

SAFETY DATA SHEET



2-Ethylhexanoic acid
10040

Version / Revision 9.01
Supersedes Version 9.00***

Revision Date 25-Jan-2022
Issuing date 25-Jan-2022

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

1.1. Product identifier

Identification of the substance/preparation

2-Ethylhexanoic acid

CAS-No 149-57-5
EC No. 205-743-6

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

Identified uses	Intermediate Formulation laboratory chemicals
Uses advised against	Functional Fluids Consumer uses To avoid exposure of consumers

1.3. Details of the supplier of the safety data sheet

Company/Undertaking Identification	OQ Chemicals GmbH Rheinpromenade 4A D-40789 Monheim Germany
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Product Information	Product Stewardship FAX: +49 (0)208 693 2053 email: sc.psq@oq.com
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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)

Reproductive toxicity Category 2, H361d

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 pictograms



Signal word

Warning

Hazard statements

H361d: Suspected of damaging the unborn child.

Precautionary statements

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P308 + P313: IF exposed or concerned: Get medical advice/ attention.
P405: Store locked up.
P501: Dispose of contents/container in accordance with local regulation.

2.3. Other hazards

Components of the product may be absorbed into the body by inhalation, ingestion and through the skin

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	1272/2008/EC	Concentration (%)
2-Ethylhexanoic acid	149-57-5	Repr. 2; H361d	> 99,50

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.

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

Main symptoms

None known.

Special hazard

Lung irritation, Lung oedema, Kidney disorders, respiratory disorder.

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. If ingested, flush stomach and compensate acidosis.

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

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

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

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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. Provide sufficient air exchange and/or exhaust in work rooms.

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

bases
amines
strong 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.

Technical measures/Storage conditions

Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care. Recommended storage temperature: $\leq 38\text{ }^{\circ}\text{C}$ / $\leq 100\text{ }^{\circ}\text{F}$.

Temperature class

T2

7.3. Specific end use(s)

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Intermediate
Formulation
laboratory chemicals
Functional Fluids
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

Exposure limits UK

No exposure limits established.

DNEL & PNEC

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Workers

DN(M)EL - long-term exposure - systemic effects - Inhalation	14 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	Low hazard (no threshold derived)
DN(M)EL - long-term exposure - systemic effects - Dermal	2 mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Dermal	Low hazard (no threshold derived)
DN(M)EL - long-term exposure - local effects - Dermal	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Dermal	Low hazard (no threshold derived)
DN(M)EL - local effects - eyes	Low hazard (no threshold derived)***

General population

DN(M)EL - long-term exposure - systemic effects - Inhalation	3,5 mg/m ³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation	Low hazard (no threshold derived)
DN(M)EL - long-term exposure - local effects - Inhalation	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Inhalation	Low hazard (no threshold derived)
DN(M)EL - long-term exposure - systemic effects - Dermal	1 mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Dermal	Low hazard (no threshold derived)
DN(M)EL - long-term exposure - local effects - Dermal	No hazard identified
DN(M)EL - acute / short-term exposure - local effects - Dermal	Low hazard (no threshold derived)

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DN(M)EL - long-term exposure - systemic effects - Oral derived)
1 mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Oral Low hazard (no threshold derived)
DN(M)EL - local effects - eyes Low hazard (no threshold derived)***

Environment

PNEC aqua - freshwater 0,398*** mg/l
PNEC aqua - marine water 0,0398*** mg/l
PNEC aqua - intermittent releases 1*** mg/l
PNEC STP 71,7 mg/l
PNEC sediment - freshwater 4,74*** mg/kg dw***
PNEC sediment - marine water 0,474*** mg/kg dw***
PNEC Air No hazard identified
PNEC soil 0,712*** mg/kg dw***
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	nitrile rubber
Evaluation	according to EN 374: level 6
Glove thickness	approx 0,55 mm
Break through time	> 480 min

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Suitable material polyvinylchloride
Evaluation Information derived from practical experience
Glove thickness approx 0.8 mm

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

Use product only in closed system. 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.

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	mild
Odour threshold	No data available
pH	3,75 (1 g/l in water @ 25 °C (77 °F)) DIN 19268
Melting point/range	-83 °C (Pour point)
Method	DIN ISO 3016***
Boiling point/range	228 °C @ 1013 hPa
Method	OECD 103
Flash point	116 °C @ 1013 hPa
Method	closed cup, DIN EN ISO 2719***
Evaporation rate	No data available
Flammability (solid, gas)	Does not apply, the substance is a liquid
Lower explosion limit	0,8 Vol %
Upper explosion limit	6,7 Vol %

Vapour pressure

Values [hPa]	Values [kPa]	Values [atm]	@ °C	@ °F	Method
0,04	0,004	< 0,001	20	68	
4,3	0,43	0,004	50	122	

Vapour density 5,0 (Air = 1) @ 20 °C (68 °F)

Relative density

Values	@ °C	@ °F	Method
0,9067	20	68	DIN 51757

Solubility 1,5 g/l @ 20 °C, in water, OECD 105
log Pow 2,7 @25 °C (77 °F), pH 4,7 OECD 107
3,0 @25°C (77 °F), pH 3,0 OECD 117***

Autoignition temperature 395 °C @ 1014 hPa***

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Method	DIN 51794
Decomposition temperature	No data available
Viscosity	7,625 mPa*s @ 20 °C
Method	dynamic, ASTM D445
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	144,21
Molecular formula	C8 H16 O2
log Koc	≤ 2,15 at ambient temperature OECD 106***
Dissociation constant	pKa 4,9 @ 21 °C (69 °F) OECD 112***
Refractive index	1,425 @ 20 °C
Surface tension	43,2 mN/m @ 20 °C (68 °F), 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 any text book on organic chemistry.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Hazardous polymerisation does not occur.

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, strong 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

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Routes of Exposure	Endpoint	Values	Species	Method
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Oral	LD50	2043 mg/kg	rat, female	OECD 401
Dermal	LD50	> 2000 mg/kg	rat, male/female	OECD 402
Inhalative	LC0	0,11 mg/l (8 h)	rat, male/female***	OECD 403

2-Ethylhexanoic acid, CAS: 149-57-5

Assessment

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

Acute oral toxicity

Acute dermal toxicity

Acute inhalation toxicity

Irritation and corrosion

2-Ethylhexanoic acid (149-57-5)

Target Organ Effects	Species	Result	Method	
Skin	rabbit	Mild skin irritation	OECD 404	4h***
Eyes	rabbit	No eye irritation***	OECD 405	24h

2-Ethylhexanoic acid, CAS: 149-57-5

Assessment

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

skin irritation/corrosion

eye irritation/corrosion

For respiratory irritation, no data are available

Sensitization

2-Ethylhexanoic acid (149-57-5)

Target Organ Effects	Species	Evaluation	Method	
Skin	guinea pig	not sensitizing	OECD 406	2 %, aqueous solution***

2-Ethylhexanoic acid, CAS: 149-57-5

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

2-Ethylhexanoic acid (149-57-5)

Type	Dose	Species	Method	
Subchronic toxicity	NOAEL: ~ 200 mg/kg/d (90d)	mouse, male/female	EPA OTS 795.2600	Oral
Subchronic toxicity	NOAEL: ~300 mg/kg/d (90d)	rat, male/female	EPA OTS 795.2600	Oral***
Subacute toxicity***	NOAEL: 200 mg/kg/d (15d)***	rat, male/female***	OECD 407***	Oral***

2-Ethylhexanoic acid, CAS: 149-57-5

Assessment

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

STOT RE

Carcinogenicity, Mutagenicity, Reproductive toxicity

2-Ethylhexanoic acid (149-57-5)

Type	Dose	Species	Evaluation	Method	
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Developmental Toxicity	NOAEL 25 mg/kg/d	rabbit		EPA OTS 798.4900	Maternal toxicity
Developmental Toxicity	NOAEL 250 mg/kg/d	rabbit		EPA OTS 798.4900	Developmental toxicity
Developmental Toxicity	NOAEL >250 mg/kg/d	rat		EPA OTS 798.4900	Maternal toxicity
Developmental Toxicity	NOAEL 100 mg/kg/d	rat		EPA OTS 798.4900	Developmental toxicity
Reproductive toxicity	NOAEL 250 mg/kg/d	rat, parental		Oral OECD 443	
Reproductive toxicity	NOAEL 800 mg/kg/d	rat, 1. Generation, male/female		Oral OECD 443	
Mutagenicity		CHO (Chinese Hamster Ovary) cells	negative	OECD 476 (Mammalian Gene Mutation)	In vitro study
Mutagenicity		mouse lymphoma cells	negative	OECD 476 (Mammalian Gene Mutation)	
Mutagenicity		Salmonella typhimurium	negative	OECD 471 (Ames)	In vitro study
Mutagenicity		rat lymphocytes	negative	OECD 473 (Chromosomal Aberration)	In vitro study
Mutagenicity		mouse male/female	negative	OECD 474	Oral micronucleus test

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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

Directive 1272/2008/EC, Annex VI: Repr. 2

Evaluation

In vitro tests showed mutagenic effects

Did not show carcinogenic effects in animal experiments

No indication for a carcinogenic potential

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Target Organ Systemic Toxicant - Single exposure

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

STOT SE

Target Organ Systemic Toxicant - Repeated exposure

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

STOT RE

Aspiration toxicity

no data available

Other adverse effects

Components of the product may be absorbed into the body by inhalation, ingestion and through 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>.

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SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic toxicity			
2-Ethylhexanoic acid (149-57-5)			
Species	Exposure time	Dose	Method
Oryzias latipes (Medaka)	96h	LC50: > 100 mg/l	OECD 203 read across***
Daphnia magna (Water flea)	48h	EC50: 85,4 mg/l	79/831/EEC.C2
Desmodesmus subspicatus	72h	EC50: 49,3 mg/l (Growth rate)***	DIN 38412, part 9
Pseudomonas putida	17 h	EC50: 112,1 mg/l (Growth inhibition)	DIN 38412, part 8
Oncorhynchus mykiss (rainbow trout)***	96h***	LC50: 180 mg/l***	OECD 203***

Long term toxicity				
2-Ethylhexanoic acid (149-57-5)				
Type	Species	Dose	Method	
Reproductive toxicity	Daphnia magna (Water flea)	LC50: 25 mg/l/21d***	OECD 211	
Reproductive toxicity***	Daphnia magna (Water flea)***	NOEC: 18 mg/l***	OECD 211***	read across***
Aquatic toxicity***	Desmodesmus subspicatus***	EC10: 32 mg/l (72 h)***	DIN 38412 / part 9***	
Aquatic toxicity***	Pseudokirchneriella subcapitata***	NOEC: 130 mg/l (3d) Growth rate***	OECD 201***	read across***

12.2. Persistence and degradability

2-Ethylhexanoic acid, CAS: 149-57-5

Biodegradation

99 % (28 d), Sewage, domestic, aerobic, OECD 301 E.

Abiotic Degradation		
2-Ethylhexanoic acid (149-57-5)		
Type	Result	Method
Photolysis	Half-life (DT50): 47,1 h	calculated
Hydrolysis	not expected	

12.3. Bioaccumulative potential

2-Ethylhexanoic acid (149-57-5)		
Type	Result	Method
log Pow	3,0 @ 25 °C (77 °F)***	measured, OECD 107

12.4. Mobility in soil

2-Ethylhexanoic acid (149-57-5)		
Type	Result	Method

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Adsorption/Desorption	Koc: $\leq 140,87$ at ambient temperature***	OECD 106
Surface tension	Surface activity not expected 43,2 mN/m @ 20 °C (68 °F)***	OECD 115***
Distribution to environmental compartments	Air: 0,93 Soil: 3,64 Water: 91,7 Sediment: 11,2***	Calculation according Mackay, Level I***

12.5. Results of PBT and vPvB assessment

2-Ethylhexanoic acid, CAS: 149-57-5

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

2-Ethylhexanoic acid, CAS: 149-57-5

No data available

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.

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 9006

14.2. UN proper shipping name

Environmentally hazardous substance, liquid, n.o.s.

14.3. Transport hazard class(es)

9

Subsidiary Risk

N3, F

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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

Product name 2-Ethylhexanoic acid
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

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Classification Repr. 2; H361d
Hazard pictograms GHS08 Health hazard
Signal word Warning
Hazard statements H361d

DI 2012/18/EU (Seveso III)

Category not subject

DI 1999/13/EC (VOC Guideline)

Component	Status
2-Ethylhexanoic acid CAS: 149-57-5	not subject

The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019 No. 758

Component	Status
2-Ethylhexanoic acid CAS: 149-57-5	The substance is/will be pre-registered

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

Other regulations

2-Ethylhexanoic acid, CAS: 149-57-5
DI 92/85/EEC

International Inventories

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AICS (AU)
DSL (CA)
IECSC (CN)
EC-No. 2057436 (EU)
ENCS (2)-608 (JP)
ISHL (2)-608 (JP)
KECI KE-13740 (KR)
INSQ (MX)
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

H361d: Suspected of damaging the unborn child.

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

A quantitative approach used to conclude safe use for:

Environmental compartment

Long-term Systemic effects via inhalation

Long-term Systemic effects via skin

Qualitative approach used to conclude safe use.

Acute local hazards via inhalation

Acute systemic hazards via skin

Acute local hazards via skin

Local hazards via eyes

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

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

Wear suitable coveralls to prevent exposure to skin, where direct contact with substances is possible

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

Wear protective gloves and eye/face protection

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

Avoidance of contact with contaminated tools and objects

Clean up spill immediately.

Workers should be warned to avoid skin and eye contact, to wash off any skin contamination immediately and to report skin/eye problems that may develop***

Exposure scenario identification

- 1 **Industrial use resulting in manufacture of another substance (use of intermediates)**
- 2 **Formulation & (re)packing of substances and mixtures**
- 3 **Use in laboratories**
- 4 **Use in laboratories**
- 5 **Functional Fluids**
- 6 **Functional Fluids**

Number of the ES 1

Short title of the exposure scenario

Industrial use resulting in manufacture of another substance (use of intermediates)

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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)

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

Environmental release categories [ERC]

ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

Product characteristics

Refer to attached safety data sheets

Further explanations

Industrial use

Assessment tool used:

Chesar 3.3

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 6a

Further specification

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

Amounts used

Daily amount per site: 50 to

Annual amount per site: 5000 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: 0.1 %

Release fraction to wastewater from process: 0.1 %

Release fraction to soil from process: 0.1%

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 (%): 87.5

Conditions and measures related to external treatment of waste for disposal

Dispose of waste product or used containers according to local regulations

Number of the contributing scenario

2

Contributing exposure scenario controlling worker exposure for PROC 1

Product characteristics

Liquid***

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

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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

Product characteristics

Liquid***

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.***

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

Product characteristics

Liquid***

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).***

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

Wear suitable gloves tested to EN374.***

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

Product characteristics

Liquid***

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 good standard of controlled ventilation (5 to 10 air changes per hour) .

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 0.312 mg/l; RCR: 0.867
Fresh Water (Sediment)	PEC: 5.52 mg/kg dw; RCR: 0.867
Marine Water (Pelagic)	PEC: 0.031 mg/l; RCR: 0.867
Marine Water (Sediment)	PEC: 0.552 mg/kg dw; RCR: 0.867
Agricultural Soil	PEC: 0.968 mg/kg dw; RCR: 0.913
Sewage Treatment Plant	PEC: 3.121 mg/l; RCR: 0.044

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(Effluent)

Man via environment – Inhalation Concentration in air: 3.81E-3 mg/m³; 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): 0.06; EE(derm): 0.034
Proc 2	EE(inhal): 6.009; EE(derm): 0.274
Proc 3	EE(inhal): 12.62; EE(derm): 0.138
Proc 8b	EE(inhal): 5.408; EE(derm): 0.685

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): 0.021
Proc 2	RCR(inhal): 0.429; RCR(derm): 0.137
Proc 3	RCR(inhal): 0.901; RCR(derm): 0.069
Proc 8b	RCR(inhal): 0.386; RCR(derm): 0.343

Number of the ES 2

Short title of the exposure scenario

Formulation & (re)packing of substances and mixtures

List of use descriptors

Sector of uses [SU]

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)

Environmental release categories [ERC]

ERC2: Formulation of preparations (mixtures)

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.

Further explanations

Industrial use

Assessment tool used:

Chesar 3.3

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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

Further specification

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

Amounts used

Daily amount per site: 4.5 to

Annual amount per site: 1000 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: 0 %

Release fraction to wastewater from process: 0.5 %

Release fraction to soil from process: 0%

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 (%): 87.5

Conditions and measures related to external treatment of waste for disposal

Dispose of waste product or used containers according to local regulations

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

Product characteristics

Liquid***

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).

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

Product characteristics

Liquid***

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.***

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

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Product characteristics

Liquid***

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).***

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

Wear suitable gloves tested to EN374.***

Number of the contributing scenario

5

Contributing exposure scenario controlling worker exposure for PROC 4

Product characteristics

Liquid***

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 controlled ventilation (5 to 10 air changes per hour) .

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Number of the contributing scenario

6

Contributing exposure scenario controlling worker exposure for PROC 5

Product characteristics

Liquid***

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 controlled ventilation (5 to 10 air changes per hour) .

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Number of the contributing scenario

7

Contributing exposure scenario controlling worker exposure for PROC 8a

Product characteristics

Liquid***

Frequency and duration of use

Avoid carrying out activities involving exposure for more than 1 hour

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 controlled ventilation (5 to 10 air changes per hour) .

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Number of the contributing scenario

8

Contributing exposure scenario controlling worker exposure for

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PROC 8b

Product characteristics

Liquid***

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 controlled ventilation (5 to 10 air changes per hour) .

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Number of the contributing scenario

9

Contributing exposure scenario controlling worker exposure for PROC 9

Product characteristics

Liquid***

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 controlled ventilation (5 to 10 air changes per hour) .

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.***

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 0.142 mg/l; RCR: 0.394
Fresh Water (Sediment)	PEC: 2.512 mg/kg dw; RCR: 0.394
Marine Water (Pelagic)	PEC: 0.014 mg/l; RCR: 0.395
Marine Water (Sediment)	PEC: 0.251 mg/kg dw; RCR: 0.394
Agricultural Soil	PEC: 0.44 mg/kg dw; RCR: 0.415
Sewage Treatment Plant (Effluent)	PEC: 1.42 mg/l; RCR: 0.02
Man via environment – Inhalation	Concentration in air: 3.63E-6 mg/m ³ ; RCR: <0.01***
Man via environment – Oral	Exposure via food consumption: 9.63E-3 mg/kg bw/day; 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): 0.06; EE(derm): 0.034
Proc 2	EE(inhal): 6.009; EE(derm): 0.274
Proc 3	EE(inhal): 12.62; EE(derm): 0.138
Proc 4	EE(inhal): 9.013; EE(derm): 0.343
Proc 5	EE(inhal): 9.013; EE(derm): 0.685
Proc 8a	EE(inhal): 3.605; EE(derm): 0.685
Proc 8b	EE(inhal): 9.013; EE(derm): 0.685
Proc 9	EE(inhal): 0.644; EE(derm): 0.343

Risk characterisation

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

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Proc 1	RCR(inhal): < 0.01; RCR(derm): 0.017
Proc 2	RCR(inhal): 0.429; RCR(derm): 0.137
Proc 3	RCR(inhal): 0.901; RCR(derm): 0.069
Proc 4	RCR(inhal): 0.644; RCR(derm): 0.172
Proc 5	RCR(inhal): 0.644; RCR(derm): 0.343
Proc 8a	RCR(inhal): 0.258; RCR(derm): 0.343
Proc 8b	RCR(inhal): 0.644; RCR(derm): 0.343
Proc 9	RCR(inhal): 0.644; RCR(derm): 0.343

Number of the ES 3

Short title of the exposure scenario

Use in laboratories

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]

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

Use of the substance within laboratory settings, including material transfers and equipment cleaning

Further explanations

Industrial use

Assessment tool used:

Chesar 3.3

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

Amounts used

Daily amount per site: 0.01 to

Annual amount per site: 5 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

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Release fraction to air from process: 1 %
Release fraction to wastewater from process: 0.5 %
Release fraction to soil from process: 0.1%

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 (%): 87.52

Conditions and measures related to external treatment of waste for disposal

Dispose of waste product or used containers according to local regulations

Number of the contributing scenario

2

Contributing exposure scenario controlling worker exposure for PROC 15

Product characteristics

Liquid***

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.***

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 0.062 mg/l; RCR: 0.174
Fresh Water (Sediment)	PEC: 1.105 mg/kg dw; RCR: 0.173
Marine Water (Pelagic)	PEC: 6.25E-3 mg/l; RCR: 0.174
Marine Water (Sediment)	PEC: 0.111 mg/kg dw; RCR: 0.173
Agricultural Soil	PEC: 0.194 mg/kg dw; RCR: 0.183
Sewage Treatment Plant (Effluent)	PEC: 0.624 mg/l; 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]. The RMMs described above suffice to control risks for both local and systemic effects.

Proc 15 EE(inhal): 3.004; EE(derm): 0.34

Risk characterisation

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

Proc 15 RCR(inhal): 0.215; RCR(derm): 0.17

Number of the ES **4**

Short title of the exposure scenario

Use in laboratories

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List of use descriptors

Sector of uses [SU]

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

Process categories [PROC]

PROC15: Use as laboratory reagent

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

Use of small quantities within laboratory settings, including material transfers and equipment cleaning

Further explanations

Professional use

Assessment tool used:

Chesar 3.3

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 8a

Amounts used

daily wide dispersive use: 0.0000027 to/d

Environment factors not influenced by risk management

River flow rate: 18000 m³/d

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: 100 %

Release fraction to wastewater from process: 100 %

Release fraction to soil from process: 0%

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 (%): 87.5

Conditions and measures related to external treatment of waste for disposal

Dispose of waste product or used containers according to local regulations

Number of the contributing scenario

2

Contributing exposure scenario controlling worker exposure for PROC 15

Product characteristics

Liquid***

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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Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal). 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.***

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 7.76E-5 mg/l; RCR: <0.01
Fresh Water (Sediment)	PEC: 1.37E-3 mg/kg dw; RCR: <0.01
Marine Water (Pelagic)	PEC: 7.32E-6 mg/l; RCR: <0.01
Marine Water (Sediment)	PEC: 1.29E-4 mg/kg dw; RCR: <0.01
Agricultural Soil	PEC: 6.1E-5 mg/kg dw; RCR: <0.01
Sewage Treatment Plant (Effluent)	PEC: 1.72E-4 mg/l; RCR: <0.01
Man via environment – Inhalation	Concentration in air: 6.53E-7 mg/m ³ ; RCR: <0.01***
Man via environment – Oral	Exposure via food consumption: 8.41E-6 mg/kg bw/day; 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]. The RMMs described above suffice to control risks for both local and systemic effects.

Proc 15 EE(inhal): 6.009; EE(derm): 0.34

Risk characterisation

RCR(inhal): inhalative risk characterisation ratio; RCR(derm): dermal risk characterisation ratio; total RCR= RCR(inhal) +RCR(derm). 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 15 RCR(inhal): 0.429; RCR(derm): 0.17

Number of the ES 5

Short title of the exposure scenario

Functional Fluids

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

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)

Environmental release categories [ERC]

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ERC7: Industrial use of substances in closed systems

Product characteristics

Refer to attached safety data sheets

Processes and activities covered by the exposure scenario

Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers

Further explanations

Industrial use

Assessment tool used:

Chesar 3.3

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 7

Further specification

release factors for (Sp)ERC were modified.

Amounts used

Daily amount per site: 3 to

Annual amount per site: 300 to

Environment factors not influenced by risk management

River flow rate: 18000 m³/d

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: 1 %

Release fraction to wastewater from process: 1 %

Release fraction to soil from process: 1%

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 (%): 87.5

Conditions and measures related to external treatment of waste for disposal

Dispose of waste product or used containers according to local regulations

Number of the contributing scenario 2

Contributing exposure scenario controlling worker exposure for PROC 1

Product characteristics

Liquid***

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).

Number of the contributing scenario 3

Contributing exposure scenario controlling worker exposure for PROC 2

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.**

Number of the contributing scenario

4

Contributing exposure scenario controlling worker exposure for PROC 3

Product characteristics

Liquid**

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).

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.**

Number of the contributing scenario

5

Contributing exposure scenario controlling worker exposure for PROC 4

Product characteristics

Liquid**

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 controlled ventilation (5 to 10 air changes per hour) .

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Number of the contributing scenario

6

Contributing exposure scenario controlling worker exposure for PROC 8a

Product characteristics

Covers percentage substance in the product up to 25 %

Liquid**

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 controlled ventilation (5 to 10 air changes per hour) .

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Number of the contributing scenario

6

Contributing exposure scenario controlling worker exposure for PROC 8b

Product characteristics

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Covers percentage substance in the product up to 25 %

Liquid***

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 controlled ventilation (5 to 10 air changes per hour) .

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Number of the contributing scenario

7

Contributing exposure scenario controlling worker exposure for PROC 9

Product characteristics

Covers percentage substance in the product up to 25 %

Liquid***

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 controlled ventilation (5 to 10 air changes per hour) .

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.***

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)

PEC: 0.187 mg/l; RCR: 0.52

Fresh Water (Sediment)

PEC: 3.312 mg/kg dw; RCR: 0.52

Marine Water (Pelagic)

PEC: 0.019 mg/l; RCR: 0.52

Marine Water (Sediment)

PEC: 0.331 mg/kg dw; RCR: 0.52

Agricultural Soil

PEC: 0.581 mg/kg dw; RCR: 0.548

Sewage Treatment Plant

PEC: 1.873 mg/l; RCR: 0.026

(Effluent)

Man via environment – Inhalation Concentration in air: 2.29E-3 mg/m³; RCR: < 0.01***

Man via environment – Oral Exposure via food consumption: 0.01 mg/kg bw/day; 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]. The RMMs described above suffice to control risks for both local and systemic effects.

Proc 1

EE(inhal): 0.06; EE(derm): 0.034

Proc 2

EE(inhal): 6.009; EE(derm): 0.274

Proc 3

EE(inhal): 12.62; EE(derm): 0.069

Proc 4

EE(inhal): 9.013; EE(derm): 0.343

Proc 8a

EE(inhal): 10.82; EE(derm): 0.411

Proc 8b

EE(inhal): 5.408; EE(derm): 0.411

Proc 9

EE(inhal): 5.408; EE(derm): 0.412

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): 0.017

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Proc 2	RCR(inhal): 0.429; RCR(derm): 0.137
Proc 3	RCR(inhal): 0.901; RCR(derm): 0.035
Proc 4	RCR(inhal): 0.644; RCR(derm): 0.172
Proc 8a	RCR(inhal): 0.773; RCR(derm): 0.206
Proc 8b	RCR(inhal): 0.386; RCR(derm): 0.206
Proc 9	RCR(inhal): 0.386; RCR(derm): 0.206

Number of the ES 6

Short title of the exposure scenario

Functional Fluids

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)

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

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

PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems

Environmental release categories [ERC]

ERC9a: Wide dispersive indoor use of substances in closed systems

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

Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers

Further explanations

Professional use

Assessment tool used:

Chesar 3.3

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 9a ERC 9b***

Further specification

release factors for (Sp)ERC were modified.

Amounts used

daily wide dispersive use: 0.00011 t/d

Fraction of EU tonnage used in region: 0.1

Environment factors not influenced by risk management

River flow rate: 18000 m³/d

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%

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Release fraction to wastewater from process: 0.5%

Release fraction to soil from process: 0.5%

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 (%): 87.5

Conditions and measures related to external treatment of waste for disposal

Dispose of waste product or used containers according to local regulations

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

Product characteristics

Liquid***

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).

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

Product characteristics

Covers percentage substance in the product up to 25 %

Liquid***

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).***

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

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

Product characteristics

Covers percentage substance in the product up to 25 %

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.***

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

Product characteristics

Covers percentage substance in the product up to 25 %

Liquid***

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Frequency and duration of use

Avoid carrying out activities involving exposure for more than 1 hour

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 controlled ventilation (5 to 10 air changes per hour) .

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Number of the contributing scenario

6

Contributing exposure scenario controlling worker exposure for PROC 9

Product characteristics

Covers percentage substance in the product up to 25 %

Liquid***

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 controlled ventilation (5 to 10 air changes per hour) .

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Number of the contributing scenario

7

Contributing exposure scenario controlling worker exposure for PROC 20

Product characteristics

Covers percentage substance in the product up to 25 %

Liquid***

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).***

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 9.47E-5 mg/l; RCR: < 0.01
Fresh Water (Sediment)	PEC: 1.68E-3 mg/kg dw; RCR: < 0.01
Marine Water (Pelagic)	PEC: 9.04E-6 mg/l; RCR: < 0.01
Marine Water (Sediment)	PEC: 1.6E-4 mg/kg dw; RCR: < 0.01
Agricultural Soil	PEC: 1.14E-4 mg/kg dw; RCR: < 0.01
Sewage Treatment Plant (Effluent)	PEC: 3.43E-4 mg/l; RCR: < 0.01
Man via environment – Inhalation	Concentration in air: 6.53E-7 mg/m ³ ; RCR: < 0.01***
Man via environment – Oral	Exposure via food consumption: 1.02E-5 mg/kg bw/day; 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]. The RMMs described above suffice to control risks for both

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local and systemic effects.

Proc 1	EE(inhal): 0.06; EE(derm): 0.034
Proc 2	EE(inhal): 12.62; EE(derm): 0.082
Proc 3	EE(inhal): 10.82; EE(derm): 0.083
Proc 8a	EE(inhal): 5.408; EE(derm): 0.823
Proc 9	EE(inhal): 10.82; EE(derm): 0.412
Proc 20	EE(inhal): 12.62; EE(derm): 0.103

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): 0.017
Proc 2	RCR(inhal): 0.901; RCR(derm): 0.041
Proc 3	RCR(inhal): 0.773; RCR(derm): 0.041
Proc 8a	RCR(inhal): 0.386; RCR(derm): 0.411
Proc 9	RCR(inhal): 0.773; RCR(derm): 0.206
Proc 20	RCR(inhal): 0.901; RCR(derm): 0.051

Exposure estimation and reference to its source

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**