# SAFETY DATA SHEET

TMB ELISA SUBSTRATE STANDARD SOLUTION



Compilation date: 05/03/2019

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Revision No: 1

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

### 1.1. Product identifier

Product name: TMB ELISA SUBSTRATE STANDARD SOLUTION

REACH registered number(s): SVHC;01-2119472430-46-XXXX

EINECS number: 212-828-1

Product code: UP664780 / UP664781 / UP664782

Synonyms: N-METHYL-2-PYRROLIDONE (NMP)

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

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

Company name: Interchim

211 bis av JF Kennedy - BP1140

03103 Montluçon cedex

France

Tel: 00 33 (0)470038855

Fax: 00 33 (0)470038260

Email: interchim@interchim.com

### 1.4. Emergency telephone number

## Section 2: Hazards identification

### 2.1. Classification of the substance or mixture

Classification under CLP: Skin Irrit. 2: H315; Eye Irrit. 2: H319; Repr. 1B: H360D; Acute Tox. 4: H302; Skin Corr. 1B: H314; Acute Tox. 4: H332

Most important adverse effects: Harmful if swallowed. Causes severe skin burns and eye damage. Causes skin irritation. Causes serious eye irritation. Harmful if inhaled. May damage the unborn child.

### 2.2. Label elements

Label elements:

Hazard statements: H302: Harmful if swallowed.

H314: Causes severe skin burns and eye damage.

H315: Causes skin irritation.

H319: Causes serious eye irritation.

H332: Harmful if inhaled.

H360D: May damage the unborn child.

Hazard pictograms: GHS07: Exclamation mark

GHS08: Health hazard

[cont...]

Signal words: Danger

Precautionary statements: P201: Obtain special instructions before use.

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

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P302+P352: IF ON SKIN: Wash with plenty of water.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

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

P321: Specific treatment (see supplemental first aid instruction on this label)

P362+P364: Take off contaminated clothing and wash it before reuse.

P405: Store locked up.

P501: Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

### 2.3. Other hazards

PBT: This product is not identified as a PBT/vPvB substance.

## Section 3: Composition/information on ingredients

### 3.2. Mixtures

Hazardous ingredients:

N-METHYL-2-PYRROLIDONE - REACH registered number(s): SVHC;01-2119472430-46-XXXX

| EINECS | CAS | CLP Classification | SCL or M-Factor | Percent |
|---|---|---|---|---|
| 212-828-1 | 872-50-4 | Skin Irrit. 2: H315; Eye Irrit. 2: H319<br>Repr. 1B: H360D; STOT SE 3: H335; | - | <5 % |

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|---|---|---|---|---|
| 231-765-0 | 7722-84-1 | Ox. Sol. 1: H271 ; Acute Tox. 4: H302<br>Skin Corr. 1A, H314<br>Acute Tox. 4: H332 | STOT SE 3; H335; C ≥ 35 %<br>Eye Dam. 1; H318: 8 % ≤ C < 50 %<br>Eye Irrit. 2; H319: 5 % ≤ C < 8 %<br>Ox. Liq. 1; H271:C ≥ 70 %<br>Ox. Liq. 2; H272:50 % ≤ C < 70 %<br>Skin Corr. 1A; H314:C ≥ 70 %<br>Skin Corr. 1B; H314:50 % ≤ C < 70 %<br>Skin Irrit. 2; H315:35 % ≤ C < 50 % | <1% |

## Section 4: First aid measures

### 4.1. Description of first aid measures

Skin contact: Remove all contaminated clothes and footwear immediately unless stuck to skin. Wash immediately with plenty of soap and water.

Eye contact: Bathe the eye with running water for 15 minutes. Transfer to hospital for specialist examination.

Ingestion: Do not induce vomiting. Wash out mouth with water. Never give anything by mouth to an unconscious person Consult a doctor.

[cont...]

Inhalation: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing Consult a doctor.

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

Skin contact: There may be irritation and redness at the site of contact.

Eye contact: There may be pain and redness. The eyes may water profusely. There may be severe pain. The vision may become blurred. May cause permanent damage. May cause harm to the unborn child

Ingestion: There may be soreness and redness of the mouth and throat. Nausea and stomach pain may occur. There may be vomiting and diarrhoea.

Inhalation: There may be irritation of the throat with a feeling of tightness in the chest. May cause harm to the unborn child

Delayed / immediate effects: Rats exposed to 1-methyl-2-pyrrolidinone at a concentration of 1 mg/L as an aerosol for 10 days showed depletion of hematopoietic cells in the bone marrow and atrophy of the lymphoid tissues of the thymus, spleen, and lymph nodes.

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

Immediate / special treatment: Show this safety data sheet to the doctor in attendance.

## Section 5: Fire-fighting measures

### 5.1. Extinguishing media

Extinguishing media: Suitable extinguishing media for the surrounding fire should be used. Water spray. Water fog. Alcohol resistant foam. Dry chemical powder. Carbon dioxide. Unsuitable extinguishing media: high volume water jet

### 5.2. Special hazards arising from the substance or mixture

Exposure hazards: In confined spaces, sewers, etc., the vapours may collect to form explosive mixtures with air Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback Gives off irritating or toxic fumes (or gases) in a fire.
Decomposition products may include nitrogen and carbon oxides

### 5.3. Advice for fire-fighters

Advice for fire-fighters: Keep container(s) exposed to fire cool, by spraying with water Collect contaminated fire extinguishing water separately. This MUST not be discharged into drains.
Prevent fire extinguishing water from contaminating surface or ground water Smoke from fires is toxic. Take precautions to protect personnel from exposure Special protective equipment: Wear self-contained breathing apparatus (SCBA). Wear full protective clothing including chemical protection suit.

## Section 6: Accidental release measures

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

Personal precautions: Do not attempt to take action without suitable protective clothing - see section 8 of SDS.

[cont...]

Mark out the contaminated area with signs and prevent access to unauthorised personnel. Refer to section 8 of SDS for personal protection details. Turn leaking containers leak-side up to prevent the escape of liquid. In confined spaces, sewers, etc., the vapours may collect to form explosive mixtures with air Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback Eliminate all sources of ignition. Personal precautions for non-emergency personnel: Wear protective clothing as per section 8; Avoid contact with skin and eyes; Avoid breathing vapours, mist or gas; Contaminated clothing should be laundered before reuse Wash thoroughly after dealing with spillage; Eyewash bottles
should be available Personal precautions for emergency responders: Evacuate the area and keep personnel upwind; Wear self-contained breathing apparatus (SCBA); Wear chemical protection suit; Butyl rubber or nitrile rubber are recommended

### 6.2. Environmental precautions

Environmental precautions: Do not discharge into drains or rivers. Contain the spillage using bunding.

### 6.3. Methods and material for containment and cleaning up

Clean-up procedures:
- In case of leakage, eliminate all ignition sources.
- Stop leak if safe to do so. - Small spills
Wipe up spillage with damp absorbent cloth or towel
Place in sealable container
Remove contaminated material to safe location for subsequent disposal - Large spills
Absorb spillage in inert material and shovel up
Place in sealable container
Seal containers and label them
Remove contaminated material to safe location for subsequent disposal Ventilate the area and wash spill site after material pick-up is complete

### 6.4. Reference to other sections

Reference to other sections:
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal informati

## Section 7: Handling and storage

### 7.1. Precautions for safe handling

Handling requirements: Avoid direct contact with the substance. Ensure there is sufficient ventilation of the area. Avoid the formation or spread of mists in the air. Keep away from heat and sources of ignition
Take precautionary measures against static discharges
Females of childbearing age should not come into contact with the product
Do not eat, drink or smoke when using this product. Do not get in eyes, on skin, or on

[cont...]

clothing.

Always wear gloves when using this product

Do not breathe vapour/fumes

Use local exhaust ventilation and/or enclosures In case of inadequate ventilation wear respiratory protection.- Wash thoroughly after handling.

Contaminated clothing should be laundered before reuse

Eyewash bottles should be available

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

Storage conditions: Store in a cool, well ventilated area. Keep container tightly closed. Keep away from direct sunlight. Store at 4 - 8 °C Keep away from oxidisers, heat, flames or ignition sources

Keep away from food, drink and animal feedingstuffs

Keep away from acids and alkalis

Keep away from reducing agents

### 7.3. Specific end use(s)

## Section 8: Exposure controls/personal protection

### 8.1. Control parameters

Workplace exposure limits: Respirable dust

| State | 8 hour TWA | 15 min. STEL | 8 hour TWA | 15 min. STEL |
|---|---|---|---|---|
| EU | 10 ppm/40mg.m3 | 20 ppm/80mg.m3 | - | - |

Hazardous ingredients:

N-METHYL-2-PYRROLIDONE

Workplace exposure limits: Respirable dust

| State | 8 hour TWA | 15 min. STEL | 8 hour TWA | 15 min. STEL |
|---|---|---|---|---|
| UK | 40 mg/m3 | 80 mg/m3 | - | - |

### DNEL/PNEC Values

Hazardous ingredients:

N-METHYL-2-PYRROLIDONE

| Type | Exposure | Value | Population | Effect |
|---|---|---|---|---|
| DNEL | Inhalation | 14.4 mg/m3 | Workers | Systemic |
| DNEL | Inhalation | 40 mg/m3 | Workers | Local |
| DNEL | Dermal | 4.8 mg/kg(bw/day) | Workers | Systemic |
| PNEC | Fresh water | 250 µg/l | - | - |

[cont...]

| | | | | |
|---|---|---|---|---|
| PNEC | aqua (intermittent releases, freshwater) | 5 mg/l | - | - |
| PNEC | Marine water | 25 µg/l | - | - |
| PNEC | STP | 10 mg/l | - | - |
| PNEC | Fresh water sediments | 1.09 mg/kg | - | - |
| PNEC | Marine sediments | 109 µg/kg | - | - |
| PNEC | terrestrial (soil) | 70.1 µg/kg | - | - |
| (EU) OELV | long term TWA | 10 ppm 40 mg/m³ | - | - |
| (EU) OELV | short term limit value | 20 ppm 80 mg/m³ | - | - |

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| Type | Exposure | Value | Population | Effect |
|---|---|---|---|---|
| WEL | long term (UK) | 1 ppm 1.4 mg/m³ | - | - |
| WEL | short term limit value (UK) | 2 ppm 2.8 mg/m³ | - | - |
| DNEL | Inhalation (Long Term) | 1.4 mg/m³ | Workers | Local |
| DNEL | Inhalation (Acute/Short Term) | 3 mg/m³ | Workers | Local |
| PNEC | Fresh water | 12.6 ug/l | - | - |
| PNEC | aqua (intermittent releases, freshwater) | 13.8 ug/l | - | - |
| PNEC | Marine water | 12.6 ug/l | - | - |
| PNEC | STP | 4.66 mg/l | - | - |
| PNEC | Fresh water sediments | 474 ug/kg | - | - |
| PNEC | Marine sediments | 47 ug/kg | - | - |
| PNEC | terrestrial (soil) | 2.3 ug/kg | - | - |

## 8.2. Exposure controls

Engineering measures: Ensure there is sufficient ventilation of the area. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: Self-contained breathing apparatus must be available in case of emergency. In case of insufficient ventilation, wear suitable respiratory equipment
Where a reusable half mask respirator is required, use EN 140, with gas/vapour filter EN 14387 type ABEK, or EN 405; EN 1827 Where a full face mask respirator is required, use EN 136, with gas/vapour filter EN 14387 type ABEK

Hand protection: Protective gloves. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and standard EN 374 Butyl rubber or nitrile rubber are recommended Breakthrough time is dependent on the characteristics of the brand of glove used and the supplier should be consulted Glove material: Butyl rubber
Thickness: 0.5 mm
Breakthrough time: >240 minutes
Reference: ECHA Gloves must be changed regularly e.g. every 30 minutes or when torn, punctured, or contaminated

[cont...]

Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product

Eye protection: Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection: Protective clothing.

Environmental: Keep the product away from drains, water courses or the soil. Clean spillages in a safe way as soon as possible.

## Section 9: Physical and chemical properties

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

State: Liquid

Colour: Colourless

Odour: no data available

Evaporation rate: No data available.

Oxidising: No data available.

Solubility in water: (NMP) 1 000 g/l at 20 °C

Viscosity: No data available.

Melting point/range°C: No data available.

upper: NMP: 9.5 % (in air)

Vapour pressure: 32 Pa @ 20 °C (NMP)

pH: No data available.

Flammability limits %: lower: NMP: 1.3 % (in air)

Flash point°C: No data available.

Relative density: No data available.

### 9.2. Other information

Other information: Partition Coefficient (n-Octanol/Water): Log Pow: NMP -0.46 @ 25 °C, Hydrogen peroxide -1.57 @ 20 °C Vapour Density: 3.42 (Air = 1.0) (NMP)

## Section 10: Stability and reactivity

### 10.1. Reactivity

Reactivity: No hazardous reactions known if used for its intended purpose

### 10.2. Chemical stability

Chemical stability: Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

Hazardous reactions: VIOLENT REACTION with: Strong oxidiser, Strong alkali, Strong acid

### 10.4. Conditions to avoid

Conditions to avoid: Heat. Flames. Hot surfaces. Sources of ignition. Sparks

### 10.5. Incompatible materials

Materials to avoid: Strong oxidising agents. Reducing agents. Strong acids. Bases.

[cont...]

### 10.6. Hazardous decomposition products

Haz. decomp. products: In combustion emits toxic fumes. In combustion emits toxic fumes of carbon dioxide. In combustion emits toxic fumes of nitrogen oxides.

## Section 11: Toxicological information

### 11.1. Information on toxicological effects

Acute Toxicity

Based on available data, the classification criteria are not met
ATE mix (oral) (calculated) > 2 000 mg/kg
ATE mix (inhal) (calculated) > 5 mg/l/4h (aerosol/mist)
ATE mix (dermal) (calculated) > 2 000 mg/kg

* Toxicity values:

| Route | Species | Test | Value | Units |
|---|---|---|---|---|
| VAPOURS | RAT | 4H LC50 | 5.1 | mg/l |
| DERMAL | RBT | LD50 | 2000-4000 | mg/kg |
| ORAL | RAT | LD50 | 3600 | mg/kg |

Hazardous ingredients:

N-METHYL-2-PYRROLIDONE

| | | | | |
|---|---|---|---|---|
| DERMAL | RAT (Effect on developmental toxicity | NOAEL | 237 | mg/kg bw/day |
| DERMAL | RBT | LD50 | 5000 | mg/kg (rat) |
| INHALATION | RAT | LD50 | 5.1 | mg/l (4Hr) |
| ORAL | RAT | NOAEL | 169 | mg/kg bw/day |
| INHALATION | RAT | NOAEC | 400 | mg/m³ |
| INHALATION | RAT (Effect on fertility) | NOAEC | 478 | mg/m³ |
| ORAL | RAT | LD50 | 4150 | mg/kg |
| ORAL | RAT | NOAEL | 678 | mg/kg bw/day |
| ORAL | RAT (Effect on developmental toxoci | NOAEL | 125 | mg/kg bw/day |
| DERMAL | RBT | NOAEL | 826 | mg/kg bw/day |
| ORAL | RAT (Effect on fertility)) | NOAEL | 350 | mg/kg bw/day |
| INHALATION | RAT (Effect on developmental toxicity) | NOAEC | 360 | mg/m³ |
| INHALATION | RAT | NOAEL | 500-1000 | mg/m³ air |

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|---|---|---|---|---|
| - | - | - | No | - |
| DERMAL | RBT | LD50 | 2000 | mg/kg |
| INHALATION | RAT | NOAEL | 2.9 | mg/m³ air |
| ORAL | RAT | LD50 | 693.7 - 1 270 | mg/kg |

Relevant hazards for product:

| Hazard | Route | Basis |
|---|---|---|
| Skin corrosion/irritation | DRM | No hazard: calculated |

[cont...]

| | | |
|---|---|---|
| Serious eye damage/irritation | OPT | Hazardous: calculated |
| Reproductive toxicity | -- | Hazardous: calculated |

### Symptoms / routes of exposure

Skin contact: There may be irritation and redness at the site of contact.

Eye contact: There may be pain and redness. The eyes may water profusely. There may be severe pain. The vision may become blurred. May cause permanent damage. May cause harm to the unborn child

Ingestion: There may be soreness and redness of the mouth and throat. Nausea and stomach pain may occur. There may be vomiting and diarrhoea.

Inhalation: There may be irritation of the throat with a feeling of tightness in the chest. May cause harm to the unborn child

Delayed / immediate effects: Rats exposed to 1-methyl-2-pyrrolidinone at a concentration of 1 mg/L as an aerosol for 10 days showed depletion of hematopoietic cells in the bone marrow and atrophy of the lymphoid tissues of the thymus, spleen, and lymph nodes.

## Section 12: Ecological information

### 12.1. Toxicity

Hazardous ingredients:

N-METHYL-2-PYRROLIDONE

| | | | |
|---|---|---|---|
| AQUATIC ALGAE | 72H ErC50 | 600.5 - 672.8 | mg/l |
| AQUATIC INVERTEBRATES | 96H ErC50 | 1.107 | g/l |
| FISH | 96H LC50 | 500 | mg/l |

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| | | | |
|---|---|---|---|
| AQUATIC ALGAE | 72H ErC50 | 1.38 | mg/l |
| AQUATIC INVERTEBRATES | 48H EC50 | 2.4 | mg/l |
| FISH | 96H LC50 | 16.4 | mg/l |

### 12.2. Persistence and degradability

Persistence and degradability: Biodegradable.

### 12.3. Bioaccumulative potential

Bioaccumulative potential: No bioaccumulation potential.

### 12.4. Mobility in soil

Mobility: Soluble in water.

### 12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

[cont...]

### 12.6. Other adverse effects

Other adverse effects: Negligible ecotoxicity.

## Section 13: Disposal considerations

### 13.1. Waste treatment methods

Disposal operations: Waste Codes in accordance with the European Waste catalogue (EWC) are origin-defined. Since this product is used in several industries, no Waste Code can be provided by the supplier. The Waste Code should be determined in arrangement with your waste disposal partner or the responsible authority. Hazardous Property Code(s): HP 10 Toxic for reproduction

Waste code number: 16 05 06

NB: The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

## Section 14: Transport information

Transport class: This product does not require a classification for transport.

## Section 15: Regulatory information

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

Specific regulations: This safety data sheet is provided in compliance with the REACH Regulation (EC) No 1907/2006, as amended by Regulation (EU) 2015/830, and the USA HCS 2012
Regulation (EC) No. 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) applies in Europe 1-methyl-2-pyrrolidone (CAS 872-50-4) is included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No.1907/2006 (REACH)
Classification (29 CFR 1910.1200) [HCS 2012]: Repr. 1B, H360D
Restrictions on use according to Annex XVII to REACH Regulation: Entry 71 - 1-methyl-2-pyrrolidone (NMP), CAS No 872-50-4, EC No 212-828-1; 1. Shall not be placed on the market as a substance on its own or in mixtures in a concentration equal to or greater than 0,3 % after 9 May 2020 unless manufacturers, importers and downstream users have included in the relevant chemical safety reports and safety data sheets, Derived No-Effect Levels (DNELs) relating to exposure of workers of 14,4 mg/m³ for exposure by inhalation and 4,8 mg/kg/day for dermal exposure.
2. Shall not be manufactured, or used, as a substance on its own or in mixtures in a concentration equal to or greater than 0,3 % after 9 May 2020 unless manufacturers and downstream users take the appropriate risk management measures and provide the appropriate operational conditions to ensure that exposure of workers is below the DNELs specified in paragraph 1.
3. By way of derogation from paragraphs 1 and 2, the obligations laid down therein shall apply from 9 May 2024 in relation to placing on the market for use, or use, as a solvent or reactant in the process of coating wires,

### 15.2. Chemical Safety Assessment

Chemical safety assessment: A chemical safety assessment has not been carried out for the substance or the mixture by the supplier.

## Section 16: Other information

### Other information

Other information: according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830
* indicates text in the SDS which has changed since the last revision.

Phrases used in s.2 and s.3: H271: May cause fire or explosion; strong oxidiser.
H272: May intensify fire; oxidiser.
H302: Harmful if swallowed.
H314: Causes severe skin burns and eye damage.
H315: Causes skin irritation.
H318: Causes serious eye damage.

[cont...]

H319: Causes serious eye irritation.

H332: Harmful if inhaled.

H335: May cause respiratory irritation.

H360D: May damage the unborn child.

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.

Exposure scenario for Downstream Users
Widespread use by professional workers; Laboratory Chemicals (PC21).
Use as a laboratory reagent (PROC15).

Life cycle stage (LCS): Widespread use by professional workers (PW)
Sector of use category (SU): SU24
Chemical product category (PC): PC21
Process category (PROC): PROC15
Environmental release category (ERC): ERC8a
Technical function (TF): Solvent

| |
|---|
| SU24 Scientific research and development |
| PC21 Laboratory chemicals |
| PROC15 Use as laboratory reagent |
| ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) |

1. Exposure Scenario: Used as a laboratory reagent
Contributing Scenarios (CS)

Environment
CS1: ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)

Worker
CS2: PROC15 Use as a laboratory reagent – indoor, with fume cupboard/local exhaust ventilation, >4 hours
CS3: PROC15 Use as a laboratory reagent – indoor, with fume cupboard/local exhaust ventilation, 1-4 hours
CS4: PROC15 Use as a laboratory reagent – indoors, with good general ventilation, >4 hours
CS5: PROC15 Use as a laboratory reagent – indoors, with general ventilation, 1-4 hours

2. Conditions of use affecting exposure

2.1 Contributing scenario CS1, controlling environmental exposure for: ERC8a

Product characteristics
Concentration of the substance in mixture: covers concentration of the substance up to 5 %.
Product is supplied in a packaging that does not require cleaning.

Technical and organisational conditions and measures
Clean up spills immediately. Do not flush to drains or release to the environment.

Conditions and measures related to treatment of waste
Do not discharge into drains or the environment, dispose to an authorised waste collection point.
To be disposed of as hazardous waste (HP10 Toxic for reproduction).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
N/A

2.2 Contributing scenario CS2, controlling worker exposure for: PROC15 (indoor, with fume cupboard/local exhaust ventilation, >4 hours)

Product characteristics
Concentration of the substance in mixture: covers concentration of the substance up to 5%.
Physical Form (at time of use): low volatile liquid

Amount used, frequency and duration of use/exposure
Covers use over 4 hours per day.

Technical and organisational conditions and measures
Fume cupboard/local exhaust ventilation (LEV). LEV inhalation - minimum efficiency of 80 %, LEV dermal - minimum efficiency of 80 %.

Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Ensure control measures are regularly inspected and maintained.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN 374 with APF10.
Wear safety glasses approved to standard EN 166.
For further specification, refer to Section 8 of the SDS.

Other conditions affecting workers exposure
Indoor use.
Assumes process temperature up to 40 °C.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
Ensure operatives are trained to minimise exposure.

2.3 Contributing scenario CS3, controlling worker exposure for: PROC15 (indoor, with fume cupboard/local exhaust ventilation, 1-4 hours)

Product characteristics
Concentration of the substance in mixture: covers concentration of the substance up to 5%.
Physical Form (at time of use): low volatile liquid

Amount used, frequency and duration of use/exposure
Covers use up to 4 hours per day.

Technical and organisational conditions and measures
Fume cupboard/local exhaust ventilation. Fume cupboard/local exhaust ventilation (LEV). LEV inhalation – minimum efficiency of 80 %, LEV dermal - minimum efficiency of 80 %.
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Ensure control measures are regularly inspected and maintained.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN 374 with APF10.
Wear safety glasses approved to standard EN 166.
For further specification, refer to Section 8 of the SDS.

Other conditions affecting workers exposure
Indoor use.
Assumes process temperature up to 40 °C.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
Ensure operatives are trained to minimise exposure.

2.4 Contributing scenario CS4, controlling worker exposure for: PROC15 (indoors, with good general ventilation, >4 hours)

Product characteristics
Concentration of the substance in mixture: covers concentration of the substance up to 5%.
Physical Form (at time of use): low volatile liquid

Amount used, frequency and duration of use/exposure
Covers use over 4 hours per day.

Technical and organisational conditions and measures
Provide a good standard of general ventilation (6 -15 air changes per hour).
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Ensure control measures are regularly inspected and maintained.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN 374 with APF10.
Wear safety glasses approved to standard EN 166.
Wear a respirator providing a minimum efficiency of 90.0 %.
For further specification, refer to Section 8 of the SDS.

Other conditions affecting workers exposure
Indoor use.
Assumes process temperature up to 40 °C.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
Ensure operatives are trained to minimise exposure.

2.5 Contributing scenario CS5, controlling worker exposure for: PROC15 (indoors, with general ventilation, 1-4 hours)

Product characteristics
Concentration of the substance in mixture: covers concentration of the substance up to 5%.
Physical Form (at time of use): low volatile liquid

Amount used, frequency and duration of use/exposure
Covers use up to 4 hours per day.

Technical and organisational conditions and measures
Provide a basic standard of general ventilation (minimum 5 air changes per hour).
Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.
Ensure control measures are regularly inspected and maintained.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN 374 with APF10.
Wear safety glasses approved to standard EN 166.
Wear a respirator providing a minimum efficiency of 95.0 %.
For further specification, refer to Section 8 of the SDS.

Other conditions affecting workers exposure
Indoor use.
Assumes process temperature up to 40 °C.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
Ensure operatives are trained to minimise exposure.

3. Exposure estimation and reference to its source

Environment
A chemical safety assessment was performed by the supplier according to REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

| Contributing Scenario | Exposure Assessment Method | Specific Conditions | Value | Level of Exposure | RCR* |
|---|---|---|---|---|---|
| CS2:PROC15 | ECETOC TRA | With Fume Cupboard/ Local Exhaust Ventilation, >4 hours | Inhalation | 0.826 mg/m³ | 0.0574 |
| CS2: PROC15 | ECETOC TRA | With Fume Cupboard/ Local Exhaust Ventilation, >4 hours | Dermal | 0.00137 mg/kg bw/day | 0.00286 |
| CS3:PROC15 | ECETOC TRA | With Fume Cupboard/ Local Exhaust Ventilation. 1-4 hours | Inhalation | 0.496 mg/m³ | 0.0344 |
| CS3: PROC15 | ECETOC TRA | With Fume Cupboard/ Local Exhaust Ventilation, 1-4 hours | Dermal | 0.00137 mg/kg bw/day | 0.00286 |
| CS4:PROC15 | ECETOC TRA | With good general ventilation, >4 hours | Inhalation | 0.289 mg/m³ | 0.0201 |

| | | | | | |
|---|---|---|---|---|---|
| CS4: PROC15 | ECETOC TRA | With good general ventilation, >4 hours | Dermal | 0.00686 mg/kg bw/day | 0.00143 |
| CS5:PROC15 | ECETOC TRA | With general ventilation. 1-4 hours | Inhalation | 0.124 mg/m³ | 0.0086 |
| CS5: PROC15 | ECETOC TRA | With general ventilation, 1-4 hours | Dermal | 0.00686 mg/kg bw/day | 0.00143 |

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

   Please refer to the following documents -

   ECHA Document - How downstream users can handle exposure scenarios. Practical Guide 13

   ECHA Document - How to comply with REACH Restriction 71, guideline for users of NMP (1-methyl-2-pyrrolidone)

--- end of annex ---