SAFETY DATA SHEET

according to REACH Regulation (EC) No. 1907/2006, as amended by UK REACH Regulations SI 2019/758

Isononanoic acid
10310

Version / Revision	6.01	**Revision Date**	25-Jan-2023
Supersedes Version	6.00***	**Issuing date**	25-Jan-2023

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

1.1. Product identifier

Identification of the substance/preparation **Isononanoic acid**

Chemical Name 3,5,5-Trimethylhexanoic acid
CAS-No 3302-10-1
EC No. 221-975-0

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

Identified uses
Intermediate
Formulation
Lubricants
Metal working fluids / rolling oils
Use in laboratories

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)

Acute oral toxicity Category 4, H302
Skin corrosion/irritation Category 2, H315
Serious eye damage/eye irritation Category 1, H318

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

2.2. Label elements

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

Hazard pictograms

Signal word	**Danger**
Hazard statements	H302: Harmful if swallowed. H315: Causes skin irritation. H318: Causes serious eye damage.
Precautionary statements	P280: Wear protective gloves/protective clothing/eye protection/face protection. P301 + P330: IF SWALLOWED: Rinse mouth P302 + P352: IF ON SKIN: Wash with plenty of soap and water. P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310: Immediately call a POISON CENTER/doctor.

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)
Endocrine disrupting assessments	The substance is not listed on the candidate list according to Art. 59(1), REACh. The substance was not assessed as having endocrine disrupting properties according to regulation 2017/2100/EU or 2018/605/EU.

SECTION 3: Composition / information on ingredients

3.1. Substances

Component	CAS-No	1272/2008/EC	Concentration (%)
3,5,5-Trimethylhexanoic acid	3302-10-1	Acute Tox. 4; H302 Skin Irrit. 2; H315 Eye Dam. 1; H318 ATE = 1160 mg/kg (oral)	88,5 - 100

Remarks
Mixture of isomeric Isononanoic acids, mainly 3,5,5-Trimethylhexanoic acid.
For full text of Hazard- and EU Hazard-statements see SECTION 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

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

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

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

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

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

Main symptoms
cough, headache, nausea, shortness of breath.

Special hazard
Lung irritation, Lung oedema.

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
Vapour/air-mixtures are explosive at intense warming
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

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

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. Keep at temperatures between 0 and 38 °C (32 and 100 °F).

Suitable material
stainless steel

Unsuitable material
mild steel, copper, brass, including their alloys

Temperature class
T2

7.3. Specific end use(s)

Intermediate
Formulation
Lubricants
Metal working fluids / rolling oils
Use in laboratories
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

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1
Workers

DN(M)EL - long-term exposure - systemic effects - Inhalation	4,4 mg/m³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - local effects - Inhalation	10 mg/m³
DN(M)EL - acute / short-term exposure - local effects - Inhalation	10 mg/m³
DN(M)EL - long-term exposure - systemic effects - Dermal	1,25 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	Low hazard (no threshold derived)
DN(M)EL - acute / short-term exposure - local effects - Dermal	Low hazard (no threshold derived)
DN(M)EL - local effects - eyes	Medium hazard (no threshold derived)

General population

DN(M)EL - long-term exposure - systemic effects - Inhalation	1,1 mg/m³
DN(M)EL - acute / short-term exposure - systemic effects - Inhalation	No hazard identified
DN(M)EL - long-term exposure - local effects - Inhalation	5 mg/m³
DN(M)EL - acute / short-term exposure - local effects - Inhalation	5 mg/m³
DN(M)EL - long-term exposure - systemic effects - Dermal	0,6 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	Low hazard (no threshold derived)
DN(M)EL - acute / short-term exposure - local effects - Dermal	Low hazard (no threshold derived)
DN(M)EL - long-term exposure - systemic effects - Oral	0,6 mg/kg bw/day
DN(M)EL - acute / short-term exposure - systemic effects - Oral	No hazard identified
DN(M)EL - local effects - eyes	Medium hazard (no threshold derived)

Environment

PNEC aqua - freshwater	0,068 mg/l
PNEC aqua - marine water	0,0068 mg/l
PNEC aqua - intermittent releases	1,36 mg/l
PNEC STP	23 mg/l
PNEC sediment - freshwater	1,08 mg/kg dw
PNEC sediment - marine water	0,108 mg/kg dw
PNEC Air	No hazard identified
PNEC soil	0,176 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
Safety glasses with side-shields. 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

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.

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

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

Physical state	liquid @ 20 °C (68 °F)
Colour	colourless
Odour	slightly acidic
Odour threshold	No data available
Melting point/freezing point	-77 °C (Pour point)
Method	DIN ISO 3016
Boiling point or initial boiling point and boiling range	236 °C @ 1013 hPa
Method	OECD 103
Flammability	Even if not classified as flammable, the product is capable of catching fire or being set on fire.***
Lower explosion limit	1,2 Vol %
Upper explosion limit	No data available
Flash point	117 °C @ 1013 hPa
Method	ISO 2719
Autoignition temperature	415 °C @ 1009 hPa
Method	DIN 51794
Decomposition temperature	No data available
pH	4,4 (0,1 g/l in water @ 25 °C (77 °F)) DIN 19268
Kinematic Viscosity	12,744 mm²/s @ 20 °C
Method	DIN 51562
Solubility	0,7 g/l @ 20 °C, in water, OECD 105

Partition coefficient n-octanol/water (log value) 3,2 @ 25 °C (77 °F) measured OECD 117

Vapour pressure

Values [hPa]	Values [kPa]	Values [atm]	@ °C	@ °F	Method
0,0046	0,00046	< 0,001	20	68	OECD 104
4,5	0,45	0,004	50	122	OECD 104

Density and/or relative density

Values	@ °C	@ °F	Method
0,900	20	68	DIN 51757
0,876	50	122	DIN 51757

Relative vapour density No data available
Particle characteristics not applicable

9.2. Other information

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
Molecular weight 158,23
Molecular formula C9 H18 O2
log Koc 2,79 @ pH 4,5
1,90 @ pH 8 calculated
Dissociation constant pKa 4,8 @ 20 °C (68 °F) OECD 112
Refractive index 1,429 @ 20 °C
Surface tension 35,3 mN/m (0,63 g/l @ 20°C (68°F)), OECD 115
Evaporation rate No data available

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.

10.6. Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

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

Acute toxicity				
3,5,5-Trimethylhexanoic acid (3302-10-1)				
Routes of Exposure	Endpoint	Values	Species	Method
Oral	LD50	1160 mg/kg	rat, male/female	OECD 401
Dermal	LD50	> 2000 mg/kg	rat, male/female	
Inhalative	LC0	0,03 mg/l (7 h)	rat, male/female	OECD 403

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1
Assessment
The available data lead to the classification given in section 2

Irritation and corrosion				
3,5,5-Trimethylhexanoic acid (3302-10-1)				
Target Organ Effects	Species	Result	Method	
Skin	rabbit	irritating	OECD 404	4h in vivo
Eyes	rabbit	severe irritation	OECD 405	72h in vivo
Respiratory tract	mouse	RD50: 420 mg/m³		in vivo

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1
Assessment
The available data lead to the classification given in section 2

Sensitization				
3,5,5-Trimethylhexanoic acid (3302-10-1)				
Target Organ Effects	Species	Evaluation	Method	
Skin	guinea pig	not sensitizing	OECD 406	

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1
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				
3,5,5-Trimethylhexanoic acid (3302-10-1)				
Type	Dose	Species	Method	
Subacute toxicity	NOAEL: 10 mg/kg/d	rat, male	OECD 422	Oral
Subchronic toxicity	NOAEL: 5 mg/kg/d (90d)	rat, male/female	OECD 408	Oral

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1
Assessment
Based on available data, the classification criteria are not met for:
STOT RE

Carcinogenicity, Mutagenicity, Reproductive toxicity					
3,5,5-Trimethylhexanoic acid (3302-10-1)					
Type	Dose	Species	Evaluation	Method	

Mutagenicity		Salmonella typhimurium	negative	OECD 471 (Ames)	In vitro study
Mutagenicity		Escherichia coli	negative	OECD 472	In vitro study
Mutagenicity		human lymphocytes	negative	OECD 473 (Chromosomal Aberration)	In vitro study
Mutagenicity		V79 cells, Chinese hamster	negative	OECD 476 (Mammalian Gene Mutation)	In vitro study
Reproductive toxicity	LOAEL 165 - 500 mg/kg/d	rat, parental, female		OECD 415	Oral
Reproductive toxicity	NOAEL 79 - 228 mg/kg/d	rat, parental, female		OECD 415	Oral
Reproductive toxicity	NOAEL 10 - 30 mg/kg/d	rat, parental male/female		OECD 422	Oral
Reproductive toxicity	NOAEL 100 mg/kg/d	rat, 1. Generation, male/female		OECD 422	Oral
Reproductive toxicity	NOAEL 120 mg/kg/d	rat, parental male/female		OECD 443	Oral
Reproductive toxicity	NOAEL 25 mg/kg/d	rat, 1. Generation, male/female		OECD 443	Oral
Developmental Toxicity	NOAEL 60 mg/kg/d	rat		OECD 414, Oral	Maternal toxicity Developmental toxicity
Developmental Toxicity	NOAEL 250 mg/kg/d	rabbit		OECD 414, Oral	Maternal toxicity Developmental toxicity

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1
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

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1
Main symptoms
cough, headache, nausea, shortness of breath.
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

11.2. Information on other hazards

Endocrine disrupting properties
The substance has not been identified as having endocrine disrupting properties in accordance with section 2.3.
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			
3,5,5-Trimethylhexanoic acid (3302-10-1)			
Species	Exposure time	Dose	Method
Oncorhynchus mykiss (rainbow trout)	96h	LC50: 122 mg/l	OECD 203
Activated sludge (bacteriae)	3 h	EC50: 470 mg/l	OECD 209
Daphnia magna (Water flea)	48h	EC50: 68 mg/l	OECD 202
Pseudokirchneriella subcapitata	72h	EC50: 81 mg/l (Growth rate)	OECD 201
Pseudokirchneriella subcapitata	72h	EC50: 51 mg/l (Biomass)	OECD 201

Long term toxicity				
3,5,5-Trimethylhexanoic acid (3302-10-1)				
Type	Species	Dose	Method	
Aquatic toxicity	Pseudokirchneriella subcapitata	NOEC: 10 mg/l (3d)	OECD 201	

12.2. Persistence and degradability

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1
Biodegradation
96 % (21 d), activated sludge, domestic, non-adapted, aerobic, OECD 301A.

Abiotic Degradation		
3,5,5-Trimethylhexanoic acid (3302-10-1)		
Type	Result	Method
Hydrolysis	not expected	
Photolysis	Half-life (DT50): 60,17 h	calculated

12.3. Bioaccumulative potential

3,5,5-Trimethylhexanoic acid (3302-10-1)		
Type	Result	Method
log Pow	3,2 @ 25 °C (77 °F)	measured, OECD 117
BCF	4,1 - 7 @ 0,1 mg/l	OECD 305 C
BCF	0,5 - 1,7 @ 1 mg/l	OECD 305 C

12.4. Mobility in soil

3,5,5-Trimethylhexanoic acid (3302-10-1)		
Type	Result	Method
Surface tension	35,3 mN/m (0,63 g/l @ 20°C (68°F))	OECD 115
Distribution to environmental	Air: 1,99 Soil: 12,6 Water: 72,6	calculated

compartments	Sediment: 12,7 Suspended sediment: 0,08 Biota: 0,01	
Adsorption/Desorption	log Koc: 2,79 @ pH 4,5	calculated
Adsorption/Desorption	log Koc: 1,90 @ pH 8	calculated

12.5. Results of PBT and vPvB assessment

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1
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. Endocrine disrupting properties

The substance has not been identified as having endocrine disrupting properties in accordance with section 2.3.

12.7. Other adverse effects

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1
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 or ID 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

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. Maritime transport in bulk according to IMO instruments

Product name	Nonanoic acid
Ship type	3
Pollution category	Y
Hazard class	P

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
3,5,5-Trimethylhexanoic acid CAS: 3302-10-1	not subject

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

Component	Status
3,5,5-Trimethylhexanoic acid CAS: 3302-10-1	The substance is/will be pre-registered

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

International Inventories

3,5,5-Trimethylhexanoic acid, CAS: 3302-10-1
AICS (AU)
DSL (CA)
IECSC (CN)
EC-No. 2219750 (EU)
ENCS (2)-608 (JP)
ISHL (2)-608 (JP)
KECI KE-34559 (KR)
PICCS (PH)

TSCA (US)
NZIoC-NZ with note
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
H302: Harmful if swallowed.
H315: Causes skin irritation.
H318: Causes serious eye damage.

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

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

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

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

Disclaimer
For industrial use only. The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. OQ Chemicals 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 local hazards via inhalation
Acute local hazards via inhalation
Long-term Systemic effects via skin
A qualitative approach used to conclude safe use for:
Long-term local effects 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 gloves tested to EN 374 for activities, where direct contact with substance is possible
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
Avoid direct eye contact with product, also via contamination on hands.
Containment as appropriate
Minimize number of staff exposed
Ensure segregation of worker from the source.
Good standard of general ventilation
Minimization of manual phases
Avoidance of contact with contaminated tools and objects
Regular cleaning of equipment and work area
Training for staff on good practice
Good standard of personal hygiene
Full skin coverage with appropriate light-weight barrier material
Chemical goggles or safety glasses
Supervision in place to check that the RMMs in place are being used correctly and OCs followed.

Exposure scenario identification

1 **Industrial use resulting in manufacture of another substance (use of intermediates)**
2 **Formulation & (re)packing of substances and mixtures**
3 **Lubricants**
4 **Lubricants**
5 **Metal working fluids / rolling oils**
6 **Metal working fluids / rolling oils**
7 **Use in laboratories**
8 **Use in laboratories**

Number of the ES 1

Short title of the exposure scenario

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

List of use descriptors

Sector of uses [SU]
SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU8: Manufacture of bulk, large scale chemicals (including petroleum products)

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

Product characteristics
Refer to attached safety data sheets

Processes and activities covered by the exposure scenario
Use as an intermediate (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (ncluding marine vessel/barge, road/rail car and bulk container).

Further explanations
Industrial use
Assessment tool used:
Chesar 3.5
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
liquid
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

Amounts used
Daily amount per site: 32.5 to
Annual amount per site: 650 to
Technical conditions and measures at process level (source) to prevent release
Release fraction to air from process: 5%
Release fraction to wastewater from process: 0.02%
Release fraction to soil from process: 0.1%
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 (m^3/d): 2000

The minimum grade of elimination in the sewage plant is (%): 87.5

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection.

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

PROC 5

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Wear respiratory protection (Efficiency: 90 %).

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Wear respiratory protection (Efficiency: 90 %).

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 95 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear 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

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

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

PROC 15

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection. Wear respiratory protection (Efficiency: 90 %).

Exposure estimation and reference to its source

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

Fresh Water (Pelagic)	PEC: 0.041 mg/l; RCR: 0.601
Fresh Water (Sediment)	PEC: 0.649 mg/kg dw; RCR: 0.601
Marine Water (Pelagic)	PEC: 4.09E-3 mg/l; RCR: 0.601
Marine Water (Sediment)	PEC: 0.065 mg/kg dw; RCR: 0.602
Agricultural Soil	PEC: 0.117 mg/kg dw; RCR: 0.662
Sewage Treatment Plant (Effluent)	PEC: 0.407 mg/l; RCR: 0.018

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

Proc 1	EE(inhal): 0.264; EE(derm): 0.034
Proc 2	EE(inhal): 2.637; EE(derm): 0.274
Proc 3	EE(inhal): 7.912; EE(derm): 0.138
Proc 4	EE(inhal): 1.319; EE(derm): 0.686
Proc 5	EE(inhal): 1.319; EE(derm): 0.686
Proc 8a	EE(inhal): 2.637; EE(derm): 0.686
Proc 8b	EE(inhal): 6.593; EE(derm): 0.686
Proc 9	EE(inhal): 1.319; EE(derm): 0.686
Proc 15	EE(inhal): 1.319; EE(derm): 0.03

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

Proc 1	RCR(inhal): 0.026; RCR(derm): 0.027
Proc 2	RCR(inhal): 0.264; RCR(derm): 0.219
Proc 3	RCR(inhal): 0.791; RCR(derm): 0.11
Proc 4	RCR(inhal): 0.132; RCR(derm): 0.549
Proc 5	RCR(inhal): 0.132; RCR(derm): 0.548
Proc 8a	RCR(inhal): 0.264; RCR(derm): 0.548
Proc 8b	RCR(inhal): 0.659; RCR(derm): 0.548
Proc 9	RCR(inhal): 0.132; RCR(derm): 0.549
Proc 15	RCR(inhal): 0.132; RCR(derm): 0.272

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

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

Environmental release categories [ERC]
ERC2: Formulation of preparations (mixtures)

Product characteristics
Refer to attached safety data sheets

Processes and activities covered by the exposure scenario
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenanance and associated laboratory activities.

Further explanations
Industrial use
Assessment tool used:
Chesar 3.5
liquid
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Covers percentage substance in the product up to 100 % (unless stated differently).
Assumes an advanced standard of occupational Health and Safety Management System

Contributing Scenarios

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

Amounts used
Daily amount per site: 7 to
Annual amount per site: 700 to
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: 0.04%
Release fraction to soil from process: 0.01%
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 98 %
Conditions and measures related to municipal sewage treatment plant
Size of municipal sewage system/ treatment plant (m³/d): 2000
Water flow in sewage/river (m³/day): 18000
The minimum grade of elimination in the sewage plant is (%): 87.5

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection.

Respiratory protection: 90 %.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Respiratory protection: 90 %.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Respiratory protection: 90 %.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 95 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Respiratory protection: 90 %.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection.

Respiratory protection: 90 %.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear respiratory protection (Efficiency: 90 %). Wear suitable gloves (tested to EN374) and eye protection.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection. Respiratory protection: 90 %.

Exposure estimation and reference to its source

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

Fresh Water (Pelagic)	PEC: 0.018 mg/l; RCR: 0.26
Fresh Water (Sediment)	PEC: 0.281 mg/kg dw; RCR: 0.26
Marine Water (Pelagic)	PEC: 1.77E-3 mg/l; RCR: 0.261
Marine Water (Sediment)	PEC: 0.028 mg/kg dw; RCR: 0.261
Agricultural Soil	PEC: 0.051 mg/kg dw; RCR: 0.292
Sewage Treatment Plant (Effluent)	PEC: 0.175 mg/l; RCR: <0.01

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

Proc 1	EE(inhal): 0.264; EE(derm): 0.034
Proc 2	EE(inhal): 2.637; EE(derm): 0.274
Proc 3	EE(inhal): 7.912; EE(derm): 0.138
Proc 4	EE(inhal): 1.319; EE(derm): 0.686
Proc 5	EE(inhal): 1.319; EE(derm): 0.686
Proc 8a	EE(inhal): 2.637; EE(derm): 0.686
Proc 8b	EE(inhal): 0.659; EE(derm): 0.686
Proc 9	EE(inhal): 1.319; EE(derm): 0.686
Proc 14	EE(inhal): 1.319; EE(derm): 0.686
Proc 15	EE(inhal): 1.319; EE(derm): 0.34

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

Proc 1	RCR(inhal): 0.026; RCR(derm): 0.027
Proc 2	RCR(inhal): 0.264; RCR(derm): 0.219
Proc 3	RCR(inhal): 0.791; RCR(derm): 0.11
Proc 4	RCR(inhal): 0.132; RCR(derm): 0.549
Proc 5	RCR(inhal): 0.132; RCR(derm): 0.548
Proc 8a	RCR(inhal): 0.264; RCR(derm): 0.548
Proc 8b	RCR(inhal): 0.066; RCR(derm): 0.548
Proc 9	RCR(inhal): 0.132; RCR(derm): 0.594
Proc 14	RCR(inhal): 0.132; RCR(derm): 0.549
Proc 15	RCR(inhal): 0.132; RCR(derm): 0.272

Number of the ES 3

Short title of the exposure scenario
Lubricants

List of use descriptors

Sector of uses [SU]
SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process categories [PROC]
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10: Roller application or brushing
PROC13: Treatment of articles by dipping and pouring
PROC17: Lubrication at high energy conditions and in partly open process

Environmental release categories [ERC]
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics
Refer to attached safety data sheets

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

Further explanations
Industrial use
Assessment tool used:
Chesar 3.5
liquid
Assumes use at not more than 20°C above ambient temperature (unless stated differently)

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

Contributing Scenarios

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

Amounts used
Daily amount per site: 5 to
Annual amount per site: 100 to
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: 100%
Release fraction to wastewater from process: 0.1%
Release fraction to soil from process: 5%
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 99.9 %
Conditions and measures related to municipal sewage treatment plant
Size of municipal sewage system/ treatment plant (m^3/d): 2000
Water flow in sewage/river (m^3/day): 18000
The minimum grade of elimination in the sewage plant is (%): 87.5

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure

Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection. Respiratory protection: 90 %.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Respiratory protection: 90 %.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal). 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 specific activity training. Use suitable eye protection. Respiratory protection: 90 %.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 95 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Respiratory protection: 90 %.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use

Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Respiratory protection: 90 %.

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

Product characteristics
Covers percentage substance in the product up to 20 %
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 chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Respiratory protection: 90 %.

Number of the contributing scenario **10**
Contributing exposure scenario controlling worker exposure for PROC 13

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Respiratory protection: 90 %.

Number of the contributing scenario **11**
Contributing exposure scenario controlling worker exposure for PROC 17

Product characteristics
Covers percentage substance in the product up to 20 %
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 chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Respiratory protection: 90 %.

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 0.031 mg/l; RCR: 0.462
Fresh Water (Sediment)	PEC: 0.5 mg/kg dw; RCR: 0.463
Marine Water (Pelagic)	PEC: 3.15E-3 mg/l; RCR: 0.463
Marine Water (Sediment)	PEC: 0.05 mg/kg dw; RCR: 0.464
Agricultural Soil	PEC: 0.101 mg/kg dw; RCR: 0.574
Sewage Treatment Plant (Effluent)	PEC: 0.313 mg/l; RCR: 0.014

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

Proc 1	EE(inhal): 0.264; EE(derm): 0.034
Proc 2	EE(inhal): 2.637; EE(derm): 0.274
Proc 3	EE(inhal): 0.791; EE(derm): 0.69
Proc 5	EE(inhal): 1.319; EE(derm): 0.686
Proc 8a	EE(inhal): 2.637; EE(derm): 0.686
Proc 8b	EE(inhal): 0.659; EE(derm): 0.686
Proc 9	EE(inhal): 1.319; EE(derm): 0.686
Proc 10	EE(inhal): 1.582; EE(derm): 0.823
Proc 13	EE(inhal): 2.637; EE(derm): 0.686
Proc 17	EE(inhal): 3.165; EE(derm): 0.823

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

Proc 1	RCR(inhal): 0.026; RCR(derm): 0.027
Proc 2	RCR(inhal): 0.264; RCR(derm): 0.219
Proc 3	RCR(inhal): 0.079; RCR(derm): 0.552
Proc 5	RCR(inhal): 0.132; RCR(derm): 0.548
Proc 8a	RCR(inhal): 0.264; RCR(derm): 0.548
Proc 8b	RCR(inhal): 0.066; RCR(derm): 0.548
Proc 9	RCR(inhal): 0.132; RCR(derm): 0.549
Proc 10	RCR(inhal): 0.158; RCR(derm): 0.658
Proc 13	RCR(inhal): 0.264; RCR(derm): 0.548
Proc 17	RCR(inhal): 0.316; RCR(derm): 0.658

Number of the ES 4

Short title of the exposure scenario
Lubricants

List of use descriptors

Sector of uses [SU]
SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process categories [PROC]
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC10: Roller application or brushing
PROC13: Treatment of articles by dipping and pouring
PROC17: Lubrication at high energy conditions and in partly open process
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
Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.

Further explanations
Professional use
Assessment tool used:
Chesar 3.5
liquid
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Covers percentage substance in the product up to 100 % (unless stated differently)
Assumes a basic standard of occupational Health and Safety Management System

Contributing Scenarios

Number of the contributing scenario **1**
Contributing exposure scenario controlling environmental exposure for ERC 9a ERC 9b

Amounts used
daily wide dispersive use: 5.5E-5 to/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: 5%
Release fraction to wastewater from process: 5%
Release fraction to soil from process: 5%
Conditions and measures related to municipal sewage treatment plant
The minimum grade of elimination in the sewage plant is (%): 87.5

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection.

Number of the contributing scenario **3**

Contributing exposure scenario controlling worker exposure for PROC 2

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection. Wear respiratory protection (Efficiency: 90 %).

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection. Wear respiratory protection (Efficiency: 90 %).

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear respiratory protection (Efficiency: 90 %).

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 20 %
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Wear respiratory protection (Efficiency: 95 %).

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

PROC 8b

Product characteristics
Covers percentage substance in the product up to 20 %
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 chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario 8
Contributing exposure scenario controlling worker exposure for PROC 10

Product characteristics
Covers percentage substance in the product up to 5 %
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Wear respiratory protection (Efficiency: 95 %).

Number of the contributing scenario 9
Contributing exposure scenario controlling worker exposure for PROC 13

Product characteristics
Covers percentage substance in the product up to 20 %
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario 10
Contributing exposure scenario controlling worker exposure for PROC 17

Product characteristics
Covers percentage substance in the product up to 5 %
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker

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

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Wear respiratory protection (Efficiency: 95 %).

Number of the contributing scenario **11**

Contributing exposure scenario controlling worker exposure for PROC 20

Frequency and duration of use

8 h (full shift)

Other given operational conditions affecting workers exposure

Indoor use

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

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

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

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

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 1.72E-4 mg/l; RCR: < 0.01
Fresh Water (Sediment)	PEC: 2.74E-3 mg/kg dw; RCR: < 0.01
Marine Water (Pelagic)	PEC: 2.14E-5 mg/l; RCR: < 0.01
Marine Water (Sediment)	PEC: 3.4E-4 mg/kg dw; RCR: < 0.01
Agricultural Soil	PEC: 1.25E-3 mg/kg dw; RCR: < 0.01
Sewage Treatment Plant (Effluent)	PEC: 1.72E-4 mg/l; RCR: < 0.01

Human exposure prediction (oral, dermal, inhalative)

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

Proc 1	EE(inhal): 0.264; EE(derm): 0.034
Proc 2	EE(inhal): 2.637; EE(derm): 0.274
Proc 3	EE(inhal): 1.582; EE(derm): 0.69
Proc 4	EE(inhal): 5.275; EE(derm): 0.686
Proc 8a	EE(inhal): 3.956; EE(derm): 0.823
Proc 8b	EE(inhal): 1.582; EE(derm): 0.823
Proc 10	EE(inhal): 1.319; EE(derm): 0.549
Proc 13	EE(inhal): 3.165; EE(derm): 0.823
Proc 17	EE(inhal): 2.637; EE(derm): 0.549
Proc 20	EE(inhal): 2.637; EE(derm): 0.171

Risk characterisation

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

Proc 1	RCR(inhal): 0.026; RCR(derm): 0.027
Proc 2	RCR(inhal): 0.264; RCR(derm): 0.219
Proc 3	RCR(inhal): 0.158; RCR(derm): 0.552
Proc 4	RCR(inhal): 0.527; RCR(derm): 0.549

Proc 8a	RCR(inhal): 0.396; RCR(derm): 0.658
Proc 8b	RCR(inhal): 0.158; RCR(derm): 0.658
Proc 10	RCR(inhal): 0.132; RCR(derm): 0.439
Proc 13	RCR(inhal): 0.316; RCR(derm): 0.658
Proc 17	RCR(inhal): 0.264; RCR(derm): 0.439
Proc 20	RCR(inhal): 0.264; RCR(derm): 0.137

Number of the ES 5

Short title of the exposure scenario

Metal working fluids / rolling oils

List of use descriptors

Sector of uses [SU]
SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process categories [PROC]
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC10: Roller application or brushing
PROC13: Treatment of articles by dipping and pouring
PROC17: Lubrication at high energy conditions and in partly open process

Environmental release categories [ERC]
ERC8a: Wide dispersive indoor use of processing aids in open systems
ERC8d: Wide dispersive outdoor use of processing aids in open systems

Product characteristics
Refer to attached safety data sheets

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

Further explanations
Professional use
Assessment tool used:
Chesar 3.5
liquid
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Covers percentage substance in the product up to 100 % (unless stated differently)
Assumes a good basic standard of occupational hygiene is implemented

Contributing Scenarios

Number of the contributing scenario 1
Contributing exposure scenario controlling environmental exposure for ERC 9a ERC 9b

Amounts used
daily wide dispersive use: 6.6E-5 to/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 wide dispersive use (regional only): 100%
Release fraction to wastewater from wide dispersive use: 100%
Release fraction to soil from wide dispersive use (regional only): 20%
Conditions and measures related to municipal sewage treatment plant
The minimum grade of elimination in the sewage plant is (%): 87.5

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Wear respiratory protection (Efficiency: 90 %).

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection. Wear respiratory protection (Efficiency: 90 %).

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

Product characteristics
Covers percentage substance in the product up to 20 %

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Wear respiratory protection (Efficiency: 90 %).

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 20 %
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Wear respiratory protection (Efficiency: 95 %).

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

Product characteristics
Covers percentage substance in the product up to 20 %
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 chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario 8
Contributing exposure scenario controlling worker exposure for PROC 10

Product characteristics
Covers percentage substance in the product up to 5 %
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection.

Wear respiratory protection (Efficiency: 95 %).

Number of the contributing scenario	**9**
Contributing exposure scenario controlling worker exposure for PROC 13	

Product characteristics
Covers percentage substance in the product up to 20 %
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Wear respiratory protection (Efficiency: 95 %).

Number of the contributing scenario	**10**
Contributing exposure scenario controlling worker exposure for PROC 17	

Product characteristics
Covers percentage substance in the product up to 5 %
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Wear respiratory protection (Efficiency: 95 %).

Exposure estimation and reference to its source

Environment

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

Fresh Water (Pelagic)	PEC: 5.68E-4 mg/l; RCR: < 0.01
Fresh Water (Sediment)	PEC: 9.03E-3 mg/kg dw; RCR: < 0.01
Marine Water (Pelagic)	PEC: 6.1E-5 mg/l; RCR: < 0.01
Marine Water (Sediment)	PEC: 9.7E-4 mg/kg dw; RCR: < 0.01
Agricultural Soil	PEC: 2.32E-3 mg/kg dw; RCR: 0.013
Sewage Treatment Plant (Effluent)	PEC: 4.13E-3 mg/l; RCR: < 0.01

Human exposure prediction (oral, dermal, inhalative)

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

Proc 1	EE(inhal): 0.264; EE(derm): 0.034
Proc 2	EE(inhal): 2.637; EE(derm): 0.137
Proc 3	EE(inhal): 1.582; EE(derm): 0.69
Proc 5	EE(inhal): 3.165; EE(derm): 0.823
Proc 8a	EE(inhal): 3.956; EE(derm): 0.823

Proc 8b	EE(inhal): 1.582; EE(derm): 0.823
Proc 10	EE(inhal): 1.319; EE(derm): 0.549
Proc 13	EE(inhal): 1.582; EE(derm): 0.823
Proc 17	EE(inhal): 2.637; EE(derm): 0.549

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

Proc 1	RCR(inhal): 0.026; RCR(derm): 0.027
Proc 2	RCR(inhal): 0.264; RCR(derm): 0.11
Proc 3	RCR(inhal): 0.158; RCR(derm): 0.552
Proc 5	RCR(inhal): 0.316; RCR(derm): 0.658
Proc 8a	RCR(inhal): 0.396; RCR(derm): 0.658
Proc 8b	RCR(inhal): 0.158; RCR(derm): 0.658
Proc 10	RCR(inhal): 0.132; RCR(derm): 0.439
Proc 13	RCR(inhal): 0.158; RCR(derm): 0.658
Proc 17	RCR(inhal): 0.264; RCR(derm): 0.439

Number of the ES 6

Short title of the exposure scenario
Metal working fluids / rolling oils

List of use descriptors

Sector of uses [SU]
SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites

Process categories [PROC]
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10: Roller application or brushing
PROC13: Treatment of articles by dipping and pouring
PROC17: Lubrication at high energy conditions and in partly open process
PROC18: Greasing at high energy conditions

Environmental release categories [ERC]
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics
Refer to attached safety data sheets

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

Further explanations
Industrial use
Assessment tool used:
Chesar 3.5
liquid
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Covers percentage substance in the product up to 100 % (unless stated differently)
Assumes an advanced standard of occupational Health and Safety Management System

Contributing Scenarios

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

Amounts used
Daily amount per site: 6 to
Annual amount per site: 120 to
Technical conditions and measures at process level (source) to prevent release
Release fraction to air from process: 100%
Release fraction to wastewater from process: 0.1%
Release fraction to soil from process: 5%
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
Onsite treatment wastewater. Apply acclimated biological treatment. Assumed Efficiency: 99.9 %
Conditions and measures related to municipal sewage treatment plant
Size of industrial sewage treatment plant (m3/d): 2000
Water flow in sewage/river (m³/day): 18000
The minimum grade of elimination in the sewage plant is (%): 87.5

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor and outdoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor 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 chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection.

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection. Wear respiratory protection (Efficiency: 90 %).

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Wear respiratory protection (Efficiency: 95 %).

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 95 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Wear respiratory protection (Efficiency: 95 %).

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 95 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Wear respiratory protection (Efficiency: 95 %).

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative).
Conditions and measures related to personal protection, hygiene and health evaluation
Use suitable eye protection. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear respiratory protection (Efficiency: 90 %).

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

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Wear respiratory protection (Efficiency: 90 %). Use suitable eye protection.

Number of the contributing scenario **10**
Contributing exposure scenario controlling worker exposure for
PROC 13

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario **11**
Contributing exposure scenario controlling worker exposure for
PROC 17

Product characteristics
Covers percentage substance in the product up to 10 %
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection.

Number of the contributing scenario **12**
Contributing exposure scenario controlling worker exposure for
PROC 18

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 chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Wear respiratory protection (Efficiency: 95 %).

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

Fresh Water (Pelagic)	PEC: 0.038 mg/l; RCR: 0.555
Fresh Water (Sediment)	PEC: 0.6 mg/kg dw; RCR: 0.555
Marine Water (Pelagic)	PEC: 3.77E-3 mg/l; RCR: 0.555
Marine Water (Sediment)	PEC: 0.06 mg/kg dw; RCR: 0.556
Agricultural Soil	PEC: 0.121 mg/kg dw; RCR: 0.688
Sewage Treatment Plant (Effluent)	PEC: 0.376 mg/l; RCR: 0.016

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

Proc 1	EE(inhal): 0.264; EE(derm): 0.034
Proc 2	EE(inhal): 2.637; EE(derm): 0.274
Proc 3	EE(inhal): 0.791; EE(derm): 0.69
Proc 5	EE(inhal): 1.319; EE(derm): 0.686
Proc 8a	EE(inhal): 2.637; EE(derm): 0.686
Proc 8b	EE(inhal): 0.659; EE(derm): 0.686
Proc 9	EE(inhal): 1.319; EE(derm): 0.686
Proc 10	EE(inhal): 1.582; EE(derm): 0.823
Proc 13	EE(inhal): 2.637; EE(derm): 0.686
Proc 17	EE(inhal): 3.165; EE(derm): 0.823
Proc 18	EE(inhal): 2.637; EE(derm): 0.686

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

Proc 1	RCR(inhal): 0.026; RCR(derm): 0.027
Proc 2	RCR(inhal): 0.264; RCR(derm): 0.219
Proc 3	RCR(inhal): 0.079; RCR(derm): 0.552
Proc 5	RCR(inhal): 0.132; RCR(derm): 0.548
Proc 8a	RCR(inhal): 0.264; RCR(derm): 0.548
Proc 8b	RCR(inhal): 0.066; RCR(derm): 0.548
Proc 9	RCR(inhal): 0.132; RCR(derm): 0.549
Proc 10	RCR(inhal): 0.158; RCR(derm): 0.658
Proc 13	RCR(inhal): 0.264; RCR(derm): 0.548
Proc 17	RCR(inhal): 0.316; RCR(derm): 0.658
Proc 18	RCR(inhal): 0.264; RCR(derm): 0.548

Number of the ES 7

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]
PROC10: Roller application or brushing
PROC15: Use as laboratory reagent

Environmental release categories [ERC]
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Product characteristics
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
Industrial use
Assessment tool used:
Chesar 3.5
liquid
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Covers percentage substance in the product up to 100 % (unless stated differently).
Assumes an advanced standard of occupational Health and Safety Management System

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

Amounts used
Daily amount per site: 0.005 to
Annual amount per site: 0.1 to
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: 5%
Conditions and measures related to municipal sewage treatment plant
Size of municipal sewage system/ treatment plant (m^3/d): 2000
Water flow in sewage/river (m^3/day): 18000
The minimum grade of elimination in the sewage plant is (%): 87.5

Number of the contributing scenario 2
Contributing exposure scenario controlling worker exposure for PROC 10

Product characteristics
Covers percentage substance in the product up to 20 %
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 chemically resistant gloves (tested to EN374) in combination with specific activity training. Use suitable eye protection. Wear respiratory protection (Efficiency: 90 %).

Number of the contributing scenario 3
Contributing exposure scenario controlling worker exposure for PROC 15

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 90 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves (tested to EN374) and eye protection. Wear respiratory protection (Efficiency: 90 %).

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

Fresh Water (Pelagic)	PEC: 0.031 mg/l; RCR: 0.462
Fresh Water (Sediment)	PEC: 0.5 mg/kg dw; RCR: 0.463
Marine Water (Pelagic)	PEC: 3.15E-3 mg/l; RCR: 0.463
Marine Water (Sediment)	PEC: 0.05 mg/kg dw; RCR: 0.464
Agricultural Soil	PEC: 0.086 mg/kg dw; RCR: 0.49
Sewage Treatment Plant (Effluent)	PEC: 0.313 mg/l; RCR: 0.014

Human exposure prediction (oral, dermal, inhalative)
Oral exposure is not expected to occur. Exposure estimates are given for short-term or long-term, systemic or local exposure depending on which lead to more conservative risk characterization ratios. The RMMs described above suffice to control risks for both local and systemic effects. EE(inhal): Estimated inhalative exposure [mg/m³]. EE(derm): Estimated dermal exposure [mg/kg b.w./d].

Proc 10	EE(inhal): 1.582; EE(derm): 0.823
Proc 15	EE(inhal): 1.319; EE(derm): 0.34

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

Proc 10	RCR(inhal): 0.158; RCR(derm): 0.658
Proc 15	RCR(inhal): 0.132; RCR(derm): 0.272

Number of the ES 8

Short title of the exposure scenario
Use in laboratories

List of use descriptors

Sector of uses [SU]
SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process categories [PROC]
PROC10: Roller application or brushing
PROC15: Use as laboratory reagent

Environmental release categories [ERC]
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:
liquid
Assumes use at not more than 20°C above ambient temperature (unless stated differently)
Covers percentage substance in the product up to 100 % (unless stated differently)
Chesar 3.5
Assumes a basic standard of occupational Health and Safety Management System

Contributing Scenarios

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

Amounts used
daily wide dispersive use: 5.5E-6 to/d
Technical conditions and measures at process level (source) to prevent release
Release fraction to air from wide dispersive use (regional only): 100%
Release fraction to wastewater from wide dispersive use: 100%
Release fraction to soil from wide dispersive use (regional only): 0%
Conditions and measures related to municipal sewage treatment plant
The minimum grade of elimination in the sewage plant is (%): 87.50

Number of the contributing scenario **2**
Contributing exposure scenario controlling worker exposure for PROC 10

Product characteristics
Covers percentage substance in the product up to 5 %
Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Use suitable eye protection. Wear respiratory protection (Efficiency: 95 %).

Number of the contributing scenario **3**
Contributing exposure scenario controlling worker exposure for PROC 15

Frequency and duration of use
8 h (full shift)
Other given operational conditions affecting workers exposure
Indoor use
Technical conditions and measures to control dispersion from source towards the worker
provide a basic standard of general ventilation (1 to 3 air changes per hour). Effectiveness of LEV (local exhaust ventilation): 80 % (inhalative); 0 % (dermal).
Conditions and measures related to personal protection, hygiene and health evaluation

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

Environment

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

Fresh Water (Pelagic)	PEC: 1.89E-4 mg/l; RCR: < 0.01
Fresh Water (Sediment)	PEC: 3.01E-3 mg/kg dw; RCR: < 0.01
Marine Water (Pelagic)	PEC: 2.31E-5 mg/l; RCR: < 0.01
Marine Water (Sediment)	PEC: 3.68E-4 mg/kg dw; RCR: < 0.01
Agricultural Soil	PEC: 1.29E-3 mg/kg dw; RCR: < 0.01
Sewage Treatment Plant (Effluent)	PEC: 3.44E-4 mg/l; RCR: < 0.01

Human exposure prediction (oral, dermal, inhalative)

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

Proc 10	EE(inhal): 1.319; EE(derm): 0.549
Proc 15	EE(inhal): 2.637; EE(derm): 0.34

Risk characterisation

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

Proc 10	RCR(inhal): 0.132; RCR(derm): 0.439
Proc 15	RCR(inhal): 0.264; RCR(derm): 0.272

Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Usage of relase factors allows downstream users to verify in a first approximation, if the combination of local usage and production conditions meets the defined release quantities resulting from this exposure scenario (calculated as M(site) [see amounts used, contributing scenario 1] x release factor [Technical conditions and measures at process level (source) to prevent release; contributing scenario 1])