eye damage, Category 1                                                   | H318: Causes serious eye damage.                       |
| Skin sensitisation, Category 1                                                   | H317: May cause an allergic skin reaction.             |
| Reproductive toxicity, Category 1B                                               | H360F: May damage fertility.                           |
| Specific target organ toxicity - single exposure, Category 3, Respiratory system | H335: May cause respiratory irritation.                |
| Chronic aquatic toxicity, Category 2                                             | H411: Toxic to aquatic life with long lasting effects. |

## 2.2 Label elements

### Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Danger

|                   |                                                  |                                          |
|-------------------|--------------------------------------------------|------------------------------------------|
| Hazard statements | H312                                             | Harmful in contact with skin.            |
|                   | H314                                             | Causes severe skin burns and eye damage. |
|                   | H317                                             | May cause an allergic skin reaction.     |
|                   | H330                                             | Fatal if inhaled.                        |
|                   | H335                                             | May cause respiratory irritation.        |
|                   | H360F                                            | May damage fertility.                    |
| H411              | Toxic to aquatic life with long lasting effects. |                                          |

|                          |                    |                                                                                                   |
|--------------------------|--------------------|---------------------------------------------------------------------------------------------------|
| Precautionary statements | <b>Prevention:</b> |                                                                                                   |
|                          | P201               | Obtain special instructions before use.                                                           |
|                          | P260               | Do not breathe mist or vapours.                                                                   |
|                          | P273               | Avoid release to the environment.                                                                 |
|                          | P280               | Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection. |

### Response:

|                           |                                                                                                                                                                            |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| P303 + P361 + P353        | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.                                                                               |
| P304 + P340 + P310        | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.                                                       |
| 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. |
| P308 + P313               | IF exposed or concerned: Get medical                                                                                                                                       |

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P391  
**Storage:**  
P403 + P233

advice/ attention.

Collect spillage.

Store in a well-ventilated place. Keep container tightly closed.

Hazardous components which must be listed on the label:

2,2'-iminodiethylamine  
4,4'-isopropylidenediphenol  
2-aminoethanol

### Additional Labelling:

Restricted to professional users.

### 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: This substance/mixture contains components considered to have endocrine disrupting properties for environment, according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100.

Toxicological information: This substance/mixture contains components considered to have endocrine disrupting properties affecting human health, according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100.

## SECTION 3: Composition/information on ingredients

### 3.2 Mixtures

Chemical nature : Amines

#### Hazardous components

| Chemical name          | CAS-No.<br>EC-No.<br>Index-No.<br>Registration number     | Classification                                                                                                                                                                                                                                                                    | Concentration<br>(% w/w) |
|------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| 2,2'-iminodiethylamine | 111-40-0<br>203-865-4<br>612-058-00-X<br>01-2119473793-27 | Acute Tox. 4; H302<br>Acute Tox. 2; H330<br>Acute Tox. 4; H312<br>Skin Corr. 1B; H314<br>Eye Dam. 1; H318<br>Skin Sens. 1; H317<br>STOT SE 3; H335<br>(Respiratory system)<br><br>Acute toxicity estimate<br><br>Acute oral toxicity: 1<br>620 mg/kg<br>Acute inhalation toxicity | >= 50 -<br>< 70          |

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|                             |                                                          |                                                                                                                                                                                                                                                                                                                                  |                 |
|-----------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|                             |                                                          | (dust/mist): 0,185 mg/l<br>Acute dermal toxicity: 1<br>045 mg/kg                                                                                                                                                                                                                                                                 |                 |
| 4,4'-isopropylidenediphenol | 80-05-7<br>201-245-8<br>604-030-00-0<br>01-2119457856-23 | Eye Dam. 1; H318<br>Skin Sens. 1; H317<br>Repr. 1B; H360F<br>STOT SE 3; H335<br>(Respiratory system)<br>Aquatic Chronic 2;<br>H411                                                                                                                                                                                               | >= 30 -<br>< 50 |
| 2-aminoethanol              | 141-43-5<br>205-483-3<br>603-030-00-8                    | Acute Tox. 4; H302<br>Acute Tox. 4; H332<br>Acute Tox. 4; H312<br>Skin Corr. 1B; H314<br>Eye Dam. 1; H318<br>STOT SE 3; H335<br>(Respiratory system)<br>Aquatic Chronic 3;<br>H412<br><br>specific concentration<br>limit<br>STOT SE 3; H335<br>>= 5 %<br><br>Acute toxicity estimate<br><br>Acute oral toxicity: 1<br>089 mg/kg | >= 5 - <<br>10  |

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.  
Symptoms of poisoning may appear several hours later.  
Treat symptomatically.  
Get medical attention if symptoms occur.
- Protection of first-aiders : First Aid responders should pay attention to self-protection  
and use the recommended protective clothing  
If potential for exposure exists refer to Section 8 for specific  
personal protective equipment.  
Avoid inhalation, ingestion and contact with skin and eyes.  
No action shall be taken involving any personal risk or without  
suitable training.  
It may be dangerous to the person providing aid to give  
mouth-to-mouth resuscitation.

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- |                         |                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| If inhaled              | : Call a physician or poison control centre immediately.<br>If inhaled, remove to fresh air.<br>Get medical attention if symptoms occur.                                                                                                                                                                                                                               |
| In case of skin contact | : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.<br>Take victim immediately to hospital.<br>If on skin, rinse well with water.<br>If on clothes, remove clothes.                                                                                                                             |
| In case of eye contact  | : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.<br>In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.<br>Continue rinsing eyes during transport to hospital.<br>Remove contact lenses.<br>Keep eye wide open while rinsing.<br>If eye irritation persists, consult a specialist. |
| If swallowed            | : Keep respiratory tract clear.<br>Do NOT induce vomiting.<br>Never give anything by mouth to an unconscious person.<br>If symptoms persist, call a physician.<br>Take victim immediately to hospital.                                                                                                                                                                 |

### 4.2 Most important symptoms and effects, both acute and delayed

None known.

### 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 : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical

Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire

### 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 : Carbon dioxide (CO<sub>2</sub>)  
Carbon monoxide  
Nitrogen oxides (NO<sub>x</sub>)

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### 5.3 Advice for firefighters

- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- 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.  
Ensure adequate ventilation.  
Evacuate personnel to safe areas.  
Refer to protective measures listed in sections 7 and 8.

### 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 : 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

For disposal considerations see section 13., See Section 1 for emergency contact information., For personal protection see section 8.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

- Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons.  
Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.  
Avoid formation of aerosol.  
Do not breathe vapours/dust.  
Avoid exposure - obtain special instructions before use.  
Avoid contact with skin and eyes.  
For personal protection see section 8.

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Smoking, eating and drinking should be prohibited in the application area.  
Provide sufficient air exchange and/or exhaust in work rooms.  
To avoid spills during handling keep bottle on a metal tray.  
Dispose of rinse water in accordance with local and national regulations.

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

Hygiene measures : Avoid contact with skin, eyes and clothing. When using do not eat or drink. When using do not smoke. Wash hands before breaks and immediately after handling the product.

### 7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Prevent unauthorized access. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Keep in properly labelled containers.

Advice on common storage : For incompatible materials please refer to Section 10 of this SDS.

Further information on storage stability : Stable under normal conditions.

Recommended storage temperature : 2 - 40 °C

### 7.3 Specific end use(s)

Specific use(s) : No data available

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational Exposure Limits

| Components                   | CAS-No.                                                                                    | Value type (Form of exposure)  | Control parameters           | Basis       |
|------------------------------|--------------------------------------------------------------------------------------------|--------------------------------|------------------------------|-------------|
| 2,2'-iminodiethylamine       | 111-40-0                                                                                   | VME                            | 1 ppm<br>4 mg/m <sup>3</sup> | FR VLE      |
| Further information          | Risk for sensitisation of the skin, Indicative exposure limits                             |                                |                              |             |
| 4,4'-isopropylidenediph enol | 80-05-7                                                                                    | VME (Dust, inhalable fraction) | 2 mg/m <sup>3</sup>          | FR VLE      |
| Further information          | Reprotoxic category 1B - Probably reprotoxic to humans, Regulatory binding exposure limits |                                |                              |             |
|                              |                                                                                            | TWA (inhalable fraction)       | 2 mg/m <sup>3</sup>          | 2017/164/EU |

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|                     |                                                                               |            |                    |            |
|---------------------|-------------------------------------------------------------------------------|------------|--------------------|------------|
| Further information | Indicative                                                                    |            |                    |            |
| 2-aminoethanol      | 141-43-5                                                                      | TWA        | 1 ppm<br>2,5 mg/m3 | 2006/15/EC |
| Further information | Indicative, Identifies the possibility of significant uptake through the skin |            |                    |            |
|                     |                                                                               | STEL       | 3 ppm<br>7,6 mg/m3 | 2006/15/EC |
| Further information | Indicative, Identifies the possibility of significant uptake through the skin |            |                    |            |
|                     |                                                                               | VLCT (VLE) | 3 ppm<br>7,6 mg/m3 | FR VLE     |
| Further information | Risk of penetration through skin, Regulatory binding exposure limits          |            |                    |            |
|                     |                                                                               | VME        | 1 ppm<br>2,5 mg/m3 | FR VLE     |
| Further information | Risk of penetration through skin, Regulatory binding exposure limits          |            |                    |            |

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

| Substance name         | End Use   | Exposure routes | Potential health effects   | Value             |
|------------------------|-----------|-----------------|----------------------------|-------------------|
| 2,2'-iminodiethylamine | Workers   | Inhalation      | Long-term systemic effects | 15,4 mg/m3        |
|                        | Workers   | Inhalation      | Acute systemic effects     | 92,1 mg/m3        |
|                        | Workers   | Inhalation      | Long-term local effects    | 0,87 mg/m3        |
|                        | Workers   | Inhalation      | Acute local effects        | 2,6 mg/m3         |
|                        | Workers   | Dermal          | Long-term systemic effects | 11,4 mg/kg bw/day |
|                        | Workers   | Dermal          | Long-term local effects    | 1,1 mg/cm2        |
|                        | Consumers | Inhalation      | Long-term systemic effects | 4,6 mg/m3         |
|                        | Consumers | Inhalation      | Acute systemic effects     | 27,5 mg/m3        |
|                        | Consumers | Dermal          | Long-term systemic effects | 4,88 mg/kg bw/day |
|                        | Consumers | Dermal          | Acute systemic effects     | 4,88 mg/kg bw/day |
|                        | Workers   | Inhalation      | Long-term systemic effects | 1 mg/m3           |
|                        | Workers   | Inhalation      | Long-term local effects    | 0,51 mg/m3        |
| 2-aminoethanol         | Consumers | Dermal          | Long-term systemic effects | 3 mg/kg bw/day    |
|                        | Consumers | Inhalation      | Long-term local effects    | 0,28 mg/m3        |
|                        | Consumers | Inhalation      | Long-term systemic effects | 0,18 mg/m3        |
|                        | Consumers | Dermal          | Long-term systemic effects | 1,5 mg/kg bw/day  |

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

| Substance name         | Environmental Compartment | Value          |
|------------------------|---------------------------|----------------|
| 2,2'-iminodiethylamine | Fresh water               | 0,56 mg/l      |
|                        | Freshwater - intermittent | 0,32 mg/l      |
|                        | Fresh water sediment      | 1072 mg/kg dry |

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|                |                           |                               |
|----------------|---------------------------|-------------------------------|
|                |                           | weight (d.w.)                 |
|                | Marine water              | 0,056 mg/l                    |
|                | Marine sediment           | 107,2 mg/kg dry weight (d.w.) |
|                | Sewage treatment plant    | 6 mg/l                        |
|                | Soil                      | 7,97 mg/kg dry weight (d.w.)  |
| 2-aminoethanol | Fresh water               | 0,07 mg/l                     |
|                | Marine water              | 0,007 mg/l                    |
|                | Freshwater - intermittent | 0,028 mg/l                    |
|                | Sewage treatment plant    | 100 mg/l                      |
|                | Fresh water sediment      | 0,357 mg/kg dry weight (d.w.) |
|                | Marine sediment           | 0,036 mg/kg dry weight (d.w.) |
|                | Soil                      | 1,29 mg/kg dry weight (d.w.)  |

### 8.2 Exposure controls

#### Personal protective equipment

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

#### Hand protection

Material : butyl-rubber  
Break through time : > 8 h

Material : Nitrile rubber  
Break through time : 10 - 480 min

#### Remarks

: Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).  
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. 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

: Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines  
Equipment should conform to EN 14387

#### Filter type

: Organic vapour type (A)

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### SECTION 9: Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

|                                                  |                                                 |
|--------------------------------------------------|-------------------------------------------------|
| Physical state                                   | : liquid                                        |
| Colour                                           | : amber                                         |
| Odour                                            | : amine-like                                    |
| Odour Threshold                                  | : No data is available on the product itself.   |
| pH                                               | : No data is available on the product itself.   |
| Melting point/freezing point                     | : No data is available on the product itself.   |
| Boiling point                                    | : 207 °C                                        |
| Flash point                                      | : > 100 °C<br>Method: Pensky-Martens closed cup |
| Flammability (solid, gas)                        | : No data is available on the product itself.   |
| Upper explosion limit / Upper flammability limit | : No data is available on the product itself.   |
| Lower explosion limit / Lower flammability limit | : No data is available on the product itself.   |
| Vapour pressure                                  | : < 1,3 hPa (20 °C)                             |
| Relative vapour density                          | : No data is available on the product itself.   |
| Relative density                                 | : No data is available on the product itself.   |
| Density                                          | : 1,05 g/cm <sup>3</sup> (25 °C)                |
| Solubility(ies)                                  |                                                 |
| Water solubility                                 | : partly soluble (20 °C)                        |
| Solubility in other solvents                     | : No data is available on the product itself.   |
| Partition coefficient: n-octanol/water           | : No data is available on the product itself.   |
| Auto-ignition temperature                        | : No data is available on the product itself.   |
| Decomposition temperature                        | : No data is available on the product itself.   |
| Viscosity                                        |                                                 |
| Viscosity, dynamic                               | : 400 mPa.s (25 °C)                             |

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### 9.2 Other information

No data available

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

No dangerous reaction known under conditions of normal use.

### 10.2 Chemical stability

Stable under normal conditions.

### 10.3 Possibility of hazardous reactions

Hazardous reactions : No hazards to be specially mentioned.

### 10.4 Conditions to avoid

Conditions to avoid : None known.

### 10.5 Incompatible materials

Materials to avoid : None known.

### 10.6 Hazardous decomposition products

No decomposition if stored and applied as directed.

Hazardous decomposition products : carbon monoxide  
carbon dioxide  
Nitrogen oxides (NO<sub>x</sub>)

## SECTION 11: Toxicological information

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

#### Acute toxicity

##### Product:

Acute oral toxicity : Acute toxicity estimate: > 2 000 mg/kg  
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: 0,3599 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: Calculation method

Assessment: The substance/mixture is not toxic on inhalation as defined by dangerous goods regulations.

Acute dermal toxicity : Acute toxicity estimate: 1 791 mg/kg  
Method: Calculation method

##### Components:

##### **2,2'-iminodiethylamine:**

Acute oral toxicity : LD50 (Rat, male): 1 620 mg/kg

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Acute toxicity estimate: 1 620 mg/kg  
Method: Calculation method

Acute inhalation toxicity : LC50 (Rat, male and female): 0,185 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: OECD Test Guideline 403

Acute toxicity estimate: 0,185 mg/l  
Test atmosphere: dust/mist  
Method: Calculation method

Acute dermal toxicity : LD50 (Rabbit): 1 045 mg/kg

Acute toxicity estimate: 1 045 mg/kg  
Method: Calculation method

### **4,4'-isopropylidenediphenol:**

Acute oral toxicity : LD50 (Rat, male and female): > 2 000 - < 5 000 mg/kg  
Method: OECD Test Guideline 401  
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat, male and female): > 170 mg/m3  
Exposure time: 6 h  
Test atmosphere: dust/mist

Acute dermal toxicity : LD50 (Rabbit, male): ca. 6 400 mg/kg

### **2-aminoethanol:**

Acute oral toxicity : LD50 (Rat, male and female): 1 089 mg/kg  
Method: OECD Test Guideline 401

Acute toxicity estimate: 1 089 mg/kg  
Method: Calculation method

Acute inhalation toxicity : LC50 (Rat, male and female): 1,3 mg/l  
Exposure time: 6 h  
Test atmosphere: vapour  
Assessment: The component/mixture is moderately toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rabbit, male and female): 2 504 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The component/mixture is moderately toxic after single contact with skin.

### **Skin corrosion/irritation**

#### **Components:**

#### **2,2'-iminodiethylamine:**

Species : Rabbit

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Assessment : Causes burns.  
Result : Causes burns.

### 4,4'-isopropylidenediphenol:

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

### 2-aminoethanol:

Species : Rabbit  
Method : OECD Test Guideline 404  
Result : Causes burns.

### Serious eye damage/eye irritation

#### Components:

#### 2,2'-iminodiethylamine:

Species : Rabbit  
Assessment : Corrosive  
Result : Corrosive

#### 4,4'-isopropylidenediphenol:

Species : Rabbit  
Method : OECD Test Guideline 405  
Result : Irreversible effects on the eye

### 2-aminoethanol:

Species : Rabbit  
Assessment : Corrosive  
Result : Corrosive

### Respiratory or skin sensitisation

#### Components:

#### 2,2'-iminodiethylamine:

Exposure routes : Skin  
Species : Mouse  
Method : OECD Test Guideline 429  
Result : May cause sensitisation by skin contact.  
Remarks : Causes sensitisation.

Exposure routes : Respiratory Tract  
Species : Mouse  
Result : Does not cause respiratory sensitisation.

#### 4,4'-isopropylidenediphenol:

Exposure routes : Skin  
Species : Mouse  
Method : OECD Test Guideline 429  
Result : Does not cause skin sensitisation.

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Exposure routes : Skin  
Species : Humans  
Assessment : May cause sensitisation by skin contact.  
Result : Causes sensitisation.

### 2-aminoethanol:

Exposure routes : Skin  
Species : Guinea pig  
Result : Does not cause skin sensitisation.

### Germ cell mutagenicity

#### Components:

#### 2,2'-iminodiethylamine:

Genotoxicity in vivo : Cell type: Somatic  
Application Route: Oral  
Dose: 85 - 850 mg/kg  
Method: OECD Test Guideline 474  
Result: negative

Application Route: Oral  
Result: negative

#### 4,4'-isopropylidenediphenol:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation  
Result: negative

Genotoxicity in vivo : Method: OECD Test Guideline 474  
Result: negative

#### 2-aminoethanol:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative

Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: negative

Metabolic activation: negative  
Result: negative

Genotoxicity in vivo : Application Route: Oral  
Exposure time: 24 h  
Dose: 375 - 1500 mg/kg  
Method: OECD Test Guideline 474  
Result: negative

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### Carcinogenicity

#### Components:

##### **2,2'-iminodiethylamine:**

|                        |               |
|------------------------|---------------|
| Species                | : Mouse, male |
| Application Route      | : Dermal      |
| Dose                   | : 56.3 mg/kg  |
| Frequency of Treatment | : 3 daily     |
| Result                 | : negative    |

##### **4,4'-isopropylidenediphenol:**

|                        |                        |
|------------------------|------------------------|
| Species                | : Rat, male and female |
| Application Route      | : Oral                 |
| Exposure time          | : 103 weeks            |
| Frequency of Treatment | : 7 daily              |
| Result                 | : negative             |

### Reproductive toxicity

#### Components:

##### **2,2'-iminodiethylamine:**

|                      |                                                                                                                                                        |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Effects on fertility | : Species: Rat, male and female<br>Application Route: Oral<br>General Toxicity - Parent: NOAEL: 30 mg/kg wet weight<br>Method: OECD Test Guideline 421 |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|

|                               |                                                                                                                                                                       |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Effects on foetal development | : Species: Rat<br>Application Route: Oral<br>General Toxicity Maternal: NOAEL: 100 mg/kg body weight<br>Method: OECD Test Guideline 421<br>Result: No adverse effects |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|

##### **4,4'-isopropylidenediphenol:**

|                      |                                                                                                                                                                                  |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Effects on fertility | : Species: Rat, male and female<br>Application Route: Oral<br>Method: OECD Test Guideline 416<br>Result: Embryotoxic effects and adverse effects on the offspring were detected. |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                               |                                                                                                                                                                                     |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Effects on foetal development | : Species: Rat, female<br>Application Route: Oral<br>General Toxicity Maternal: NOAEL: < 160 mg/kg body weight<br>Method: OECD Test Guideline 416<br>Result: No teratogenic effects |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                    |                                                                                                    |
|------------------------------------|----------------------------------------------------------------------------------------------------|
| Reproductive toxicity - Assessment | : Clear evidence of adverse effects on sexual function and fertility, based on animal experiments. |
|------------------------------------|----------------------------------------------------------------------------------------------------|

##### **2-aminoethanol:**

|                      |                                                                                                  |
|----------------------|--------------------------------------------------------------------------------------------------|
| Effects on fertility | : Species: Rat, male and female<br>Application Route: Oral<br>Target Organs: Reproductive organs |
|----------------------|--------------------------------------------------------------------------------------------------|

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Method: OECD Test Guideline 416  
Result: No effects on fertility and early embryonic development were detected.

Effects on foetal development : Species: Rat  
Application Route: Oral  
General Toxicity Maternal: NOAEL: 120 mg/kg body weight  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

Species: Rat  
Application Route: Dermal  
General Toxicity Maternal: NOAEL: 75 mg/kg body weight  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

### STOT - single exposure

#### Components:

##### **2,2'-iminodiethylamine:**

Target Organs : Respiratory Tract  
Assessment : May cause respiratory irritation.

##### **4,4'-isopropylidenediphenol:**

Assessment : The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

##### **2-aminoethanol:**

Exposure routes : Inhalation  
Target Organs : Respiratory Tract  
Assessment : May cause respiratory irritation.

### STOT - repeated exposure

No data available

### Repeated dose toxicity

#### Components:

##### **2,2'-iminodiethylamine:**

Species : Rat, male and female  
NOEC : 70 - 80 mg/m<sup>3</sup>  
Application Route : Ingestion  
Test atmosphere : vapour  
Exposure time : 360 h  
Number of exposures : 7 d  
Method : Subchronic toxicity

Species : Rat, male and female  
NOAEL : 114 mg/kg/d  
Application Route : Skin contact  
Exposure time : 9 600 h

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Number of exposures : 6 d  
Method : Chronic toxicity

### 4,4'-isopropylidenediphenol:

Species : Dog, male and female  
NOEC : 75 mg/kg, 10 mg/m<sup>3</sup>  
Application Route : Ingestion  
Test atmosphere : dust/mist  
Exposure time : 2 160 h  
Number of exposures : 7 d  
Method : Subchronic toxicity

Species : Rat, male and female  
LOAEL : 600 mg/kg  
Application Route : Ingestion  
Exposure time : 672 h  
Number of exposures : 7 d  
Method : Subchronic toxicity

### 2-aminoethanol:

Species : Rat, male and female  
NOEC : 300 mg/m<sup>3</sup>  
Application Route : Ingestion  
Test atmosphere : vapour  
Exposure time : 672 h  
Number of exposures : 7 d  
Method : OECD Test Guideline 412

### Aspiration toxicity

No data available

## 11.2 Information on other hazards

### Endocrine disrupting properties

#### Product:

Assessment : This substance/mixture contains components considered to have endocrine disrupting properties affecting human health, according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100.

### Experience with human exposure

No data available

### Toxicology, Metabolism, Distribution

No data available

### Neurological effects

No data available

### Further information

No data available

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### SECTION 12: Ecological information

#### 12.1 Toxicity

##### Components:

##### **2,2'-iminodiethylamine:**

- Toxicity to fish : LC50 : 430 mg/l  
Exposure time: 96 h  
Test Type: semi-static test  
Test substance: Fresh water  
Method: Directive 67/548/EEC, Annex V, C.1.
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 64,6 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: Regulation (EC) No. 440/2008, Annex, C.2
- EC50 (Daphnia magna (Water flea)): 16 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: DIN 38412
- Toxicity to algae/aquatic plants : EbC50 (Selenastrum capricornutum (green algae)): 1 164 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201
- Toxicity to fish (Chronic toxicity) : NOEC: 10 mg/l  
Exposure time: 28 d  
Test Type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 210
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 5,6 mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Test Type: semi-static test  
Test substance: Fresh water  
Method: Directive 67/548/EEC, Annex V, C.20
- Toxicity to soil dwelling organisms : EC50: > 1 000 mg/kg  
Exposure time: 56 d  
Species: Eisenia fetida (earthworms)  
Method: OECD Test Guideline 222

##### **Ecotoxicology Assessment**

- Acute aquatic toxicity : This product has no known ecotoxicological effects.

##### **4,4'-isopropylidenediphenol:**

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Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 7,5 mg/l  
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 : 3,9 - 10,2 mg/l  
Exposure time: 48 h  
(Ceriodaphnia dubia (Water flea)):

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 2,5 - 3,1 mg/l  
Exposure time: 96 h

Toxicity to fish (Chronic toxicity) : NOEC: 0,016 mg/l  
Exposure time: 444 d  
Species: Pimephales promelas (fathead minnow)  
Test Type: flow-through test  
Test substance: Fresh water  
Method: Fish Life Cycle Toxicity  
Remarks: Toxic to aquatic organisms.

### Ecotoxicology Assessment

Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

### 2-aminoethanol:

Toxicity to fish : LC50 (Cyprinus carpio (Carp)): 349 mg/l  
Exposure time: 96 h  
Test Type: semi-static test  
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 65 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: Directive 67/548/EEC, Annex V, C.2.

Toxicity to algae/aquatic plants : ErC50 : 2,8 mg/l  
Exposure time: 72 h  
Test substance: Fresh water  
Method: OECD Test Guideline 201  
  
NOECr : 1 mg/l  
Exposure time: 72 h  
Test substance: Fresh water  
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity) : NOEC: 1,2 mg/l  
Exposure time: 30 d  
Species: Oryzias latipes (Orange-red killifish)  
Test substance: Fresh water  
Method: OECD Test Guideline 210

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 0,85 mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)

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Test substance: Fresh water  
Method: OECD Test Guideline 211

### 12.2 Persistence and degradability

#### Components:

##### **2,2'-iminodiethylamine:**

Biodegradability : Inoculum: activated sludge  
Result: Readily biodegradable.  
Biodegradation: 87 %  
Exposure time: 21 d  
Method: OECD Test Guideline 301D

Photodegradation : Test Type: Air  
Rate constant: 500000  
Degradation (direct photolysis): 50 %

##### **4,4'-isopropylidenediphenol:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 1 - 2 %  
Exposure time: 28 d

##### **2-aminoethanol:**

Biodegradability : Inoculum: activated sludge  
Concentration: 20 mg/l  
Result: Readily biodegradable.  
Biodegradation: > 90 %  
Exposure time: 21 d  
Method: OECD Test Guideline 301A

Photodegradation : Test Type: Air  
Rate constant: 35.844  
Degradation (direct photolysis): 50 %

### 12.3 Bioaccumulative potential

#### Components:

##### **2,2'-iminodiethylamine:**

Bioaccumulation : Species: Cyprinus carpio (Carp)  
Exposure time: 42 d  
Bioconcentration factor (BCF): 0,3 - 6,3  
Test substance: Fresh water  
Method: flow-through test  
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: -1,58 (20 °C)  
pH: 7

##### **2-aminoethanol:**

Partition coefficient: n-octanol/water : log Pow: -1,31 (25 °C)

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### 12.4 Mobility in soil

#### Components:

##### **2,2'-iminodiethylamine:**

Distribution among : Koc: 19111  
environmental compartments

##### **2-aminoethanol:**

Distribution among : Koc: 1,167  
environmental compartments

### 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 : This substance/mixture contains components considered to have endocrine disrupting properties for environment , according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100.

#### Components:

##### **4,4'-isopropylidenediphenol:**

Assessment : The substance is considered to have endocrine disrupting properties according to REACH Article 57(f) for the environment.

### 12.7 Other adverse effects

#### Product:

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

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

Product : Dispose of contents and container in accordance with all local, regional, national and international regulations.  
Do not dispose of waste into sewer.  
Do not contaminate ponds, waterways or ditches with chemical or used container.

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

### SECTION 14: Transport information

#### 14.1 UN number or ID number

|      |           |
|------|-----------|
| ADN  | : UN 2735 |
| ADR  | : UN 2735 |
| RID  | : UN 2735 |
| IMDG | : UN 2735 |
| IATA | : UN 2735 |

#### 14.2 UN proper shipping name

|      |                                                             |
|------|-------------------------------------------------------------|
| ADN  | : AMINES, LIQUID, CORROSIVE, N.O.S.<br>(DIETHYLENETRIAMINE) |
| ADR  | : AMINES, LIQUID, CORROSIVE, N.O.S.<br>(DIETHYLENETRIAMINE) |
| RID  | : AMINES, LIQUID, CORROSIVE, N.O.S.<br>(DIETHYLENETRIAMINE) |
| IMDG | : AMINES, LIQUID, CORROSIVE, N.O.S.<br>(DIETHYLENETRIAMINE) |
| IATA | : Amines, liquid, corrosive, n.o.s.<br>(DIETHYLENETRIAMINE) |

#### 14.3 Transport hazard class(es)

|      |     |
|------|-----|
| ADN  | : 8 |
| ADR  | : 8 |
| RID  | : 8 |
| IMDG | : 8 |
| IATA | : 8 |

#### 14.4 Packing group

|                              |       |
|------------------------------|-------|
| <b>ADN</b>                   |       |
| Packing group                | : II  |
| Classification Code          | : C7  |
| Hazard Identification Number | : 80  |
| Labels                       | : 8   |
| <b>ADR</b>                   |       |
| Packing group                | : II  |
| Classification Code          | : C7  |
| Hazard Identification Number | : 80  |
| Labels                       | : 8   |
| Tunnel restriction code      | : (E) |

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### RID

Packing group : II  
Classification Code : C7  
Hazard Identification Number : 80  
Labels : 8

### IMDG

Packing group : II  
Labels : 8  
EmS Code : F-A, S-B

### IATA (Cargo)

Packing instruction (cargo aircraft) : 855  
Packing instruction (LQ) : Y840  
Packing group : II  
Labels : Corrosive

### IATA (Passenger)

Packing instruction (passenger aircraft) : 851  
Packing instruction (LQ) : Y840  
Packing group : II  
Labels : Corrosive

## 14.5 Environmental hazards

### ADN

Environmentally hazardous : yes

### ADR

Environmentally hazardous : yes

### RID

Environmentally hazardous : yes

### IMDG

Marine pollutant : yes(4,4'-Isopropylidenediphenol)

## 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 - List of substances subject to authorisation (Annex XIV) : Not applicable

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : 4,4'-isopropylidenediphenol

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Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

H2 ACUTE TOXIC

E2 ENVIRONMENTAL  
HAZARDS

Occupational Illnesses (R- : 51, 49, 49 bis  
461-3, France)

Installations classified for the : 4120, 4511  
protection of the environment  
(Environment Code R511-9)

Other regulations:

Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

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

DSL : All components of this product are on the Canadian DSL

AIIC : On the inventory, or in compliance with the inventory

NZIoC : On the inventory, or in compliance with the inventory

ENCS : 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

TCSI : On the inventory, or in compliance with the inventory

TSCA : All substances listed as active on the TSCA inventory

### Inventories

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AICS (Australia), AIIIC (Australia), DSL (Canada), IECSC (China), ENCS (Japan), KECI (Korea), NZIOC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States of America (USA))

### 15.2 Chemical safety assessment

Chemical Safety Assessments for all substances in this product are either Complete or Not applicable.

## SECTION 16: Other information

### Full text of H-Statements

|       |                                                      |
|-------|------------------------------------------------------|
| H302  | : Harmful if swallowed.                              |
| H312  | : Harmful in contact with skin.                      |
| H314  | : Causes severe skin burns and eye damage.           |
| H317  | : May cause an allergic skin reaction.               |
| H318  | : Causes serious eye damage.                         |
| H330  | : Fatal if inhaled.                                  |
| H332  | : Harmful if inhaled.                                |
| H335  | : May cause respiratory irritation.                  |
| H360F | : May damage fertility.                              |
| H411  | : Toxic to aquatic life with long lasting effects.   |
| H412  | : Harmful to aquatic life with long lasting effects. |

### Full text of other abbreviations

|                     |                                                                                                                        |
|---------------------|------------------------------------------------------------------------------------------------------------------------|
| Acute Tox.          | : Acute toxicity                                                                                                       |
| Aquatic Chronic     | : Chronic aquatic toxicity                                                                                             |
| Eye Dam.            | : Serious eye damage                                                                                                   |
| Repr.               | : Reproductive toxicity                                                                                                |
| Skin Corr.          | : Skin corrosion                                                                                                       |
| Skin Sens.          | : Skin sensitisation                                                                                                   |
| STOT SE             | : Specific target organ toxicity - single exposure                                                                     |
| 2006/15/EC          | : Europe. Indicative occupational exposure limit values                                                                |
| 2017/164/EU         | : Europe. Commission Directive 2017/164/EU establishing a fourth list of indicative occupational exposure limit values |
| FR VLE              | : France. Occupational Exposure Limits (INRS)                                                                          |
| 2006/15/EC / TWA    | : Limit Value - eight hours                                                                                            |
| 2006/15/EC / STEL   | : Short term exposure limit                                                                                            |
| 2017/164/EU / TWA   | : Limit Value - eight hours                                                                                            |
| FR VLE / VME        | : Time Weighted Average                                                                                                |
| FR VLE / VLCT (VLE) | : Short Term Exposure Limit                                                                                            |

### Further information

#### Classification of the mixture:

|               |       |
|---------------|-------|
| Acute Tox. 2  | H330  |
| Acute Tox. 4  | H312  |
| Skin Corr. 1B | H314  |
| Eye Dam. 1    | H318  |
| Skin Sens. 1  | H317  |
| Repr. 1B      | H360F |
| STOT SE 3     | H335  |

#### Classification procedure:

|                    |
|--------------------|
| Calculation method |
| Calculation method |
| Calculation method |
| Calculation method |
| Calculation method |
| Calculation method |
| Calculation method |

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

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## HARDENER 946 US

|         |                |              |                                 |
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Aquatic Chronic 2

H411

Calculation method

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