

SAFETY DATA SHEET



n-Nonanal
10540

Version / Revision
Supersedes Version

2.01
2.00***

Revision Date
Issuing date

30-Nov-2020
30-Nov-2020

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

1.1. Product identifier

Identification of the
substance/preparation

n-Nonanal

CAS-No 124-19-6
EC No. 204-688-5
Registration number (REACH) 01-2119969440-35

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

Identified uses Compounding (mixing of fragrances)
Formulation
Uses advised against None

1.3. Details of the supplier of the safety data sheet

Company/Undertaking
Identification **OQ Chemicals GmbH**
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

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)

Environmental hazard Aquatic Chronic 3; H412

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).

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Hazard statements H412: Harmful to aquatic life with long lasting effects.

Precautionary statements P273: Avoid release to the environment.
P501: Dispose of contents/container in accordance with local regulation.

2.3. Other hazards

Vapour/air-mixtures are explosive at intense warming

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

3.1. Substances

Component	CAS-No	REACH-No	1272/2008/EC	Concentration (%)
Nonanal	124-19-6	01-2119969440-35	Aquatic Chronic 3; H412	> 88,0

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. Obtain medical attention.

Ingestion

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

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

Main symptoms

nausea, shortness of breath, dizziness.

Special hazard

Lung oedema, Lung irritation.

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. In case of lung irritation, first treatment with cortisone spray.



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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

alcohol-resistant 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

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

Vapours are heavier than air and may spread along floors

Vapour/air-mixtures are explosive at intense warming

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

Keep people away from and upwind of fire. Cool containers / tanks with water spray. Dike and collect water used to fight fire. Water run-off can cause environmental damage.

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). Water runoff can cause environmental damage.

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. DO NOT use combustible materials such as sawdust. Keep in suitable, closed containers for disposal. If liquid has been spilt in large quantities clean up promptly by scoop or vacuum. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

6.4. Reference to other sections

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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. Do not breathe vapours or spray mist. Wash hands before breaks and immediately after handling the product. Provide sufficient air exchange and/or exhaust in work rooms. Refill and handle product only in closed system.

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

acids and bases
amines
oxidizing agents

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/air-mixtures are explosive at intense warming.

Technical measures/Storage conditions

Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care. Handle under nitrogen, protect from moisture. Keep at temperatures between 0 and 49 °C (32 and 120 °F).

Temperature class

T4

7.3. Specific end use(s)

Compounding (mixing of fragrances)
Formulation

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 UK

No exposure limits established.

DNEL & PNEC

Nonanal, CAS: 124-19-6 Workers

DN(M)EL - long-term exposure - systemic effects - Inhalation	24.9 mg/m ³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - systemic effects - Dermal	7 mg/kg bw/day
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	No hazard identified

General population

DN(M)EL - long-term exposure - systemic effects - Inhalation	6.1 mg/m ³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - systemic effects - Dermal	3.5 mg/kg bw/day
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	3.5 mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Oral	No hazard identified
DN(M)EL - local effects - eyes	No hazard identified

Environment

PNEC aqua - freshwater	1.45 µg/l
PNEC aqua - marine water	0.145 µg/l
PNEC aqua - intermittent releases	14.5 µg/l
PNEC STP	3.16 mg/l ^{***}
PNEC sediment - freshwater	0.1056 ^{***} µg/kg
PNEC sediment - marine water	10.56 ^{***} mg/kg dw ^{***}
PNEC Air	No hazard identified
PNEC soil	20.22 µg/kg dw ^{***}
Secondary poisoning	PNEC oral: 313 mg/kg

8.2. Exposure controls

Special adaptations (REACH)

Not applicable.^{***}

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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	nitrile rubber
Evaluation	according to EN 374: level 4
Glove thickness	approx 0,55 mm
Break through time	approx 90 min

Suitable material	butyl-rubber
Evaluation	according to EN 374: level 3
Glove thickness	approx 0,3 mm
Break through time	approx 50 min

Skin and body protection

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

Respiratory protection

Respirator with A 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 emission 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.

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>.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

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Appearance liquid @ 20 °C (68 °F)
Colour colourless
Odour fruity
Odour threshold No data available
pH No data available
Melting point/range -19 °C (Pour point) @ 1013 hPa
Method DIN ISO 3016
Boiling point/range 183 °C @ 1013 hPa
Method OECD 103
Flash point 75 °C @ 1013 hPa
Method ISO 2719
Evaporation rate No data available
Flammability (solid, gas) Does not apply, the substance is a liquid
Lower explosion limit 0,59 Vol %
Upper explosion limit 6,54 Vol %

Vapour pressure

Values [hPa]	Values [kPa]	Values [atm]	@ °C	@ °F	Method
2	0,2	< 0,001	20	68	DIN EN 13016-2
8,1	0,81	0,008	50	122	DIN EN 13016-2

Vapour density 4,9 (Air = 1) @ 20 °C (68 °F)

Relative density

Values	@ °C	@ °F	Method
0,8230	20	68	DIN 51757

Solubility 101 mg/l @ 20 °C, in water, OECD 105

log Pow OECD 117, 4,1 @ 25 °C (77 °F)***

Autoignition temperature 195 °C @ 1016 hPa***

Method DIN 51794

Decomposition temperature No data available

Viscosity 1,40 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 142,24

Molecular formula C₉H₁₈O

log K_{oc} 2,84 @ 35 °C OECD 121

Dissociation constant No data available

Refractive index 1,424 @ 20 °C

Surface tension 48.1 mN/m (89.26 mg/l @ 20°C), OECD 115

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

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any text book on organic chemistry.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

When finely distributed, self-ignition is possible. May form explosive peroxides. Hazardous polymerisation may occur. Polymerization is a highly exothermic reaction and may generate sufficient heat to cause thermal decomposition and/or rupture containers.

10.4. Conditions to avoid

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

10.5. Incompatible materials

bases, amines, acids, oxidizing agents.

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				
Nonanal (124-19-6)				
Routes of Exposure	Endpoint	Values	Species	Method
Oral	LD50	5000 mg/kg	rat, male/female***	Weight of evidence***
Inhalative	LC0	0,95 mg/l	rat	
Dermal	LD50	5000 mg/kg	rabbit	Weight of evidence***

Nonanal, CAS: 124-19-6

Assessment

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

Acute oral toxicity

Acute dermal toxicity

Acute inhalation toxicity

Irritation and corrosion				
Nonanal (124-19-6)				
Target Organ Effects	Species	Result	Method	
Eyes	rabbit	No eye irritation	EPA OPP 81-4	in vivo***
Skin	rabbit	irritating	EC Directive L251	4h in vivo***

Nonanal, CAS: 124-19-6

Assessment

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Based on available data, the classification criteria are not met for:
skin irritation/corrosion
eye irritation/corrosion

Sensitization				
Nonanal (124-19-6)				
Target Organ Effects	Species	Evaluation	Method	
Skin	Human experience	not sensitizing	Human repeat insult patch test (HRIPT) read across	5 %, in Ethanol read across***

Nonanal, CAS: 124-19-6

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				
Nonanal (124-19-6)				
Type	Dose	Species	Method	
Subacute toxicity	LOAEL: 500 mg/kg/d (2 weeks)	rabbit	Dermal	
Subchronic toxicity 90-day	NOAEL: 20000 ppm	rat	OECD 408 Oral read across	

Nonanal, CAS: 124-19-6

Assessment

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

STOT RE

Carcinogenicity, Mutagenicity, Reproductive toxicity					
Nonanal (124-19-6)					
Type	Dose	Species	Evaluation	Method	
Mutagenicity		rat, hepatocytes human hepatocytes	negative	UDS test	In vitro study
Mutagenicity		Salmonella typhimurium	negative	OECD 471 (Ames)	In vitro study
Mutagenicity		rat, hepatocytes	positive	SCE	In vitro study
Mutagenicity		rat, hepatocytes	negative	Chromosomal Aberration	In vitro study
Mutagenicity		mouse lymphoma cells	negative	Mouse lymphoma assay	In vitro study
Mutagenicity		mouse	negative	OECD 474	in vivo read across
Reproductive toxicity	LOAEL 1500 mg/kg/d	rat, parental, female***		Weight of evidence	Oral read across***
Reproductive toxicity	NOAEL 200 mg/kg/d	Rat, prenatal, female***		Weight of evidence	Oral read across***
Developmental Toxicity	No data available				
Reproductive toxicity***	NOEL 200 mg/kg/d***	rat, 1. Generation, male/female***		Weight of evidence***	Oral read across***

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Nonanal, CAS: 124-19-6

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
In the absence of specific alerts no cancer testing is required

Nonanal, CAS: 124-19-6

Main symptoms

nausea, shortness of breath, dizziness.

Target Organ Systemic Toxicant - Single exposure

Due to lack of data, a classification is not possible for:
STOT SE

Target Organ Systemic Toxicant - Repeated exposure

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

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			
Nonanal (124-19-6)			
Species	Exposure time	Dose	Method
Daphnia magna (Water flea)	48h	EC50: 1,54 mg/l	OECD 202
Pseudokirchneriella subcapitata***	72h	EC50: 4,50 mg/l (Growth rate)	OECD 201
Pseudokirchneriella subcapitata***	72h	EC50: 1,79 mg/l (Biomass)	OECD 201
Oncorhynchus mykiss (rainbow trout)	96h	EC50: 2,1 mg/l	OECD 203
Activated sludge (domestic)	3 h	EC50: ca 70 mg/l***	OECD 209

Long term toxicity			
Nonanal (124-19-6)			
Type	Species	Dose	Method
Aquatic toxicity	Pseudokirchneriella subcapitata***	NOEC: 0,759 mg/l (3d)	OECD 201

12.2. Persistence and degradability

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Biodegradation

83 % (28 d), inoculum, activated sludge (domestic), aerobic, OECD 301 F.***

Abiotic Degradation	
Nonanal (124-19-6)	

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Type	Result	Method
Hydrolysis	No data available	
Photolysis	No data available	

12.3. Bioaccumulative potential

Nonanal (124-19-6)		
Type	Result	Method
log Pow	4,1 @ 25 °C***	measured, OECD 117
BCF	94 l/kg	calculated

12.4. Mobility in soil

Nonanal (124-19-6)		
Type	Result	Method
Surface tension	48,1 mN/m @ 20 °C (68 °F) @ 89,26 mg/l	OECD 115
Adsorption/Desorption	log Koc: 2,84 @ 35 °C	OECD 121
Distribution to environmental compartments	no data available	

12.5. Results of PBT and vPvB assessment

Nonanal, CAS: 124-19-6

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

Nonanal, CAS: 124-19-6

No data available

Note

Avoid release to the environment.

SECTION 13: Disposal considerations

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.

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SECTION 14: Transport information

Section 14.1 - 14.6

ADR/RID

Not restricted

ADN

ADN Container
Not restricted

ADN

ADN Tanker

14.1. UN number

ID 9003

14.2. UN proper shipping name

Substances with a flashpoint between 60 °C and not more than 100 °C (n-Nonanal)

14.3. Transport hazard class(es)

9

Subsidiary Risk

F, N2

14.4. Packing group

-

14.5. Environmental hazards

Fish and tree

14.6. Special precautions for user

no data available

ICAO-TI / IATA-DGR

Not restricted

IMDG

Not restricted

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

not applicable

SECTION 15: Regulatory information

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

Regulation 1272/2008, Annex VI

not listed

DI 2012/18/EU (Seveso III)

Category not subject

DI 1999/13/EC (VOC Guideline)

Component	Status
Nonanal CAS: 124-19-6	regulated

International Inventories

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AICS (AU)
DSL (CA)
IECSC (CN)
EC-No. 2046885 (EU)
ENCS (2)-494 (JP)
ISHL (2)-494 (JP)
KECI KE-26088 (KR)
PICCS (PH)
TSCA (US)
NZIoC (NZ)
TCSI (TW)

National regulatory information Great Britain

Releases to air (Pollution Inventory Substances)

not subject

Releases to water (Pollution Inventory Substances)

not subject

Releases to sewer (Pollution Inventory Substances)

not subject

For details and further information please refer to the original regulation

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

H412: Harmful to aquatic life with long lasting effects.

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



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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 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

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

Exposure scenario identification

- 1 **Formulation & (re)packing of substances and mixtures**
- 2 **Compounding (mixing of fragrances)**

Number of the ES 1

Short title of the exposure scenario

Formulation & (re)packing of substances and mixtures

List of use descriptors

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)

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, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

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Further explanations

Industrial use

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

Further specification

Specific Environmental Release Categories [SPERC] ATIEL-ATC SPERC 2.Ai-a.v1
assessment tool used: Chesar 3.1

Amounts used

Daily amount per site: 1 to
Annual amount per site: 100 to

Environment factors not influenced by risk management

River flow rate: 18000 m³/d

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

Release fraction to air from process: 5E-5 %
Release fraction to wastewater from process: 0.02 %
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 %

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 (%): 92.45

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

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

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).

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

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Operation is carried out at elevated temperature (> 20°C above ambient temperature)

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):

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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 4
Contributing exposure scenario controlling worker exposure for PROC 2

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Outdoor use

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

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 respiratory protection (Efficiency: 90 %).

Number of the contributing scenario 5
Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

Operation is carried out at elevated temperature (> 20°C above ambient temperature)

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): 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 4

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

4 h (half shift)

Other given operational conditions affecting workers exposure

Indoor use

Operation is carried out at elevated temperature (> 20°C above ambient temperature)

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. Wear respiratory protection (Efficiency: 90 %).

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Number of the contributing scenario 7
Contributing exposure scenario controlling worker exposure for PROC 4

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

0.25 h per shift

Other given operational conditions affecting workers exposure

Indoor and outdoor use

Operation is carried out at elevated temperature (> 20°C above ambient temperature)

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 %).

Number of the contributing scenario 8
Contributing exposure scenario controlling worker exposure for PROC 5

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

4 h (half shift)

Other given operational conditions affecting workers exposure

Indoor use

Operation is carried out at elevated temperature (> 20°C above ambient temperature)

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. Wear respiratory protection (Efficiency: 90 %).

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

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

Avoid carrying out activities involving exposure for more than 1 hour 1 h per shift

Other given operational conditions affecting workers exposure

Indoor use

Operation is carried out at elevated temperature (> 20°C above ambient temperature)

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. Wear respiratory protection (Efficiency: .? %).

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

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PROC 8b

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

0.25 h per shift

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

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

11

Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

1 h per shift

Other given operational conditions affecting workers exposure

Indoor use

Operation is carried out at elevated temperature (> 20°C above ambient temperature)

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

12

Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

1 h per shift

Other given operational conditions affecting workers exposure

Indoor use

Operation is carried out at elevated temperature (> 20°C above ambient temperature)

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

13

Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

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Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

4 h (half shift)

Other given operational conditions affecting workers exposure

Indoor use

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

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 14
Contributing exposure scenario controlling worker exposure for PROC 8b

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

1 h per shift

Other given operational conditions affecting workers exposure

Outdoor use

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

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 %).

Number of the contributing scenario 15
Contributing exposure scenario controlling worker exposure for PROC 9

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

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

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. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario 16
Contributing exposure scenario controlling worker exposure for PROC 15

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

4 h (half shift)

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Other given operational conditions affecting workers exposure

Indoor use

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

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: 7.54E-4 mg/l; RCR: 0.52
Fresh Water (Sediment)	PEC: 0.055 mg/kg dw; RCR: 0.52
Marine Water (Pelagic)	PEC: 7.54E-5 mg/l; RCR: 0.52
Marine Water (Sediment)	PEC: 5.49E-3 mg/kg dw; RCR: 0.52
Agricultural Soil	PEC: 0.015 mg/kg dw; RCR: 0.752
Sewage Treatment Plant (Effluent)	PEC: 7.55E-3 mg/l; RCR: < 0.01
Predator's prey (freshwater)	PEC: 9.72E-3 mg/kg ww; RCR: < 0.01
Predator's prey (marine water)	PEC: 9.72E-4 mg/kg ww; RCR: < 0.01
Top predator's prey (marine water)	PEC: 1.95E-4 mg/kg ww; RCR: < 0.01
Predator's prey (terrestrial)	PEC: 4.03E-3 mg/kg ww; RCR: < 0.01
Man via environment – Inhalation	Concentration in air: 4.12E-6 mg/m ³ ; RCR: <0.01
Man via environment – Oral	Exposure via food consumption: 7.81E-5 mg/kg bw/day; RCR: <0.01
Man via environment - combined routes	RCR: <0.01

Human exposure prediction (oral, dermal, inhalative)

EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm): Estimated dermal long-term exposure [mg/kg b.w./d]. Oral exposure is not expected to occur.

Proc 1	EE(inhal): 0.059 ; EE(derm): 0.034
Proc 2	EE(inhal): 14.82 ; EE(derm): 1.37 - Contributing Scenarios 3 EE(inhal): 2.074 ; EE(derm): 1.37 - Contributing Scenarios 4
Proc 3	EE(inhal): 20.74 ; EE(derm): 0.69
Proc 4	EE(inhal): 3.556 ; EE(derm): 4.116 - Contributing Scenarios 6 EE(inhal): 5.927 ; EE(derm): 0.686 - Contributing Scenarios 7
Proc 5	EE(inhal): 8.89 ; EE(derm): 1.645
Proc 8a	EE(inhal): 2.963 ; EE(derm): 2.742
Proc 8b	EE(inhal): 14.82; EE(derm): 1.371 - Contributing Scenarios 10 EE(inhal): 8.89; EE(derm): 2.742 - Contributing Scenarios 11 EE(inhal): 8.89; EE(derm): 2.742 - Contributing Scenarios 12
Proc 9	EE(inhal): 2.963 ; EE(derm): 1.372
Proc 15	EE(inhal): 2.963; EE(derm): 1.372

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio; total RCR= RCR(inhal) +RCR(derm).

Proc 1	RCR(inhal): < 0.01 ; RCR(derm): < 0.01
Proc 2	RCR(inhal): 0.595 ; RCR(derm): 0.196 - Contributing Scenarios 3 RCR(inhal): 0.083 ; RCR(derm): 0.196 - Contributing Scenarios 4
Proc 3	RCR(inhal): 0.833 ; RCR(derm): 0.833
Proc 4	RCR(inhal): 0.143 ; RCR(derm): 0.588 - Contributing Scenarios 6 RCR(inhal): 0.238 ; RCR(derm): 0.098 - Contributing Scenarios 7
Proc 5	RCR(inhal): 0.357 ; RCR(derm): 0.235
Proc 8a	RCR(inhal): 0.119 ; RCR(derm): 0.392

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Proc 8b	RCR(inhal): 0.595 ; RCR(derm): 0.196 - Contributing Scenarios 10 RCR(inhal): 0.357 ; RCR(derm): 0.392 - Contributing Scenarios 11 RCR(inhal): 0.357 ; RCR(derm): 0.392 - Contributing Scenarios 12
Proc 9	RCR(inhal): 0.119 ; RCR(derm): 0.196
Proc 15	RCR(inhal): 0.143 ; RCR(derm): 0.029

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 $M(\text{site})$ [see amounts used, contributing scenario 1] x release factor [Technical conditions and measures at process level (source) to prevent release; contributing scenario 1])

associated uses:

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

Number of the ES 2

Short title of the exposure scenario

Compounding (mixing of fragrances)

List of use descriptors

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

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

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

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

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ERC 2

Further specification

Specific Environmental Release Categories [SPERC], IFRA 2.1a.v1, assessment tool used:, Chesar 3.1.

Amounts used

Daily amount per site: 0.4 to

Annual amount per site: 100 to

Environment factors not influenced by risk management

River flow rate: 18000 m³/d

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

Release fraction to air from process: 2.5 %

Release fraction to wastewater from process: 0.06 %

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: 701 %

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 (%): 2000 3

Number of the contributing scenario

2

Contributing exposure scenario controlling worker exposure for PROC 1

Further specification

Assessment tool used:

Product characteristics

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

Frequency and duration of use

1 h per shift

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

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).

Number of the contributing scenario

3

Contributing exposure scenario controlling worker exposure for PROC 2

Further specification

Assessment tool used:

Product characteristics

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

Frequency and duration of use

0.25 h per shift

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

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).

Number of the contributing scenario

4

Contributing exposure scenario controlling worker exposure for PROC 3

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

4 h (half shift)

Other given operational conditions affecting workers exposure

Indoor use

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

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).

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

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

4 h (half shift)

Other given operational conditions affecting workers exposure

Indoor use

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

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 6
Contributing exposure scenario controlling worker exposure for PROC 8a

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

Covers percentage substance in the product up to 25 %

Frequency and duration of use

4 h (half shift)

Other given operational conditions affecting workers exposure

Indoor use

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

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

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

1 h per shift

Other given operational conditions affecting workers exposure

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Indoor use

Assumes a good basic standard of occupational hygiene is implemented

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.

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

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

Covers percentage substance in the product up to 25 %

Frequency and duration of use

1 h per shift

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

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).

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

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

Covers percentage substance in the product up to 25 %

Frequency and duration of use

1 h per shift

Other given operational conditions affecting workers exposure

Indoor use

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

Technical conditions and measures to control dispersion from source towards the worker provide a good standard of controlled ventilation (5 to 10 air changes per hour) .

Number of the contributing scenario 10
Contributing exposure scenario controlling worker exposure for PROC 15

Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

0.25 h per shift

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

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).

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

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Further specification

Assessment tool used: Chesar 3.1

Product characteristics

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

Frequency and duration of use

0.25 h per shift

Other given operational conditions affecting workers exposure

Indoor and outdoor use

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

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).

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 9.05E-4 mg/l; RCR: 0.624***
Fresh Water (Sediment)	PEC: 0.066 mg/kg dw; RCR: 0.624
Marine Water (Pelagic)	PEC: 9.05E-5 mg/l; RCR: 0.624
Marine Water (Sediment)	PEC: 6.59E-3 mg/kg dw; RCR: 0.624
Agricultural Soil	PEC: 0.018 mg/kg dw; RCR: 0.911
Sewage Treatment Plant (Effluent)	PEC: 9.06E-3 mg/l; RCR: < 0.01
Predator's prey (freshwater)	PEC: 0.029 mg/kg ww; RCR: < 0.01
Predator's prey (marine water)	PEC: 2.91E-3 mg/kg ww; RCR: < 0.01
Top predator's prey (marine water)	PEC: 5.83E-4 mg/kg ww; RCR: < 0.01
Predator's prey (terrestrial)	PEC: 5.03E-3 mg/kg ww; RCR: < 0.01
Man via environment – Inhalation	Concentration in air: 1.9E-3 mg/m ³ ; RCR: < 0.01
Man via environment – Oral	Exposure via food consumption: 1.65E-4 mg/kg bw/day; RCR: < 0.01
Man via environment - combined routes	RCR: < 0.01

Human exposure prediction (oral, dermal, inhalative)

Oral exposure is not expected to occur. EE(inhal): Estimated inhalative long-term exposure [mg/m³]; EE(derm): Estimated dermal long-term exposure [mg/kg b.w./d].

Proc 1	EE(inhal): 0.012 ; EE(derm): 6.8E-3
Proc 2	EE(inhal): 2.963 ; EE(derm): 0.137
Proc 3	EE(inhal): 3.556 ; EE(derm): 0.414
Proc 5	EE(inhal): 17.78 ; EE(derm): 1.645
Proc 8a	EE(inhal): 10.67 ; EE(derm): 0.987
Proc 8b	EE(inhal): 20.74 ; EE(derm): 0.548 - Contributing Scenarios 7 EE(inhal): 17.78 ; EE(derm): 1.645 - Contributing Scenarios 8
Proc 9	EE(inhal): 10.67 ; EE(derm): 0.823
Proc 15	EE(inhal): 5.927 ; EE(derm): 0.034

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio; total RCR= RCR(inhal) +RCR(derm).

Proc 1	RCR(inhal): < 0.01 ; RCR(derm): < 0.01
Proc 2	RCR(inhal): 0.119 ; RCR(derm): 0.02
Proc 3	RCR(inhal): 0.143 ; RCR(derm): 0.143
Proc 5	RCR(inhal): 0.714 ; RCR(derm): 0.235
Proc 8a	RCR(inhal): 0.428 ; RCR(derm): 0.141
Proc 8b	RCR(inhal): 0.833 ; RCR(derm): 0.078 - Contributing Scenarios 7 RCR(inhal): 0.714 ; RCR(derm): 0.235 - Contributing Scenarios 8

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Proc 9
Proc 15

RCR(inhal): 0.428 ; RCR(derm): 0.118
RCR(inhal): 0.238 ; RCR(derm): < 0.01

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 $M(\text{site})$ [see amounts used, contributing scenario 1] x release factor [Technical conditions and measures at process level (source) to prevent release; contributing scenario 1])

associated uses:

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