

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Date of issue: 19/01/2018

Revision date: _____

Version: 1.0

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

1.1. Product identifier

Product form : Mixture
Product name : VOA Additions Standard
Product code : AL0-130175
Product group : Trade product

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

1.2.1. Relevant identified uses

Main use category : Laboratory Use
Industrial/Professional use spec : Industrial
For professional use only
Use of the substance/mixture : Certified reference material for laboratory use only

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Phenova
6390 Joyce Dr. Suite 100
80403 Golden, CO - United States
T 1-866-942-2978 - F 1-866-283-0269
info@phenova.com - www.phenova.com

1.4. Emergency telephone number

Emergency number : ChemTel Assistance (US/Canada) 1-800-255-3924
ChemTel Assistance (International) +1 813-248-0585

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

| | |
|-----------------------|------|
| Flam. Liq. 2 | H225 |
| Acute Tox. 3 (Oral) | H301 |
| Acute Tox. 3 (Dermal) | H311 |
| Carc. 1B | H350 |
| STOT SE 1 | H370 |
| STOT RE 2 | H373 |
| Aquatic Chronic 3 | H412 |
| Ozone | |

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

Carc.Cat.2; R45
F; R11
T; R23/24/25
T; R39/23/24/25
Xn; R48/20
N; R59
R19
R52/53

Full text of R-phrases: see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

2.2. Label elements

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

Hazard pictograms (CLP) :



GHS02

GHS06

GHS08

Signal word (CLP) :

Danger

Hazard statements (CLP) :

H225 - Highly flammable liquid and vapor
H301+H311 - Toxic if swallowed or in contact with skin
H350 - May cause cancer
H370 - Causes damage to organs
H373 - May cause damage to organs through prolonged or repeated exposure
H412 - Harmful to aquatic life with long lasting effects

Precautionary statements (CLP) :

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P233 - Keep container tightly closed
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P264 - Wash hands, forearms and face thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P273 - Avoid release to the environment
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
P302+P352 - IF ON SKIN: Wash with plenty of water
P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water
P308+P313 - IF exposed or concerned: Get medical advice/attention
P361+P364 - Take off immediately all contaminated clothing and wash it before reuse
P370+P378 - In case of fire: Use media other than water to extinguish
P403+P235 - Store in a well-ventilated place. Keep cool
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

EUH phrases :

EUH059 - Hazardous to the ozone layer
EUH208 - Contains acrylonitrile, inhibited(107-13-1). May produce an allergic reaction
EUH019 - May form explosive peroxides

No labeling applicable

2.3. Other hazards

No additional information available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

| Name | Product identifier | % | Classification according to Regulation (EC) No. 1272/2008 [CLP] |
|---|---|-----|--|
| methanol (Component) | (CAS No) 67-56-1 (EC-No.) 200-659-6 (EC index no) 603-001-00-X | 96 | Flam. Liq. 2, H225 Acute Tox. 3 (Oral), H301 Acute Tox. 3 (Dermal), H311 Acute Tox. 3 (Inhalation), H331 STOT SE 1, H370 |
| acrylonitrile, inhibited (Component) | (CAS No) 107-13-1 (EC-No.) 203-466-5 (EC index no) 608-003-00-4 | 0.2 | Flam. Liq. 2, H225 Acute Tox. 3 (Oral), H301 Acute Tox. 2 (Dermal), H310 Acute Tox. 3 (Inhalation), H331 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Carc. 1B, H350 STOT SE 3, H335 Aquatic Chronic 2, H411 |
| carbon disulfide (Component) | (CAS No) 75-15-0 (EC-No.) 200-843-6 (EC index no) 006-003-00-3 | 0.2 | Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Repr. 2, H361fd STOT RE 1, H372 |
| 1-bromo-2-chloroethane (Component) | (CAS No) 107-04-0 (EC-No.) 203-456-0 | 0.2 | Acute Tox. 3 (Oral), H301 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| Name | Product identifier | % | Classification according to Regulation (EC) No. 1272/2008 [CLP] |
|--|--|--|---|
| 1-chlorohexane (Component) | (CAS No) 544-10-5 (EC-No.) 208-859-5 | 0.2 | Flam. Liq. 3, H226 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 Aquatic Acute 1, H400 |
| iodomethane (Component) | (CAS No) 74-88-4 (EC-No.) 200-819-5 (EC index no) 602-005-00-9 | 0.2 | Acute Tox. 3 (Oral), H301 Acute Tox. 4 (Dermal), H312 Acute Tox. 3 (Inhalation), H331 Skin Irrit. 2, H315 Carc. 2, H351 STOT SE 3, H335 Aquatic Acute 1, H400 |
| 1,4-dichloro-2-butene, trans- (Component) | (CAS No) 110-57-6 (EC-No.) 203-779-7 (EC index no) 602-073-00-X | 0.2 | Flam. Liq. 3, H226 Acute Tox. 3 (Oral), H301 Acute Tox. 3 (Dermal), H311 Skin Corr. 1B, H314 Carc. 1B, H350 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 |
| dichlorofluoromethane, liquefied, under pressure (Component) | (CAS No) 75-43-4 (EC-No.) 200-869-8 | 0.2 | Ozone |
| cyclohexane (Component) | (CAS No) 110-82-7 (EC-No.) 203-806-2 (EC index no) 601-017-00-1 | 0.2 | Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 |
| 1,2-dichloro-1,1,2,2-tetrafluoroethane (Component) | (CAS No) 76-14-2 (EC-No.) 200-937-7 | 0.2 | Ozone |
| 2,2,4-trimethylpentane (Component) | (CAS No) 540-84-1 (EC-No.) 208-759-1 (EC index no) 601-009-00-8 | 0.2 | Flam. Liq. 2, H225 Asp. Tox. 1, H304 Skin Irrit. 2, H315 STOT SE 3, H336 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 |
| tert-Butyl Methyl Ether (MTBE) (Component) substance with a Community workplace exposure limit | (CAS No) 1634-04-4 (EC-No.) 216-653-1 (EC index no) 603-181-00-X | 0.2 | Flam. Liq. 2, H225 Skin Irrit. 2, H315 |
| tetrahydrofuran (Component) | (CAS No) 109-99-9 (EC-No.) 203-726-8 (EC index no) 603-025-00-0 | 0.2 | Flam. Liq. 2, H225 Acute Tox. 1 (Oral), H300 Eye Irrit. 2, H319 Carc. 2, H351 STOT SE 3, H335 |
| 1,1,2-trichloro-1,2,2-trifluoroethane (Component) | (CAS No) 76-13-1 (EC-No.) 200-936-1 | 0.2 | Aquatic Chronic 2, H411 Ozone |
| 1,3,5-trichlorobenzene (Component) | (CAS No) 108-70-3 (EC-No.) 203-608-6 | 0.2 | Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 Aquatic Chronic 2, H411 |
| methylcyclohexane (Component) | (CAS No) 108-87-2 (EC-No.) 203-624-3 (EC index no) 601-018-00-7 | 0.2 | Flam. Liq. 2, H225 Asp. Tox. 1, H304 Skin Irrit. 2, H315 STOT SE 3, H336 Aquatic Chronic 2, H411 |
| Name | Product identifier | Specific concentration limits | |
| methanol (Component) | (CAS No) 67-56-1 (EC-No.) 200-659-6 (EC index no) 603-001-00-X | (3 =<C < 10) STOT SE 2, H371 (C >= 10) STOT SE 1, H370 | |
| carbon disulfide (Component) | (CAS No) 75-15-0 (EC-No.) 200-843-6 (EC index no) 006-003-00-3 | (0.2 =<C < 1) STOT RE 2, H373 (C >= 1) STOT RE 1, H372 (C >= 1) Repr. 2, H361fd | |
| 1,4-dichloro-2-butene, trans- (Component) | (CAS No) 110-57-6 (EC-No.) 203-779-7 (EC index no) 602-073-00-X | (C >= 0.01) Carc. 1B, H350 (C >= 5) STOT SE 3, H335 | |
| tetrahydrofuran (Component) | (CAS No) 109-99-9 (EC-No.) 203-726-8 (EC index no) 603-025-00-0 | (C >= 25) Eye Irrit. 2, H319 (C >= 25) STOT SE 3, H335 | |

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general : Never give anything by mouth to an unconscious person. Call a POISON CENTER or doctor/physician. IF exposed or concerned: Get medical advice/attention.
- First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing.

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| | |
|---------------------------------------|---|
| First-aid measures after skin contact | : Rinse skin with water/shower. Remove/Take off immediately all contaminated clothing. Immediately call a poison center or doctor/physician. Wash with plenty of soap and water. Wash contaminated clothing before reuse. |
| First-aid measures after eye contact | : Remove contact lenses, if present and easy to do. Continue rinsing. Rinse cautiously with water for several minutes. Obtain medical attention if pain, blinking or redness persists. |
| First-aid measures after ingestion | : Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention. Immediately call a poison center or doctor/physician. |

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

| | |
|-------------------------------------|---|
| Symptoms/effects after skin contact | : Repeated exposure to this material can result in absorption through skin causing significant health hazard. Toxic in contact with skin. |
| Symptoms/effects after ingestion | : Toxic if swallowed. Swallowing a small quantity of this material will result in serious health hazard. |

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

| | |
|--------------------------------|---|
| Suitable extinguishing media | : Use extinguishing media appropriate for surrounding fire. |
| Unsuitable extinguishing media | : Do not use a heavy water stream. |

5.2. Special hazards arising from the substance or mixture

| | |
|------------------|---|
| Fire hazard | : Highly flammable liquid and vapor. |
| Explosion hazard | : May form flammable/explosive vapor-air mixture. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries. May form explosive peroxides. |

5.3. Advice for firefighters

| | |
|--------------------------------|--|
| Firefighting instructions | : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment. DO NOT fight fire when fire reaches explosives. Evacuate area. |
| Protection during firefighting | : Do not enter fire area without proper protective equipment, including respiratory protection. |

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

| | |
|----------------------|-----------------------------------|
| Emergency procedures | : Evacuate unnecessary personnel. |
|----------------------|-----------------------------------|

6.1.2. For emergency responders

| | |
|----------------------|---|
| Protective equipment | : Equip cleanup crew with proper protection. Avoid breathing dust/fume/gas/mist/vapors/spray. |
| Emergency procedures | : Ventilate area. |

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

| | |
|-------------------------|--|
| Methods for cleaning up | : Take up in absorbent material. Collect spillage. |
|-------------------------|--|

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

| | |
|-----------------------------------|---|
| Additional hazards when processed | : Handle empty containers with care because residual vapors are flammable. Hazardous waste due to potential risk of explosion. |
| Precautions for safe handling | : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor. No open flames. No smoking. Use only non-sparking tools. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from sources of ignition - No smoking. |
| Hygiene measures | : Do not eat, drink or smoke when using this product. Gently wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing. Wash contaminated clothing before reuse. |

7.2. Conditions for safe storage, including any incompatibilities

| | |
|--------------------|---|
| Technical measures | : Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. |
| Storage conditions | : Keep in fireproof place. Keep container tightly closed. Keep container tightly closed and in a well-ventilated place. Keep away from any flames or sparking source. |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Incompatible products : Oxidizing agent.
Incompatible materials : Direct sunlight. Heat sources.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

| acrylonitrile, inhibited (107-13-1) | | |
|-------------------------------------|----------------------------------|---|
| Belgium | Limit value (mg/m ³) | 4.4 mg/m ³ (Acrylonitrile; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Limit value (ppm) | 2 ppm (Acrylonitrile; Belgium; Time-weighted average exposure limit 8 h) |
| France | VLE (mg/m ³) | 32.5 mg/m ³ (Acrylonitrile; France; Short time value; VL: Valeur non réglementaire indicative) |
| France | VLE (ppm) | 15 ppm (Acrylonitrile; France; Short time value; VL: Valeur non réglementaire indicative) |
| France | VME (mg/m ³) | 4.5 mg/m ³ (Acrylonitrile; France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| France | VME (ppm) | 2 ppm (Acrylonitrile; France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 2 ppm (Acrylonitrile; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |
| United Kingdom | WEL TWA (mg/m ³) | 4.4 mg/m ³ Acrylonitrile; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL TWA (ppm) | 2 ppm Acrylonitrile; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |

| carbon disulfide (75-15-0) | | |
|------------------------------|---|--|
| EU | IOELV TWA (mg/m ³) | 15 mg/m ³ (Carbon disulphide; EU; Time-weighted average exposure limit 8 h; Indicative occupational exposure limit value) |
| EU | IOELV TWA (ppm) | 5 ppm (Carbon disulphide; EU; Time-weighted average exposure limit 8 h; Indicative occupational exposure limit value) |
| Belgium | Limit value (mg/m ³) | 3.16 mg/m ³ (Carbone (sulfure de); Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Limit value (ppm) | 1 ppm (Carbone (sulfure de); Belgium; Time-weighted average exposure limit 8 h) |
| France | VLE (mg/m ³) | 75 mg/m ³ (Sulfure de carbone; France; Short time value; VL: Valeur non réglementaire indicative) |
| France | VLE (ppm) | 25 ppm (Sulfure de carbone; France; Short time value; VL: Valeur non réglementaire indicative) |
| France | VME (mg/m ³) | 15 mg/m ³ (Sulfure de carbone; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante) |
| France | VME (ppm) | 5 ppm (Sulfure de carbone; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante) |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 1 ppm (Carbon disulfide; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |
| Netherlands | Grenswaarde TGG 8H (mg/m ³) | 15 mg/m ³ (Zwavelkoolstof; Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value) |
| Netherlands | Grenswaarde TGG 8H (ppm) | 4.74 ppm (Zwavelkoolstof; Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value) |
| United Kingdom | WEL TWA (mg/m ³) | 15 mg/m ³ Carbon disulphide; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL TWA (ppm) | 5 ppm Carbon disulphide; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| cyclohexane (110-82-7) | | |
|---|--|--|
| EU | IOELV TWA (mg/m ³) | 700 mg/m ³ (Cyclohexane; EU; Time-weighted average exposure limit 8 h; Indicative occupational exposure limit value) |
| EU | IOELV TWA (ppm) | 200 ppm (Cyclohexane; EU; Time-weighted average exposure limit 8 h; Indicative occupational exposure limit value) |
| Belgium | Limit value (mg/m ³) | 350 mg/m ³ (Cyclohexane; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Limit value (ppm) | 100 ppm (Cyclohexane; Belgium; Time-weighted average exposure limit 8 h) |
| France | VLE (mg/m ³) | 1300 mg/m ³ (Cyclohexane; France; Short time value; VL: Valeur non réglementaire indicative) |
| France | VLE (ppm) | 375 ppm (Cyclohexane; France; Short time value; VL: Valeur non réglementaire indicative) |
| France | VME (mg/m ³) | 700 mg/m ³ (Cyclohexane; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante) |
| France | VME (ppm) | 200 ppm (Cyclohexane; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante) |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 100 ppm (Cyclohexane; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |
| Netherlands | Grenswaarde TGG 8H (mg/m ³) | 700 mg/m ³ (Cyclohexaan; Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value) |
| Netherlands | Grenswaarde TGG 8H (ppm) | 200 ppm (Cyclohexaan; Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value) |
| Netherlands | Grenswaarde TGG 15MIN (mg/m ³) | 1400 mg/m ³ (Cyclohexaan; Netherlands; Short time value; Public occupational exposure limit value) |
| Netherlands | Grenswaarde TGG 15MIN (ppm) | 400 ppm (Cyclohexaan; Netherlands; Short time value; Public occupational exposure limit value) |
| United Kingdom | WEL TWA (mg/m ³) | 350 mg/m ³ Cyclohexane; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL TWA (ppm) | 100 ppm Cyclohexane; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL STEL (mg/m ³) | 1050 mg/m ³ Cyclohexane; United Kingdom; Short time value; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL STEL (ppm) | 300 ppm Cyclohexane; United Kingdom; Short time value; Workplace exposure limit (EH40/2005) |
| 1,4-dichloro-2-butene, trans- (110-57-6) | | |
| Belgium | Limit value (mg/m ³) | 0.025 mg/m ³ (1,4-Dichloro-2-butène; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Limit value (ppm) | 0.005 ppm (1,4-Dichloro-2-butène; Belgium; Time-weighted average exposure limit 8 h) |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 0.005 ppm (1,4-Dichloro-2-butene; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |
| dichlorofluoromethane, liquefied, under pressure (75-43-4) | | |
| Belgium | Limit value (mg/m ³) | 43 mg/m ³ (Dichlorofluorométhane; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Limit value (ppm) | 10 ppm (Dichlorofluorométhane; Belgium; Time-weighted average exposure limit 8 h) |
| France | VME (mg/m ³) | 40 mg/m ³ (Dichlorofluorométhane (F 21); France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| France | VME (ppm) | 10 ppm (Dichlorofluorométhane (F 21); France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 10 ppm (Dichlorofluoromethane; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |
| United Kingdom | WEL TWA (mg/m ³) | 43 mg/m ³ Dichlorofluoromethane; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| dichlorofluoromethane, liquefied, under pressure (75-43-4) | | |
|---|----------------------------------|---|
| United Kingdom | WEL TWA (ppm) | 10 ppm Dichlorofluoromethane; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| 1,2-dichloro-1,1,2,2-tetrafluoroethane (76-14-2) | | |
| Belgium | Limit value (mg/m ³) | 7092 mg/m ³ (1,2-Dichlorotétrafluoroéthane; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Limit value (ppm) | 1000 ppm (1,2-Dichlorotétrafluoroéthane; Belgium; Time-weighted average exposure limit 8 h) |
| France | VME (mg/m ³) | 7000 mg/m ³ (1,2-Dichlorotétrafluoroéthane (F 114); France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| France | VME (ppm) | 1000 ppm (1,2-Dichlorotétrafluoroéthane (F 114); France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 1000 ppm (Dichlorotetrafluoroethane; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |
| United Kingdom | WEL TWA (mg/m ³) | 7110 mg/m ³ Cryofluorane (INN); United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL TWA (ppm) | 1000 ppm Cryofluorane (INN); United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL STEL (mg/m ³) | 8890 mg/m ³ Cryofluorane (INN); United Kingdom; Short time value; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL STEL (ppm) | 1250 ppm Cryofluorane (INN); United Kingdom; Short time value; Workplace exposure limit (EH40/2005) |
| iodomethane (74-88-4) | | |
| Belgium | Limit value (mg/m ³) | 12 mg/m ³ (Iodométhane; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Limit value (ppm) | 2 ppm (Iodométhane; Belgium; Time-weighted average exposure limit 8 h) |
| France | VME (mg/m ³) | 12 mg/m ³ (Iodométhane; France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| France | VME (ppm) | 2 ppm (Iodométhane; France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 2 ppm (Methyl iodide; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |
| United Kingdom | WEL TWA (mg/m ³) | 12 mg/m ³ Iodomethane; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL TWA (ppm) | 2 ppm Iodomethane; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| 2,2,4-trimethylpentane (540-84-1) | | |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 300 ppm (Octane, all isomers; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |
| methylcyclohexane (108-87-2) | | |
| Belgium | Limit value (mg/m ³) | 1633 mg/m ³ (Méthylcyclohexane; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Limit value (ppm) | 400 ppm (Méthylcyclohexane; Belgium; Time-weighted average exposure limit 8 h) |
| France | VME (mg/m ³) | 1600 mg/m ³ (Méthylcyclohexane; France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| France | VME (ppm) | 400 ppm (Méthylcyclohexane; France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 400 ppm (Methyl cyclohexane; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| tert-Butyl Methyl Ether (MTBE) (1634-04-4) | | |
|---|--|--|
| EU | IOELV TWA (mg/m ³) | 183.5 mg/m ³ (Tertiary-butyl-methyl ether; EU; Time-weighted average exposure limit 8 h; Indicative occupational exposure limit value) |
| EU | IOELV TWA (ppm) | 50 ppm (Tertiary-butyl-methyl ether; EU; Time-weighted average exposure limit 8 h; Indicative occupational exposure limit value) |
| EU | IOELV STEL (mg/m ³) | 367 mg/m ³ (Tertiary-butyl-methyl ether; EU; Short time value; Indicative occupational exposure limit value) |
| EU | IOELV STEL (ppm) | 100 ppm (Tertiary-butyl-methyl ether; EU; Short time value; Indicative occupational exposure limit value) |
| Belgium | Limit value (mg/m ³) | 146 mg/m ³ (Oxyde de méthyle et de tert-butyle; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Limit value (ppm) | 40 ppm (Oxyde de méthyle et de tert-butyle; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Short time value (mg/m ³) | 367 mg/m ³ (Oxyde de méthyle et de tert-butyle; Belgium; Short time value) |
| Belgium | Short time value (ppm) | 100 ppm (Oxyde de méthyle et de tert-butyle; Belgium; Short time value) |
| France | VLE (mg/m ³) | 367 mg/m ³ (Oxyde de tert-butyle et de méthyle; France; Short time value; VRC: Valeur réglementaire contraignante) |
| France | VLE (ppm) | 100 ppm (Oxyde de tert-butyle et de méthyle; France; Short time value; VRC: Valeur réglementaire contraignante) |
| France | VME (mg/m ³) | 183.5 mg/m ³ (Oxyde de tert-butyle et de méthyle; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante) |
| France | VME (ppm) | 50 ppm (Oxyde de tert-butyle et de méthyle; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante) |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 50 ppm (Methyl-tert butyl ether (MTBE); USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |
| Netherlands | Grenswaarde TGG 8H (mg/m ³) | 180 mg/m ³ (tert-Butylmethylether; Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value) |
| Netherlands | Grenswaarde TGG 8H (ppm) | 49 ppm (tert-Butylmethylether; Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value) |
| Netherlands | Grenswaarde TGG 15MIN (mg/m ³) | 360 mg/m ³ (tert-Butylmethylether; Netherlands; Short time value; Public occupational exposure limit value) |
| Netherlands | Grenswaarde TGG 15MIN (ppm) | 98 ppm (tert-Butylmethylether; Netherlands; Short time value; Public occupational exposure limit value) |
| United Kingdom | WEL TWA (mg/m ³) | 183.5 mg/m ³ Methyl-tert-butyl-ether or Tertiary-butyl-methyl-ether; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL TWA (ppm) | 50 ppm Methyl-tert-butyl-ether or Tertiary-butyl-methyl-ether; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL STEL (mg/m ³) | 367 mg/m ³ Methyl-tert-butyl-ether or Tertiary-butyl-methyl-ether; United Kingdom; Short time value; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL STEL (ppm) | 100 ppm Methyl-tert-butyl-ether or Tertiary-butyl-methyl-ether; United Kingdom; Short time value; Workplace exposure limit (EH40/2005) |
| tetrahydrofuran (109-99-9) | | |
| EU | IOELV TWA (mg/m ³) | 150 mg/m ³ (Tetrahydrofuran; EU; Time-weighted average exposure limit 8 h; Indicative occupational exposure limit value) |
| EU | IOELV TWA (ppm) | 50 ppm (Tetrahydrofuran; EU; Time-weighted average exposure limit 8 h; Indicative occupational exposure limit value) |
| EU | IOELV STEL (mg/m ³) | 300 mg/m ³ (Tetrahydrofuran; EU; Short time value; Indicative occupational exposure limit value) |
| EU | IOELV STEL (ppm) | 100 ppm (Tetrahydrofuran; EU; Short time value; Indicative occupational exposure limit value) |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| tetrahydrofuran (109-99-9) | | |
|--|--|--|
| Belgium | Limit value (mg/m ³) | 150 mg/m ³ (Tétrahydrofurane; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Limit value (ppm) | 50 ppm (Tétrahydrofurane; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Short time value (mg/m ³) | 300 mg/m ³ (Tétrahydrofurane; Belgium; Short time value) |
| Belgium | Short time value (ppm) | 100 ppm (Tétrahydrofurane; Belgium; Short time value) |
| France | VLE (mg/m ³) | 300 mg/m ³ (Tétrahydrofurane; France; Short time value; VRC: Valeur réglementaire contraignante) |
| France | VLE (ppm) | 100 ppm (Tétrahydrofurane; France; Short time value; VRC: Valeur réglementaire contraignante) |
| France | VME (mg/m ³) | 150 mg/m ³ (Tétrahydrofurane; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante) |
| France | VME (ppm) | 50 ppm (Tétrahydrofurane; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante) |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 50 ppm (Tetrahydrofuran; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |
| Italy - Portugal - USA ACGIH | ACGIH STEL (ppm) | 100 ppm (Tetrahydrofuran; USA; Short time value; TLV - Adopted Value) |
| Netherlands | Grenswaarde TGG 8H (mg/m ³) | 300 mg/m ³ (Tetrahydrofuraan; Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value) |
| Netherlands | Grenswaarde TGG 8H (ppm) | 100 ppm (Tetrahydrofuraan; Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value) |
| Netherlands | Grenswaarde TGG 15MIN (mg/m ³) | 600 mg/m ³ (Tetrahydrofuraan; Netherlands; Short time value; Public occupational exposure limit value) |
| Netherlands | Grenswaarde TGG 15MIN (ppm) | 200 ppm (Tetrahydrofuraan; Netherlands; Short time value; Public occupational exposure limit value) |
| United Kingdom | WEL TWA (mg/m ³) | 150 mg/m ³ Tetrahydrofuran; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL TWA (ppm) | 50 ppm Tetrahydrofuran; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL STEL (mg/m ³) | 300 mg/m ³ Tetrahydrofuran; United Kingdom; Short time value; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL STEL (ppm) | 100 ppm Tetrahydrofuran; United Kingdom; Short time value; Workplace exposure limit (EH40/2005) |
| 1,1,2-trichloro-1,2,2-trifluoroethane (76-13-1) | | |
| Belgium | Limit value (mg/m ³) | 7781 mg/m ³ (1,1,2-Trichloro-1,2,2-trifluoroéthane; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Limit value (ppm) | 1000 ppm (1,1,2-Trichloro-1,2,2-trifluoroéthane; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Short time value (mg/m ³) | 9729 mg/m ³ (1,1,2-Trichloro-1,2,2-trifluoroéthane; Belgium; Short time value) |
| Belgium | Short time value (ppm) | 1250 ppm (1,1,2-Trichloro-1,2,2-trifluoroéthane; Belgium; Short time value) |
| France | VLE (mg/m ³) | 9500 mg/m ³ (1,1,2-Trichlorotrifluoroéthane (F 113); France; Short time value; VL: Valeur non réglementaire indicative) |
| France | VLE (ppm) | 1250 ppm (1,1,2-Trichlorotrifluoroéthane (F 113); France; Short time value; VL: Valeur non réglementaire indicative) |
| France | VME (mg/m ³) | 7600 mg/m ³ (1,1,2-Trichlorotrifluoroéthane (F 113); France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| France | VME (ppm) | 1000 ppm (1,1,2-Trichlorotrifluoroéthane (F 113); France; Time-weighted average exposure limit 8 h; VL: Valeur non réglementaire indicative) |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 1000 ppm (1,1,2-Trichloro-1,2,2-trifluoroethane; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| 1,1,2-trichloro-1,2,2-trifluoroethane (76-13-1) | | |
|---|---|---|
| Italy - Portugal - USA ACGIH | ACGIH STEL (ppm) | 1250 ppm (1,1,2-Trichloro-1,2,2-trifluoroethane; USA; Short time value; TLV - Adopted Value) |
| methanol (67-56-1) | | |
| EU | IOELV TWA (mg/m ³) | 260 mg/m ³ (Methanol; EU; Time-weighted average exposure limit 8 h; Indicative occupational exposure limit value) |
| EU | IOELV TWA (ppm) | 200 ppm (Methanol; EU; Time-weighted average exposure limit 8 h; Indicative occupational exposure limit value) |
| Belgium | Limit value (mg/m ³) | 266 mg/m ³ (Alcool méthylique; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Limit value (ppm) | 200 ppm (Alcool méthylique; Belgium; Time-weighted average exposure limit 8 h) |
| Belgium | Short time value (mg/m ³) | 333 mg/m ³ (Alcool méthylique; Belgium; Short time value) |
| Belgium | Short time value (ppm) | 250 ppm (Alcool méthylique; Belgium; Short time value) |
| France | VLE (mg/m ³) | 1300 mg/m ³ (Methanol; France; Short time value; VL: Valeur non réglementaire indicative) |
| France | VLE (ppm) | 1000 ppm (Methanol; France; Short time value; VL: Valeur non réglementaire indicative) |
| France | VME (mg/m ³) | 260 mg/m ³ (Methanol; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante) |
| France | VME (ppm) | 200 ppm (Methanol; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante) |
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 200 ppm (Methanol; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value) |
| Italy - Portugal - USA ACGIH | ACGIH STEL (ppm) | 250 ppm (Methanol; USA; Short time value; TLV - Adopted Value) |
| Netherlands | Grenswaarde TGG 8H (mg/m ³) | 133 mg/m ³ (Methanol; Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value) |
| Netherlands | Grenswaarde TGG 8H (ppm) | 100 ppm (Methanol; Netherlands; Time-weighted average exposure limit 8 h; Public occupational exposure limit value) |
| United Kingdom | WEL TWA (mg/m ³) | 266 mg/m ³ Methanol; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL TWA (ppm) | 200 ppm Methanol; United Kingdom; Time-weighted average exposure limit 8 h; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL STEL (mg/m ³) | 333 mg/m ³ Methanol; United Kingdom; Short time value; Workplace exposure limit (EH40/2005) |
| United Kingdom | WEL STEL (ppm) | 250 ppm Methanol; United Kingdom; Short time value; Workplace exposure limit (EH40/2005) |

8.2. Exposure controls

Appropriate engineering controls

: Either local exhaust or general room ventilation is usually required.

Personal protective equipment

: Avoid all unnecessary exposure. Gloves. Protective clothing. Protective goggles. Safety glasses.



Hand protection

: Wear chemically resistant protective gloves. Wear suitable gloves resistant to chemical penetration.

Eye protection

: Chemical goggles or safety glasses. Safety glasses.

Skin and body protection

: Wear chemically protective gloves, lab coat or apron to prevent prolonged or repeated skin contact.

Respiratory protection

: Where exposure through inhalation may occur from use, respiratory protection equipment is recommended.

Other information

: Do not eat, drink or smoke during use.

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

| | |
|---------------------------|-------------------------------------|
| Physical state | : Liquid |
| Color | : Colorless. |
| Odor | : characteristic. |
| pH | : No data available |
| Melting point | : No data available |
| Freezing point | : No data available |
| Boiling point | : No data available |
| Flash point | : No data available |
| Auto-ignition temperature | : No data available |
| Decomposition temperature | : No data available |
| Flammability (solid, gas) | : Highly flammable liquid and vapor |
| Relative density | : No data available |
| Solubility | : No data available |
| Explosive properties | : May form explosive peroxides. |
| Oxidizing properties | : No data available |
| Explosion limits | : No data available |

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Highly flammable liquid and vapor. May form flammable/explosive vapor-air mixture.

10.3. Possibility of hazardous reactions

Reacts vigorously with strong oxidizers and acids.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures. Open flame. Heat. Sparks. Overheating.

10.5. Incompatible materials

Oxidizing agent.

10.6. Hazardous decomposition products

May release flammable gases. May form explosive peroxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Toxic if swallowed. Dermal: Toxic in contact with skin.

| VOA Additions Standard | |
|-------------------------------------|---------------------------|
| ATE CLP (oral) | 94.639 mg/kg body weight |
| ATE CLP (dermal) | 308.793 mg/kg body weight |
| acrylonitrile, inhibited (107-13-1) | |
| LD50 oral rat | 78 mg/kg (Rat) |
| LD50 dermal rat | 148 mg/kg (Rat) |
| LD50 dermal rabbit | 63 mg/kg (Rabbit) |
| LC50 inhalation rat (mg/l) | 0.72 mg/l/4h (Rat) |
| LC50 inhalation rat (ppm) | 333 ppm/4h (Rat) |
| ATE CLP (oral) | 78 mg/kg body weight |
| ATE CLP (dermal) | 63 mg/kg body weight |
| ATE CLP (gases) | 333 ppmV/4h |
| ATE CLP (vapors) | 0.72 mg/l/4h |
| ATE CLP (dust, mist) | 0.72 mg/l/4h |
| 1-bromo-2-chloroethane (107-04-0) | |
| LD50 oral rat | 64 mg/kg (Rat) |
| ATE CLP (oral) | 64 mg/kg body weight |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| | |
|---|--|
| carbon disulfide (75-15-0) | |
| LD50 oral rat | 3188 mg/kg (Rat) |
| ATE CLP (oral) | 3188 mg/kg body weight |
| cyclohexane (110-82-7) | |
| LD50 oral rat | > 12705 mg/kg (Rat; Equivalent or similar to OECD 401; Experimental value; >5000 mg/kg bodyweight; Rat) |
| LD50 dermal rabbit | > 2000 mg/kg body weight (Rabbit; Experimental value; Equivalent or similar to OECD 402) |
| LC50 inhalation rat (mg/l) | > 19.07 mg/l/4h (Rat; Experimental value) |
| LC50 inhalation rat (ppm) | > 5540 ppm/4h (Rat) |
| 1,4-dichloro-2-butene, trans- (110-57-6) | |
| LC50 inhalation rat (mg/l) | 0.45 mg/l/4h (Rat) |
| LC50 inhalation rat (ppm) | 86 ppm/4h (Rat) |
| ATE CLP (oral) | 100 mg/kg body weight |
| ATE CLP (dermal) | 300 mg/kg body weight |
| ATE CLP (gases) | 86 ppmV/4h |
| ATE CLP (vapors) | 0.45 mg/l/4h |
| ATE CLP (dust, mist) | 0.45 mg/l/4h |
| dichlorofluoromethane, liquefied, under pressure (75-43-4) | |
| LC50 inhalation rat (mg/l) | 214 mg/l/4h (Rat) |
| LC50 inhalation rat (ppm) | 49900 ppm/4h (Rat) |
| ATE CLP (gases) | 49900 ppmV/4h |
| ATE CLP (vapors) | 214 mg/l/4h |
| ATE CLP (dust, mist) | 214 mg/l/4h |
| iodomethane (74-88-4) | |
| LD50 oral rat | 7984 mg/kg (Rat; OECD 401: Acute Oral Toxicity; Experimental value; 131,98 mg/kg bodyweight; Rat; OECD 401: Acute Oral Toxicity; Experimental value) |
| LD50 dermal rabbit | > 2000 mg/kg body weight (Rabbit; Experimental value; OECD 402: Acute Dermal Toxicity) |
| LC50 inhalation rat (mg/l) | 401 mg/l/4h (Rat; Calculated value; 1,3 mg/l/4h; Rat) |
| LC50 inhalation rat (ppm) | 691 ppm/4h (Rat; Experimental value) |
| ATE CLP (oral) | 100 mg/kg body weight |
| ATE CLP (dermal) | 1100 mg/kg body weight |
| ATE CLP (gases) | 691 ppmV/4h |
| ATE CLP (vapors) | 3 mg/l/4h |
| ATE CLP (dust, mist) | 0.5 mg/l/4h |
| 2,2,4-trimethylpentane (540-84-1) | |
| LD50 oral rat | > 5000 mg/kg body weight (Rat; OECD 401: Acute Oral Toxicity; Experimental value) |
| LD50 dermal rabbit | > 2000 mg/kg body weight (Rabbit; Experimental value; OECD 402: Acute Dermal Toxicity) |
| LC50 inhalation rat (mg/l) | > 33.52 mg/l/4h (Rat; Experimental value) |
| methylcyclohexane (108-87-2) | |
| LD50 oral rat | > 5840 mg/kg body weight (Rat; OECD 401: Acute Oral Toxicity; Read-across) |
| LD50 dermal rat | > 2800 mg/kg body weight (Rat; Read-across) |
| LD50 dermal rabbit | 86700 mg/kg (Rabbit; Literature study) |
| tert-Butyl Methyl Ether (MTBE) (1634-04-4) | |
| LD50 oral rat | 4000 mg/kg (Rat) |
| LD50 dermal rat | > 6800 mg/kg (Rat) |
| LD50 dermal rabbit | > 10000 mg/kg (Rabbit) |
| LC50 inhalation rat (mg/l) | 85 mg/l/4h (Rat) |
| LC50 inhalation rat (ppm) | 23576 ppm/4h (Rat) |
| ATE CLP (oral) | 4000 mg/kg body weight |
| ATE CLP (gases) | 23576 ppmV/4h |
| ATE CLP (vapors) | 85 mg/l/4h |
| ATE CLP (dust, mist) | 85 mg/l/4h |
| tetrahydrofuran (109-99-9) | |
| LD50 oral rat | 2.3 - 3.6 (Rat; OECD 401: Acute Oral Toxicity; Experimental value; 1650 mg/kg bodyweight; Rat; OECD 401: Acute Oral Toxicity; Experimental value) |
| LD50 dermal rat | > 2000 mg/kg body weight (Rat; Experimental value; OECD 402: Acute Dermal Toxicity) |
| LC50 inhalation rat (mg/l) | 54 mg/l/4h (Rat; Literature study) |
| LC50 inhalation rat (ppm) | 18200 ppm/4h (Rat; Literature study) |
| ATE CLP (oral) | 2.3 mg/kg body weight |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| tetrahydrofuran (109-99-9) | |
|--|--|
| ATE CLP (gases) | 18200 ppmV/4h |
| ATE CLP (vapors) | 54 mg/l/4h |
| ATE CLP (dust, mist) | 54 mg/l/4h |
| 1,3,5-trichlorobenzene (108-70-3) | |
| LD50 oral rat | 800 mg/kg (Rat) |
| ATE CLP (oral) | 800 mg/kg body weight |
| ATE CLP (dermal) | 1100 mg/kg body weight |
| 1,1,2-trichloro-1,2,2-trifluoroethane (76-13-1) | |
| LD50 oral rat | 43000 mg/kg (Rat) |
| LD50 dermal rabbit | > 11000 mg/kg (Rabbit) |
| LC50 inhalation rat (mg/l) | 300 mg/l/4h (Rat) |
| LC50 inhalation rat (ppm) | 38500 ppm/4h (Rat) |
| ATE CLP (oral) | 43000 mg/kg body weight |
| ATE CLP (gases) | 38500 ppmV/4h |
| ATE CLP (vapors) | 300 mg/l/4h |
| ATE CLP (dust, mist) | 300 mg/l/4h |
| methanol (67-56-1) | |
| LD50 oral rat | > 5000 mg/kg (Rat; BASF test; Literature study; 1187-2769 mg/kg bodyweight; Rat; Weight of evidence) |
| LD50 dermal rabbit | 15800 mg/kg (Rabbit; Literature study) |
| LC50 inhalation rat (mg/l) | 85 mg/l/4h (Rat; Literature study) |
| LC50 inhalation rat (ppm) | 64000 ppm/4h (Rat; Literature study) |
| ATE CLP (oral) | 100 mg/kg body weight |
| ATE CLP (dermal) | 300 mg/kg body weight |
| ATE CLP (gases) | 700 ppmV/4h |
| ATE CLP (vapors) | 3 mg/l/4h |
| ATE CLP (dust, mist) | 0.5 mg/l/4h |

| | |
|---|--|
| Skin corrosion/irritation | : Not classified Based on available data, the classification criteria are not met |
| Serious eye damage/irritation | : Not classified Based on available data, the classification criteria are not met |
| Respiratory or skin sensitization | : Not classified Based on available data, the classification criteria are not met |
| Germ cell mutagenicity | : Not classified Based on available data, the classification criteria are not met |
| Carcinogenicity | : May cause cancer. May cause cancer |
| Reproductive toxicity | : Not classified Based on available data, the classification criteria are not met |
| Specific target organ toxicity – single exposure | : Causes damage to organs. |
| Specific target organ toxicity – repeated exposure | : May cause damage to organs through prolonged or repeated exposure. |
| Aspiration hazard | : Not classified Based on available data, the classification criteria are not met |
| Potential Adverse human health effects and symptoms | : Toxic if swallowed. Toxic in contact with skin. |

SECTION 12: Ecological information

12.1. Toxicity

| | |
|-----------------|--|
| Ecology - air | : Dangerous for the ozone layer. |
| Ecology - water | : Harmful to aquatic life with long lasting effects. |

| acrylonitrile, inhibited (107-13-1) | |
|--|---|
| EC50 Daphnia 1 | 7.55 mg/l (EC50; 48 h) |
| LC50 fish 2 | 25 mg/l (LC50; 96 h; Brachydanio rerio) |
| carbon disulfide (75-15-0) | |
| LC50 fish 2 | 4 mg/l (LC50; OECD 203: Fish, Acute Toxicity Test; 96 h; Poecilia reticulata) |
| EC50 Daphnia 2 | 2.1 mg/l (EC50; OECD 202: Daphnia sp. Acute Immobilisation Test; 48 h; Daphnia magna) |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| | |
|--|--|
| carbon disulfide (75-15-0) | |
| Threshold limit algae 1 | 21 mg/l (EC50; OECD 201: Alga, Growth Inhibition Test; 96 h; Chlorella sp.) |
| 1-chlorohexane (544-10-5) | |
| LC50 fish 1 | < 1 mg/l (96 h, Pisces) |
| cyclohexane (110-82-7) | |
| LC50 fish 1 | 4.53 mg/l (LC50; OECD 203: Fish, Acute Toxicity Test; 96 h; Pimephales promelas; Flow-through system; Fresh water; Experimental value) |
| EC50 Daphnia 1 | 0.9 mg/l (EC50; OECD 202: Daphnia sp. Acute Immobilisation Test; 48 h; Daphnia magna; Static system; Fresh water; Experimental value) |
| Threshold limit algae 1 | 3.428 mg/l (EbC50; OECD 201: Alga, Growth Inhibition Test; 72 h; Selenastrum capricornutum) |
| Threshold limit algae 2 | 0.925 mg/l (NOEC; OECD 201: Alga, Growth Inhibition Test; 72 h; Selenastrum capricornutum) |
| iodomethane (74-88-4) | |
| LC50 fish 2 | 1.4 mg/l (LC50; OECD 203: Fish, Acute Toxicity Test; 96 h; Oncorhynchus mykiss; Static system; Fresh water; Experimental value) |
| EC50 Daphnia 2 | 0.57 mg/l (LC50; OECD 202: Daphnia sp. Acute Immobilisation Test; 48 h; Daphnia magna; Semi-static system; Fresh water; Experimental value) |
| Threshold limit algae 2 | 2.55 mg/l (ErC50; OECD 201: Alga, Growth Inhibition Test; 72 h; Pseudokirchneriella subcapitata; Static system; Fresh water; Experimental value) |
| 2,2,4-trimethylpentane (540-84-1) | |
| EC50 Daphnia 1 | 0.4 mg/l (EC50; Other; 48 h; Daphnia magna; Static system; Fresh water; Read-across) |
| Threshold limit algae 1 | 2.943 mg/l (EC50; Other; 72 h; Pseudokirchneriella subcapitata; Fresh water) |
| methylcyclohexane (108-87-2) | |
| LC50 fish 2 | 5.4 mg/l (LC50; 96 h; Salmo gairdneri; Semi-static system) |
| Threshold limit algae 2 | 29 mg/l (ErC50; OECD 201: Alga, Growth Inhibition Test; 72 h; Selenastrum capricornutum; Static system; Fresh water; Read-across) |
| tert-Butyl Methyl Ether (MTBE) (1634-04-4) | |
| LC50 fish 1 | 672 - 706 mg/l (LC50; 96 h; Pimephales promelas) |
| EC50 Daphnia 1 | 651 mg/l (EC50; OECD 202: Daphnia sp. Acute Immobilisation Test; 48 h; Daphnia magna) |
| tetrahydrofuran (109-99-9) | |
| LC50 fish 1 | 2160 mg/l (LC50; Equivalent or similar to OECD 203; 96 h; Pimephales promelas; Flow-through system; Fresh water; Experimental value) |
| Threshold limit algae 2 | 3700 mg/l (EC0; Other; 8 days; Scenedesmus quadricauda; Static system; Fresh water; Experimental value) |
| 1,3,5-trichlorobenzene (108-70-3) | |
| LC50 fish 2 | 5.5 mg/l (LC50; 96 h) |
| 1,1,2-trichloro-1,2,2-trifluoroethane (76-13-1) | |
| EC50 Daphnia 1 | 71 mg/l (EC50; 48 h) |
| LC50 fish 2 | 7.4 mg/l (LC50; 96 h; Salmo gairdneri) |
| methanol (67-56-1) | |
| LC50 fish 1 | 15400 mg/l (LC50; EPA 660/3 - 75/009; 96 h; Lepomis macrochirus; Flow-through system; Fresh water; Experimental value) |
| EC50 Daphnia 1 | > 10000 mg/l (EC50; DIN 38412-11; 48 h; Daphnia magna; Static system; Fresh water; Experimental value) |
| LC50 fish 2 | 10800 mg/l (LC50; 96 h; Salmo gairdneri) |

12.2. Persistence and degradability

| | |
|--|--|
| VOA Additions Standard | |
| Persistence and degradability | May cause long-term adverse effects in the environment. |
| acrylonitrile, inhibited (107-13-1) | |
| Persistence and degradability | Inherently biodegradable. Not readily biodegradable in water. Biodegradable in water. Biodegradable in the soil. |
| Biochemical oxygen demand (BOD) | 0.72 g O ₂ /g substance |
| Chemical oxygen demand (COD) | 1.39 g O ₂ /g substance |
| ThOD | 3.17 g O ₂ /g substance |
| BOD (% of ThOD) | 0.22 |
| carbon disulfide (75-15-0) | |
| Persistence and degradability | Readily biodegradable in water. Biodegradability in soil: no data available. |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| | |
|---|---|
| 1-chlorohexane (544-10-5) | |
| Persistence and degradability | Biodegradability in water: no data available. |
| cyclohexane (110-82-7) | |
| Persistence and degradability | Readily biodegradable in water. Non degradable in the soil. Low potential for adsorption in soil. |
| Biochemical oxygen demand (BOD) | 0.22 g O ₂ /g substance |
| ThOD | 3.425 g O ₂ /g substance |
| BOD (% of ThOD) | < 0.5 (Literature study) |
| dichlorofluoromethane, liquefied, under pressure (75-43-4) | |
| Persistence and degradability | Biodegradability in water: no data available. |
| 1,2-dichloro-1,1,2,2-tetrafluoroethane (76-14-2) | |
| Persistence and degradability | Biodegradability in soil: no data available. |
| iodomethane (74-88-4) | |
| Persistence and degradability | Not readily biodegradable in water. Highly mobile in soil. Photolysis in the air. |
| 2,2,4-trimethylpentane (540-84-1) | |
| Persistence and degradability | Not readily biodegradable in water. Non degradable in the soil. |
| ThOD | 3.5 g O ₂ /g substance |
| methylcyclohexane (108-87-2) | |
| Persistence and degradability | Not readily biodegradable in water. Low potential for adsorption in soil. |
| tert-Butyl Methyl Ether (MTBE) (1634-04-4) | |
| Persistence and degradability | Not readily biodegradable in water. |
| tetrahydrofuran (109-99-9) | |
| Persistence and degradability | Readily biodegradable in water. Biodegradable in the soil. Highly mobile in soil. |
| Chemical oxygen demand (COD) | 1.855 g O ₂ /g substance |
| ThOD | 2.44 g O ₂ /g substance |
| 1,3,5-trichlorobenzene (108-70-3) | |
| Persistence and degradability | Not readily biodegradable in water. |
| Biochemical oxygen demand (BOD) | 0 g O ₂ /g substance |
| BOD (% of ThOD) | 0 |
| 1,1,2-trichloro-1,2,2-trifluoroethane (76-13-1) | |
| Persistence and degradability | Not readily biodegradable in water. Biodegradable in the soil under anaerobic conditions. |
| methanol (67-56-1) | |
| Persistence and degradability | Readily biodegradable in water. Biodegradable in the soil. Highly mobile in soil. |
| Biochemical oxygen demand (BOD) | 0.6 - 1.12 g O ₂ /g substance |
| Chemical oxygen demand (COD) | 1.42 g O ₂ /g substance |
| ThOD | 1.5 g O ₂ /g substance |
| BOD (% of ThOD) | 0.8 (Literature study) |
| 12.3. Bioaccumulative potential | |
| VOA Additions Standard | |
| Bioaccumulative potential | Not established. |
| acrylonitrile, inhibited (107-13-1) | |
| BCF fish 1 | 48 (BCF; 672 h; Lepomis macrochirus) |
| Log Pow | -0.9 - 0.3 (Experimental value) |
| Bioaccumulative potential | Low potential for bioaccumulation (BCF < 500). |
| 1-bromo-2-chloroethane (107-04-0) | |
| Log Pow | 1.62 |
| Bioaccumulative potential | Low potential for bioaccumulation (Log Kow < 4). |
| carbon disulfide (75-15-0) | |
| BCF fish 1 | 4.3 - 8 (BCF) |
| BCF fish 2 | < 60 (BCF) |
| Log Pow | 1.94 (Experimental value) |
| Bioaccumulative potential | Low potential for bioaccumulation (BCF < 500). |
| 1-chlorohexane (544-10-5) | |
| Bioaccumulative potential | No bioaccumulation data available. |
| cyclohexane (110-82-7) | |
| BCF fish 2 | 31 - 129 (BCF; 8 weeks; Cyprinus carpio) |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| | |
|---|---|
| cyclohexane (110-82-7) | |
| Log Pow | 3.44 (Experimental value; 25 °C) |
| Bioaccumulative potential | Low potential for bioaccumulation (BCF < 500). |
| 1,4-dichloro-2-butene, trans- (110-57-6) | |
| Log Pow | 2.11 - 2.6 (QSAR) |
| Bioaccumulative potential | Low potential for bioaccumulation (Log Kow < 4). |
| dichlorofluoromethane, liquefied, under pressure (75-43-4) | |
| Log Pow | 1.55 (Experimental value) |
| Bioaccumulative potential | Low potential for bioaccumulation (Log Kow < 4). |
| 1,2-dichloro-1,1,2,2-tetrafluoroethane (76-14-2) | |
| Log Pow | 2.82 |
| Bioaccumulative potential | Low potential for bioaccumulation (Log Kow < 4). |
| iodomethane (74-88-4) | |
| Log Pow | 1.57 (Experimental value; OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method) |
| Bioaccumulative potential | Low potential for bioaccumulation (Log Kow < 4). |
| 2,2,4-trimethylpentane (540-84-1) | |
| BCF fish 2 | 231 (BCF) |
| Log Pow | 4.08 - 5.18 (Calculated; KOWWIN) |
| methylcyclohexane (108-87-2) | |
| BCF fish 1 | 95 - 321 (BCF; 8 weeks; Cyprinus carpio) |
| Log Pow | 3.88 (Literature) |
| Bioaccumulative potential | Low potential for bioaccumulation (BCF < 500). |
| tert-Butyl Methyl Ether (MTBE) (1634-04-4) | |
| BCF fish 1 | 1.5 (BCF; 672 h) |
| Log Pow | 1.06 (Experimental value) |
| Bioaccumulative potential | Low potential for bioaccumulation (BCF < 500). |
| tetrahydrofuran (109-99-9) | |
| Log Pow | 0.45 (Experimental value; OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method; 25 °C) |
| Bioaccumulative potential | Low potential for bioaccumulation (Log Kow < 4). |
| 1,3,5-trichlorobenzene (108-70-3) | |
| BCF fish 1 | 150 - 1700 (BCF) |
| BCF fish 2 | 1800 (BCF) |
| BCF other aquatic organisms 1 | 0.00012 (BCF) |
| BCF other aquatic organisms 2 | 250 (BCF) |
| Log Pow | 4.2 |
| Bioaccumulative potential | Potential for bioaccumulation (500 ≤ BCF ≤ 5000). |
| 1,1,2-trichloro-1,2,2-trifluoroethane (76-13-1) | |
| BCF fish 1 | 11 - 86 (BCF) |
| Log Pow | 1.66 - 3.3 (Calculated) |
| Bioaccumulative potential | Low potential for bioaccumulation (BCF < 500). |
| methanol (67-56-1) | |
| BCF fish 1 | < 10 (BCF; 72 h; Leuciscus idus) |
| Log Pow | -0.77 (Experimental value; Other) |
| Bioaccumulative potential | Low potential for bioaccumulation (BCF < 500). |
| 12.4. Mobility in soil | |
| acrylonitrile, inhibited (107-13-1) | |
| Surface tension | 0.027 N/m (20 °C) |
| carbon disulfide (75-15-0) | |
| Surface tension | 0.032 N/m (20 °C) |
| cyclohexane (110-82-7) | |
| Surface tension | 0.025 N/m (20 °C) |
| Log Koc | log Koc, Other; 2.89; QSAR; Koc; Other; 770; QSAR |
| 1,4-dichloro-2-butene, trans- (110-57-6) | |
| Surface tension | 0.024 N/m (20 °C) |
| Log Koc | log Koc, 2.33; Experimental value; Other isomer |

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| | |
|---|---|
| dichlorodifluoromethane, liquefied, under pressure (75-43-4) | |
| Surface tension | 0.023 N/m (0 °C) |
| iodomethane (74-88-4) | |
| Surface tension | 0.026 N/m (43 °C) |
| Log Koc | log Koc, OECD 106: Adsorption/Desorption Using a Batch Equilibrium Method; 1.15 - 1.79; Experimental value; GLP |
| 2,2,4-trimethylpentane (540-84-1) | |
| Log Koc | log Koc, SRC PCKOCWIN v2.0; 2.58; Calculated value; Koc; SRC PCKOCWIN v2.0; 240.3; Calculated value |
| methylcyclohexane (108-87-2) | |
| Log Koc | log Koc, SRC PCKOCWIN v2.0; 2.369; Calculated value |
| tert-Butyl Methyl Ether (MTBE) (1634-04-4) | |
| Surface tension | 0.02 N/m (20 °C) |
| tetrahydrofuran (109-99-9) | |
| Surface tension | 0.028 N/m |
| Log Koc | log Koc, 1.26 - 1.37; Experimental value |
| 1,1,2-trichloro-1,2,2-trifluoroethane (76-13-1) | |
| Surface tension | 0.023 N/m |
| methanol (67-56-1) | |
| Surface tension | 0.023 N/m (20 °C) |
| Log Koc | Koc, PCKOCWIN v1.66; 1; Calculated value |

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

Additional information : Avoid release to the environment

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations : Dispose in a safe manner in accordance with local/national regulations.
Additional information : Handle empty containers with care because residual vapors are flammable. Hazardous waste due to potential risk of explosion.
Ecology - waste materials : Avoid release to the environment. Hazardous waste due to toxicity.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No. (ADR) : 1992
UN-No. (IATA) : 1992
UN-No. (IMDG) : 1992
UN-No. (ADN) : 1992

14.2. UN proper shipping name

Proper Shipping Name (ADR) : FLAMMABLE LIQUID, TOXIC, N.O.S.
Proper Shipping Name (IATA) : Flammable liquid, toxic, n.o.s.
Proper Shipping Name (IMDG) : FLAMMABLE LIQUID, TOXIC, N.O.S.
Proper Shipping Name (ADN) : FLAMMABLE LIQUID, TOXIC, N.O.S.
Transport document description (ADR) : UN 1992 FLAMMABLE LIQUID, TOXIC, N.O.S., 3 (6.1), II, (D/E)

14.3. Packing group

Class (ADR) : 3
Classification code (ADR) : FT1
Class (IATA) : 3
Class (IMDG) : 3
Class (ADN) : 3
Classification code (ADN) : FT1
Subsidiary risks (ADR) : 6.1
Subsidiary risks (IMDG) : 6.1

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Hazard labels (ADR) : 3, 6.1



Hazard labels (IATA) : 3, 6.1



Hazard labels (IMDG) : 3, 6.1



Hazard labels (ADN) : 3, 6.1



14.4. Packing group

Packing group (ADR) : II
Packing group (IATA) : II
Packing group (IMDG) : II
Packing group (ADN) : II

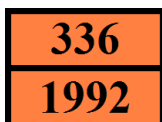
14.5. Environmental hazards

Other information : No supplementary information available.

14.6. Special precautions for user

14.6.1. Overland transport

Hazard identification number (Kemler No.) : 336
Classification code (ADR) : FT1
Orange plates :



Special provision (ADR) : 274
Transport category (ADR) : 2
Tunnel restriction code (ADR) : D/E
Limited quantities (ADR) : 1I
Excepted quantities (ADR) : E2

14.6.2. Transport by sea

Special provision (IMDG) : 274
Limited quantities (IMDG) : 1 L
Excepted quantities (IMDG) : E2
Packing instructions (IMDG) : P001
IBC packing instructions (IMDG) : IBC02
Tank instructions (IMDG) : T7
Tank special provisions (IMDG) : TP2, TP13
EmS-No. (Fire) : F-E
EmS-No. (Spillage) : S-D
Stowage category (IMDG) : B
Properties and observations (IMDG) : Flammable toxic liquid which is not specified by name in this class or, on account of its characteristics, in some other class. Toxic if swallowed, by skin contact or by inhalation.

14.6.3. Air transport

CAO packing instructions (IATA) : 364
CAO max net quantity (IATA) : 60L

VOA Additions Standard

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

| | |
|--|--------|
| PCA packing instructions (IATA) | : 352 |
| PCA Limited quantities (IATA) | : Y341 |
| PCA limited quantity max net quantity (IATA) | : 1L |
| PCA max net quantity (IATA) | : 1L |
| PCA Excepted quantities (IATA) | : E2 |
| Special provision (IATA) | : A3 |
| ERG code (IATA) | : 3HP |

14.6.4. Inland waterway transport

| | |
|-----------------------------------|----------------------|
| Special provision (ADN) | : 274, 802 |
| Limited quantities (ADN) | : 1 L |
| Excepted quantities (ADN) | : E2 |
| Carriage permitted (ADN) | : T |
| Equipment required (ADN) | : PP, EP, EX, TOX, A |
| Ventilation (ADN) | : VE01, VE02 |
| Number of blue cones/lights (ADN) | : 2 |
| Carriage prohibited (ADN) | : No |

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

Contains no REACH substances with Annex XVII restrictions

Contains no REACH candidate substance

Contains no REACH Annex XIV substances.

15.1.2. National regulations

Germany

Water hazard class (WGK) : 3 - strongly hazardous to water

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Data sources : REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Other information : None.

PHV SDS EU

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