

SAFETY DATA SHEET



n-Propyl acetate
10580

Version / Revision 3
Supersedes Version 2.00***

Revision Date 27-Jan-2022
Issuing date 27-Jan-2022

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

1.1. Product identifier

Identification of the
substance/preparation

n-Propyl acetate

Chemical Name Propyl acetate***
CAS-No 109-60-4
EC No. 203-686-1
Registration number (REACH) 01-2119484620-39***

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

Identified uses Formulation
Distribution of substance
coatings
cleaning agent
Lubricants and lubricant additives
Metal working fluids / rolling oils
laboratory chemicals

Uses advised against None

1.3. Details of the supplier of the safety data sheet

Company/Undertaking **OQ Chemicals GmbH**
Identification Rheinpromenade 4A
D-40789 Monheim
Germany

Product Information Product Stewardship
FAX: +49 (0)208 693 2053
email: sc.psq@oq.com

1.4. Emergency telephone number

Emergency telephone number +44 (0) 1235 239 670 (UK)
available 24/7***

National emergency telephone number National Poisons Information Centre
+353 (0)1 809 2166
available to the public 8 am - 10 pm
+353 (0)1 809 2566
available 24/7 for medical professionals

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

This substance is classified based on Directive 1272/2008/EC and its amendments (CLP Regulation)

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Flammable liquid Category 2, H225***
Serious eye damage/eye irritation Category 2, H319***
Target Organ Systemic Toxicant - Single exposure Category 3, H336***

Additional information

For full text of Hazard- and EU Hazard-statements see SECTION 16.***

2.2. Label elements

Labelling according to Regulation 1272/2008/EC and its amendments (CLP Regulation).***

Hazard pictograms



Signal word

Danger

Hazard statements

H225: Highly flammable liquid and vapour.
H319: Causes serious eye irritation.
H336: May cause drowsiness or dizziness.

Precautionary statements

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P261: Avoid breathing gas/mist/vapours.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312: Call a POISON CENTRE/doctor if you feel unwell.
P403 + P235: Store in a well ventilated place. Keep cool.***

Supplemental Hazard Information (EU)

EUH 066: Repeated exposure may cause skin dryness or cracking.

2.3. Other hazards

Vapours may form explosive mixture with air
Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback
Components of the product may be absorbed into the body by inhalation and ingestion

PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

SECTION 3: Composition / information on ingredients

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3.1. Substances

| Component | CAS-No | REACH-No | 1272/2008/EC | Concentration (%) |
|----------------|----------|-------------------------|--|-------------------|
| Propyl acetate | 109-60-4 | 01-2119484620-39** * | Flam. Liq. 2; H225 Eye Irrit. 2; H319 STOT SE 3; H336 EU H066 | > 99,5 |

For full text of Hazard- and EU Hazard-statements see SECTION 16.***

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation

Keep at rest. Aerate with fresh air. When symptoms persist or in all cases of doubt seek medical advice.

Skin

Wash off immediately with soap and plenty of water. When symptoms persist or in all cases of doubt seek medical advice.

Eyes

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.

Ingestion

Call a physician immediately. Do not induce vomiting without medical advice.

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

Main symptoms

dizziness, drowsiness, cough, unconsciousness.

Special hazard

central nervous system effects, Prolonged skin contact may defat the skin and produce dermatitis.

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

General advice

Remove contaminated, soaked clothing immediately and dispose of safely. First aider needs to protect himself.

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

foam, dry chemical, carbon dioxide (CO₂), water spray

Unsuitable Extinguishing Media

Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

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Under conditions giving incomplete combustion, hazardous gases produced may consist of:
carbon monoxide (CO)
carbon dioxide (CO₂)
Combustion gases of organic materials must in principle be graded as inhalation poisons
Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback
Vapours may form explosive mixture with air

5.3. Advice for firefighters

Special protective equipment for firefighters

Fire fighter protection should include a self-contained breathing apparatus (NIOSH-approved or EN 133) and full fire-fighting turn out gear.

Precautions for firefighting

Cool containers / tanks with water spray. Dike and collect water used to fight fire. Keep people away from and upwind of fire.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: For personal protective equipment see section 8. Avoid contact with skin and eyes. Avoid breathing vapors or mists. Keep people away from and upwind of spill/leak. Ensure adequate ventilation, especially in confined areas. Keep away from heat and sources of ignition.
For emergency responders: Personal protection see section 8.***

6.2. Environmental precautions

Prevent further leakage or spillage. Do not discharge product into the aquatic environment without pretreatment (biological treatment plant).

6.3. Methods and material for containment and cleaning up

Methods for containment

Stop the flow of material, if possible without risk. Dike spilled material, where this is possible.

Methods for cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. If liquid has been spilt in large quantities clean up promptly by scoop or vacuum. Dispose of in accordance with local regulations. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

6.4. Reference to other sections

For personal protective equipment see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Further info may be available in the appropriate Exposure scenarios in the annex to this SDS.***

Advice on safe handling

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

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Provide sufficient air exchange and/or exhaust in work rooms. Do not use compressed air for filling, discharging or handling.

Hygiene measures

When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Advice on the protection of the environment

See Section 8: Environmental exposure controls.

Incompatible products

oxidizing agents
bases
amines

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion

Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). In case of fire, emergency cooling with water spray should be available. Ground and bond containers when transferring material. Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback. Vapours may form explosive mixture with air.

Technical measures/Storage conditions

Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care.

Suitable material

stainless steel, mild steel

Unsuitable material

Attacks some forms of plastic and rubber

Temperature class

T2

7.3. Specific end use(s)

Formulation

Distribution of substance

coatings

cleaning agent

Lubricants and lubricant additives

Metal working fluids / rolling oils

laboratory chemicals

For specific end use information see the annex of this safety data sheet

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Exposure limits European Union

No exposure limits established

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Exposure limits Ireland

Ireland OELs

| Component | TWA (mg/m ³) | TWA (ppm) | STEL (mg/m ³) | STEL (ppm) | Skin Absorption | Sensitizer |
|---------------------------------|-----------------------------|--------------|------------------------------|---------------|--------------------|------------|
| Propyl acetate CAS: 109-60-4 | | 100 *** | | 150 *** | | |

Notes

For details and further information please refer to the original regulation.

DNEL & PNEC

Propyl acetate, CAS: 109-60-4

Workers

| | |
|---|--------------------------------------|
| DN(M)EL - long-term exposure - systemic effects - Inhalation | No hazard identified*** |
| DN(M)EL - acute / short-term exposure - systemic effects - Inhalation | No hazard identified*** |
| DN(M)EL - long-term exposure - local effects - Inhalation | 420 mg/m ³ |
| DN(M)EL - acute / short-term exposure - local effects - Inhalation | 840 mg/m ³ |
| DN(M)EL - long-term exposure - systemic effects - Dermal | No hazard identified*** |
| DN(M)EL - acute / short-term exposure - systemic effects - Dermal | No hazard identified*** |
| DN(M)EL - long-term exposure - local effects - Dermal | No hazard identified*** |
| DN(M)EL - acute / short-term exposure - local effects - Dermal | No hazard identified*** |
| DN(M)EL - local effects - eyes | Low hazard (no threshold derived)*** |

General population

| | |
|---|--------------------------------------|
| DN(M)EL - long-term exposure - systemic effects - Inhalation | 149 mg/m ³ |
| DN(M)EL - acute / short-term exposure - systemic effects - Inhalation | 298 mg/m ³ |
| DN(M)EL - long-term exposure - local effects - Inhalation | 210*** mg/m ³ |
| DN(M)EL - acute / short-term exposure - local effects - Inhalation | 420*** mg/m ³ |
| DN(M)EL - long-term exposure - systemic effects - Dermal | No hazard identified*** |
| DN(M)EL - acute / short-term exposure - systemic effects - Dermal | No hazard identified*** |
| DN(M)EL - long-term exposure - local effects - Dermal | No hazard identified*** |
| DN(M)EL - acute / short-term exposure - local effects - Dermal | No hazard identified*** |
| DN(M)EL - long-term exposure - systemic effects - Oral | No hazard identified*** |
| DN(M)EL - acute / short-term exposure - systemic effects - Oral | No hazard identified*** |
| DN(M)EL - local effects - eyes | Low hazard (no threshold derived)*** |

Environment

| | |
|-----------------------------------|-------------------------|
| PNEC aqua - freshwater | 0,06 mg/l |
| PNEC aqua - marine water | 0,006 mg/l |
| PNEC aqua - intermittent releases | 0,6 mg/l |
| PNEC STP | 1 mg/l |
| PNEC sediment - freshwater | 0,16 mg/kg dw*** |
| PNEC sediment - marine water | 0,016 mg/kg dw*** |
| PNEC Air | No hazard identified*** |
| PNEC soil | 0,0215 mg/kg dw*** |

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Secondary poisoning

No potential for bioaccumulation***

8.2. Exposure controls

Special adaptations (REACH)

Not applicable.***

Appropriate Engineering controls

General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Personal protective equipment

General industrial hygiene practice

Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures

When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Eye protection

Tightly fitting safety goggles. In addition to goggles, wear a face shield if there is a reasonable chance for splash to the face.

Equipment should conform to EN 166

Hand protection

Wear protective gloves. Recommendations are listed below. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

| | |
|---------------------------|------------------------------|
| Suitable material | butyl-rubber |
| Evaluation | according to EN 374: level 4 |
| Glove thickness | approx 0,3 mm |
| Break through time | approx 120 min |

| | |
|---------------------------|------------------------------------|
| Suitable material | polyvinylchloride / nitrile rubber |
| Evaluation | according to EN 374: level 1 |
| Glove thickness | approx 0,9 mm |
| Break through time | approx 15 min |

Skin and body protection

Impervious clothing. Wear face-shield and protective suit for abnormal processing problems.

Respiratory protection

Respirator with A/PA filter. Full mask with above mentioned filter according to producers using requirements or self-contained breathing apparatus. Equipment should conform to EN 136 or EN 140 and EN 143.

Environmental exposure controls

If possible use in closed systems. If leakage can not be prevented, the substance needs to be suck off at the emersion point, if possible without danger. Observe the exposure limits, clean exhaust air if needed. If recycling is not practicable, dispose of in compliance with local regulations. Inform the responsible authorities in case of leakage into the atmosphere, or of entry into waterways, soil or drains.

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Additional advice

Further details on substance data can be found in the registration dossier under the following link:
<http://echa.europa.eu/information-on-chemicals/registered-substances>. For specific exposure controls see the annex to this safety data sheet.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

| | | | | | |
|---------------------------|---|--------------|-----------|------|--------|
| Appearance | liquid | | | | |
| Colour | colourless | | | | |
| Odour | fruity | | | | |
| Odour threshold | No data available | | | | |
| pH | No data available | | | | |
| Melting point/range | < -90 °C | | | | |
| Method | DIN ISO 3016*** | | | | |
| Boiling point/range | 102 °C @ 1013 hPa | | | | |
| Method | OECD 103*** | | | | |
| Flash point | 12 °C | | | | |
| Method | EU A.9*** | | | | |
| Evaporation rate | No data available | | | | |
| Flammability (solid, gas) | Does not apply, the substance is a liquid | | | | |
| Lower explosion limit | 2 Vol % | | | | |
| Upper explosion limit | 8 Vol % | | | | |
| Vapour pressure | *** | | | | |
| Values [hPa] | Values [kPa] | Values [atm] | @ °C | @ °F | Method |
| 34*** | 3,4*** | 0,034*** | 20 | 68 | |
| 151,5*** | 15,2*** | 0,150*** | 50 | 122 | |
| Vapour density | 3,5 (Air = 1) @ 20 °C (68 °F) | | | | |
| Relative density | *** | | | | |
| Values | @ °C | @ °F | Method | | |
| 0,888 | 20 | 68 | DIN 51757 | | |
| Solubility | 18,7 g/l @ 20 °C, in water*** | | | | |
| log Pow | 1,4 @ 25 °C (77 °F) OECD 117*** | | | | |
| Autoignition temperature | 380 °C @ 1013 hPa*** | | | | |
| Method | DIN 51794 | | | | |
| Decomposition temperature | No data available | | | | |
| Viscosity | 0,58 mPa*s @ 20 °C | | | | |
| Method | ASTM D445, dynamic*** | | | | |
| Explosive properties | Does not apply, substance is not explosive. There are no chemical groups associated with explosive properties | | | | |
| Oxidizing properties | Does not apply, substance is not oxidising. There are no chemical groups associated with oxidizing properties | | | | |

9.2. Other information

| | |
|-------------------|--|
| Molecular weight | 102,13 |
| Molecular formula | C5 H10 O2 |
| log Koc | 1008 calculated*** |
| Refractive index | 1,384 @ 20 °C |
| Surface tension | 67,5 mN/m @ 20,1 °C (68,2 °F) @ 1000 mg/l, OECD 115*** |



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SECTION 10: Stability and Reactivity

10.1. Reactivity

The reactivity of the product corresponds to the typical reactivity shown by the substance group as described in any text book on organic chemistry.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Vapours may form explosive mixture with air.***

10.4. Conditions to avoid

Avoid contact with heat, sparks, open flame and static discharge. Avoid any source of ignition.

10.5. Incompatible materials

oxidizing agents, amines, bases.

10.6. Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure Ingestion, Inhalation, Eye contact, Skin contact***

| Acute toxicity | | | | |
|---------------------------|----------|----------------|----------------|-------------|
| Propyl acetate (109-60-4) | | | | |
| Routes of Exposure | Endpoint | Values | Species | Method |
| Oral | LD50 | ~ 8700 mg/kg | rat, male | |
| Dermal | LD50 | > 17800 mg/kg | rabbit male*** | |
| Inhalative | LC50 | ~ 32 mg/l (4h) | rat | (vapour)*** |

Propyl acetate, CAS: 109-60-4

Assessment

Based on available data, the classification criteria are not met for:

Acute oral toxicity

Acute dermal toxicity

Acute inhalation toxicity***

| Irritation and corrosion | | | | |
|---------------------------|---------|--------------------|--------|------------|
| Propyl acetate (109-60-4) | | | | |
| Target Organ Effects | Species | Result | Method | |
| Skin | rabbit | No skin irritation | | in vivo*** |
| Eyes | rabbit | irritating | | in vivo*** |

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Propyl acetate, CAS: 109-60-4

Assessment

The available data lead to the classification given in section 2***

| Sensitization | | | | |
|---------------------------|------------|-----------------|-------------------|-------------|
| Propyl acetate (109-60-4) | | | | |
| Target Organ Effects | Species | Evaluation | Method | |
| Skin | guinea pig | not sensitizing | Maximisation Test | read across |

Propyl acetate, CAS: 109-60-4

Assessment

Based on available data, the classification criteria are not met for:

Skin sensitization

For respiratory sensitization, no data are available***

| Subacute, subchronic and prolonged toxicity | | | | |
|---|---|---------------------|------------------|---------------------------|
| Propyl acetate (109-60-4) | | | | |
| Type | Dose | Species | Method | |
| Subchronic toxicity | NOAEL: 2,35 mg/l | rat, male/female | EPA OTS 798.2450 | Inhalation read across*** |
| Subchronic toxicity*** | NOAEC: >= 6,48 mg/l (90d) systemic effects*** | rat, male/female*** | OECD 413*** | Inhalation*** |
| Subchronic toxicity*** | NOAEC: 0,63 mg/l (90d) Local effects*** | rat, male/female*** | OECD 413*** | Inhalation*** |
| Subchronic toxicity*** | LOAEC: 2,14 mg/l (90 d) Local effects*** | rat, male/female*** | OECD 413*** | Inhalation*** |

Propyl acetate, CAS: 109-60-4

Assessment

Based on available data, the classification criteria are not met for:

STOT RE***

| Carcinogenicity, Mutagenicity, Reproductive toxicity | | | | | |
|--|------------------|-----------------------------------|-------------------|------------------------------------|------------------------------|
| Propyl acetate (109-60-4) | | | | | |
| Type | Dose | Species | Evaluation | Method | |
| Mutagenicity | | Salmonella typhimurium | negative | OECD 471 (Ames) | In vitro study |
| Mutagenicity | | CHO (Chinese Hamster Ovary) cells | negative | OECD 476 (Mammalian Gene Mutation) | |
| Mutagenicity | | V79 cells, Chinese hamster | negative | Chromosomal Aberration | read across |
| Reproductive toxicity | LOAEC: 750 ppm | rat, parental male/female*** | | OECD 416 Inhalation*** | read across Local effects*** |
| Developmental Toxicity | LOAEL: 7,05 mg/l | rat | Maternal toxicity | Inhalation | read across |
| Developmental Toxicity | NOAEL 7,05 mg/l | rat | Teratogenicity | Inhalation | read across |
| Developmental Toxicity | NOAEL 7,05 mg/l | rabbit | Maternal toxicity | Inhalation | read across |
| Developmental Toxicity | NOAEL 7,05 mg/l | rabbit | Teratogenicity | Inhalation | read across |
| Mutagenicity*** | | human lymphoblastoid | negative*** | OECD 487 micronucleus | In vitro study*** |

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| | | | | | |
|---------------------------------------|-----------------------------------|--|--|------------------------------------|---|
| | | cells (TK6) ^{***} | | test ^{***} | |
| Reproductive toxicity ^{***} | NOAEC: 750 ppm ^{***} | rat, parental male/female ^{***} | | OECD 416 Inhalation ^{***} | Developmental toxicity read across ^{***} |
| Reproductive toxicity ^{***} | NOAEC: 2000 ppm ^{***} | rat, parental male/female ^{***} | | OECD 416 Inhalation ^{***} | Fertility read across ^{***} |
| Reproductive toxicity ^{***} | NOAEC: 750 ppm ^{***} | rat, 1. Generation, male/female rat 2. Generation, male/female ^{***} | | OECD 416 Inhalation ^{***} | read across ^{***} |
| Developmental Toxicity ^{***} | NOAEL 1000 mg/kg/d ^{***} | rat rabbit ^{***} | | OECD 414, Oral ^{***} | Maternal toxicity Developmental toxicity, Teratogenicity ^{***} |

Propyl acetate, CAS: 109-60-4

CMR Classification

The available data on CMR properties are summarized in the table above. They do not indicate a classification into categories 1A or 1B^{***}

Evaluation

In vitro tests did not show mutagenic effects^{***}

Propyl acetate, CAS: 109-60-4

Main symptoms

dizziness, drowsiness, cough, unconsciousness.

Target Organ Systemic Toxicant - Single exposure

The available data lead to the classification given in section 2^{***}

Target Organ Systemic Toxicant - Repeated exposure

Based on available data, the classification criteria are not met for:

STOT RE^{***}

Other adverse effects

Components of the product may be absorbed into the body by inhalation and ingestion. Dries out the skin.

Note

Handle in accordance with good industrial hygiene and safety practice. Further details on substance data can be found in the registration dossier under the following link:

<http://echa.europa.eu/information-on-chemicals/registered-substances>.

SECTION 12: Ecological information

12.1. Toxicity

| | | | |
|--------------------------------------|---------------|------------------------------|-------------------|
| Acute aquatic toxicity | | | |
| Propyl acetate (109-60-4) | | | |
| Species | Exposure time | Dose | Method |
| Pimephales promelas (fathead minnow) | 96h | LC50: 60 mg/l | |
| Daphnia magna (Water flea) | 48h | EC50: 91,5 mg/l | OECD 202 |
| Pseudokirchneriella subcapitata | 72h | EC50: 672 mg/l (Growth rate) | OECD 201 |
| Pseudomonas putida | 16 h | TTC: 170 mg/l | DIN 38412, part 8 |

Long term toxicity

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| Propyl acetate (109-60-4) | | | | |
|---------------------------|------------------------------------|-------------------------|-------------|--|
| Type | Species | Dose | Method | |
| Aquatic toxicity*** | Pseudokirchneriella subcapitata*** | NOEC: 83,2 mg/l (3d)*** | OECD 201*** | |

12.2. Persistence and degradability

Propyl acetate, CAS: 109-60-4

Biodegradation

62 % (5 d), Sewage, domestic, non-adapted, aerobic, OECD 301 D.

| Abiotic Degradation | | | |
|---------------------------|-------------------------------|------------------|--|
| Propyl acetate (109-60-4) | | | |
| Type | Result | Method | |
| Hydrolysis*** | not expected*** | | |
| Photolysis*** | Half-life (DT50): 3,2 days*** | SRC AOP v1.92*** | |

12.3. Bioaccumulative potential

| Propyl acetate (109-60-4) | | |
|---------------------------|------------------------|-----------------------|
| Type | Result | Method |
| log Pow*** | 1,4 @ 25 °C (77 °F)*** | measured, OECD 117*** |
| BCF*** | not expected*** | |

12.4. Mobility in soil

| Propyl acetate (109-60-4) | | |
|---|--|----------------------------------|
| Type | Result | Method |
| Surface tension*** | no data available 67,5 mN/m @ 20,1 °C (68,2 °F) @ 1000 mg/l*** | OECD 115*** |
| Adsorption/Desorption*** | Koc: 10,17*** | calculated SRC PCKOCWIN v2.00*** |
| Distribution to environmental compartments*** | no data available*** | |

12.5. Results of PBT and vPvB assessment

Propyl acetate, CAS: 109-60-4

PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

12.6. Other adverse effects

Propyl acetate, CAS: 109-60-4

No data available***

SECTION 13: Disposal considerations

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13.1. Waste treatment methods

Product Information

Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal.

Hazardous waste according to European Waste Catalogue (EWC)

Uncleaned empty packaging

Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

SECTION 14: Transport information

ADR/RID

| | |
|---|----------------------|
| | *** |
| 14.1. UN number | *** UN 1276 |
| 14.2. UN proper shipping name | *** n-Propyl acetate |
| 14.3. Transport hazard class(es) | *** 3 |
| 14.4. Packing group | *** II |
| 14.5. Environmental hazards | no*** |
| 14.6. Special precautions for user | *** |
| ADR Tunnel restriction code | (D/E) |
| Classification Code | F1 |
| Hazard Number | 33 |

ADN

| | |
|---|----------------------|
| | ADN Container |
| 14.1. UN number | *** UN 1276 |
| 14.2. UN proper shipping name | *** n-Propyl acetate |
| 14.3. Transport hazard class(es) | *** 3 |
| 14.4. Packing group | *** II |
| 14.5. Environmental hazards | no*** |
| 14.6. Special precautions for user | *** |
| Classification Code | F1 |
| Hazard Number | 33 |

ADN

| | |
|---|----------------------|
| | ADN Tanker |
| 14.1. UN number | *** UN 1276 |
| 14.2. UN proper shipping name | *** n-Propyl acetate |
| 14.3. Transport hazard class(es) | *** 3 |
| Subsidiary Risk | N3*** |
| 14.4. Packing group | *** II |
| 14.5. Environmental hazards | no*** |
| 14.6. Special precautions for user | *** |
| Classification Code | F1 |

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ICAO-TI / IATA-DGR

| | |
|------------------------------------|-------------------------|
| | *** |
| 14.1. UN number | *** UN 1276 |
| 14.2. UN proper shipping name | *** n-Propyl acetate*** |
| 14.3. Transport hazard class(es) | *** 3 |
| 14.4. Packing group | *** II |
| 14.5. Environmental hazards | no*** |
| 14.6. Special precautions for user | no data available*** |

IMDG

| | |
|--|-----------------------|
| | *** |
| 14.1. UN number | *** UN 1276 |
| 14.2. UN proper shipping name | *** Propyl acetate*** |
| 14.3. Transport hazard class(es) | *** 3 |
| 14.4. Packing group | *** II |
| 14.5. Environmental hazards | no*** |
| 14.6. Special precautions for user | *** |
| EmS | F-E, S-D |
| 14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code | *** |
| Product name | n-Propyl acetate |
| Ship type | 3 |
| Pollution category | Y |

SECTION 15: Regulatory information

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

Regulation 1272/2008, Annex VI

Propyl acetate, CAS: 109-60-4

| | |
|--------------------------|---|
| Classification | Flam. Liq. 2; H225 Eye Irrit. 2; H319 STOT SE 3; H336 |
| Hazard pictograms | GHS02 Flame GHS07 Exclamation mark*** |
| Signal word | Danger |
| Hazard statements | H225 H319 H336 EUH066 |

DI 2012/18/EU (Seveso III) ***

| | |
|-----------------|---|
| Category | Annex I, part 1: P5a - c; depending on conditions*** |
|-----------------|---|

DI 1999/13/EC (VOC Guideline)

| Component | Status |
|-----------|--------|
|-----------|--------|

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| | |
|---------------------------------|--------------|
| Propyl acetate CAS: 109-60-4 | regulated*** |
|---------------------------------|--------------|

International Inventories

Propyl acetate, CAS: 109-60-4

AICS (AU)
DSL (CA)
IECSC (CN)
EC-No. 2036861 (EU)
ENCS (2)-727 (JP)
ISHL (2)-727 (JP)
KECI KE-29778 (KR)
INSQ (MX)***
PICCS (PH)
TSCA (US)
NZIoC (NZ)***
TCSI (TW)***

15.2. Chemical safety assessment

The Chemical Safety Report (CSR) has been generated. For Exposure Scenarios see the annex.***

SECTION 16: Other information

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

H225: Highly flammable liquid and vapour.
H319: Causes serious eye irritation.
H336: May cause drowsiness or dizziness.
EUH 066: Repeated exposure may cause skin dryness or cracking.

Abbreviations

A table of terms and abbreviations can be found under the following link:
http://echa.europa.eu/documents/10162/13632/information_requirements_r20_en.pdf

Training advice

For effective first-aid, special training / education is needed.

Sources of key data used to compile the datasheet

Information contained in this safety data sheet is based on OQ owned data and public sources deemed valid or acceptable. The absence of data elements required by OSHA, ANSI or Annex II, Regulation 1907/2006/EC indicates, that no data meeting these requirements is available.

Further information for the safety data sheet

Changes against the previous version are marked by ***. Observe national and local legal requirements. For more information, other material safety data sheets or technical data sheets please consult the OQ homepage (www.chemicals.oq.com).

Disclaimer

For industrial use only. The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. OQ makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. User has the sole responsibility to determine the suitability of the materials for any use and the



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manner of use contemplated. User must meet all applicable safety and health standards.

End of Safety Data Sheet

Annex to the extended Safety Data Sheet (eSDS)

General information

A quantitative approach used to conclude safe use for:

Long term local hazards via inhalation

Acute local hazards via inhalation

Environmental compartment

A qualitative approach used to conclude safe use for:

Local hazards via eyes

For consumer applications in the following usage areas please contact OQ (sc.psq@oq.com):

Uses in coatings

Use in Cleaning Agents

Lubricants

Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation

Other combinations of operational conditions may also be safe. Please contact OQ in case your local operational conditions differ from the ones described below and you are unsure if they are also safe***

Operational conditions and risk management measures

Supervision in place to check that the RMMs in place are being used correctly and OCs followed.

Following operational conditions and risk management measures, are based on qualitative risk characterisation:

Minimization of manual phases

Avoid direct contact with the chemical/the product/the preparation by establishing organisational measures

Wear protective gloves and eye/face protection***

Exposure scenario identification

- | | |
|-------|---|
| 1 | Formulation & (re)packing of substances and mixtures |
| 2 | Distribution of substance |
| 3*** | Uses in coatings |
| 4*** | Uses in coatings |
| 5*** | Use in Cleaning Products |
| 6*** | Use in Cleaning Products |
| 7*** | Lubricants |
| 8*** | Lubricants |
| 9*** | Metal working fluids / rolling oils |
| 10*** | Metal working fluids / rolling oils |
| 11*** | Use in laboratories |

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Number of the ES 1

Short title of the exposure scenario

Formulation & (re)packing of substances and mixtures

List of use descriptors

Sector of uses [SU]

SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys)

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14: production of preparations or articles by tableting, compression, extrusion, pelettisation
PROC15: Use as laboratory reagent***

Environmental release categories [ERC]

ERC2: Formulation of preparations (mixtures)

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities

Further explanations

Industrial use
Assessment tool used:
Chesar 3.3
liquid
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Covers percentage substance in the product up to 100 % (unless stated differently).
Assumes an advanced standard of occupational Health and Safety Management System***

Contributing Scenarios

Number of the contributing scenario

1***

Contributing exposure scenario controlling environmental exposure for ERC 2***

Product characteristics

liquid.***

Amounts used

Daily amount per site: 20 to
Annual amount per site: 2000 to
Fraction of EU tonnage used in region: 1***

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Other given operational conditions affecting environmental exposure

Indoor/Outdoor use***

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from process: 0.025%

Release fraction to wastewater from process: 1E-3%

Release fraction to soil from process: 0.01%***

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 99,95 % Onsite treatment off-air.

Upgrade Systems in place or implement additional treatment. Assumed Efficiency: 99 %***

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000

Water flow in sewage/river (m³/day): 18000

The minimum grade of elimination in the sewage plant is (%): 16,25

Do not apply industrial sludge to natural soils***

Number of the contributing scenario 2***

Contributing exposure scenario controlling worker exposure for PROC 1

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 3***

Contributing exposure scenario controlling worker exposure for PROC 2

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 4***

Contributing exposure scenario controlling worker exposure for PROC 3

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 5***

Contributing exposure scenario controlling worker exposure for PROC 4

Frequency and duration of use

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8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 6***
Contributing exposure scenario controlling worker exposure for PROC 5

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation):

90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 7***
Contributing exposure scenario controlling worker exposure for PROC 8a

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation):

90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection.

Number of the contributing scenario 8***
Contributing exposure scenario controlling worker exposure for PROC 8b

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation):

95 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 9***
Contributing exposure scenario controlling worker exposure for PROC 9

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

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provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374), coverall and eye protection.***

Number of the contributing scenario 10***
Contributing exposure scenario controlling worker exposure for PROC 14***

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 11***
Contributing exposure scenario controlling worker exposure for PROC 15***

Frequency and duration of use

8 h (full shift)***

Other given operational conditions affecting workers exposure

Indoor and outdoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio***

| | |
|-----------------------------------|--------------------------------------|
| Fresh Water (Pelagic) | PEC: 8.53E-3 mg/l; RCR: 0.142*** |
| Fresh Water (Sediment) | PEC: 0.078 mg/kg dw; RCR: 0.491*** |
| Marine Water (Pelagic) | PEC: 8.93E-4 mg/l; RCR: 0.149*** |
| Marine Water (Sediment) | PEC: 8.22E-3 mg/kg dw; RCR: 0.514*** |
| Agricultural Soil | PEC: 8.29E-4 mg/kg dw; RCR: 0.039*** |
| Sewage Treatment Plant (Effluent) | PEC: 0.084 mg/l; RCR: 0.084*** |

Human exposure prediction (oral, dermal, inhalative)

EE(inhal): Estimated inhalative exposure [mg/m³]. Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects.***

| | |
|---------|---------------------|
| Proc 1 | EE(inhal): 0.17 |
| Proc 2 | EE(inhal): 85.11 |
| Proc 3 | EE(inhal): 170.2 |
| Proc 4 | EE(inhal): 340.4 |
| Proc 5 | EE(inhal): 85.11 |
| Proc 8a | EE(inhal): 85.11 |
| Proc 8b | EE(inhal): 21.28 |
| Proc 9 | EE(inhal): 85.11 |
| Proc 14 | EE(inhal): 425.5*** |
| Proc 15 | EE(inhal): 170.2 |

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Risk characterisation

RCR(inhal): inhalative risk characterisation ratio. Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

| | |
|---------|----------------------|
| Proc 1 | RCR(inhal): < 0.01 |
| Proc 2 | RCR(inhal): 0.101 |
| Proc 3 | RCR(inhal): 0.203 |
| Proc 4 | RCR(inhal): 0.405 |
| Proc 5 | RCR(inhal): 0.101 |
| Proc 8a | RCR(inhal): 0.101 |
| Proc 8b | RCR(inhal): 0.025 |
| Proc 9 | RCR(inhal): 0.101 |
| Proc 14 | RCR(inhal): 0.507*** |
| Proc 15 | RCR(inhal): 0.203 |

Number of the ES 2

Short title of the exposure scenario

Distribution of substance

List of use descriptors

Sector of uses [SU]

SU8: Manufacture of bulk, large scale chemicals (including petroleum products)
SU9: Manufacture of fine chemicals

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC15: Use as laboratory reagent

Environmental release categories [ERC]

ERC2: Formulation of preparations (mixtures)

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, distribution and associated laboratory activities.

Further explanations

Assessment tool used:

Chesar 3.3

liquid

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

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Covers percentage substance in the product up to 100 % (unless stated differently)
Assumes an advanced standard of occupational Health and Safety Management System***

Contributing Scenarios

Number of the contributing scenario 1***
Contributing exposure scenario controlling environmental exposure for ERC 2***

Amounts used

daily wide dispersive use: 33.3 to/d
Annual amount per site: 10000 to
Fraction of EU tonnage used in region: 0.002***

Frequency and duration of use

Covers use up to: 300 days***

Other given operational conditions affecting environmental exposure

Indoor/Outdoor use***

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from process: 0.025%
Release fraction to wastewater from process: 2E-4%
Release fraction to soil from process: 0.01%***

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 99.99 % Onsite treatment off-air. Upgrade Systems in place or implement additional treatment. Assumed Efficiency: 99 % Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption.***

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000
The minimum grade of elimination in the sewage plant is (%): 16.25***

Number of the contributing scenario 2***
Contributing exposure scenario controlling worker exposure for PROC 1

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 3***
Contributing exposure scenario controlling worker exposure for PROC 2

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

If no adequate ventilation is available and the operation is carried out for more than .?3h, limit the concentration to .?4%.***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 4***
Contributing exposure scenario controlling worker exposure for PROC 3

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Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

5***

Contributing exposure scenario controlling worker exposure for PROC 4

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

6***

Contributing exposure scenario controlling worker exposure for PROC 8a

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.***

Number of the contributing scenario

7***

Contributing exposure scenario controlling worker exposure for PROC 8b

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 95 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

8***

Contributing exposure scenario controlling worker exposure for PROC 9

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

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Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection.

Number of the contributing scenario

9***

Contributing exposure scenario controlling worker exposure for PROC 15

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio***

| | |
|-----------------------------------|--------------------------------------|
| Fresh Water (Pelagic) | PEC: 2.95E-3 mg/l; RCR: 0.049*** |
| Fresh Water (Sediment) | PEC: 0.027 mg/kg dw; RCR: 0.17*** |
| Marine Water (Pelagic) | PEC: 3.35E-4 mg/l; RCR: 0.056*** |
| Marine Water (Sediment) | PEC: 3.08E-3 mg/kg dw; RCR: 0.193*** |
| Agricultural Soil | PEC: 5.19E-3 mg/kg dw; RCR: 0.241*** |
| Sewage Treatment Plant (Effluent) | PEC: 0.028 mg/l; RCR: 0.028*** |

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. EE(inhal): Estimated inhalative exposure [mg/m³].***

| | |
|---------|------------------|
| Proc 1 | EE(inhal): 0.17 |
| Proc 2 | EE(inhal): 85.11 |
| Proc 3 | EE(inhal): 170.2 |
| Proc 4 | EE(inhal): 340.4 |
| Proc 8a | EE(inhal): 85.11 |
| Proc 8b | EE(inhal): 21.28 |
| Proc 9 | EE(inhal): 85.11 |
| Proc 15 | EE(inhal): 170.2 |

Risk characterisation

Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values. RCR(inhal): inhalative risk characterisation ratio.

| | |
|---------|--------------------|
| Proc 1 | RCR(inhal): < 0.01 |
| Proc 2 | RCR(inhal): 0.101 |
| Proc 3 | RCR(inhal): 0.203 |
| Proc 4 | RCR(inhal): 0.405 |
| Proc 8a | RCR(inhal): 0.101 |
| Proc 8b | RCR(inhal): 0.025 |
| Proc 9 | RCR(inhal): 0.101 |
| Proc 15 | RCR(inhal): 0.203 |

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Number of the ES 3***

Short title of the exposure scenario

Uses in coatings

List of use descriptors

Sector of uses [SU]

SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC10: Roller application or brushing

PROC13: Treatment of articles by dipping and pouring

PROC15: Use as laboratory reagent

Environmental release categories [ERC]

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use in coatings (paints, inks, adhesives, etc) within closed or contained systems including incidental exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application activities and film formation) and equipment cleaning, maintenance and associated laboratory activities.

Further explanations

Industrial use

Assessment tool used:

Chesar 3.3

liquid

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Covers percentage substance in the product up to 100 % (unless stated differently)

Assumes an advanced standard of occupational Health and Safety Management System***

Contributing Scenarios

Number of the contributing scenario

1***

Contributing exposure scenario controlling environmental exposure for ERC 4***

Further specification

Specific Environmental Release Categories [SPERC], SpERC ESVOC 4.3a.v1 (ESVOC 5), release factors for (Sp)ERC were modified.***

Amounts used

Daily amount per site: 30 to

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Annual amount per site: 9000 to
Fraction of Regional tonnage used locally: 1***

Other given operational conditions affecting environmental exposure

Indoor/Outdoor use***

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from process: 0.05%
Release fraction to wastewater from process: 5E-4%
Release fraction to soil from process: 0%***

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 99.9 % Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption. Onsite treatment off-air. Upgrade Systems in place or implement additional treatment. Assumed Efficiency: 99 %***

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000
Water flow in sewage/river (m³/day): 18000
The minimum grade of elimination in the sewage plant is (%): 16.25
Do not apply industrial sludge to natural soils***

Number of the contributing scenario 2***
Contributing exposure scenario controlling worker exposure for PROC 1

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 3***
Contributing exposure scenario controlling worker exposure for PROC 2

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 4***
Contributing exposure scenario controlling worker exposure for PROC 3

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 5***

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Contributing exposure scenario controlling worker exposure for PROC 4

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 6***
Contributing exposure scenario controlling worker exposure for PROC 5

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 7***
Contributing exposure scenario controlling worker exposure for PROC 8a

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 8***
Contributing exposure scenario controlling worker exposure for PROC 8b

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 95 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 9***
Contributing exposure scenario controlling worker exposure for PROC 9

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Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

10***

Contributing exposure scenario controlling worker exposure for PROC 10

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

11***

Contributing exposure scenario controlling worker exposure for PROC 13

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

12***

Contributing exposure scenario controlling worker exposure for PROC 15

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio***

| | |
|-------------------------|--------------------------------------|
| Fresh Water (Pelagic) | PEC: 6.44E-3 mg/l; RCR: 0.107*** |
| Fresh Water (Sediment) | PEC: 0.059 mg/kg dw; RCR: 0.37*** |
| Marine Water (Pelagic) | PEC: 6.84E-4 mg/l; RCR: 0.114*** |
| Marine Water (Sediment) | PEC: 6.29E-3 mg/kg dw; RCR: 0.393*** |
| Agricultural Soil | PEC: 0.063 mg/kg dw; RCR: 0.063*** |

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Sewage Treatment Plant (Effluent) PEC: 6.29E-3 mg/l; RCR: 0.393***

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects. EE(inhal): Estimated inhalative exposure [mg/m³].***

| | |
|---------|------------------|
| Proc 1 | EE(inhal): 0.17 |
| Proc 2 | EE(inhal): 85.11 |
| Proc 3 | EE(inhal): 170.2 |
| Proc 4 | EE(inhal): 340.4 |
| Proc 5 | EE(inhal): 85.11 |
| Proc 8a | EE(inhal): 85.11 |
| Proc 8b | EE(inhal): 21.28 |
| Proc 9 | EE(inhal): 85.11 |
| Proc 10 | EE(inhal): 85.11 |
| Proc 13 | EE(inhal): 85.11 |
| Proc 15 | EE(inhal): 170.2 |

Risk characterisation

Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values. RCR(inhal): inhalative risk characterisation ratio.

| | |
|---------|--------------------|
| Proc 1 | RCR(inhal): < 0.01 |
| Proc 2 | RCR(inhal): 0.101 |
| Proc 3 | RCR(inhal): 0.203 |
| Proc 4 | RCR(inhal): 0.405 |
| Proc 5 | RCR(inhal): 0.101 |
| Proc 8a | RCR(inhal): 0.101 |
| Proc 8b | RCR(inhal): 0.025 |
| Proc 9 | RCR(inhal): 0.101 |
| Proc 10 | RCR(inhal): 0.101 |
| Proc 13 | RCR(inhal): 0.101 |
| Proc 15 | RCR(inhal): 0.203 |

Number of the ES 4***

Short title of the exposure scenario

Uses in coatings

List of use descriptors

Sector of uses [SU]

SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated

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facilities

PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC10: Roller application or brushing

PROC11: Non industrial spraying

PROC13: Treatment of articles by dipping and pouring

PROC15: Use as laboratory reagent

PROC19: Hand-mixing with intimate contact and only PPE available

Environmental release categories [ERC]

ERC8a: Wide dispersive indoor use of processing aids in open systems

ERC8d: Wide dispersive outdoor use of processing aids in open systems

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning

Further explanations

Professional use

Assessment tool used:

Chesar 3.3

StoffenManager V 4 for Following PROC:

PROC 11

liquid

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Covers percentage substance in the product up to 100 % (unless stated differently)

Assumes a good basic standard of occupational hygiene is implemented***

Contributing Scenarios

Number of the contributing scenario

1***

Contributing exposure scenario controlling environmental exposure for ERC 8d***

Further specification

Specific Environmental Release Categories [SPERC], SpERC ESVOC 8.3b.v1.***

Amounts used

daily wide dispersive use: 0.0025 to/d

Fraction of EU tonnage used in region: 0.1***

Frequency and duration of use

Covers use up to: 365 days***

Other given operational conditions affecting environmental exposure

Indoor/Outdoor use***

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from wide dispersive use (regional only): 98%

Release fraction to wastewater from wide dispersive use: 1%

Release fraction to soil from wide dispersive use (regional only): 1%***

Conditions and measures related to municipal sewage treatment plant

The minimum grade of elimination in the sewage plant is (%): 16.253***

Number of the contributing scenario

2***

Contributing exposure scenario controlling worker exposure for PROC 1

Frequency and duration of use

8 h (full shift)

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Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

3***

Contributing exposure scenario controlling worker exposure for PROC 2

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

4***

Contributing exposure scenario controlling worker exposure for PROC 3

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

5***

Contributing exposure scenario controlling worker exposure for PROC 4

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

6***

Contributing exposure scenario controlling worker exposure for PROC 5

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection. Wear respiratory protection (Efficiency: 90 %).***

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Number of the contributing scenario 7***
Contributing exposure scenario controlling worker exposure for PROC 8a

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 8***
Contributing exposure scenario controlling worker exposure for PROC 8b

Frequency and duration of use

8 h (full shift)***

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 9***
Contributing exposure scenario controlling worker exposure for PROC 9

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 10***
Contributing exposure scenario controlling worker exposure for PROC 10

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 11***

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Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

Assessment tool used: StoffenManager

Frequency and duration of use

Exposure time per day: 2.5 h/d***

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

Provide extract ventilation to points where emissions occur. Provide enhanced general ventilation by mechanical means. Use in ventilated spray booths only.***

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

Conditions and measures related to personal protection, hygiene and health evaluation

Inspect and clean equipment regularly. Wear suitable gloves (tested to EN374) and eye protection. Wear respiratory protection (Efficiency: 80 %) Alternatively: Use duration max. 1 h. Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m).***

Number of the contributing scenario

12***

Contributing exposure scenario controlling worker exposure for PROC 13***

Frequency and duration of use

8 h (full shift)***

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

13***

Contributing exposure scenario controlling worker exposure for PROC 15***

Frequency and duration of use

8 h (full shift)***

Other given operational conditions affecting workers exposure

Indoor and outdoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

14***

Contributing exposure scenario controlling worker exposure for PROC 19***

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

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Environment

PEC = predicted environmental concentration (local+regional); RCR = risk characterisation ratio***

| | |
|-----------------------------------|--------------------------------------|
| Fresh Water (Pelagic) | PEC: 1.2E-3 mg/l; RCR: 0.02*** |
| Fresh Water (Sediment) | PEC: 0.011 mg/kg dw; RCR: 0.069*** |
| Marine Water (Pelagic) | PEC: 1.6E-4 mg/l; RCR: 0.027*** |
| Marine Water (Sediment) | PEC: 1.47E-3 mg/kg dw; RCR: 0.092*** |
| Agricultural Soil | PEC: 6.69E-4 mg/kg dw; RCR: 0.031*** |
| Sewage Treatment Plant (Effluent) | PEC: 0.01 mg/l; RCR: 0.01*** |

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects. EE(inhal): Estimated inhalative exposure [mg/m³].***

| | |
|---------|--------------------|
| Proc 1 | EE(inhal): 0.17 |
| Proc 2 | EE(inhal): 340.4 |
| Proc 3 | EE(inhal): 425.5 |
| Proc 4 | EE(inhal): 170.2 |
| Proc 5 | EE(inhal): 170.2 |
| Proc 8a | EE(inhal): 340.4 |
| Proc 8b | EE(inhal): 85.11 |
| Proc 9 | EE(inhal): 340.4 |
| Proc 10 | EE(inhal): 340.4 |
| Proc 11 | EE(inhal): 0.00*** |
| Proc 13 | EE(inhal): 238.3 |
| Proc 15 | EE(inhal): 170.2 |
| Proc 19 | EE(inhal): 340.4 |

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio. Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

| | |
|---------|--------------------|
| Proc 1 | RCR(inhal): < 0.01 |
| Proc 2 | RCR(inhal): 0.405 |
| Proc 3 | RCR(inhal): 0.507 |
| Proc 4 | RCR(inhal): 0.203 |
| Proc 5 | RCR(inhal): 0.203 |
| Proc 8a | RCR(inhal): 0.405 |
| Proc 8b | RCR(inhal): 0.101 |
| Proc 9 | RCR(inhal): 0.405 |
| Proc 10 | RCR(inhal): 0.405 |
| Proc 11 | RCR(inhal): 0*** |
| Proc 13 | RCR(inhal): 0.284 |
| Proc 15 | RCR(inhal): 0.203 |
| Proc 19 | RCR(inhal): 0.405 |

Number of the ES 5***

Short title of the exposure scenario

Use in Cleaning Products

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List of use descriptors

Sector of uses [SU]

SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

PROC7: Industrial spraying

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC10: Roller application or brushing

PROC13: Treatment of articles by dipping and pouring

Environmental release categories [ERC]

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.

Further explanations

Industrial use

Assessment tool used:

Chesar 3.3

StoffenManager V 4 for Following PROC:

PROC 7

liquid

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Covers percentage substance in the product up to 100 % (unless stated differently).

Assumes an advanced standard of occupational Health and Safety Management System***

Contributing Scenarios

Number of the contributing scenario

1***

Contributing exposure scenario controlling environmental exposure for ERC 4***

Further specification

Specific Environmental Release Categories [SPERC], SpERC ESVOC 4.4a.v1 (ESVOC 8).***

Amounts used

Daily amount per site: 5 to

Annual amount per site: 500 to***

Frequency and duration of use

Covers use up to: 20 days***

Other given operational conditions affecting environmental exposure

Indoor use***

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from process: 0.5%

Release fraction to wastewater from process: 8E-3%

Release fraction to soil from process: 0%***

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Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 99,99 % Onsite treatment off-air. Upgrade Systems in place or implement additional treatment. Assumed Efficiency: 99 % Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption.***

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000
The minimum grade of elimination in the sewage plant is (%): 16,25
Do not apply industrial sludge to natural soils***

Number of the contributing scenario 2***
Contributing exposure scenario controlling worker exposure for PROC 1

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 3***
Contributing exposure scenario controlling worker exposure for PROC 2

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 4***
Contributing exposure scenario controlling worker exposure for PROC 3

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 5***
Contributing exposure scenario controlling worker exposure for PROC 4

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

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Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

6***

Contributing exposure scenario controlling worker exposure for PROC 7

Further specification

Assessment tool used: StoffenManager

Frequency and duration of use

Covers frequency up to 4-5 d/week. Exposure time per day: 4-8 h/d***

Other given operational conditions affecting workers exposure

Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m).

Room volume > 1000 m3***

Technical conditions and measures to control dispersion from source towards the worker

Use in ventilated spray booths only. Distance from source: > 1 m2. provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection. Inspect and clean equipment regularly.***

Number of the contributing scenario

7***

Contributing exposure scenario controlling worker exposure for PROC 8a

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation):

90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

8***

Contributing exposure scenario controlling worker exposure for PROC 8b

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation):

95 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

9***

Contributing exposure scenario controlling worker exposure for PROC 9

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

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provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 10***
Contributing exposure scenario controlling worker exposure for PROC 10

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Use suitable eye protection.

Number of the contributing scenario 11***
Contributing exposure scenario controlling worker exposure for PROC 13

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio***

| | |
|-----------------------------------|--------------------------------------|
| Fresh Water (Pelagic) | PEC: 0.017 mg/l; RCR: 0.282*** |
| Fresh Water (Sediment) | PEC: 0.155 mg/kg dw; RCR: 0.972*** |
| Marine Water (Pelagic) | PEC: 1.73E-3 mg/l; RCR: 0.289*** |
| Marine Water (Sediment) | PEC: 0.016 mg/kg dw; RCR: 0.995*** |
| Agricultural Soil | PEC: 3.69E-3 mg/kg dw; RCR: 0.172*** |
| Sewage Treatment Plant (Effluent) | PEC: 0.168 mg/l; RCR: 0.168*** |

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects. EE(inhal): Estimated inhalative exposure [mg/m³].***

| | |
|---------|------------------|
| Proc 1 | EE(inhal): 0.17 |
| Proc 2 | EE(inhal): 85.11 |
| Proc 3 | EE(inhal): 170.2 |
| Proc 4 | EE(inhal): 340.4 |
| Proc 7 | EE(inhal): 0.00 |
| Proc 8a | EE(inhal): 85.11 |
| Proc 8b | EE(inhal): 21.28 |
| Proc 9 | EE(inhal): 85.11 |
| Proc 10 | EE(inhal): 85.11 |

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Proc 13

EE(inhal): 85.11

Risk characterisation

Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values. RCR(inhal): inhalative risk characterisation ratio.

| | |
|---------|--------------------|
| Proc 1 | RCR(inhal): < 0.01 |
| Proc 2 | RCR(inhal): 0.101 |
| Proc 3 | RCR(inhal): 0.203 |
| Proc 4 | RCR(inhal): 0.405 |
| Proc 7 | RCR(inhal): < 0.01 |
| Proc 8a | RCR(inhal): 0.101 |
| Proc 8b | RCR(inhal): 0.025 |
| Proc 9 | RCR(inhal): 0.101 |
| Proc 10 | RCR(inhal): 0.101 |
| Proc 13 | RCR(inhal): 0.101 |

Number of the ES 6***

Short title of the exposure scenario

Use in Cleaning Products

List of use descriptors

Sector of uses [SU]

SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC10: Roller application or brushing

PROC11: Non industrial spraying

PROC13: Treatment of articles by dipping and pouring

Environmental release categories [ERC]

ERC8a: Wide dispersive indoor use of processing aids in open systems

ERC8d: Wide dispersive outdoor use of processing aids in open systems

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand).

Further explanations

Professional use

Assessment tool used:

SAFETY DATA SHEET



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Chesar 3.3

StoffenManager V 4 for Following PROC:

PROC 11

liquid

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Covers percentage substance in the product up to 100 % (unless stated differently)

Assumes a good basic standard of occupational hygiene is implemented***

Contributing Scenarios

Number of the contributing scenario 1***
Contributing exposure scenario controlling environmental exposure for ERC 8d***

Further specification

Specific Environmental Release Categories [SPERC], SpERC ESVOC 8.4b.v1 (ESVOC 9).***

Amounts used

Daily amount per site: 0.000055 to

Fraction of EU tonnage used in region: 0.1***

Frequency and duration of use

Covers use up to: 365 days***

Other given operational conditions affecting environmental exposure

Indoor/Outdoor use***

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from wide dispersive use (regional only): 2%

Release fraction to wastewater from wide dispersive use: 1E-4%

Release fraction to soil from wide dispersive use (regional only): 0%***

Conditions and measures related to municipal sewage treatment plant

The minimum grade of elimination in the sewage plant is (%): 16.25***

Number of the contributing scenario 2***
Contributing exposure scenario controlling worker exposure for PROC 1

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 3***
Contributing exposure scenario controlling worker exposure for PROC 2

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 4***
Contributing exposure scenario controlling worker exposure for PROC 3

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Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

5***

Contributing exposure scenario controlling worker exposure for PROC 4

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

6***

Contributing exposure scenario controlling worker exposure for PROC 8a

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.

Number of the contributing scenario

7***

Contributing exposure scenario controlling worker exposure for PROC 8b

Frequency and duration of use

8 h (full shift)***

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

8***

Contributing exposure scenario controlling worker exposure for PROC 9

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

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provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 9***
Contributing exposure scenario controlling worker exposure for PROC 10

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 10***
Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

Assessment tool used: StoffenManager

Frequency and duration of use

Covers frequency up to 4-5 d/week. Exposure time per day: 4-8 h/d***

Other given operational conditions affecting workers exposure

Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m).

Room volume 1000 m3***

Technical conditions and measures to control dispersion from source towards the worker

Use in ventilated spray booths only. Distance from source: > 1 m2. provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection. Inspect and clean equipment regularly.***

Number of the contributing scenario 11***
Contributing exposure scenario controlling worker exposure for PROC 13***

Frequency and duration of use

8 h (full shift)***

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Environment

PEC = predicted environmental concentration (local+regional); RCR = risk characterisation ratio***

| | |
|-------------------------|---------------------------------------|
| Fresh Water (Pelagic) | PEC: 1.59E-4 mg/l; RCR: < 0.01*** |
| Fresh Water (Sediment) | PEC: 1.46E-3 mg/kg dw; RCR: < 0.01*** |
| Marine Water (Pelagic) | PEC: 5.59E-5 mg/l; RCR: < 0.01*** |
| Marine Water (Sediment) | PEC: 5.14E-4 mg/kg dw; RCR: 0.032*** |

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Agricultural Soil PEC: 1.1E-4 mg/kg dw; RCR: < 0.01***
Sewage Treatment Plant (Effluent) PEC: 2.3E-8 mg/l; RCR: < 0.01***

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects. EE(inhal): Estimated inhalative exposure [mg/m³].***

| | |
|---------|--------------------|
| Proc 1 | EE(inhal): 0.17 |
| Proc 2 | EE(inhal): 340.4 |
| Proc 3 | EE(inhal): 425.5 |
| Proc 4 | EE(inhal): 595.8 |
| Proc 8a | EE(inhal): 340.4 |
| Proc 8b | EE(inhal): 595.8 |
| Proc 9 | EE(inhal): 340.4 |
| Proc 10 | EE(inhal): 340.4 |
| Proc 11 | EE(inhal): 0.00*** |
| Proc 13 | EE(inhal): 340.4 |

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio. Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

| | |
|---------|-----------------------|
| Proc 1 | RCR(inhal): < 0.01 |
| Proc 2 | RCR(inhal): 0.405 |
| Proc 3 | RCR(inhal): 0.507 |
| Proc 4 | RCR(inhal): 0.709 |
| Proc 8a | RCR(inhal): 0.405 |
| Proc 8b | RCR(inhal): 0.709 |
| Proc 9 | RCR(inhal): 0.405 |
| Proc 10 | RCR(inhal): 0.405 |
| Proc 11 | RCR(inhal): < 0.01*** |
| Proc 13 | RCR(inhal): 0.405 |

Number of the ES 7***

Short title of the exposure scenario

Lubricants

List of use descriptors

Sector of uses [SU]

SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

PROC7: Industrial spraying

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

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PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10: Roller application or brushing
PROC13: Treatment of articles by dipping and pouring
PROC17: Lubrication at high energy conditions and in partly open process

Environmental release categories [ERC]

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of machinery/engines and similar articles, reworking on reject articles, equipment maintenance and disposal of wastes.

Further explanations

Industrial use

Assessment tool used:

Chesar 3.3

StoffenManager V 4 for Following PROC:

PROC 7

liquid

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Covers percentage substance in the product up to 100 % (unless stated differently)

Assumes an advanced standard of occupational Health and Safety Management System***

Contributing Scenarios

Number of the contributing scenario

1***

Contributing exposure scenario controlling environmental exposure for ERC 4***

Further specification

release factors for (Sp)ERC were modified.***

Amounts used

Daily amount per site: 5 to

Annual amount per site: 100 to***

Frequency and duration of use

Covers use up to: 20 days***

Other given operational conditions affecting environmental exposure

Indoor use***

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from process: 0.05%

Release fraction to soil from process: 0%

Release fraction to wastewater from process: 5E-3%

Do not apply industrial sludge to natural soils***

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 99,95 % Onsite treatment off-air.

Upgrade Systems in place or implement additional treatment. Assumed Efficiency: 90 % Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption.***

Conditions and measures related to municipal sewage treatment plant

Size of industrial sewage treatment plant (m3/d): 2000

The minimum grade of elimination in the sewage plant is (%): 16,25

Do not apply industrial sludge to natural soils***

Number of the contributing scenario

2***

Contributing exposure scenario controlling worker exposure for PROC 1

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Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

3***

Contributing exposure scenario controlling worker exposure for PROC 2

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

4***

Contributing exposure scenario controlling worker exposure for PROC 3

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

5***

Contributing exposure scenario controlling worker exposure for PROC 4

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

6***

Contributing exposure scenario controlling worker exposure for PROC 7

Further specification

Assessment tool used: StoffenManager

Frequency and duration of use

Covers frequency up to 4-5 d/week. Exposure time per day: 4-8 h/d***

Other given operational conditions affecting workers exposure

Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m).

Room volume 1000 m³***

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Technical conditions and measures to control dispersion from source towards the worker

Use in ventilated spray booths only. Distance from source: > 1 m². provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection. Inspect and clean equipment regularly.***

Number of the contributing scenario

7***

Contributing exposure scenario controlling worker exposure for PROC 8a

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

8***

Contributing exposure scenario controlling worker exposure for PROC 8b

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 95 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

9***

Contributing exposure scenario controlling worker exposure for PROC 9

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

10***

Contributing exposure scenario controlling worker exposure for PROC 10

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

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provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 11***
Contributing exposure scenario controlling worker exposure for PROC 13

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 12***
Contributing exposure scenario controlling worker exposure for PROC 17

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 13***
Contributing exposure scenario controlling worker exposure for PROC 17

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Assumes process temperature up to

64 °C***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio***

| | |
|-----------------------------------|---------------------------------------|
| Fresh Water (Pelagic) | PEC: 0.011 mg/l; RCR: 0.177*** |
| Fresh Water (Sediment) | PEC: 0.098 mg/kg dw; RCR: 0.611*** |
| Marine Water (Pelagic) | PEC: 1.1E-3 mg/l; RCR: 0.184*** |
| Marine Water (Sediment) | PEC: 0.01 mg/kg dw; RCR: 0.634*** |
| Agricultural Soil | PEC: 1.83E-4 mg/kg dw; RCR: < 0.01*** |
| Sewage Treatment Plant (Effluent) | PEC: 0.105 mg/l; RCR: 0.105*** |

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Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects. EE(inhal): Estimated inhalative exposure [mg/m³].***

| | |
|---------|--|
| Proc 1 | EE(inhal): 0.17 |
| Proc 2 | EE(inhal): 85.11 |
| Proc 3 | EE(inhal): 170.2 |
| Proc 4 | EE(inhal): 340.4 |
| Proc 7 | EE(inhal): 0.00 |
| Proc 8a | EE(inhal): 85.11 |
| Proc 8b | EE(inhal): 21.28 |
| Proc 9 | EE(inhal): 85.11 |
| Proc 10 | EE(inhal): 85.11 |
| Proc 13 | EE(inhal): 85.11 |
| Proc 17 | EE(inhal): 595.8 - Contributing Scenario 12 EE(inhal): 170.2 - Contributing Scenario 13 |

Risk characterisation

Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values. RCR(inhal): inhalative risk characterisation ratio.

| | |
|---------|--|
| Proc 1 | RCR(inhal): < 0.01 |
| Proc 2 | RCR(inhal): 0.101 |
| Proc 3 | RCR(inhal): 0.203 |
| Proc 4 | RCR(inhal): 0.405 |
| Proc 7 | RCR(inhal): < 0.01 |
| Proc 8a | RCR(inhal): 0.101 |
| Proc 8b | RCR(inhal): 0.025 |
| Proc 9 | RCR(inhal): 0.101 |
| Proc 10 | RCR(inhal): 0.101 |
| Proc 13 | RCR(inhal): 0.101 |
| Proc 17 | RCR(inhal): 0.709 - Contributing Scenarios 12 RCR(inhal): 0.203 - Contributing Scenarios 13 |

Number of the ES 8***

Short title of the exposure scenario

Lubricants

List of use descriptors

Sector of uses [SU]

SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

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PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10: Roller application or brushing
PROC11: Non industrial spraying
PROC13: Treatment of articles by dipping and pouring
PROC17: Lubrication at high energy conditions and in partly open process***

Environmental release categories [ERC]

ERC9b: Wide dispersive outdoor use of substances in closed systems

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.

Further explanations

Professional use

Assessment tool used:

Chesar 3.3

StoffenManager V 4 for Following PROC:

PROC 11

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Covers percentage substance in the product up to 100 % (unless stated differently)

Assumes a good basic standard of occupational hygiene is implemented***

Contributing Scenarios

Number of the contributing scenario

1***

Contributing exposure scenario controlling environmental exposure for ERC 9b***

Further specification

Specific Environmental Release Categories [SPERC], SpERC ESVOC 9.6b.v1 (ESVOC 14).***

Amounts used

daily wide dispersive use: 0.000055 to/d

Fraction of EU tonnage used in region: 0.1***

Frequency and duration of use

Covers use up to: 365 days***

Other given operational conditions affecting environmental exposure

Indoor/Outdoor use***

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from wide dispersive use (regional only): 1%

Release fraction to wastewater from wide dispersive use: 1%

Release fraction to soil from wide dispersive use (regional only): 1%***

Conditions and measures related to municipal sewage treatment plant

The minimum grade of elimination in the sewage plant is (%): 16.25***

Number of the contributing scenario

2***

Contributing exposure scenario controlling worker exposure for PROC 1

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

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Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 3***
Contributing exposure scenario controlling worker exposure for PROC 2

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 4***
Contributing exposure scenario controlling worker exposure for PROC 3

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 5***
Contributing exposure scenario controlling worker exposure for PROC 4

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 6***
Contributing exposure scenario controlling worker exposure for PROC 8a

Frequency and duration of use

8 h (full shift)***

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

Provide extract ventilation to points where emissions occur. Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative). If no adequate ventilation is available, respiratory protection (efficiency 803 %) must be used. provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 7***



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Contributing exposure scenario controlling worker exposure for PROC 8b

Frequency and duration of use

Avoid carrying out activities involving exposure for more than 4 hours

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 8***
Contributing exposure scenario controlling worker exposure for PROC 9

Frequency and duration of use

8 h (full shift)***

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 9***
Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

Assessment tool used: StoffenManager

Frequency and duration of use

Covers frequency up to 4-5 d/week. Exposure time per day: 4-8 h/d***

Other given operational conditions affecting workers exposure

Ensure that the task is not carried out by more than one worker simultaneously.

The task is not followed by a period of evaporation, drying or curing.

Room volume <100 m³***

Technical conditions and measures to control dispersion from source towards the worker

Distance from source: > 1 m. provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

Conditions and measures related to personal protection, hygiene and health evaluation

Inspect and clean equipment regularly. Wear suitable gloves (tested to EN374) and eye protection. Wear respiratory protection (Efficiency: 80 %) Alternatively: Use duration max. 2 h.***

Number of the contributing scenario 10***
Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

Assessment tool used: StoffenManager

Frequency and duration of use

Covers frequency up to 4-5 d/week. Exposure time per day: 4-8 h/d***

Other given operational conditions affecting workers exposure

Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m).

Room volume >1000 m³***

Technical conditions and measures to control dispersion from source towards the worker

Use in ventilated spray booths only. Distance from source: 1 m. provide a basic standard of general ventilation (1 to 3 air

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changes per hour).***

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

Conditions and measures related to personal protection, hygiene and health evaluation

Inspect and clean equipment regularly. Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 11***
Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

Assessment tool used: StoffenManager

Frequency and duration of use

Covers frequency up to 4-5 d/week. Exposure time per day: max. 4 h/d***

Other given operational conditions affecting workers exposure

Ensure that the task is not carried out by more than one worker simultaneously.

The task is not followed by a period of evaporation, drying or curing.

Room volume 100-1000 m³***

Technical conditions and measures to control dispersion from source towards the worker

Provide enhanced general ventilation by mechanical means. Effectiveness of LEV (local exhaust ventilation): 47 % (inhalative).

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

Conditions and measures related to personal protection, hygiene and health evaluation

Inspect and clean equipment regularly. Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 12***
Contributing exposure scenario controlling worker exposure for PROC 13

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation):

80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.

Number of the contributing scenario 13***
Contributing exposure scenario controlling worker exposure for PROC 17

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Assumes process temperature up to

64 °C***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection. Wear respiratory protection (Efficiency: 95 %).***

Number of the contributing scenario 14***
Contributing exposure scenario controlling worker exposure for PROC 17

Product characteristics

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Covers percentage substance in the product up to 1 %***

Frequency and duration of use

4 h (half shift)***

Other given operational conditions affecting workers exposure

Indoor use

Assumes process temperature up to

64 °C***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear respiratory protection (Efficiency: 90 %).***

Number of the contributing scenario

15***

Contributing exposure scenario controlling worker exposure for PROC 10***

Frequency and duration of use

8 h (full shift)***

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Environment

PEC = predicted environmental concentration (local+regional); RCR = risk characterisation ratio***

| | |
|-----------------------------------|---------------------------------------|
| Fresh Water (Pelagic) | PEC: 1.82E-4 mg/l; RCR: < 0.01*** |
| Fresh Water (Sediment) | PEC: 1.67E-3 mg/kg dw; RCR: 0.01*** |
| Marine Water (Pelagic) | PEC: 5.82E-5 mg/l; RCR: < 0.01*** |
| Marine Water (Sediment) | PEC: 5.35E-4 mg/kg dw; RCR: 0.033*** |
| Agricultural Soil | PEC: 1.23E-4 mg/kg dw; RCR: < 0.01*** |
| Sewage Treatment Plant (Effluent) | PEC: 2.3E-4 mg/l; RCR: < 0.01*** |

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects. EE(inhal): Estimated inhalative exposure [mg/m³].***

| | |
|---------|--|
| Proc 1 | EE(inhal): 0.17 |
| Proc 2 | EE(inhal): 340.4 |
| Proc 3 | EE(inhal): 425.5 |
| Proc 4 | EE(inhal): 595.8 |
| Proc 8a | EE(inhal): 340.4 |
| Proc 8b | EE(inhal): 595.8 |
| Proc 9 | EE(inhal): 340.4 |
| Proc 10 | EE(inhal): 340.4*** |
| Proc 11 | EE(inhal): 0 - Contributing Scenario 9 EE(inhal): 286.4 - Contributing Scenario 10 EE(inhal): 269.1 - Contributing Scenario 11 |
| Proc 13 | EE(inhal): 340.4 |
| Proc 17 | EE(inhal): 425.5 - Contributing Scenario 13 EE(inhal): 170.2 - Contributing Scenario 14 |

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio. Where required local and systemic effects were evaluated both

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for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

| | |
|---------|---|
| Proc 1 | RCR(inhal): < 0.01 |
| Proc 2 | RCR(inhal): 0.405 |
| Proc 3 | RCR(inhal): 0.507 |
| Proc 4 | RCR(inhal): 0.709 |
| Proc 8a | RCR(inhal): 0.405 |
| Proc 8b | RCR(inhal): 0.709 |
| Proc 9 | RCR(inhal): 0.405 |
| Proc 10 | RCR(inhal): 0.405*** |
| Proc 11 | RCR(inhal): > 0.01 - Contributing Scenarios 9 RCR(inhal): 0.682 - Contributing Scenarios 10 RCR(inhal): 0.641 - Contributing Scenarios 11 |
| Proc 13 | RCR(inhal): 0.405 |
| Proc 17 | RCR(inhal): 0.507 - Contributing Scenarios 13 RCR(inhal): 0.203 - Contributing Scenarios 14 |

Number of the ES 9***

Short title of the exposure scenario

Metal working fluids / rolling oils

List of use descriptors

Sector of uses [SU]

SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

PROC7: Industrial spraying

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC10: Roller application or brushing

PROC13: Treatment of articles by dipping and pouring

PROC17: Lubrication at high energy conditions and in partly open process

Environmental release categories [ERC]

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use in formulated MWFs (MWFs)/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils.

Further explanations

Industrial use

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Assessment tool used:

Chesar 3.3

StoffenManager V 4 for Following PROC:

PROC 7

liquid

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Covers percentage substance in the product up to 100 % (unless stated differently)

Assumes an advanced standard of occupational Health and Safety Management System***

Contributing Scenarios

Number of the contributing scenario 1***
Contributing exposure scenario controlling environmental exposure for ERC 4***

Further specification

Specific Environmental Release Categories [SPERC], SpERC ESVOC 4.7a.v1 (ESVOC 18).***

Amounts used

Daily amount per site: 5 to

Annual amount per site: 100 to

Fraction of EU tonnage used in region: 1***

Other given operational conditions affecting environmental exposure

Indoor use***

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from process: 0.6%

Release fraction to wastewater from process: 1E-3%

Release fraction to soil from process: 0%***

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 99 % Typical measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs: e.g. thermal wet scrubber, gas removal and/or air filtration, particle removal and/or thermal oxidation and/or vapour recovery, adsorption. Onsite treatment off-air.

Upgrade Systems in place or implement additional treatment. Assumed Efficiency: 70 %***

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/ treatment plant (m³/d): 2000

The minimum grade of elimination in the sewage plant is (%): 16.25***

Number of the contributing scenario 2***
Contributing exposure scenario controlling worker exposure for PROC 1

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 3***
Contributing exposure scenario controlling worker exposure for PROC 2

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

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Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 4***
Contributing exposure scenario controlling worker exposure for PROC 3

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 5***
Contributing exposure scenario controlling worker exposure for PROC 5

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 6***
Contributing exposure scenario controlling worker exposure for PROC 7

Further specification

Assessment tool used: StoffenManager

Frequency and duration of use

Covers frequency up to 4-5 d/week. Exposure time per day: 4-8 h/d***

Other given operational conditions affecting workers exposure

Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m).

Room volume >1000 m3***

Technical conditions and measures to control dispersion from source towards the worker

Use in ventilated spray booths only. Distance from source: > 1 m2. provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection. Inspect and clean equipment regularly.***

Number of the contributing scenario 7***
Contributing exposure scenario controlling worker exposure for PROC 8a

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

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Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 8***
Contributing exposure scenario controlling worker exposure for PROC 8b

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 9***
Contributing exposure scenario controlling worker exposure for PROC 9

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 10***
Contributing exposure scenario controlling worker exposure for PROC 10

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 11***
Contributing exposure scenario controlling worker exposure for PROC 13

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

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Number of the contributing scenario 12***
Contributing exposure scenario controlling worker exposure for PROC 17

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 13***
Contributing exposure scenario controlling worker exposure for PROC 17

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Assumes process temperature up to

64 °C***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Environment

PEC = predicted environmental concentration (local); RCR = risk characterisation ratio***

| | |
|-----------------------------------|--------------------------------------|
| Fresh Water (Pelagic) | PEC: 2.25E-3 mg/l; RCR: 0.038*** |
| Fresh Water (Sediment) | PEC: 0.021 mg/kg dw; RCR: 0.13*** |
| Marine Water (Pelagic) | PEC: 2.65E-4 mg/l; RCR: 0.044*** |
| Marine Water (Sediment) | PEC: 2.44E-3 mg/kg dw; RCR: 0.152*** |
| Agricultural Soil | PEC: 2.09E-3 mg/kg dw; RCR: 0.097*** |
| Sewage Treatment Plant (Effluent) | PEC: 0.021 mg/l; RCR: 0.021*** |

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects. EE(inhal): Estimated inhalative exposure [mg/m³].***

| | |
|---------|--|
| Proc 1 | EE(inhal): 0.17 |
| Proc 2 | EE(inhal): 85.11 |
| Proc 3 | EE(inhal): 170.2 |
| Proc 5 | EE(inhal): 85.11 |
| Proc 7 | EE(inhal): 0.00 |
| Proc 8a | EE(inhal): 85.11 |
| Proc 8b | EE(inhal): 425.5 |
| Proc 9 | EE(inhal): 85.11 |
| Proc 10 | EE(inhal): 85.11 |
| Proc 13 | EE(inhal): 85.11 |
| Proc 17 | EE(inhal): 595.8 - Contributing Scenario 12 EE(inhal): 170.2 - Contributing Scenario 13 |

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Risk characterisation

RCR(inhal): inhalative risk characterisation ratio. Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

| | |
|---------|--|
| Proc 1 | RCR(inhal): < 0.01 |
| Proc 2 | RCR(inhal): 0.101 |
| Proc 3 | RCR(inhal): 0.203 |
| Proc 5 | RCR(inhal): 0.101 |
| Proc 7 | RCR(inhal): < 0.01 |
| Proc 8a | RCR(inhal): 0.101 |
| Proc 8b | RCR(inhal): 0.507 |
| Proc 9 | RCR(inhal): 0.101 |
| Proc 10 | RCR(inhal): 0.101 |
| Proc 13 | RCR(inhal): 0.101 |
| Proc 17 | RCR(inhal): 0.709 - Contributing Scenarios 12 RCR(inhal): 0.203 - Contributing Scenarios 13 |

Number of the ES 10***

Short title of the exposure scenario

Metal working fluids / rolling oils

List of use descriptors

Sector of uses [SU]

SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process categories [PROC]

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC10: Roller application or brushing

PROC11: Non industrial spraying

PROC13: Treatment of articles by dipping and pouring

PROC17: Lubrication at high energy conditions and in partly open process***

Environmental release categories [ERC]

ERC8a: Wide dispersive indoor use of processing aids in open systems

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Covers the use in formulated MWFs (MWFs) including transfer operations, open and contained cutting/machining activities, automated and manual application of corrosion protections, draining and working on contaminated/ reject articles, and disposal of waste oils.

Further explanations

Professional use

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Assessment tool used:

Chesar 3.3

StoffenManager V 4 for Following PROC:

PROC 11

liquid

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Covers percentage substance in the product up to 100 % (unless stated differently).

Assumes a basic standard of occupational Health and Safety Management System***

Contributing Scenarios

Number of the contributing scenario 1***
Contributing exposure scenario controlling environmental exposure for ERC 8a***

Further specification

Specific Environmental Release Categories [SPERC], SpERC ESVOC 8.7c.v1 (ESVOC 20).***

Amounts used

daily wide dispersive use: 0.000055 to/d

Fraction of EU tonnage used in region: 0.0000553***

Other given operational conditions affecting environmental exposure

Indoor/Outdoor use***

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from wide dispersive use (regional only): 40%

Release fraction to wastewater from wide dispersive use: 5%

Release fraction to soil from wide dispersive use (regional only): 5%***

Conditions and measures related to municipal sewage treatment plant

The minimum grade of elimination in the sewage plant is (%): 16.25***

Number of the contributing scenario 2***
Contributing exposure scenario controlling worker exposure for PROC 1

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 3***
Contributing exposure scenario controlling worker exposure for PROC 2

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 4***
Contributing exposure scenario controlling worker exposure for PROC 3

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Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

5***

Contributing exposure scenario controlling worker exposure for PROC 5

Frequency and duration of use

4 h (half shift)***

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

6***

Contributing exposure scenario controlling worker exposure for PROC 8a

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

7***

Contributing exposure scenario controlling worker exposure for PROC 8b

Frequency and duration of use

8 h (full shift)***

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

8***

Contributing exposure scenario controlling worker exposure for PROC 10

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

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Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario

9***

Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

Assessment tool used: StoffenManager

Frequency and duration of use

Covers frequency up to 4-5 d/week. Exposure time per day: 4-8 h/d***

Other given operational conditions affecting workers exposure

Ensure that the task is not carried out by more than one worker simultaneously.

The task is not followed by a period of evaporation, drying or curing.

Room volume < 100 m³***

Technical conditions and measures to control dispersion from source towards the worker

Distance from source: > 1 m². provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

Conditions and measures related to personal protection, hygiene and health evaluation

Inspect and clean equipment regularly. Wear suitable gloves (tested to EN374) and eye protection. Wear respiratory protection (Efficiency: 80 %) Alternatively: Use duration max. 2 h.***

Number of the contributing scenario

10***

Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

Assessment tool used: StoffenManager

Frequency and duration of use

Covers frequency up to 4-5 d/week. Exposure time per day: 4-8 d/d***

Other given operational conditions affecting workers exposure

Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m).

Room volume > 1000 m³***

Technical conditions and measures to control dispersion from source towards the worker

Use in ventilated spray booths only. Distance from source: 1 m. provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day

Conditions and measures related to personal protection, hygiene and health evaluation

Inspect and clean equipment regularly. Wear suitable gloves (tested to EN374), coverall and eye protection.***

Number of the contributing scenario

11***

Contributing exposure scenario controlling worker exposure for PROC 11

Further specification

Assessment tool used: StoffenManager

Frequency and duration of use

Covers frequency up to 4-5 d/week. Exposure time per day: max 4h/d***

Other given operational conditions affecting workers exposure

Ensure that the task is not carried out by more than one worker simultaneously.

The task is not followed by a period of evaporation, drying or curing.

Room volume 100-1000 m³***

Technical conditions and measures to control dispersion from source towards the worker

Provide enhanced general ventilation by mechanical means. Effectiveness of LEV (local exhaust ventilation): 47 % (inhalative);

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0 % (dermal).***

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day***

Conditions and measures related to personal protection, hygiene and health evaluation

Inspect and clean equipment regularly. Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 12***
Contributing exposure scenario controlling worker exposure for PROC 13

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 13***
Contributing exposure scenario controlling worker exposure for PROC 17

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 14***
Contributing exposure scenario controlling worker exposure for PROC 17

Frequency and duration of use

1 h per shift***

Other given operational conditions affecting workers exposure

Indoor use

Assumes process temperature up to

< 64 °C***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Environment

PEC = predicted environmental concentration (local+regional); RCR = risk characterisation ratio***

| | |
|-----------------------------------|---------------------------------------|
| Fresh Water (Pelagic) | PEC: 2.74E-4 mg/l; RCR: < 0.01*** |
| Fresh Water (Sediment) | PEC: 2.52E-3 mg/kg dw; RCR: 0.016*** |
| Marine Water (Pelagic) | PEC: 6.74E-5 mg/l; RCR: 0.011*** |
| Marine Water (Sediment) | PEC: 6.2E-4 mg/kg dw; RCR: 0.039*** |
| Agricultural Soil | PEC: 1.72E-4 mg/kg dw; RCR: < 0.01*** |
| Sewage Treatment Plant (Effluent) | PEC: 1.15E-3 mg/l; RCR: < 0.01*** |

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Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects. EE(inhal): Estimated inhalative exposure [mg/m³].***

| | |
|---------|---|
| Proc 1 | EE(inhal): 0.17 |
| Proc 2 | EE(inhal): 340.4 |
| Proc 3 | EE(inhal): 425.5 |
| Proc 5 | EE(inhal): 340.4 |
| Proc 8a | EE(inhal): 340.4 |
| Proc 8b | EE(inhal): 595.8 |
| Proc 10 | EE(inhal): 340.4 |
| Proc 11 | EE(inhal): 0.00 - Contributing Scenario 9 EE(inhal): 286.4 - Contributing Scenario 10 EE(inhal): 269.1 - Contributing Scenario 11 |
| Proc 13 | EE(inhal): 340.4 |
| Proc 17 | EE(inhal): 680.9 - Contributing Scenario 13 EE(inhal): 680.9 - Contributing Scenario 14 |

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio. Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

| | |
|---------|---|
| Proc 1 | RCR(inhal): < 0.01 |
| Proc 2 | RCR(inhal): 0.405 |
| Proc 3 | RCR(inhal): 0.507 |
| Proc 5 | RCR(inhal): 0.405 |
| Proc 8a | RCR(inhal): 0.405 |
| Proc 8b | RCR(inhal): 0.709 |
| Proc 10 | RCR(inhal): 0.405 |
| Proc 11 | RCR(inhal): < 0.01 - Contributing Scenarios 9 RCR(inhal): 0.682 - Contributing Scenarios 10 RCR(inhal): 0.641 - Contributing Scenarios 11 |
| Proc 13 | RCR(inhal): 0.405 |
| Proc 17 | RCR(inhal): 0.811 - Contributing Scenarios 13 RCR(inhal): 0.811 - Contributing Scenarios 14 |

Number of the ES 11***

Short title of the exposure scenario

Use in laboratories

List of use descriptors

Sector of uses [SU]

SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)***

Process categories [PROC]

PROC10: Roller application or brushing

PROC15: Use as laboratory reagent

Environmental release categories [ERC]

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics

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Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Use of the substance within laboratory settings, including material transfers and equipment cleaning

Further explanations

Professional use

Assessment tool used:

Chesar 3.3

liquid

Assumes use at not more than 20°C above ambient temperature (unless stated differently)

Covers percentage substance in the product up to 100 % (unless stated differently)

Assumes a basic standard of occupational Health and Safety Management System***

Contributing Scenarios

Number of the contributing scenario 1***
Contributing exposure scenario controlling environmental exposure for ERC 8a***

Further specification

Specific Environmental Release Categories [SPERC], SpERC ESVOC 8.17.v1 (ESVOC 39).***

Amounts used

daily wide dispersive use: 0.000055 to/d

Fraction of Regional tonnage used locally: 0.1***

Other given operational conditions affecting environmental exposure

Indoor/Outdoor use***

Technical conditions and measures at process level (source) to prevent release

Release fraction to air from wide dispersive use (regional only): 50%

Release fraction to wastewater from wide dispersive use: 50%

Release fraction to soil from wide dispersive use (regional only): 0%***

Conditions and measures related to municipal sewage treatment plant

The minimum grade of elimination in the sewage plant is (%): 16.253***

Number of the contributing scenario 2***
Contributing exposure scenario controlling worker exposure for PROC 10

Frequency and duration of use

4 h (half shift)***

Other given operational conditions affecting workers exposure

Indoor use***

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation):

80 % (inhalative); 0 % (dermal).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

Number of the contributing scenario 3***
Contributing exposure scenario controlling worker exposure for PROC 15

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Technical conditions and measures to control dispersion from source towards the worker

provide a basic standard of general ventilation (1 to 3 air changes per hour).***

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374) and eye protection.***

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Environment

PEC = predicted environmental concentration (local+regional); RCR = risk characterisation ratio***

| | |
|--------------------------------------|--------------------------------------|
| Fresh Water (Pelagic) | PEC: 1.31E-3 mg/l; RCR: 0.022*** |
| Fresh Water (Sediment) | PEC: 0.012 mg/kg dw; RCR: 0.075*** |
| Marine Water (Pelagic) | PEC: 1.71E-4 mg/l; RCR: 0.029*** |
| Marine Water (Sediment) | PEC: 1.57E-3 mg/kg dw; RCR: 0.098*** |
| Agricultural Soil | PEC: 7.31E-4 mg/kg dw; RCR: 0.034*** |
| Sewage Treatment Plant (Effluent) | PEC: 0.012 mg/l; RCR: 0.012*** |

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. Exposure estimates are given for either short-term or long-term exposure depending on which lead to more conservative risk characterisation ratios. The RMMs described above suffice to control risks for both local and systemic effects. EE(inhal): Estimated inhalative exposure [mg/m³].***

| | |
|---------|------------------|
| Proc 10 | EE(inhal): 340.4 |
| Proc 15 | EE(inhal): 170.2 |

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio. Where required local and systemic effects were evaluated both for short-term and long-term exposure. The RCR's given correspond in each case to the most conservative calculated values.

| | |
|---------|-------------------|
| Proc 10 | RCR(inhal): 0.405 |
| Proc 15 | RCR(inhal): 0.203 |

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Usage of release factors allows downstream users to verify in a first approximation, if the combination of local usage and production conditions meets the defined release quantities resulting from this exposure scenario (calculated as M(site) [see amounts used, contributing scenario 1] x release factor [Technical conditions and measures at process level (source) to prevent release; contributing scenario 1])

For specific information regarding the SPERC used please refer to the ESIG webpage
<https://www.esig.org/reach-ges/environment/>***

associated uses:

Should consumer uses be associated with this exposure scenario, please contact OQ for further details
Other combinations of operational conditions may also be safe. Please contact OQ in case your local operational conditions differ from the ones described above and you are unsure if they are also safe***