SIBUR-NEFTEKHIM JSC

SAFETY DATA SHEET

According to Regulations (EC) 1907/2006 (REACH), (EC) 1272/2008 (CLP) & (EU) 2015/830

DIETHYLENE GLYCOL

Version: 3.2
Date created: 13/03/2020

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

1.1.Product identifier

Product form:	Substance
Substance name:	2,2'-oxydiethanol
Chemical name:	2,2'-oxydiethanol
EC index No.:	603-140-00-6
EC No.:	203-872-2
CAS-No.:	111-46-6
REACH registration No:	01-2119457857-21-0022
Formula:	$C_4H_{10}O_3$
Synonyms:	2-(2-hydroxyethoxy)ethan-1-olб 2,2’-oxybisethanol, ethylene diglycol, diethylene glycol
Trade names:	Diethylene glycol, DEG

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

1.2.1. Relevant identified uses

Use of the substance/mixture:

- Use as Intermediate
- Use as Process chemical
- Distribution of substance
- Formulation & (re)packing of substance and mixtures
- Production of Polymers
- Use in Paints/Coatings/Adhesives/ Sealants/ Foams/ Polymers/ filled Polymers
- Use in Paints/Coatings /Surface treatment products
- Use in Cleaning agents
- Use in Biocidal products
- Use in Lubricants
- Use in Metal-working fluids
- Use in/as Functional fluids
- Use in Heat transfer and Hydraulic fluids
- Use in/as De-icing/Anti-icing applications/agents
- Use in laboratories
- Use in Adhesives and Sealants
- Production of Polymers, filled polymers, Foams, Coatings, Adhesives, Sealants
- Production of rigid foam
- Use in Water-treatment chemicals

See Section 16 for a complete list of uses for which an ES is provided as an Annex

1.2.2. Uses advised against

Restrictions on use: PC 29: Pharmaceuticals

	Uses other than those given in section 1.2.1 are not recommended unless an assessment is completed, prior to commencement of that use, which demonstrates that the use will be controlled

1.3. Details of the supplier of the safety data sheet

Only representative

Company name:	Gazprom Marketing and Trading France
Address:	68 avenue des Champs-Elysées, 75008, Paris, France
Contact Telephone:	+33 1 42 99 73 50
Fax:	+33 1 42 99 73 99
Email Address:	didier.lebout@gazprom-mt.com

Manufacturer

Company name:	SIBUR-NEFTEKHIM JSC
Address:	Building 390, Eastern Industrial Zone, Dzerzhinsk, Nizhniy Novgorod region, 606000, Russian Federation
Contact phone:	+7 8313 27-59-09
Fax:	+7 8313 27-59-09
Email Address:	infosnh@snh.sibur.ru
Emergency Telephone:	+7 8313 27-59-09 (round the clock)

1.4. Emergency telephone number

Emergency phone in the country of delivery	**112** (*Please note that emergency numbers may vary depending upon the country of delivery though 112 remains valid as universal number*

SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Acute Tox. 4	H302

Full text of hazard classes and H-statements : see section 16

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP):

GHS07

Signal word (CLP):	Warning
Hazard statements (CLP):	H302: Harmful if swallowed.
Precautionary statements (CLP):	P260 Do not breathe dust/fume/gas/mist/vapours/spray. P264 Wash with plenty of water and soap thoroughly after handling. P270 Do not eat, drink or smoke when using this product P301 + P312 IF SWALLOWED: Call a POISON CENTRE/doctor/…if you feel unwell. … P501 Dispose of contents/container to hazardous or special waste collection point
EUH-statements:	Not available.

2.3. Other hazards

Other hazards not contributing to the classification:	Not available.
Assessment PBT / vPvB:	According to Annex XIII of Regulation (EC) No.1907/2006 (REACH): - not fulfilling PBT (persistent/bioaccumulative/toxic) criteria;

- not fulfilling vPvB (very persistent/very bioaccummulative) criteria.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Name	Product identifier	%	Classification [CLP]
2,2'-oxydiethanol	(CAS-No.) 111-46-6 (EC No.) 203-872-2 (EC index No.) 603-140-00-6 (REACH-no) 01-2119457857-21-0022	99.5 - 100	H302

The product does not contain impurities or additives that could affect product's labelling and classification according to Regulation (EC) No 67/548/EEC and Regulation (EC) No 1272/2008 (CLP).

3.2. Mixtures

Not applicable.

SECTION 4. FIRST-AID MEASURES

4.1. Description of first aid measures

Product-specific hazards and other issues

The product is harmful if swallowed. Symptoms of poisoning may occur even after several hours; therefore medical observation is suggested for at least 48 hours after the accident.

First-aid measures general

Remove contaminated clothing.

First-aid measures after inhalation

Keep patient calm, remove to fresh air, seek medical attention.

In case of adverse exposure to vapours and/or aerosols formed at elevated temperatures, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest.

First-aid measures after skin contact

Wash thoroughly with soap and water.

First-aid measures after eye contact

Wash affected eyes for at least 15 minutes under running water with eyelids held open.

First-aid measures after ingestion

Immediately rinse mouth and then drink 200-300 ml of water. Seek immediate medical attention. If medical attention will be delayed, contact a Regional Poison Centre or emergency medical professional regarding the induction of vomiting or use of activated charcoal/syrup of ipecac. Do not induce vomiting or give anything by mouth to a groggy or unconscious person.

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

Symptoms/effects:

Symptoms/effects after inhalation: Headache, dizziness, weakness.

Symptoms/effects after skin contact: Mild skin irritation, redness, edema

Symptoms/effects after eye contact: Mild eye irritation, lacrimation, pain

Symptoms/effects after ingestion: Headache, dizziness, weakness, vomiting, nausea, diarrhea. In case of severe poisoning: fainting, convulsions.

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

Advice to physician

Treatment: Treat according to symptoms (decontamination, vital functions).

This product contains ethylene glycol and/or diethylene glycol which, if ingested, are metabolized to toxic metabolites by the enzyme alcohol dehydrogenase, for which ethanol and 4-methylpyrazole {U.S. drug name Fomepizole, trade name Antizol} are antagonists. Administration of oral or intravenous ethanol or intravenous 4-methylpyrazole may arrest further metabolism of this material and thereby

ameliorate the toxicity. Use of ethanol or 4-methylpyrazole does not affect toxic metabolites that are already present and is not a substitute for hemodialysis.

SECTION 5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media	Water spray, dry powder, alcohol-resistant foam, carbon dioxide.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard:	Combustible liquid.
Explosion hazard:	Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
Hazardous decomposition products in case of fire:	During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

5.3. Advice for firefighters

Firefighting instructions:	Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.
Protection during firefighting:	Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves).
Further information:	The degree of risk is governed by the burning substance and the fire conditions. Contaminated extinguishing water must be disposed of in accordance with official regulations.

SECTION 6. ACCIDENTAL RELEASE MEASURE

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures	Evacuate non-essential personnel. Do not touch or walk through spilled material.

6.1.2. For emergency responders

Emergency procedures	Isolate area. Stop leak if you can do so without risk. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. Avoid contact with spilled or released material. Use personal protective clothing.

6.2. Environmental precautions

Prevent from entering into soil, ditches, sewers, waterways and/or groundwater.

Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Use appropriate containment to avoid environmental contamination. Ventilate contaminated area thoroughly.
Inform authorities if product enters waterways or municipal sewers.

6.3. Methods and material for containment and cleaning up

Contain spilled material if possible and dispose of properly.
Collect in suitable and properly labeled containers.
For small amounts: Pick up with suitable absorbent material (e.g. sand, sawdust, general-purpose binder, kieselguhr).
For large amounts: Dike area to contain spill. Pump into suitable and properly labeled containers.

6.4. Reference to other sections

SECTION 8: Exposure controls/personal protection. SECTION 13: Disposal considerations.

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Precautions for safe handling	Protection against fire and explosion: Take precautionary measures against static discharges. Electrical devices must meet the specified temperature class. Temperature class: T2 (Autoignition temperature >300 °C). Avoid breathing of or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. Use local exhaust extraction over processing area. Handle and open container with care in a well-ventilated area. Do not empty into drains. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Handling temperature is ambient up to 60 °C maximum.
Hygiene measures	Take off contaminated clothing and wash before reuse. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

7.2. Conditions for safe storage, including any incompatibilities

Incompatible materials	Oxidizing agents, acids, alkalis.
Storage area	Keep container tightly closed and dry; store in a cool place. Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat. Drums should be stacked to a maximum of 3 high. Do not pressurize drum containers to empty. Protect from air. Protect from atmospheric humidity. Protect contents from the effects of light. Storage temperature: < 40 °C. The stated storage temperature should be noted. Storage duration: 12 Months
Packaging materials	Suitable materials for containers: aluminum, Stainless steel 1.4439, High density polyethylene(HDPE), light-impervious

7.3. Specific end use(s)

Not applicable.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

8.1.1. Occupational Exposure Limits

2,2'-Oxydiethanol (CAS 111-46-6)

	LTEL TWA ppm	LTEL TWA mg/m³	STEL ppm	STEL mg/m³	Note
Austria	10	44	40	176	
Belgium					
Denmark	2,5	11	5	22	
France					
Germany (AGS)	10(1)	44 (1)	40 (1)(2)	176 (1)(2)	(1) Inhalable aerosol and vapour (2) 15 minutes reference period
Germany (DFG)	10	44	40	176	
Ireland	23	100			
Latvia		10			
Sweden	10	45	20 (1)	90 (1)	(1) Inhalable aerosol and vapour
Switzerland	10	44	40	176	
United Kingdom	23	101			

8.1.2. DNEL/ PNEC values

2,2'-Oxydiethanol (CAS 111-46-6)	
DNEL/DMEL (Workers)	
Acute - systemic effects, dermal	No hazard identified
Acute - systemic effects, inhalation	No hazard identified
Acute - local effects, dermal	No hazard identified
Acute - local effects, inhalation	No hazard identified
Long-term - systemic effects, dermal	43 mg/kg bw/day
Long-term - systemic effects, inhalation	44 mg/m³
Long-term - local effects, dermal	No hazard identified
Long-term - local effects, inhalation	60 mg/m³
DNEL/DMEL (General population)	
Acute - systemic effects, dermal	No hazard identified
Acute - systemic effects, inhalation	No hazard identified
Acute - systemic effects, oral	No hazard identified
Acute - local effects, dermal	No hazard identified
Acute - local effects, inhalation	No hazard identified
Long-term - systemic effects, dermal	21 mg/kg bw/day
Long-term - systemic effects, inhalation	12 mg/m³
Long-term - systemic effects,oral	No hazard identified
Long-term - local effects, dermal	No hazard identified
Long-term - local effects, inhalation	12 mg/m³
PNEC (water)	
PNEC aqua (freshwater)	10 mg/L
PNEC aqua (marine water)	1 mg/L
PNEC aqua (intermittent, freshwater)	-
PNEC (Sediment)	
PNEC sediment (freshwater)	20.9 mg/kg sediment dw
PNEC sediment (marine water)	2.09 mg/kg sediment dw
PNEC (Soil)	
PNEC soil	1.53 mg/kg soil dw
PNEC (Oral)	
PNEC oral (secondary poisoning)	No potential for bioaccumulation

PNEC (STP)	
PNEC sewage treatment plant	199.5mg/L

8.2. Exposure controls

Appropriate engineering controls:
Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of vapours.

Hand protection:
Suitable chemical resistant safety gloves (EN 374) also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN 374): E.g. nitrile rubber (0.4 mm), chloroprene rubber (0.5 mm), butyl rubber (0.7 mm) etc.
Manufacturer's directions for use should be observed because of great diversity of types.
Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.

Eye protection:
Safety glasses with side-shields (frame goggles) (e.g. EN 166).

Skin and body protection:
Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical

Respiratory protection:
Wear respiratory protection if ventilation is inadequate. Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A) Consider the risk management measures as outlined in the exposure scenario.

Environmental exposure controls:
Avoid release to the environment. Do not allow to enter drains or water courses. Assure that emissions are compliant with all applicable air pollution control regulations.

Other information:
Handle in accordance with good industrial hygiene and safety practice.
For more information please see the relevant exposure scenario in Annex of this SDS.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical state at 20 °C and 101.3 kpa	Liquid Form: viscous Colour: colourless Odour: nearly odourless
Melting / freezing point	-6.5 °C
Boiling point	244.9 °C at 1013 hpa
Relative density	1.118 g/cm^3 at 20 °C
Vapour pressure	0.008 hpa at 25 °C
Surface tension	Not surface active
Water solubility	Miscible in any proportion
Partition coefficient n-octanol/water (log value)	-1.98
Flash point	138 °C
Flammability	Non flammable upon ignition. The substance has no pyrophoric properties and does not liberate flammable gases on contact with water.
Explosive properties	Non explosive
Self-ignition temperature	372 °C

Oxidising properties	No oxidising properties
Granulometry	Not applicable
Stability in organic solvents and identity of relevant degradation products	Not applicable
Dissociation constant	Not applicable
Viscosity	30 mPas at 25 °C

9.2. Other information

Not available.

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

Corrosion to metals: No corrosive effect on metal.
Formation of flammable gases: Forms no flammable gases in the presence of water.
Hygroscopic (absorbs moisture from the air).

10.2. Chemical stability

The product is stable if stored and handled as prescribed/indicated.

10.3. Possibility of hazardous reactions

No hazardous reactions if stored and handled as prescribed/indicated.

10.4. Conditions to avoid

> 40 °C
Avoid humidity. Avoid daylight. Disregard of the conditions mentioned may result in undesirable decomposition reactions.

10.5. Incompatible materials

Substances to avoid: Strong acids. Strong alkalis. Strong oxidizing agents.

10.6. Hazardous decomposition products

Carbonyl compounds, Dioxolan derivatives.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity The available experimental animal data are reliable and suitable for classification purposes under Regulation (EC) No 1272/2008. As a result the substance is not considered to be classified for acute toxicity under Regulation (EC) No 1272/2008.
However, as the substance is classified as Acute Tox 4, H302 according to Annex VI under Regulation (EC) No 1272/2008 this classification is followed.

2,2'-Oxydiethanol (CAS 111-46-6)	
LD50, oral, rats	19600 mg/kg bw
LC50, inhalation, rats	>4.6 mg/L
LD50, dermal, rabbits	13300 mg/kg bw
Oral lethal dose for human	From 0.014 to 0.170 mg DEG/kg body weight

Skin corrosion/irritation No adverse effect observed (not irritating)
Additional information Primary dermal irritation index (PDII):
0 (Time point: 6 weeks)(10% solution)
Mean maximum cutaneous index:
0.04 (Time point: no data)(undiluted DEG)
0.47 (Time point: 6 weeks)(undiluted DEG)

Serious eye damage/irritation No adverse effect observed (not irritating)
Additional information Readings of the treated eyes revealed no signs of ocular irritation due to the treatment with 0.5 mL of undiluted test item.

Respiratory or skin sensitisation	DEG is not considered to be sensitizing to the skin.
Additional information	For intradermal induction a 5% diethylene glycol (DEG) formulation in NaCl and for epidermal induction a 75% DEG formulation in water were used. A 50% DEG formulation in water was applied for challenge. No skin reactions could be observed.
Germ cell mutagenicity	Genetic toxicity: no adverse effect observed (negative)
Additional information	Data of a whole battery of robust high quality in vitro studies as well as an in vivo test show that the test item does not possess any mutagenic or genotoxic properties. In vivo micronucleus test with mouse according to the OECD TG 474 under GLP conditions was also negative.
Carcinogenicity	The substance is not considered to be classified for carcinogenicity under Regulation (EC) No 1272/2008.

2,2'-Oxydiethanol (CAS 111-46-6)	
NOAEL (carcinogenicity), oral, rat	1160 mg/kg bw/day

Toxicity for reproduction	The substance does not affect the reproductive performance and fertility, and neither possesses an embryo/fetotoxic nor a teratogenic potential. Therefore, no classification is warranted according to Regulation (EC) No. 1272/2008.

2,2'-Oxydiethanol (CAS 111-46-6)	
NOAEL (effects on fertility), subacute, oral, mouse	3060mg/kg bw/day
NOAEL (effects on fertility), subacute, oral, rats	2200 mg/kg bw/day

STOT-single exposure	Not available.
Repeated dose toxicity	No adverse effect observed.

2,2'-Oxydiethanol (CAS 111-46-6)	
NOAEL, subchronic, oral, rat, male	300 mg/kg bw/day(98 days)(System: urinary. Organ: kidney)
NOAEL, subacute, dermal, dog	2220 mg/kg bw/day(21/28 days)(OECD Guideline 410)
NOAEC, subacute, inhalation, human	120 mg/m³

Aspiration hazard	Not available.

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

2,2'-Oxydiethanol (CAS 111-46-6)	
Fish (Short-term toxicity)	
LC50 (96h)	75200 mg/L (Pimephales promelas)
Fish (Long-term toxicity)	
NOEC (28 d)	> 1500 mg/L (Pimephales promelas) (ASTM E-47.01, Draft No. 3, 1980)
NOEC (7 d)	15380 mg/L (Pimephales promelas) (EPA 600/4-89/001)
Aquatic invertebrates (Short-term toxicity)	
EC50 (24 h)	>10000 mg/L (Daphnia magna)(basic method for the implementation of DIN 38412/11)
Aquatic invertebrates (Long-term toxicity)	
NOEC (7 d)	8590 mg/L (Ceriodaphnia dubia) (EPA 600/4-89/001)
NOEC (21 d):	7500 - 15000 mg/L (Daphnia magna)(ASTM E-47.01 and E 35.21, Draft No. 1 and 4)
Algae and aquatic plants	

NOEC (72h)	>100 mg/L (Pseudokirchneriella subcapitata)(OECD Guideline 201)
LD50 (7d)	6 238 mg/L (Echinodorus cordifolius)
Toxicity to aquatic micro-organisms	
EC20 (30min)	> 1 995 mg/L (activated sludge, domestic)(ISO 8192)

12.2. Persistence and degradability

Abiotic degradation:	After evaporation or exposure to the air, the product will be rapidly degraded by photochemical processes. No data on hydrolysis are available. However, glycols are generally regarded as stable towards hydrolysis. Phototransformation in air: Half-life (DT50):17.2 h. After evaporation or exposure to the air, the product will be rapidly degraded by photochemical processes
Biodegradation	Readily biodegradable (according to OECD criteria). Diethylene glycol was shown to meet the ready biodegradability criteria in a carbon dioxide evolution test according to OECD 301B. % Degradation of test substance: 90 – 100% after 28d
Persistence and degradability	Not P / vP based on ready biodegradability: The substance is readily biodegradable according to OECD criteria.

12.3. Bioaccumulative potential

Aquatic bioaccumulation:	The substance has a log Kow value of ca. -1.5. Therefore, accumulation in organisms is not to be expected. Absence of bioaccumulation was also shown in a 3 -day BCF study with fish (L. Idus) in which a BCF of 100 was observed (Freitag et al., 1985).
Secondary poisoning:	Based on the available information, there is no indication of a bioaccumulation potential and, hence, secondary poisoning is not considered relevant.

12.4. Mobility in soil

Biodegradation in soil:	The study does not need to be conducted because the substance is readily biodegradable.

12.5. Results of PBT and vPvB assessment

Regarding all available data on biotic and abiotic degradation, bioaccumulation and toxicity it can be stated that the substance does not fulfil the PBT criteria (not PBT) and not the vPvB criteria (not vPvB).

12.6. Other adverse effects

Not available.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste disposal recommendations	Waste must be disposed of in accordance with federal, state and local environmental control regulations. Dispose of material through a licensed waste contractor. Normally suitable for incineration by an approved agent.
European List of Waste (LoW) code	Not available.

SECTION 14. TRANSPORT INFORMATION

14.1. Land transport (ADR/ RID)

Not regulated.

14.2. Inland waterway transport (ADN)

Not regulated.

14.3. Sea transport (IMDG)

Not regulated.

14.4. Air transport (IATA/ICAO)

Not regulated.

14.5. Special precautions for user

Always transport in closed containers. Ensure that persons transporting the product know what to do in the event of an accident or spillage. For information regarding Exposure Controls/Personal Protection see Section 8 of the SDS.

14.6. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable.

SECTION 15. REGULATORY INFORMATION

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

15.1.1. EU-Regulations

Authorisations and/or restrictions on use (Annex XVII): Not applicable.
2,2'-Oxydiethanol (CAS 111-46-6) is not on the REACH Candidate List.
2,2'-Oxydiethanol (CAS 111-46-6)is not on the REACH Annex XIV List.

Other information, restriction and prohibition regulations	Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer. Annex II - Not listed. Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances- (SEVESO III): Not listed. Directive 2013/39/EU priority substances in the field of water policy (amending Directive 2006/60/EC – Water Framework Directive and Directive 2008/105/EC on environmental quality standards in the field of water policy): Not listed. Regulation (EC) No 850/2004 on persistent organic pollutants: Annex III – Not listed. Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals: Not listed.

15.1.2. National regulations

Germany *AwSV (Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen)*	Stoffname: Diethylenglykol CAS-Nummer: 111-46-6 EG-Nummer: 203-872-2 Kennummer: 79 WGK: 1

15.2. Chemical safety assessment

Chemical Safety Report has been performed for ***2,2'-Oxydiethanol (CAS 111-46-6)***.

SECTION 16. OTHER INFORMATION

16.1. Indication of changes

Version	Date of change	Section	Description of changes
1.0	08/12/2010	1-16, Annex	Initial SDS
2.0	08/02/2011	1-16	Data updated
3.0	19/03/2018	1-16, Annex	SDS has been corrected in according to new contact information, data of Registration dossier and Chemical Safety Report
3.1	18/03/2019	2, 3, 11, 15, 16	The following hazard class was removed:

			STOT RE 2, H373 (May cause damage to organs through prolonged or repeated exposure. Affected organs: kidney. Route of exposure: Oral) Justification: SUBSTANCE EVALUATION CONCLUSION as required by REACH Article 48 and EVALUATION REPORT for 2,2'-oxydiethanol (EC No 203-872-2; CAS No 111-46-6); Evaluating Member State: Hungary; Dated: 07 September 2016
3.2	13/03/2020	1, 9	Manufacturee's contact details and the value of Relative density were modified

16.2. Abbreviations and acronyms

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
AGS	The German Committee on Hazardous Substances (Ausschuss für Gefahrstoffe – AGS)
BCF	Bioconcentration factor
DFG	Germany Research Foundation
DNEL	Derived No Effect Level
IMDG	International Maritime Dangerous Goods
ICAO-TI	Technical Instructions for the Safe Transport of Dangerous Goods by Air
K_{oc}	Adsorption coefficient
Kow	octanol-water partition coefficient
LC50	Lethal Concentration to 50 % of a test population
LD50	Lethal Dose to 50% of a test population (Median Lethal Dose)
LOAEC	Lowest Observable Adverse Effect Concentration
LTEL	Long Term Exposure Limit
NIOSH	National Institute for Occupational Safety and Health *(USA CDC)*
NOEC	No Observed Effect Concentration
NOAEL	No Observed Adverse Effect Level
OECD	Organization for Economic Co-operation and Development
OSHA	Occupational Safety & Health Administration *(USA)*
PNEC	Predicted No Effect Concentration
PBT	Persistent, bioaccumulative, toxic chemical
vPvB	Very Persistent, Very Bioaccumulative
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SCOEL	Scientific Committee on Occupational Exposure Limits
STEL	Short Term Exposure Limit
STP	sewage treatment plant
STOT	Specific Target Organ Toxicity
(STOT) RE	Repeated Exposure
(STOT) SE	Single Exposure
TWA	Time Weighted Average
UN	United Nations
WGK	Wassergefährdungsklasse *(German: Water Hazard Class)*

16.3. Full text of H- and EUH-statements:

H302	Acute Tox. 4	H302: Harmful if swallowed.

16.4. List of ES (exposure scenario) given in Annex to the extended SDS

ES1	Use as Intermediate p.16
ES2	Use as Process chemical p.20
ES3	Distribution of substance p.25
ES4	Formulation & (re)packing of substance and mixtures p.29
ES5	Production of Polymers p.33
ES6	Use in Paints/Coatings (industrial) p.37
ES7	Use in Paints/Coatings/Adhesives/ Sealants/ Foams/ Polymers/ filled Polymers (professional) p.43
ES8	Use in Paints/Coatings /Surface treatment products (Consumer use) p.50
ES9	Use in Cleaning agents (industrial) p.57
ES10	Use in Cleaning agents (professional) p.62
ES11	Use in Cleaning agents (Consumer use) p.67
ES12	Use in Biocidal products (Consumer use) p.73
ES13	Use in Lubricants (industrial) p.75
ES14	Use in Metal-working fluids (industrial) p.81
ES15	Use in metal-working fluids (professional) p.87.
ES16	Use in/as Functional fluids (industrial) p.93
ES17	Use in/as Functional fluids (professional) p.96
ES18	Use in Heat transfer and Hydraulic fluids (Consumer use) p.99
ES19	Use in/as De-icing/Anti-icing applications/agents (professional) p.101
ES20	Use in/as De-icing/Anti-icing applications/agents (Consumer use) p.105
ES21	Use in laboratories (industrial) p.107
ES22	Use in laboratories (professional) p.108
ES23	Use in Adhesives and Sealants (Consumer use) p.109
ES24	Production of Polymers, filled polymers, Foams, Coatings, Adhesives, Sealants p.111
ES25	Production of rigid foam (Consumer use) p.117
ES26	Use in Water-treatment chemicals (industrial) p.118
ES27	Use in Water-treatment chemicals (professional) p.121

16.5. Key literature references and sources

DOCUMENTS, PROVIDED BY FERC CONSORTIUM:

CHEMICAL SAFETY REPORT to ***2,2'-Oxydiethanol (CAS 111-46-6)***.

EU REGULATIONS:

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

Regulation (EC) No 1272/2008 REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Training advice

Product handling instruction shall be included into the educational system about the safety work (initial training, training at the workplace, repeated training) according to specific conditions at the workplace.

DISCLAIMER

This information is based on our current level of knowledge. This information may be subject to revision as new knowledge and experience becomes available, and SIBUR makes no warranties and assumes no liability in connection with any use of this information. Since SIBUR cannot be aware of all aspects of your business and the impact the REACH Regulation has for your company, SIBUR strongly encourages you to get familiar with the REACH Regulation in order to comply with its requirements and timelines.

ANNEX. EXPOSURE SCENARIOS

ES 1 (Exposure Scenario 1): Use as Intermediate

Free short title	Use as Intermediate (2)
Systematic title based on use descriptor	ERC 6A; PROC 1, 2, 3, 4, 5, 8A, 8B, 9, 15
Name of contributing environmental scenario and corresponding ERC	ERC 6a Industrial use of intermediates
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line) PROC 15 - Use of laboratory reagents in small scale laboratories
Contributing Scenario (1) controlling environmental exposure for ERC 6A	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (2) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (3) controlling industrial worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	

Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors

Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (8) controlling industrial worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling industrial worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Human factors not influenced by risk management	

Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (10) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Use as laboratory reagent
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

ES 2 (Exposure Scenario 2): Use as Process chemical

Free short title	**Use as Process chemical (3)**
Systematic title based on use descriptor	ERC 4; PROC 1, 2, 3, 4, 5, 8A, 8B, 9, 13, 14, 15
Name of contributing environmental scenario and corresponding ERC	ERC 4 Industrial use of processing aids
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line) PROC 13 - Treatment of articles by dipping and pouring PROC 14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation PROC 15 - Use of laboratory reagents in small scale laboratories
Contributing Scenario (1) controlling environmental exposure for ERC 4	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	

Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (2) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (3) controlling industrial worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors

Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).

Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (8) controlling industrial worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling industrial worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	

Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (10) controlling industrial worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Treatment of articles by dipping and pouring.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (11) controlling industrial worker exposure for PROC 14	
Name of contributing scenario	14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation
Scenario subtitle	Production of preparations or articles by tabletting, compression, extrusion, pelletisation.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (12) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Use as laboratory reagent
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	

Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

ES 3 (Exposure Scenario 3): Distribution of substance

Free short title	Distribution of substance (4)
Systematic title based on use descriptor	ERC 1; PROC 1, 2, 3, 4, 8A, 8B, 9, 15
Name of contributing environmental scenario and corresponding ERC	ERC 1 Production of chemicals
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line) PROC 15 - Use of laboratory reagents in small scale laboratories
Contributing Scenario (1) controlling environmental exposure for ERC 1	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (2) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (3) controlling industrial worker exposure for PROC 2	

Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 8A	

Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (8) controlling industrial worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no

Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Use as laboratory reagent
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

ES 4 (Exposure Scenario 4): Formulation & (re)packing of substance and mixtures

Free short title	Formulation & (re)packing of substance and mixtures (5)
Systematic title based on use descriptor	ERC 2; PROC 1, 2, 3, 4, 5, 8A, 8B, 9, 14, 15
Name of contributing environmental scenario and corresponding ERC	ERC 2 Formulation of preparations
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line) PROC 14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation PROC 15 - Use of laboratory reagents in small scale laboratories
Contributing Scenario (1) controlling environmental exposure for ERC 2	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (2) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure

Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (3) controlling industrial worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.

Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

Contributing Scenario (8) controlling industrial worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling industrial worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (10) controlling industrial worker exposure for PROC 14	
Name of contributing scenario	14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation
Scenario subtitle	Production of preparations or articles by tabletting, compression, extrusion, pelletisation.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

Contributing Scenario (11) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Use as laboratory reagent
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

ES 5 (Exposure Scenario 5): Production of Polymers

Free short title	**Production of Polymers (6)**
Systematic title based on use descriptor	ERC 6C; PROC 1, 2, 3, 4, 5, 6, 8A, 8B, 9, 15
Name of contributing environmental scenario and corresponding ERC	ERC 6c Production of plastics
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 6 - Calendering operations PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line) PROC 15 - Use of laboratory reagents in small scale laboratories
Contributing Scenario (1) controlling environmental exposure for ERC 6C	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (2) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2

Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (3) controlling industrial worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	

Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 6	
Name of contributing scenario	6 - Calendering operations
Scenario subtitle	Calendering operations
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (8) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).

Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling industrial worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (10) controlling industrial worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (11) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Use as laboratory reagent

Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	No

ES 6 (Exposure Scenario 6): Use in Paints/Coatings (industrial)

Free short title	Use in Paints/Coatings (industrial) (7)
Systematic title based on use descriptor	ERC 4; PROC 1, 2, 3, 4, 5, 7, 8A, 8B, 10, 13, 15
Name of contributing environmental scenario and corresponding ERC	ERC 4 Industrial use of processing aids
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 7 - Industrial spraying PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 10 - Roller application or brushing PROC 13 - Treatment of articles by dipping and pouring PROC 15 - Use of laboratory reagents in small scale laboratories
Contributing Scenario (1) controlling environmental exposure for ERC 4	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (2) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial

Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (3) controlling industrial worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	

Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 7	
Name of contributing scenario	7 - Industrial spraying
Scenario subtitle	Industrial spraying
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

Use of external/measured value dermal	The RISKSOFDERM V2.1 model has been used to estimate dermal exposure. The 70th percentile of the "Exposure loading per shift body" was added with the 70th percentile of the "Exposure loading per shift hand". The values given in µl was converted into mg and divided by a body weight of 70 kg which is generally assumed for workers. In addition, appropriate body protection was considered within the calculation of the final dermal exposure value. RISKOFDERM v2.1 – Process: "Spraying" Physical state: Liquid Concentration of substance: 100% Vapour pressure of the substance: 0.008 hPa Application rate: 1 l/min Duration of exposure: 6 hours/day Exposed skin surface: Whole body Location: Inside Direction of spraying: Downward/ Level Segregation: Ensure that worker is > 1 m from the source Local exhaust ventilation (Direction of airflow away from the worker): yes (effectiveness: ca. 50%) Use of suitable gloves with basic training: Yes (Effectiveness: 90%) Wearing of appropriate working clothes (e.g. an overall): Yes (Effectiveness: 80%)
Use of external/measured value inhalation	The ART model has been used to estimate inhalative exposure. Mechanistic model results: The predicted 75th percentile full-shift exposure is 0.27 mg/m³. The inter-quartile confidence interval is 0.13 mg/m³ to 0.57 mg/m³. Emission sources: Far field Process temperature: Room temperature Vapour pressure: 8 Pa Liquid weight fraction: 1 Viscosity: medium (oil-like) Substance product type: Liquids Situation: Surface spraying of liquids, Moderate application rate (0.3 - 3 l/minute) Spray direction: Only horizontal or downward Spray technique: Spraying with high compressed air use Primary localized controls: LEV systems (50.00 % reduction) Secondary localized controls: No (0 % reduction) Segregation: Partial segregation with ventilation and filtration of recirculated air (70.00 % reduction) Personal enclosure: No (0% reduction) Effective housekeeping practices in place: Yes Process fully enclosed: No Room size: 1000 m³ Work area: Indoors Duration (mins): 360 Ventilation rate: No restriction on general ventilation characteristics Respiratory protection required: No
Contributing Scenario (8) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	

Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling industrial worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (10) controlling industrial worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Roller application or brushing
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (11) controlling industrial worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Treatment of articles by dipping and pouring.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2

Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (12) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Use as laboratory reagent
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

ES 7 (Exposure Scenario 7): Use in Paints/Coatings/Adhesives/ Sealants/ Foams/ Polymers/ filled Polymers (professional)

Free short title	Use in Paints/Coatings/Adhesives/ Sealants/ Foams/ Polymers/ filled Polymers (professional) (8)
Systematic title based on use descriptor	ERC 8A, 8C, 8D, 8F; PROC 1, 2, 3, 4, 5, 8A, 8B, 9, 10, 11, 13, 14, 15, 19
Name of contributing environmental scenario and corresponding ERC	ERC 8a Wide dispersive indoor use of processing aids in open systems ERC 8c Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC 8d Wide dispersive outdoor use of processing aids in open systems ERC 8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line) PROC 10 - Roller application or brushing PROC 11 - Non industrial spraying PROC 13 - Treatment of articles by dipping and pouring PROC 14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation PROC 15 - Use of laboratory reagents in small scale laboratories PROC 19 - Hand-mixing with intimate contact (only PPE available
Contributing Scenario (1) controlling environmental exposure for ERC 8A	
Contributing Scenario (2) controlling environmental exposure for ERC 8C	

Contributing Scenario (3) controlling environmental exposure for ERC 8D	
Contributing Scenario (4) controlling environmental exposure for ERC 8F	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (5) controlling professional worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling professional worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (7) controlling professional worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	

Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (8) controlling professional worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling professional worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant con-tact)
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (10) controlling professional worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities

Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 80 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (11) controlling professional worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (12) controlling professional worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)

Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (13) controlling professional worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Roller application or brushing
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 80 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (14) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying
Scenario subtitle	Non industrial spraying
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value dermal	The RISKSOFDERM V2.1 model has been used to estimate dermal exposure. The 70th percentile of the “Exposure loading per shift body” was added with the 70th percentile of the “Exposure loading per shift hand”. The values given in µl was converted into mg and divided by a body weight of 70 kg which is generally assumed for workers. In addition, appropriate body protection was considered within the calculation of the final dermal exposure value.

	RISKOFDERM v2.1 – Process: "Spraying" Physical state: Liquid Concentration of substance: 100% Vapour pressure of the substance: 0.008 hPa Application rate: 0.05 l/min Duration of exposure: 180 mins Exposed skin surface: Whole body Location: Inside Direction of spraying: Level Segregation: Worker is within one meter of the source Direction of airflow: Not clearly away from the worker Use of suitable gloves with basic training: Yes (Effectiveness: 90%) Wearing of appropriate working clothes (e.g. an overall): Yes (Effectiveness: 80%)
Use of external/measured value inhalation	The ART model has been used to estimate inhalative exposure. Mechanistic model results: The predicted 75th percentile full-shift exposure is 3 mg/m³. The inter-quartile confidence interval is 1.4 mg/m³ to 6.3 mg/m³. Emission sources: Near field Process temperature: Room temperature Vapour pressure: 8 Pa Liquid weight fraction: 1 Viscosity: medium (oil-like) Substance product type: Liquids Situation: Surface spraying of liquids, Low application rate (0.03 – 0.3 l/minute) Spray direction: Only horizontal or downward Spray technique: Spraying with high compressed air use Primary localized controls: No (0% reduction) Secondary localized controls: No (0 % reduction) Effective housekeeping practices in place: No General housekeeping in place: Yes Process fully enclosed: No Room size: 100 m³ Work area: Indoors Duration (mins): 180 Ventilation rate: Mechanical ventilation giving at least 1 ACH Respiratory protection required: No
Contributing Scenario (15) controlling professional worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Treatment of articles by dipping and pouring.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %

Respiratory protection	no
Contributing Scenario (16) controlling professional worker exposure for PROC 14	
Name of contributing scenario	14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation
Scenario subtitle	Production of preparations or articles by tabletting, compression, extrusion, pelletisation.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (17) controlling professional worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Use as laboratory reagent.
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (18) controlling professional worker exposure for PROC 19	
Name of contributing scenario	19 - Hand-mixing with intimate contact (only PPE available
Scenario subtitle	Hand-mixing with intimate contact and only PPE available
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	less than 15 mins
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	1,980 cm^2

Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

ES 8 (Exposure Scenario 8): Use in Paints/Coatings /Surface treatment products (Consumer use)

Free short title	Use in Paints/Coatings /Surface treatment products (Consumer use) (9)
Systematic title based on use descriptor	ERC 8A, 8C, 8D, 8F; PC 9a, 15, 18, 23, 34, 31
Name of contributing environmental scenario and corresponding ERC	ERC 8a Wide dispersive indoor use of processing aids in open systems ERC 8c Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC 8d Wide dispersive outdoor use of processing aids in open systems ERC 8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Name(s) of contributing consumer scenarios and corresponding PCs/ACs	PC 9a Coatings and Paints, thinners, paint removers PC 15 Non-metal-surface treatment products PC 9a Coatings and Paints, thinners, paint removers PC 15 Non-metal-surface treatment products PC 18 Ink and Toners PC 18 Ink and Toners PC 23 Leather tanning, dye, finishing, impregnation and care products PC 34 Textile dyes, finishing and impregnating products PC 31 Polishes and Wax Blends
Contributing Scenario (1) controlling environmental exposure for ERC 8A	
Contributing Scenario (2) controlling environmental exposure for ERC 8C	
Contributing Scenario (3) controlling environmental exposure for ERC 8D	
Contributing Scenario (4) controlling environmental exposure for ERC 8F	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Contributing Scenario (5) controlling consumer exposure for PC 9a	
Name of contributing scenario	PC 9a Coatings and Paints, thinners, paint removers
Scenario subtitle	Use in Paints/Coatings - non-spraying products
Calculation model	ConsExpo
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per day
Exposure time	132 min
Application duration	120 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per day
Release duration	7,200 sec
Product characteristics	

Spray application	no
Product ingredient fraction by weight	10 %
Mol weight matrix	45 g/mol
Mass transfer rate	0.277 m/min
Amounts used	
Inhalation	1,250 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	1,900 cm^2
Contact rate	30 mg/min
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	20 m^3
Ventilation rate	0.600 1/h
Release area increases over time	
Release area	1.00E5 cm^2
Release temperature	25 °C
Dermal	
Protective gloves	0 %
Uptake fraction	100 %
Contributing Scenario (6) controlling consumer exposure for PC 15	
Name of contributing scenario	PC 15 Non-metal-surface treatment products
Scenario subtitle	Use in Paints/Coatings - non-spraying products
Calculation model	ConsExpo
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per day
Exposure time	132 min
Application duration	120 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per day
Release duration	7,200 sec
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Mol weight matrix	45 g/mol
Mass transfer rate	0.277 m/min
Amounts used	
Inhalation	1,250 g

Human factors not influenced by risk management	
Exposed skin surface (dermal)	1,900 cm^2
Contact rate	30 mg/min
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	20 m^3
Ventilation rate	0.600 1/h
Release area increases over time	
Release area	1.00E5 cm^2
Release temperature	25 °C
Dermal	
Protective gloves	0 %
Uptake fraction	100 %
Contributing Scenario (7) controlling consumer exposure for PC 9a	
Name of contributing scenario	PC 9a Coatings and Paints, thinners, paint removers
Scenario subtitle	Use in Paints/Coatings - spraying products
Calculation model	ConsExpo spray can - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per day
Spray duration	900 sec
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per day
Release duration	900 sec
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	10 %
Amounts used	
Human factors not influenced by risk management	
Exposed skin surface (dermal)	1,900 cm^2
Contact rate	100 mg/min
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	1.5 1/h
Room height	2.25 m
Mass generation rate	0.330 g/s
Airborne fraction	100 %

Density non-volatile	1.5 %
Droplet distribution	LogNormal, median: 30 µm, coeff. of variation: 0.800 µm, cut-off diameter: 15 µm
Dermal	
Uptake fraction	100 %
Contributing Scenario (8) controlling consumer exposure for PC 15	
Name of contributing scenario	PC 15 Non-metal-surface treatment products
Scenario subtitle	Use in Paints/Coatings - spraying products
Calculation model	ConsExpo spray can - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per day
Spray duration	900 sec
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per day
Release duration	900 sec
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	10 %
Amounts used	
Human factors not influenced by risk management	
Exposed skin surface (dermal)	1,900 cm^2
Contact rate	100 mg/min
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	1.5 1/h
Room height	2.25 m
Mass generation rate	0.330 g/s
Airborne fraction	100 %
Density non-volatile	1.5 %
Droplet distribution	LogNormal, median: 30 µm, coeff. of variation: 0.800 µm, cut-off diameter: 15 µm
Dermal	
Uptake fraction	100 %
Contributing Scenario (9) controlling consumer exposure for PC 18	
Name of contributing scenario	PC 18 Ink and Toners
Scenario subtitle	Use in Printing inks- Part A. Refilling of toners (cartridges)
Calculation model	ConsExpo Liquid cleaner - Mixing & Loading

Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	365 per year
Exposure time	0.750 min
Application duration	0.300 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	365 per year
Product characteristics	
Spray application	no
Product ingredient fraction by weight	5 %
Mol weight matrix	22 g/mol
Mass transfer rate	0.277 m/min
Amounts used	
Inhalation	50 g
Dermal	0.010 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	215 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	1 m^3
Ventilation rate	0.500 1/h
Release are is constant	
Release area	20 cm^2
Release temperature	25 °C
Dermal	
Uptake fraction	100 %
Contributing Scenario (10) controlling consumer exposure for PC 18	
Name of contributing scenario	PC 18 Ink and Toners
Scenario subtitle	Use in Printing inks- Part B. Printing process
Calculation model	ConsExpo Liquid cleaner - Mixing & Loading
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	365 per year
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	365 per year
Product characteristics	

Spray application	no
Product ingredient fraction by weight	5 %
Amounts used	
Inhalation	16 g
Dermal	0.010 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	215 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	25 m^3
Ventilation rate	0.600 1/h
Dermal	
Uptake fraction	100 %
Contributing Scenario (11) controlling consumer exposure for PC 23	
Name of contributing scenario	PC 23 Leather tanning, dye, finishing, impregnation and care products
Scenario subtitle	Use in surface treatment products – non-spraying products
This scenario has not been calculated. Justification:	It is assumed that the use of impregnation products for leather or textiles is covered within the scenarios described for PC 9a and 15. As DEG is a solvent which usually evaporated during or immediately after the application, a possible exposure to DEG by wearing/using impregnated products is considered to be negligible.
Contributing Scenario (12) controlling consumer exposure for PC 34	
Name of contributing scenario	PC 34 Textile dyes, finishing and impregnating products
Scenario subtitle	Use in surface treatment products – non-spraying products
This scenario has not been calculated. Justification:	It is assumed that the use of impregnation products for leather or textiles is covered within the scenarios described for PC 9a and 15. As DEG is a solvent which usually evaporated during or immediately after the application, a possible exposure to DEG by wearing/using impregnated products is considered to be negligible.
Contributing Scenario (13) controlling consumer exposure for PC 31	
Name of contributing scenario	PC 31 Polishes and Wax Blends
Scenario subtitle	Use in surface treatment products – non-spraying products
Calculation model	ConsExpo Furniture polish - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per day
Exposure time	240 min
Application duration	900 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per day
Product characteristics	
Spray application	no

Product ingredient fraction by weight	10 %
Mol weight matrix	272 g/mol
Mass transfer rate	4,660 m/min
Amounts used	
Inhalation	550 g
Dermal	5.5 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	430 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	58 m^3
Ventilation rate	0.500 1/h
Release area increases over time	
Release area	2.20E5 cm^2
Release temperature	25 °C
Dermal	
Uptake fraction	100 %

ES 9 (Exposure Scenario 9): Use in Cleaning agents (industrial)

Free short title	Use in Cleaning agents (industrial) (10)
Systematic title based on use descriptor	ERC 4; PROC 1, 2, 3, 4, 7, 8A, 8B, 10, 13
Name of contributing environmental scenario and corresponding ERC	ERC 4 Industrial use of processing aids
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 7 - Industrial spraying PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 10 - Roller application or brushing PROC 13 - Treatment of articles by dipping and pouring
Contributing Scenario (1) controlling environmental exposure for ERC 4	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (2) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure

Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (3) controlling industrial worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	

Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 7	
Name of contributing scenario	7 - Industrial spraying
Scenario subtitle	Industrial spraying
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value dermal	The RISKSOFDERM V2.1 model has been used to estimate dermal exposure. The 70th percentile of the “Exposure loading per shift body” was added with the 70th percentile of the “Exposure loading per shift hand”. The values given in µl was converted into mg and divided by a body weight of 70 kg which is generally assumed for workers. In addition, appropriate body protection was considered within the calculation of the final dermal exposure value. RISKOFDERM v2.1 – Process: “Spraying” Physical state: Liquid Concentration of substance: 100% Vapour pressure of the substance: 0.008 hPa Application rate: 1 l/min Duration of exposure: 6 hours/day Exposed skin surface: Whole body Location: Inside Direction of spraying: Downward/ Level Segregation: Ensure that worker is > 1 m from the source Local exhaust ventilation (Direction of airflow away from the worker): yes (effectiveness: ca. 50%) Use of suitable gloves with basic training: Yes (Effectiveness: 90%) Wearing of appropriate working clothes (e.g. an overall): Yes (Effectiveness: 80%)

Use of external/measured value inhalation	The ART model has been used to estimate inhalative exposure. Mechanistic model results: The predicted 75th percentile full-shift exposure is 0.27 mg/m³. The inter-quartile confidence interval is 0.13 mg/m³ to 0.57 mg/m³. Emission sources: Far field Process temperature: Room temperature Vapour pressure: 8 Pa Liquid weight fraction: 1 Viscosity: medium (oil-like) Substance product type: Liquids Situation: Surface spraying of liquids, Moderate application rate (0.3 - 3 l/minute) Spray direction: Only horizontal or downward Spray technique: Spraying with high compressed air use Primary localized controls: LEV systems (50.00 % reduction) Secondary localized controls: No (0 % reduction) Segregation: Partial segregation with ventilation and filtration of recirculated air (70.00 % reduction) Personal enclosure: No (0% reduction) Effective housekeeping practices in place: Yes Process fully enclosed: No Room size: 1000 m³ Work area: Indoors Duration (mins): 360 Ventilation rate: No restriction on general ventilation characteristics Respiratory protection required: No
Contributing Scenario (7) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (8) controlling industrial worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	

Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling industrial worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Roller application or brushing
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (10) controlling industrial worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Treatment of articles by dipping and pouring.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

ES 10 (Exposure Scenario 10): Use in Cleaning agents (professional)

Free short title	Use in Cleaning agents (professional) (11)
Systematic title based on use descriptor	ERC 8A, 8D; PROC 1, 2, 3, 4, 8A, 8B, 10, 11, 13
Name of contributing environmental scenario and corresponding ERC	ERC 8a Wide dispersive indoor use of processing aids in open systems ERC 8d Wide dispersive outdoor use of processing aids in open systems

Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 10 - Roller application or brushing PROC 11 - Non industrial spraying PROC 13 - Treatment of articles by dipping and pouring
Contributing Scenario (1) controlling environmental exposure for ERC 8A	
Contributing Scenario (2) controlling environmental exposure for ERC 8D	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (3) controlling professional worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling professional worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	

Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling professional worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling professional worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (7) controlling professional worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional

Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 80 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (8) controlling professional worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (9) controlling professional worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Roller application or brushing
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 80 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (10) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying

Scenario subtitle	Non industrial spraying
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value dermal	The RISKSOFDERM V2.1 model has been used to estimate dermal exposure. The 70th percentile of the "Exposure loading per shift body" was added with the 70th percentile of the "Exposure loading per shift hand". The values given in µl was converted into mg and divided by a body weight of 70 kg which is generally assumed for workers. In addition, appropriate body protection was considered within the calculation of the final dermal exposure value. RISKOFDERM v2.1 – Process: "Spraying" Physical state: Liquid Concentration of substance: 100% Vapour pressure of the substance: 0.008 hPa Application rate: 0.05 l/min Duration of exposure: 180 mins Exposed skin surface: Whole body Location: Inside Direction of spraying: Level Segregation: Worker is within one meter of the source Direction of airflow: Not clearly away from the worker Use of suitable gloves with basic training: Yes (Effectiveness: 90%) Wearing of appropriate working clothes (e.g. an overall): Yes (Effectiveness: 80%)
Use of external/measured value inhalation	The ART model has been used to estimate inhalative exposure. Mechanistic model results: The predicted 75th percentile full-shift exposure is 3 mg/m^3. The inter-quartile confidence interval is 1.4 mg/m^3 to 6.3 mg/m^3. Emission sources: Near field Process temperature: Room temperature Vapour pressure: 8 Pa Liquid weight fraction: 1 Viscosity: medium (oil-like) Substance product type: Liquids Situation: Surface spraying of liquids, Low application rate (0.03 – 0.3 l/minute) Spray direction: Only horizontal or downward Spray technique: Spraying with high compressed air use Primary localized controls: No (0% reduction) Secondary localized controls: No (0 % reduction) Effective housekeeping practices in place: No General housekeeping in place: Yes Process fully enclosed: No Room size: 100 m^3 Work area: Indoors Duration (mins): 180

	Ventilation rate: Mechanical ventilation giving at least 1 ACH Respiratory protection required: No
Contributing Scenario (11) controlling professional worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Treatment of articles by dipping and pouring.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

ES 11 (Exposure Scenario 11): Use in Cleaning agents (Consumer use)

Free short title	Use in Cleaning agents (Consumer use) (12)
Systematic title based on use descriptor	ERC 8A, 8D; PC 35
Name of contributing environmental scenario and corresponding ERC	ERC 8a Wide dispersive indoor use of processing aids in open systems ERC 8d Wide dispersive outdoor use of processing aids in open systems
Name(s) of contributing consumer scenarios and corresponding PCs/ACs	PC 35 Washing and Cleaning Products (including solvent based products) PC 35 Washing and Cleaning Products (including solvent based products) PC 35 Washing and Cleaning Products (including solvent based products) PC 35 Washing and Cleaning Products (including solvent based products) PC 35 Washing and Cleaning Products (including solvent based products) PC 35 Washing and Cleaning Products (including solvent based products)
Contributing Scenario (1) controlling environmental exposure for ERC 8A	
Contributing Scenario (2) controlling environmental exposure for ERC 8D	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Contributing Scenario (3) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)
Scenario subtitle	Use in All-purpose cleaners - non-spraying products-Part A. Mixing and Loading
Calculation model	ConsExpo Liquid cleaner - Mixing & Loading
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per day
Exposure time	0.750 min
Application duration	0.300 min
Dermal	

Exposure calculation result type	Internal dose chronic
Frequency of use	1 per day
Product characteristics	
Spray application	no
Product ingredient fraction by weight	20 %
Mol weight matrix	22 g/mol
Mass transfer rate	3,660 m/min
Amounts used	
Inhalation	500 g
Dermal	0.010 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	215 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	1 m^3
Ventilation rate	0.500 1/h
Release are is constant	
Release area	20 cm^2
Release temperature	25 °C
Dermal	
Uptake fraction	100 %
Contributing Scenario (4) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)
Scenario subtitle	Use in All-purpose cleaners - non-spraying products-Part B. Application
Calculation model	ConsExpo Liquid cleaner - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per day
Exposure time	240 min
Application duration	20 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per day
Product characteristics	
Spray application	no
Product ingredient fraction by weight	4 %
Mol weight matrix	18 g/mol
Mass transfer rate	3,660 m/min
Amounts used	

Inhalation	400 g
Dermal	19 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	1,900 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	58 m^3
Ventilation rate	0.500 1/h
Release area increases over time	
Release area	1.00E5 cm^2
Release temperature	25 °C
Dermal	
Uptake fraction	100 %
Contributing Scenario (5) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)
Scenario subtitle	Use in All-purpose cleaners - spraying products-Part A. Spraying
Calculation model	ConsExpo Spray cleaner - Application: spraying
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	365 per year
Spray duration	24.6 sec
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	365 per year
Release duration	24.6 sec
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	5 %
Amounts used	
Human factors not influenced by risk management	
Exposed skin surface (dermal)	1,900 cm^2
Contact rate	46 mg/min
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	15 m^3
Ventilation rate	2.5 1/h
Room height	2.5 m
Mass generation rate	0.780 g/s
Airborne fraction	20 %

Density non-volatile	1.8 %
Droplet distribution	LogNormal, median: 100 µm, coeff. of variation: 0.600 µm, cut-off diameter: 15 µm
Dermal	
Uptake fraction	100 %
Contributing Scenario (6) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)
Scenario subtitle	Use in All-purpose cleaners - spraying products-Part B. Cleaning
Calculation model	ConsExpo Spray cleaner - Application: cleaning
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	365 per year
Exposure time	60 min
Application duration	10 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	365 per year
Product characteristics	
Spray application	no
Product ingredient fraction by weight	5 %
Mol weight matrix	22 g/mol
Mass transfer rate	3,660 m/min
Amounts used	
Inhalation	16.2 g
Dermal	0.160 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	215 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	15 m^3
Ventilation rate	2.5 1/h
Release are is constant	
Release area	1.71E4 cm^2
Release temperature	25 °C
Dermal	
Uptake fraction	100 %
Contributing Scenario (7) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)

Scenario subtitle	Use in All-purpose cleaners - Use in Floor cleaning products-Part A. Mixing and Loading
Calculation model	ConsExpo Floor cleaning liquid - Mixing & Loading
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per day
Exposure time	0.750 min
Application duration	0.300 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per day
Product characteristics	
Spray application	no
Product ingredient fraction by weight	4 %
Mol weight matrix	22 g/mol
Mass transfer rate	3,660 m/min
Amounts used	
Inhalation	500 g
Dermal	0.010 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	215 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	1 m^3
Ventilation rate	1 1/h
Release are is constant	
Release area	20 cm^2
Release temperature	25 °C
Dermal	
Uptake fraction	100 %
Contributing Scenario (8) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)
Scenario subtitle	Use in All-purpose cleaners - Use in Floor cleaning products-Part B Application
Calculation model	ConsExpo Floor cleaning liquid - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per day

Exposure time	240 min
Application duration	30 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	1 per day
Product characteristics	
Spray application	no
Product ingredient fraction by weight	4 %
Mol weight matrix	18 g/mol
Mass transfer rate	3,660 m/min
Amounts used	
Inhalation	880 g
Dermal	19 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	215 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	58 m^3
Ventilation rate	0.500 1/h
Release area increases over time	
Release area	2.20E5 cm^2
Release temperature	25 °C
Dermal	
Uptake fraction	100 %

ES 12 (Exposure Scenario 12): Use in Biocidal products (Consumer use)

Free short title	Use in Biocidal products (Consumer use) (13)
Systematic title based on use descriptor	ERC 8A, 8D; PC 8
Name of contributing environmental scenario and corresponding ERC	ERC 8a Wide dispersive indoor use of processing aids in open systems ERC 8d Wide dispersive outdoor use of processing aids in open systems
Name(s) of contributing consumer scenarios and corresponding PCs/ACs	PC 8 Biocidal Products (e.g. Disinfectants, pest control) PC 8 Biocidal Products (e.g. Disinfectants, pest control)
Contributing Scenario (1) controlling environmental exposure for ERC 8A	
Contributing Scenario (2) controlling environmental exposure for ERC 8D	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Contributing Scenario (3) controlling consumer exposure for PC 8	
Name of contributing scenario	PC 8 Biocidal Products (e.g. Disinfectants, pest control)
Scenario subtitle	Use in Biocidal products-Part A. Spraying
Calculation model	ConsExpo Disinfectants for use indoors: - Spraying
Frequency and duration of use	
Inhalation	

Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	365 per year
Spray duration	30.6 sec
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	365 per year
Release duration	2.6 sec
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	10 %
Amounts used	
Human factors not influenced by risk management	
Exposed skin surface (dermal)	1,900 cm^2
Contact rate	46 mg/min
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	15 m^3
Ventilation rate	2.5 1/h
Room height	2.5 m
Mass generation rate	0.750 g/s
Airborne fraction	20 %
Density non-volatile	1.8 %
Droplet distribution	LogNormal, median: 50 µm, coeff. of variation: 0.600 µm, cut-off diameter: 15 µm
Dermal	
Uptake fraction	100 %
Contributing Scenario (4) controlling consumer exposure for PC 8	
Name of contributing scenario	PC 8 Biocidal Products (e.g. Disinfectants, pest control)
Scenario subtitle	Use in Biocidal products-Part B. Wiping
Calculation model	ConsExpo Disinfectants for use indoors: - Wiping
Frequency and duration of use	
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	365 per year
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Amounts used	
Dermal	0.020 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	215 cm^2

Other given operational conditions affecting consumers exposure	
Dermal	
Uptake fraction	100 %

ES 13 (Exposure Scenario 13): Use in Lubricants (industrial)

Free short title	Use in Lubricants (industrial) (14)
Systematic title based on use descriptor	ERC 4, 7; PROC 1, 2, 3, 4, 7, 8A, 8B, 9, 10, 13, 17, 18
Name of contributing environmental scenario and corresponding ERC	ERC 4 Industrial use of processing aids ERC 7 Industrial use of substances in closed systems
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 7 - Industrial spraying PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line) PROC 10 - Roller application or brushing PROC 13 - Treatment of articles by dipping and pouring PROC 17 - Lubrication at high energy conditions and in partly open process PROC 18 - Greasing at high energy conditions
Contributing Scenario (1) controlling environmental exposure for ERC 4	
Contributing Scenario (2) controlling environmental exposure for ERC 7	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (3) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 2	

Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 7	
Name of contributing scenario	7 - Industrial spraying

Scenario subtitle	Industrial spraying
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value dermal	The RISKSOFDERM V2.1 model has been used to estimate dermal exposure. The 70th percentile of the “Exposure loading per shift body” was added with the 70th percentile of the “Exposure loading per shift hand”. The values given in µl was converted into mg and divided by a body weight of 70 kg which is generally assumed for workers. In addition, appropriate body protection was considered within the calculation of the final dermal exposure value. RISKOFDERM v2.1 – Process: “Spraying” Physical state: Liquid Concentration of substance: 100% Vapour pressure of the substance: 0.008 hPa Application rate: 1 l/min Duration of exposure: 6 hours/day Exposed skin surface: Whole body Location: Inside Direction of spraying: Downward/ Level Segregation: Ensure that worker is > 1 m from the source Local exhaust ventilation (Direction of airflow away from the worker): yes (effectiveness: ca. 50%) Use of suitable gloves with basic training: Yes (Effectiveness: 90%) Wearing of appropriate working clothes (e.g. an overall): Yes (Effectiveness: 80%)

Use of external/measured value inhalation	The ART model has been used to estimate inhalative exposure. Mechanistic model results: The predicted 75th percentile full-shift exposure is 0.27 mg/m³. The inter-quartile confidence interval is 0.13 mg/m³ to 0.57 mg/m³. Emission sources: Far field Process temperature: Room temperature Vapour pressure: 8 Pa Liquid weight fraction: 1 Viscosity: medium (oil-like) Substance product type: Liquids Situation: Surface spraying of liquids, Moderate application rate (0.3 - 3 l/minute) Spray direction: Only horizontal or downward Spray technique: Spraying with high compressed air use Primary localized controls: LEV systems (50.00 % reduction) Secondary localized controls: No (0 % reduction) Segregation: Partial segregation with ventilation and filtration of recirculated air (70.00 % reduction) Personal enclosure: No (0% reduction) Effective housekeeping practices in place: Yes Process fully enclosed: No Room size: 1000 m³ Work area: Indoors Duration (mins): 360 Ventilation rate: No restriction on general ventilation characteristics Respiratory protection required: No
Contributing Scenario (8) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling industrial worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	

Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (10) controlling industrial worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (11) controlling industrial worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Roller application or brushing
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (12) controlling industrial worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Treatment of articles by dipping and pouring.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors

Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (13) controlling industrial worker exposure for PROC 17	
Name of contributing scenario	17 - Lubrication at high energy conditions and in partly open process
Scenario subtitle	Lubrication at high energy conditions and in partly open process.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (14) controlling industrial worker exposure for PROC 18	
Name of contributing scenario	18 - Greasing at high energy conditions
Scenario subtitle	Greasing at high energy conditions.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

ES 14 (Exposure Scenario 14): Use in Metal-working fluids (industrial)

Free short title	**Use in Metal-working fluids (industrial) (15)**

Systematic title based on use descriptor	ERC 4; PROC 1, 2, 3, 4, 5, 7, 8A, 8B, 9, 10, 13, 17
Name of contributing environmental scenario and corresponding ERC	ERC 4 Industrial use of processing aids
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 7 - Industrial spraying PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line) PROC 10 - Roller application or brushing PROC 13 - Treatment of articles by dipping and pouring PROC 17 - Lubrication at high energy conditions and in partly open process
Contributing Scenario (1) controlling environmental exposure for ERC 4	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (2) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (3) controlling industrial worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors

Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial

Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 7	
Name of contributing scenario	7 - Industrial spraying
Scenario subtitle	Industrial spraying
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value dermal	The RISKSOFDERM V2.1 model has been used to estimate dermal exposure. The 70th percentile of the “Exposure loading per shift body” was added with the 70th percentile of the “Exposure loading per shift hand”. The values given in µl was converted into mg and divided by a body weight of 70 kg which is generally assumed for workers. In addition, appropriate body protection was considered within the calculation of the final dermal exposure value. RISKOFDERM v2.1 – Process: “Spraying” Physical state: Liquid Concentration of substance: 100% Vapour pressure of the substance: 0.008 hPa Application rate: 1 l/min Duration of exposure: 6 hours/day Exposed skin surface: Whole body Location: Inside Direction of spraying: Downward/ Level Segregation: Ensure that worker is > 1 m from the source Local exhaust ventilation (Direction of airflow away from the worker): yes (effectiveness: ca. 50%) Use of suitable gloves with basic training: Yes (Effectiveness: 90%) Wearing of appropriate working clothes (e.g. an overall): Yes (Effectiveness: 80%)
Use of external/measured value inhalation	The ART model has been used to estimate inhalative exposure. Mechanistic model results: The predicted 75th percentile full-shift exposure is 0.27 mg/m^3. The inter-quartile confidence interval is 0.13 mg/m^3 to 0.57 mg/m^3. Emission sources: Far field Process temperature: Room temperature Vapour pressure: 8 Pa Liquid weight fraction: 1 Viscosity: medium (oil-like) Substance product type: Liquids

	Situation: Surface spraying of liquids, Moderate application rate (0.3 - 3 l/minute) Spray direction: Only horizontal or downward Spray technique: Spraying with high compressed air use Primary localized controls: LEV systems (50.00 % reduction) Secondary localized controls: No (0 % reduction) Segregation: Partial segregation with ventilation and filtration of recirculated air (70.00 % reduction) Personal enclosure: No (0% reduction) Effective housekeeping practices in place: Yes Process fully enclosed: No Room size: 1000 m³ Work area: Indoors Duration (mins): 360 Ventilation rate: No restriction on general ventilation characteristics Respiratory protection required: No
Contributing Scenario (8) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling industrial worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

Contributing Scenario (10) controlling industrial worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (11) controlling industrial worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Roller application or brushing
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (12) controlling industrial worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Treatment of articles by dipping and pouring.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (13) controlling industrial worker exposure for PROC 17	

Name of contributing scenario	17 - Lubrication at high energy conditions and in partly open process
Scenario subtitle	Lubrication at high energy conditions and in partly open process.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

ES 15 (Exposure Scenario 15): Use in metal-working fluids (professional)

Free short title	Use in metal-working fluids (professional) (16)
Systematic title based on use descriptor	ERC 8A; PROC 1, 2, 3, 5, 8A, 8B, 9, 10, 11, 13, 17
Name of contributing environmental scenario and corresponding ERC	ERC 8a Wide dispersive indoor use of processing aids in open systems
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line) PROC 10 - Roller application or brushing PROC 11 - Non industrial spraying PROC 13 - Treatment of articles by dipping and pouring PROC 17 - Lubrication at high energy conditions and in partly open process
Contributing Scenario (1) controlling environmental exposure for ERC 8A	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (2) controlling professional worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure

Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (3) controlling professional worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling professional worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling professional worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant con-tact)
Human factors not influenced by risk management	

Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (6) controlling professional worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 80 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (7) controlling professional worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no

Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (8) controlling professional worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling professional worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Roller application or brushing
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 80 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (10) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying
Scenario subtitle	Non industrial spraying
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors

Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value dermal	The RISKSOFDERM V2.1 model has been used to estimate dermal exposure. The 70th percentile of the "Exposure loading per shift body" was added with the 70th percentile of the "Exposure loading per shift hand". The values given in µl was converted into mg and divided by a body weight of 70 kg which is generally assumed for workers. In addition, appropriate body protection was considered within the calculation of the final dermal exposure value. RISKOFDERM v2.1 – Process: "Spraying" Physical state: Liquid Concentration of substance: 100% Vapour pressure of the substance: 0.008 hPa Application rate: 0.05 l/min Duration of exposure: 180 mins Exposed skin surface: Whole body Location: Inside Direction of spraying: Level Segregation: Worker is within one meter of the source Direction of airflow: Not clearly away from the worker Use of suitable gloves with basic training: Yes (Effectiveness: 90%) Wearing of appropriate working clothes (e.g. an overall): Yes (Effectiveness: 80%)
Use of external/measured value inhalation	The ART model has been used to estimate inhalative exposure. Mechanistic model results: The predicted 75th percentile full-shift exposure is 3 mg/m³. The inter-quartile confidence interval is 1.4 mg/m³ to 6.3 mg/m³. Emission sources: Near field Process temperature: Room temperature Vapour pressure: 8 Pa Liquid weight fraction: 1 Viscosity: medium (oil-like) Substance product type: Liquids Situation: Surface spraying of liquids, Low application rate (0.03 – 0.3 l/minute) Spray direction: Only horizontal or downward Spray technique: Spraying with high compressed air use Primary localized controls: No (0% reduction) Secondary localized controls: No (0 % reduction) Effective housekeeping practices in place: No General housekeeping in place: Yes Process fully enclosed: No Room size: 100 m³ Work area: Indoors Duration (mins): 180 Ventilation rate: Mechanical ventilation giving at least 1 ACH Respiratory protection required: No
Contributing Scenario (11) controlling professional worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Treatment of articles by dipping and pouring.

Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (12) controlling professional worker exposure for PROC 17	
Name of contributing scenario	17 - Lubrication at high energy conditions and in partly open process
Scenario subtitle	Lubrication at high energy conditions and in partly open process.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 80 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

ES 16 (Exposure Scenario 16): Use in/as Functional fluids (industrial)

Free short title	Use in/as Functional fluids (industrial) (17)
Systematic title based on use descriptor	ERC 7; PROC 1, 2, 3, 4, 8A, 8B, 9
Name of contributing environmental scenario and corresponding ERC	ERC 7 Industrial use of substances in closed systems
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line)
Contributing Scenario (1) controlling environmental exposure for ERC 7	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	

Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (2) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (3) controlling industrial worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial

Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2

Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (8) controlling industrial worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

ES 17 (Exposure Scenario 17): Use in/as Functional fluids (professional)

Free short title	Use in/as Functional fluids (professional) (18)
Systematic title based on use descriptor	ERC 9A, 9B; PROC 1, 2, 3, 4, 8A, 9, 20
Name of contributing environmental scenario and corresponding ERC	ERC 9a Wide dispersive indoor use of substances in closed systems ERC 9b Wide dispersive outdoor use of substances in closed systems
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line) PROC 20 - Heat and pressure transfer fluids (closed systems) in dispersive use
Contributing Scenario (1) controlling environmental exposure for ERC 9A	
Contributing Scenario (2) controlling environmental exposure for ERC 9B	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid

Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (3) controlling professional worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling professional worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling professional worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	

Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling professional worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (7) controlling professional worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 80 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (8) controlling professional worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2

Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling professional worker exposure for PROC 20	
Name of contributing scenario	20 - Heat and pressure transfer fluids (closed systems) in dispersive use
Scenario subtitle	Heat and pressure transfer fluids in dispersive, professional use but closed systems.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

ES 18 (Exposure Scenario 18: Use in Heat transfer and Hydraulic fluids (Consumer use)

Free short title	Use in Heat transfer and Hydraulic fluids (Consumer use) (19)
Systematic title based on use descriptor	ERC 9A, 9B; PC 16, 17
Name of contributing environmental scenario and corresponding ERC	ERC 9a Wide dispersive indoor use of substances in closed systems ERC 9b Wide dispersive outdoor use of substances in closed systems
Name(s) of contributing consumer scenarios and corresponding PCs/ACs	PC 16 Heat Transfer Fluids PC 17 Hydraulic Fluids
Contributing Scenario (1) controlling environmental exposure for ERC 9A	
Contributing Scenario (2) controlling environmental exposure for ERC 9B	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Contributing Scenario (3) controlling consumer exposure for PC 16	
Name of contributing scenario	PC 16 Heat Transfer Fluids
Scenario subtitle	Use in Heat transfer and Hydraulic fluids
Calculation model	Ecetoc TRA
Frequency and duration of use	
Frequency of use	0.547945 time(s)/day
Exposure time	0.250 h
Product characteristics	
Spray application	no

Product ingredient fraction by weight (inhalation)	45 %
Product ingredient fraction by weight (dermal)	45 %
Amounts used	
Amounts used	100 g
Human factors not influenced by risk management	
Skin surface area dermal	hands
Skin surface area oral	-
Tranfer factor dermal	100 %
Other given operational conditions affecting consumers exposure	
Room volume	20 m^3
Release fraction to air	1.0 %
Contributing Scenario (4) controlling consumer exposure for PC 17	
Name of contributing scenario	PC 17 Hydraulic Fluids
Scenario subtitle	Use in Heat transfer and Hydraulic fluids
Calculation model	Ecetoc TRA
Frequency and duration of use	
Frequency of use	0.547945 time(s)/day
Exposure time	0.250 h
Product characteristics	
Spray application	no
Product ingredient fraction by weight (inhalation)	45 %
Product ingredient fraction by weight (dermal)	45 %
Amounts used	
Amounts used	100 g
Human factors not influenced by risk management	
Skin surface area dermal	hands
Skin surface area oral	-
Tranfer factor dermal	100 %
Other given operational conditions affecting consumers exposure	
Room volume	20 m^3
Release fraction to air	1.0 %

ES 19 (Exposure Scenario 19): Use in/as De-icing/Anti-icing applications/agents (professional)

Free short title	Use in/as De-icing/Anti-icing applications/agents (professional) (20)
Systematic title based on use descriptor	ERC 8D; PROC 1, 2, 8A, 8B, 11
Name of contributing environmental scenario and corresponding ERC	ERC 8d Wide dispersive outdoor use of processing aids in open systems
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 11 - Non industrial spraying
Contributing Scenario (1) controlling environmental exposure for ERC 8D	

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (2) controlling professional worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (3) controlling professional worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling professional worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.

Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 80 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling professional worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (6) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying
Scenario subtitle	Non industrial spraying
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

Use of external/measured value dermal	The RISKSOFDERM V2.1 model has been used to estimate dermal exposure. The 70th percentile of the "Exposure loading per shift body" was added with the 70th percentile of the "Exposure loading per shift hand". The values given in µl was converted into mg and divided by a body weight of 70 kg which is generally assumed for workers. In addition, appropriate body protection was considered within the calculation of the final dermal exposure value. RISKOFDERM v2.1 – Process: "Spraying" Physical state: Liquid Concentration of substance: 100% Vapour pressure of the substance: 0.008 hPa Application rate: 0.05 l/min Duration of exposure: 180 mins Exposed skin surface: Whole body Location: Inside Direction of spraying: Level Segregation: Worker is within one meter of the source Direction of airflow: Not clearly away from the worker Use of suitable gloves with basic training: Yes (Effectiveness: 90%) Wearing of appropriate working clothes (e.g. an overall): Yes (Effectiveness: 80%)
Use of external/measured value inhalation	The ART model has been used to estimate inhalative exposure. Mechanistic model results: The predicted 75th percentile full-shift exposure is 3 mg/m³. The inter-quartile confidence interval is 1.4 mg/m³ to 6.3 mg/m³. Emission sources: Near field Process temperature: Room temperature Vapour pressure: 8 Pa Liquid weight fraction: 1 Viscosity: medium (oil-like) Substance product type: Liquids Situation: Surface spraying of liquids, Low application rate (0.03 – 0.3 l/minute) Spray direction: Only horizontal or downward Spray technique: Spraying with high compressed air use Primary localized controls: No (0% reduction) Secondary localized controls: No (0 % reduction) Effective housekeeping practices in place: No General housekeeping in place: Yes Process fully enclosed: No Room size: 100 m³ Work area: Indoors Duration (mins): 180 Ventilation rate: Mechanical ventilation giving at least 1 ACH Respiratory protection required: No

ES 20 (Exposure Scenario 20): Use in/as De-icing/Anti-icing applications/agents (Consumer use)

Free short title	Use in/as De-icing/Anti-icing applications/agents (Consumer use) (21)
Systematic title based on use descriptor	ERC 8D; PC 4
Name of contributing environmental scenario and corresponding ERC	ERC 8d Wide dispersive outdoor use of processing aids in open systems
Name(s) of contributing consumer scenarios and corresponding PCs/ACs	PC 4 Anti-Freeze and De-icing products PC 4 Anti-Freeze and De-icing products PC 4 Anti-Freeze and De-icing products
Contributing Scenario (1) controlling environmental exposure for ERC 8D	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Contributing Scenario (2) controlling consumer exposure for PC 4	

Name of contributing scenario	PC 4 Anti-Freeze and De-icing products
Scenario subtitle	Use in De-icing applications - spraying products-Part A. Spraying
Calculation model	ConsExpo Glass cleaner - Application: spraying
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	365 per year
Spray duration	42 sec
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	365 per year
Release duration	42 sec
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	100 %
Amounts used	
Human factors not influenced by risk management	
Exposed skin surface (dermal)	1,900 cm^2
Contact rate	46 mg/min
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	58 m^3
Ventilation rate	0.500 1/h
Room height	2.5 m
Mass generation rate	0.780 g/s
Airborne fraction	100 %
Density non-volatile	1.8 %
Droplet distribution	LogNormal, median: 100 µm, coeff. of variation: 0.600 µm, cut-off diameter: 15 µm
Dermal	
Uptake fraction	100 %
Contributing Scenario (3) controlling consumer exposure for PC 4	
Name of contributing scenario	PC 4 Anti-Freeze and De-icing products
Scenario subtitle	Use in De-icing applications - spraying products-Part B. Cleaning
Calculation model	ConsExpo Glass cleaner - Application: cleaning
Frequency and duration of use	
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	365 per year
Product characteristics	
Spray application	no

Product ingredient fraction by weight	100 %
Amounts used	
Dermal	0.290 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	215 cm^2
Other given operational conditions affecting consumers exposure	
Dermal	
Uptake fraction	100 %
Contributing Scenario (4) controlling consumer exposure for PC 4	
Name of contributing scenario	PC 4 Anti-Freeze and De-icing products
Scenario subtitle	Use in De-icing applications - Use in Anti-freezing agents
Calculation model	Ecetoc TRA
Frequency and duration of use	
Frequency of use	0.547945 time(s)/day
Exposure time	0.250 h
Product characteristics	
Spray application	no
Product ingredient fraction by weight (inhalation)	45 %
Product ingredient fraction by weight (dermal)	45 %
Amounts used	
Amounts used	100 g
Human factors not influenced by risk management	
Skin surface area dermal	hands
Skin surface area oral	-
Tranfer factor dermal	100 %
Other given operational conditions affecting consumers exposure	
Room volume	20 m^3
Release fraction to air	1.0 %

ES 21 (Exposure Scenario 21): Use in laboratories (industrial)

Free short title	Use in laboratories (industrial) (22a)
Systematic title based on use descriptor	ERC 4; PROC 15
Name of contributing environmental scenario and corresponding ERC	ERC 4 Industrial use of processing aids
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 15 - Use of laboratory reagents in small scale laboratories
Contributing Scenario (1) controlling environmental exposure for ERC 4	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Contributing Scenario (2) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Use in laboratories (industrial)

Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

ES 22 (Exposure Scenario 22): Use in laboratories (professional)

Free short title	Use in laboratories (professional) (22b)
Systematic title based on use descriptor	ERC 8A; PROC 15
Name of contributing environmental scenario and corresponding ERC	ERC 8a Wide dispersive indoor use of processing aids in open systems
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 15 - Use of laboratory reagents in small scale laboratories
Contributing Scenario (1) controlling environmental exposure for ERC 8A	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Contributing Scenario (2) controlling professional worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Use in laboratories (professional)
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional

Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no

ES 23 (Exposure Scenario 23): Use in Adhesives and Sealants (Consumer use)

Free short title	Use in Adhesives and Sealants (Consumer use) (23)
Systematic title based on use descriptor	ERC 8C, 8F; PC 1
Name of contributing environmental scenario and corresponding ERC	ERC 8c Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC 8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Name(s) of contributing consumer scenarios and corresponding PCs/ACs	PC 1 Adhesives, Sealants
Contributing Scenario (1) controlling environmental exposure for ERC 8C	
Contributing Scenario (2) controlling environmental exposure for ERC 8F	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Contributing Scenario (3) controlling consumer exposure for PC 1	
Name of contributing scenario	PC 1 Adhesives, Sealants
Scenario subtitle	Mixing and Loading
Calculation model	ConsExpo Carpet glue - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	0.250 per year
Exposure time	75 min
Application duration	75 min
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	0.250 per year
Release duration	4,500 sec
Product characteristics	
Spray application	no
Product ingredient fraction by weight	0.075 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	3,660 m/min
Amounts used	
Inhalation	9,000 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	110 cm^2
Contact rate	30 mg/min
Other given operational conditions affecting consumers exposure	

Inhalation	
Room volume	58 m^3
Ventilation rate	0.500 1/h
Release are is constant	
Release area	4.00E4 cm^2
Release temperature	25 °C
Dermal	
Uptake fraction	100 %

ES 24 (Exposure Scenario 24): Production of Polymers, filled polymers, Foams, Coatings, Adhesives, Sealants

Free short title	Production of Polymers, filled polymers, Foams, Coatings, Adhesives, Sealants (24)
Systematic title based on use descriptor	ERC 2, 3, 5, 6C; PROC 1, 2, 3, 4, 5, 7, 8A, 8B, 9, 10, 13, 14, 15
Name of contributing environmental scenario and corresponding ERC	ERC 2 Formulation of preparations ERC 3 Formulation in articles ERC 5 Industrial use resulting in inclusion into or onto a matrix ERC 6c Production of plastics
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5 - Mixing or blending in batch processes (multistage and/or significant contact) PROC 7 - Industrial spraying PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 9 - Transfer of chemicals into small containers (dedicated filling line) PROC 10 - Roller application or brushing PROC 13 - Treatment of articles by dipping and pouring PROC 14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation PROC 15 - Use of laboratory reagents in small scale laboratories
Contributing Scenario (1) controlling environmental exposure for ERC 2	
Contributing Scenario (2) controlling environmental exposure for ERC 3	
Contributing Scenario (3) controlling environmental exposure for ERC 5	
Contributing Scenario (4) controlling environmental exposure for ERC 6C	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (5) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	

Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (8) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2

Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)
Scenario subtitle	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (10) controlling industrial worker exposure for PROC 7	
Name of contributing scenario	7 - Industrial spraying
Scenario subtitle	Industrial spraying
Human factors not influenced by risk management	
Exposed skin surface	1,500 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Use of external/measured value dermal	The RISKSOFDERM V2.1 model has been used to estimate dermal exposure. The 70th percentile of the “Exposure loading per shift body” was added with the 70th percentile of the “Exposure loading per shift hand”. The values given in µl was converted into mg and divided by a body weight of 70 kg which is generally assumed for workers. In addition, appropriate body protection was considered within the calculation of the final dermal exposure value. RISKOFDERM v2.1 – Process: “Spraying”

	Physical state: Liquid Concentration of substance: 100% Vapour pressure of the substance: 0.008 hPa Application rate: 1 l/min Duration of exposure: 6 hours/day Exposed skin surface: Whole body Location: Inside Direction of spraying: Downward/ Level Segregation: Ensure that worker is > 1 m from the source Local exhaust ventilation (Direction of airflow away from the worker): yes (effectiveness: ca. 50%) Use of suitable gloves with basic training: Yes (Effectiveness: 90%) Wearing of appropriate working clothes (e.g. an overall): Yes (Effectiveness: 80%)
Use of external/measured value inhalation	The ART model has been used to estimate inhalative exposure. Mechanistic model results: The predicted 75th percentile full-shift exposure is 0.27 mg/m³. The inter-quartile confidence interval is 0.13 mg/m³ to 0.57 mg/m³. Emission sources: Far field Process temperature: Room temperature Vapour pressure: 8 Pa Liquid weight fraction: 1 Viscosity: medium (oil-like) Substance product type: Liquids Situation: Surface spraying of liquids, Moderate application rate (0.3 - 3 l/minute) Spray direction: Only horizontal or downward Spray technique: Spraying with high compressed air use Primary localized controls: LEV systems (50.00 % reduction) Secondary localized controls: No (0 % reduction) Segregation: Partial segregation with ventilation and filtration of recirculated air (70.00 % reduction) Personal enclosure: No (0% reduction) Effective housekeeping practices in place: Yes Process fully enclosed: No Room size: 1000 m³ Work area: Indoors Duration (mins): 360 Ventilation rate: No restriction on general ventilation characteristics Respiratory protection required: No
Contributing Scenario (11) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)

Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (12) controlling industrial worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (13) controlling industrial worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Scenario subtitle	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (14) controlling industrial worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Scenario subtitle	Roller application or brushing
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)

Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (15) controlling industrial worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Treatment of articles by dipping and pouring.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (16) controlling industrial worker exposure for PROC 14	
Name of contributing scenario	14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation
Scenario subtitle	Production of preparations or articles by tabletting, compression, extrusion, pelletisation.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (17) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Scenario subtitle	Use as laboratory reagent
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	

Protective gloves	No
Respiratory protection	no

ES 25 (Exposure Scenario 25): Production of rigid foam (Consumer use)

Free short title	Production of rigid foam (Consumer use) (25)
Systematic title based on use descriptor	ERC 8C, 8F; PC 32
Name of contributing environmental scenario and corresponding ERC	ERC 8c Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC 8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix
Name(s) of contributing consumer scenarios and corresponding PCs/ACs	PC 32 Polymer Preparations and Compounds
Contributing Scenario (1) controlling environmental exposure for ERC 8C	
Contributing Scenario (2) controlling environmental exposure for ERC 8F	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Contributing Scenario (3) controlling consumer exposure for PC 32	
Name of contributing scenario	PC 32 Polymer Preparations and Compounds
Scenario subtitle	Production of rigid foam (Consumer use)
Calculation model	ConsExpo Insulation foam - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	0.200 per year
Dermal	
Exposure calculation result type	Internal dose chronic
Frequency of use	0.200 per year
Product characteristics	
Spray application	no
Product ingredient fraction by weight	5 %
Amounts used	
Inhalation	825 g
Dermal	0.250 g
Human factors not influenced by risk management	
Exposed skin surface (dermal)	1,900 cm^2
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	57.5 m^3
Ventilation rate	1.5 1/h
Dermal	
Uptake fraction	100 %

ES 26 (Exposure Scenario 26): Use in Water-treatment chemicals (industrial)

Free short title	Use in Water-treatment chemicals (industrial) (26)

Systematic title based on use descriptor	ERC 3, 4; PROC 1, 2, 3, 4, 8A, 8B, 13
Name of contributing environmental scenario and corresponding ERC	ERC 3 Formulation in articles ERC 4 Industrial use of processing aids
Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 13 - Treatment of articles by dipping and pouring
Contributing Scenario (1) controlling environmental exposure for ERC 3	
Contributing Scenario (2) controlling environmental exposure for ERC 4	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (3) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling industrial worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	

Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear a suitable respiratory protection with adequate effectiveness (90%).
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors

Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (8) controlling industrial worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (9) controlling industrial worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Treatment of articles by dipping and pouring.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	industrial
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 90 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

ES 27 (Exposure Scenario 27): Use in Water-treatment chemicals (professional)

Free short title	Use in Water-treatment chemicals (professional) (27)
Systematic title based on use descriptor	ERC 8F; PROC 1, 2, 3, 4, 8A, 8B, 13
Name of contributing environmental scenario and corresponding ERC	ERC 8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix

Name(s) of contributing worker scenarios and corresponding PROCs	PROC 1 - Use in closed process, no likelihood of exposure PROC 2 - Use in closed, continuous process with occasional controlled exposure PROC 3 - Use in closed batch process (synthesis or formulation) PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities PROC 8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities PROC 13 - Treatment of articles by dipping and pouring
Contributing Scenario (1) controlling environmental exposure for ERC 8F	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	low
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (2) controlling professional worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Scenario subtitle	Use in closed process, no likelihood of exposure
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (3) controlling professional worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Scenario subtitle	Use in closed, continuous process with occasional controlled exposure.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (4) controlling professional worker exposure for PROC 3	

Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Scenario subtitle	Use in closed batch process (synthesis or formulation).
Human factors not influenced by risk management	
Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (5) controlling professional worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Scenario subtitle	Use in batch and other process (synthesis) where opportunity for exposure arises.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	No
Respiratory protection	no
Contributing Scenario (6) controlling professional worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	yes (inhalation 80 %)
Conditions and measures related to personal protection, hygiene and health evaluation	

Protective gloves	No
Respiratory protection	no
Contributing Scenario (7) controlling professional worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Scenario subtitle	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
Qualitative Risk Assessment	
General	In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Human factors not influenced by risk management	
Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no
Contributing Scenario (8) controlling professional worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Scenario subtitle	Treatment of articles by dipping and pouring.
Human factors not influenced by risk management	
Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	
Location	indoors
Ventilation	good (30%)
Domain	professional
Technical conditions and measures to control dispersion and exposure	
Local exhaust ventilation	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Protective gloves	Gloves APF 10 90 %
Respiratory protection	no

END OF SAFETY DATA SHEET