SIBUR-KHIMPROM JSC

SAFETY DATA SHEET

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

ISO-BUTANOL

Version: 3.0
Date created: 03/04/2018

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

1.1. Product identifier

Product form:	Substance
Substance name:	2-methyl-propan-1-ol
Chemical name:	2-methyl-propan-1-ol
EC index No.:	603-108-00-1
EC No.:	201-148-0
CAS-No.:	78-83-1
REACH registration No:	01-2119484609-23-0003
Formula:	$C_4H_{10}O$
Synonyms:	Isobutyl alcohol, isobutanol, IBA, 2-methyl-1-propanol, Isopropylcarbinol
Trade names:	Iso-butanol

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:

Distribution of substances
Distribution of substances (professional)
Formulation & (re)packing of substances and mixtures
Manufacture of substances
Metal working fluids / rolling oils
Metal working fluids / rolling oils (professional)
Production of iso-butanol
Use as consumer care product
Use as intermediate
Use in cleaning agents
Use in cleaning agents (consumer)
Use in cleaning agents (professional)
Use in Coatings (paint, ink, toners, adhesives)
Use in Coatings (paints, ink, toners, adhesives), consumer
Use in Coatings (paints, ink, toners, adhesives), professional
Use in Laboratories
Use in lubricants
Use in Lubricants (consumer)
Use in Lubricants (professional)

For the detailed identified uses of the product see Annex.

1.2.2. Uses advised against

Restrictions on use: 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-Khimprom JSC
Address:	98, Promishlennaya str., Perm, Perm region, 614055, Russian Federation
Contact phone:	+7 3422 90-89-01 (Chief Engineer, Moscow time, 7.00 to 15.00)
Fax:	+7 3422 90-86-60
Email Address:	mail-shp@sibur.ru
Emergency Telephone:	+7 3422 90-87-05 (round the clock)
Importer:	List of importers is available with the Only Representative

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]

H226	Flam. Liquid 3
H315	Skin Irrit. 2
H318	Eye Dam. 1
H335	STOT Single Exp. 3
H336	STOT Single Exp. 3

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):

GHS02 GHS05 GHS07

Signal word (CLP): Danger

Hazard statements (CLP):
H226: Flammable liquid and vapour.
H315: Causes skin irritation.
H318: Causes serious eye damage.
H335: May cause respiratory irritation.
Affected organs: respiratory tract.
H336: May cause drowsiness or dizziness.
Affected organs: central nervous system.

Precautionary statements (CLP): P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof electrical/ventilating/lighting equipment.
P242: Use non-sparking tools.
P243: Take precautionary measures against static discharge.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P370+P378: In case of fire: Use water spray, dry extinguishing media, alcohol-resistant foam, carbon dioxide for extinction.
P403+P235: Store in a well-ventilated place. Keep cool.
P501: Dispose of contents/container in accordance with local/regional/national /international regulations.

EUH-statements: Not applicable.

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-methyl-propan-1-ol	(CAS-No.) 78-83-1 (EC No.) 201-148-0 (EC index No.) 603-108-00-1 (REACH-no) 01-2119484609-23-0003	98.5-99.8	H226, H315, H318, H335, H336
Butan-1-ol	(CAS-No.) 71-36-3 (EC No.) 200-751-6 (EC index No.) 603-004-00-6	<0.1	H226, H302, H315, H318, H335, H336
Dibutyl ether	(CAS-No.) 142-96-1 (EC No.) 205-575-3 (EC index No.) 603-054-00-9	<0.22	H226,H315,H319, H335, H412

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

First-aid measures general

First aid personnel should pay attention to their own safety. If the patient is likely to become

unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

First-aid measures after inhalation

Move any exposed person to fresh air at once. Keep warm and at rest. If there is respiratory distress give oxygen. If respiration stops or shows signs of failing, apply artificial respiration.
Get medical attention immediately.

First-aid measures after skin contact

Remove contaminated clothing and wash skin with plenty of running water, under a shower if affected area is large enough to warrant this. Get medical attention if irritation develops or persists.

First-aid measures after eye contact

Rinse immediately eye with plenty of low pressure water for at least 15 minutes.
Remove any contact lenses. Get medical attention immediately.

First-aid measures after ingestion

Potential for aspiration if swallowed. Get medical aid immediately. Wash out mouth with water and give plenty of water to drink, provided person is conscious. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, have victim lean forward.

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

Symptoms/effects after inhalation:	Dyspnoea, discoordination, irritation of respiratory tract, nausea, vomiting, weakness
Symptoms/effects after skin contact:	Dryness, redness
Symptoms/effects after eye contact:	Pain, lacrimation
Symptoms/effects after ingestion:	Dyspnoea, discoordination, irritation of respiratory tract, nausea, vomiting, weakness

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

Advice to physician

Treat according to symptoms (decontamination, vital functions), no known specific antidote.

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 straight streams of water. Material is lighter than water and a fire may be spread by the use of water.

5.2. Special hazards arising from the substance or mixture

Fire hazard:	Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.
Explosion hazard:	Vapours may form explosive mixture with air. Prevent buildup of vapours or gases to explosive concentrations. Vapours may travel considerable distance to a source of ignition and flash back. Water may cause splattering. Container may rupture on heating.
Hazardous decomposition products in case of fire:	May evolve oxides of carbon (COx) under fire conditions. Combustion generates irritating and highly toxic fumes.

5.3. Advice for firefighters

Firefighting instructions:	Evacuate unnecessary personnel to safe areas. Use water spray to keep fire-exposed containers cool. Water may be ineffective in fighting the fire. Fight fire from a protected location. Move containers from fire area if you can do so without risk.
Protection during firefighting:	Wear self-contained breathing apparatus and chemical-protective clothing.
Further information:	Collect contaminated extinguishing water separately, do not allow to reach sewage or effluent systems. Foam should be applied in large quantities as it is broken down to some extent by the product.

SECTION 6. ACCIDENTAL RELEASE MEASURE

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures	Immediately evacuate all personnel from danger area.

6.1.2. For emergency responders

Emergency procedures	May form explosive mixtures with air. Immediately evacuate all personnel from danger area. Ventilate closed spaces before entering them. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep upwind. Keep unauthorized personnel away. Stop the flow of material, if this is without risk. Prevent entry into waterways, sewer, basements or confined areas. In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

6.2. Environmental precautions

Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so.

6.3. Methods and material for containment and cleaning up

For large amounts: Pump off product. Dike far ahead of larger spill for later recovery and disposal. For residues: Pick up with suitable absorbent material (e.g. sand, sawdust, general-purpose binder, kieselguhr). Dispose of absorbed material in accordance with regulations.

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	Use only in a well-ventilated area. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapour), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Take precautionary measures against static discharges. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Hygiene measures	Wash thoroughly after handling. Wash your hands at the end of each work shift, before and after eating, drinking, smoking or using the toilet.

7.2. Conditions for safe storage, including any incompatibilities

Conditions for safe storage	Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.
Incompatible materials	Strong oxidizing agents.
Storage area	Ensure thorough ventilation of stores and work areas.

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-methyl-propan-1-ol (CAS 78-83-1)

	LTEL TWA ppm	LTEL TWA mg/m^3	STEL ppm	STEL mg/m^3	Note
Austria	50	150	200	600	
Belgium	50	154			
Denmark	50	150	50	150	
France	50	150			
Germany (AGS)	100	310	100 (1)	310 (1)	15 minutes average value
Germany (DFG)	100	310	100	310	
Ireland	50	150	75 (1)	225 (1)	15 minutes average value
Latvia		10			
Poland		100		200	
Spain	50	154			
Sweden	50	150	75 (1)	250 (1)	15 minutes average value
Switzerland	50	150	50	150	
United Kingdom	50	154	75	231	

8.1.2. DNEL/ PNEC values

2-methyl-propan-1-ol (CAS 78-83-1)

DNEL/DMEL (Workers)	
Acute - systemic effects, dermal	No hazard identified
Acute - systemic effects, inhalation	Low hazard (no threshold derived)
Acute - local effects, dermal	Medium hazard (no threshold derived)
Acute - local effects, inhalation	Low hazard (no threshold derived)
Long-term - systemic effects, dermal	No hazard identified
Long-term - systemic effects, inhalation	Low hazard (no threshold derived)
Long-term - local effects, dermal	Medium hazard (no threshold derived)
Long-term - local effects, inhalation	310 mg/m³
Eyes, local effects	Medium hazard (no threshold derived)
DNEL/DMEL (General population)	
Acute - systemic effects, dermal	No hazard identified

Acute - systemic effects, inhalation	Low hazard (no threshold derived)
Acute - systemic effects, oral	No hazard identified
Acute - local effects, dermal	Medium hazard (no threshold derived)
Acute - local effects, inhalation	Low hazard (no threshold derived)
Long-term - systemic effects, dermal	No hazard identified
Long-term - systemic effects, inhalation	Low hazard (no threshold derived)
Long-term - systemic effects,oral	No hazard identified
Long-term - local effects, dermal	Medium hazard (no threshold derived)
Long-term - local effects, inhalation	55 mg/m³
Eyes, local effects	Medium hazard (no threshold derived)
PNEC (water)	
PNEC aqua (freshwater)	0.4 mg/L
PNEC aqua (marine water)	0.04 mg/L
PNEC aqua (intermittent, freshwater)	11 mg/L
PNEC (Sediment)	
PNEC sediment (freshwater)	1.56 mg/kg sediment dw
PNEC sediment (marine water)	0.156 mg/kg sediment dw
PNEC (Soil)	
PNEC soil	0.0765 mg/kg soil dw
PNEC (Oral)	
PNEC oral (secondary poisoning)	As the substance is not considered bioaccumulative, secondary poisoning is not a relevant exposure route.
PNEC (STP)	
PNEC sewage treatment plant	10 mg/L

8.2. Exposure controls

Appropriate engineering controls:

Use explosion-proof ventilation equipment. Provide easy access to water supply and eye wash facilities. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

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. 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:

Tightly fitting safety goggles (splash 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-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

Respiratory protection:

A respiratory protection program compliant with all applicable regulations must be followed

whenever workplace conditions require the use of a respirator. Under normal use conditions, respirator is not usually required.
Use appropriate respiratory protection if exposure to dust particles, mist or vapours is likely. Use self-contained breathing apparatus for entry into confined space, for other poorly ventilated areas, for large spill clean-up sites, or if exposure limits are exceeded, or if irritation or other symptoms are experienced.

Environmental exposure controls:
Do not contaminate water sources or sewer.

Other information:
Hygiene measures: Observe good industrial hygiene practices. Do not get in eyes. Avoid contact with skin. Wash contaminated clothing before reuse. When using do not smoke. Wash hands before breaks and immediately after handling the product.
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
Melting / freezing point	< -90° C
Boiling point	108 °C at 1013 hPa
Relative density	0.8017 g/cm³ at 20° C
Vapour pressure	< 16 hPa at 20° C
Surface tension	69.7 mN/m at 20° C (1 g/L)
Water solubility	70 g/L at 20° C
Partition coefficient n-octanol/water (log value)	Log Kow (Pow): 1 at 25 °C
Flash point	31° C at 1013 hPa (ISO 2719 closed cup)
Flammability	Flammable upon ignition. The substance has no pyrophoric properties and does not liberate flammable gases on contact with water.
Explosive properties	Non explosive There are no chemical groups associated with explosive properties present in the molecule.
Self-ignition temperature	400° C at 1007 hPa (EU A15)
Oxidising properties	No oxidizing properties. The substance is incapable of reacting exothermically with combustible materials on the basis of the chemical structure.
Viscosity	3.1028 mPa s at 20°C (dynamic)
Granulometry	Not applicable Substance is marketed or used in a non solid or granular form.
Stability in organic solvents and identity of relevant degradation products	not applicable The stability of the substance is not considered as critical.
Dissociation constant	not applicable The substance does not contain any ionic structure.

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.

10.2. Chemical stability

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

10.3. Possibility of hazardous reactions

Reacts with strong oxidizing agents.

10.4. Conditions to avoid

Heat, sparks, flames.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

No hazardous decomposition products if stored and handled as prescribed/indicated. Thermal decomposition or combustion may generate smoke, carbon monoxide, carbon dioxide, and other products of incomplete combustion.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity The available data for isobutanol indicate a relative low potential for acute toxicity. The substance has not to be classified for acute toxicity according to 1272/2008/EC (CLP) requirements.

2-methyl-propan-1-ol (CAS 78-83-1)	
LD50, oral, rats, males	>2830 mg/kg bw (EPA OTS 798.1175, OECD 401)
LD50, oral, rats, females	3350 mg/kg bw (EPA OTS 798.1175, OECD 401)
LD50, oral, mouse	3500 mg/kg bw
LD50, oral, rabbit	ca. 3000 mg/kg bw
LC0(6 h), inhalation, rats	>= 18.2 mg/L (neurotoxicity guideline)
LC50(4 h), inhalation, rats	24.6 mg/L
LC50(4 h), inhalation, rats	19.6 mg/L (irritation of the respiratory tract)
LC50(4 h), inhalation, mouse	15.5 mg/L
LC50(4 h), inhalation, rabbit	26.3 mg/L
LC50(4 h), inhalation, guinea pig	19.9 mg/L
LD50, dermal, rabbit, males	> 2000 mg/kg bw (OECD 402)
LD50, dermal, rabbit, females	2460 mg/kg bw (OECD 402)

LD50, dermal, rabbit, males	3392 mg/kg bw

Skin corrosion/irritation	Adverse effect observed (moderately irritating). In summary, results of the available studies led to the classification as a skin irritant Cat. 2 according to 1272/2008/EC (CLP) requirements. Classification as corrosive to the skin does not seem warranted.
Additional information	Erythema score: 1.2 of max. 2 (mean) (Time point: 24, 48 and 72 hours) (not fully reversible within: 14 days) (Maximum score observed. One animal had a score of 1 on day 14.) (EPA OTS 798.4470 , OECD Guideline 404)
Serious eye damage/irritation	Adverse effect observed (corrosive). Due to the irreversible irritation effects on rabbit eyes, isobutanol has to be classified as posing the risk of serious eye damage Cat. 1 according to 1272/2008/EC (CLP) criteria.
Additional information	Cornea score: 1 of max. 1 (mean) (Time point: 24, 48 and 72 hours) (EPA OTS 798.4500, OECD Guideline 405)
Irritation of respiratory tract	Due to the effects observed in an acute inhalation study in rats and with n-butanol in humans, isobutanol has to be classified as irritant to the respiratory tract (STOT SE Cat. 3) according to 1272/2008/EC (CLP) requirements.
Respiratory or skin sensitisation	Not sensitizing.
Additional information	Due to the negative results of a QSAR calculation for isobutanol and of the analogous substance propan-1-ol in a guinea pig maximisation test, isobutanol has not to be classified as skin sensitiser according to 1272/2008/EC (CLP) requirements.
Germ cell mutagenicity	The test substance was not genotoxic in in vitro experiments using human, rodent, and bacterial cells or in vivo experiments in mice. For isobutanol, there is therefore no need for classification for mutagenic effects according to 1272/2008/EC (CLP) requirements.
Additional information	Gene mutation in bacteria: S. typhimurium TA 1535, TA 1537, TA 97, TA 98 and TA 100, with and without metabolic activation (Ames test): negative (standardized test protocol). Gene mutation in mammalian cells: CHL V79 cells (HPRT test), with and without metabolic activation: negative. Cytogenicity in mammalian cells: CHL V79 cells (in vitro micronucleus test), without metabolic activation: negative. Cytogenicity in vivo: NMRI mouse (micronucleus test), up to 2000 mg/kg: negative
Carcinogenicity	Not classified according to 1272/2008/EC (CLP) requirements.
Additional information	Due to the lack of mutagenicity, a cancerogenic potential of isobutanol based mutagenic effects can widely be ruled out. Additionally, no structural fragments were found in a structure-activity-relationship model (CASE) indicating a carcinogenic potential. Thus, there is at

present no evidence for a carcinogenic potential of isobutanol. Therefore a carcinogenicity study is not justified.

Toxicity for reproduction

Due to the lack of toxicity on fertility and development in definite studies with isobutanol, there is no need for classification according to reproductive toxicity according to 1272/2008/EC (CLP) requirements.

2-methyl-propan-1-ol (CAS 78-83-1)	
NOAEL P/F1/F2 (effects on fertility), inhalation, rat, 2-gen	>= ca. 7.5 mg/L (=2500 ppm) (EPA guideline OPPTS 870.3800)
NOAEL (developmental toxicity), inhalation, rat, gestation day 6-15	>= 10 mg/L (NOAEL, maternal, teratogenicity and fetotoxicity) (OECD 414)
NOAEL (developmental toxicity), inhalation, rabbit, gestation day 7-19	= 2.5 mg/L (maternal) (due to slight impairment of body weight gain) = 10 mg/L (teratogenicity and fetotoxicity) (OECD 414)

STOT-single exposure

Due to the effects observed in an acute inhalation study in rats and with n-butanol in humans, isobutanol has to be classified as irritant to the respiratory tract (STOT SE Cat. 3) according to 1272/2008/EC (CLP) requirements.

Repeated dose toxicity

No adverse systemic effects were observed in any of the available studies. Consequently, there is no need for classification of effects according to 1272/2008/EC (CLP) requirements due to repeated exposure to the test substance.

2-methyl-propan-1-ol (CAS 78-83-1)	
NOAEL, oral, rat (90 d)	>= ca. 1450 mg/kg bw/ day (= 16000 ppm) (OECD 408)
Dermal, rabbit	(4-6 times 0.3 mL for 24 h within 7 d): occlusive: no systemic toxicity studied; local: highly irritant (TSCATS OTS 0510692),
NOAEL, inhalation, systemic, rat (90 d)	>= ca. 7.5 mg/L/day (2500 ppm) (6 h/d, 5 d/wk) (EPA OPPTS 870.3800; ACC 2003)

Aspiration hazard

Not available.

Other effects

Neurotoxicity

Effects indicative for CNS depression were observed after single and repeated application. Therefore, the substance has to be classified as STOT single exposure, Cat. 3 (for narcotic effects) according to 1272/2008/EC (CLP) criteria.

2-methyl-propan-1-ol (CAS 78-83-1)	
NOAEL(90 d), rat, neurotoxicity	>= 7.5 mg/L (2500 ppm) (neurotoxicity guideline 82-7 F)
NOAEL(90 d), rat, neurotoxicity/behaviour	>= 7.5 mg/L (2500 ppm)(neurotoxicity guideline 85 F)
LOEL (acute), rat, neurotoxicity	= 4.5 mg/L (1500 ppm) (slight hypoactivation during exposure) (EPA guidelines 798.6050 & 789.6200)

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

2-methyl-propan-1-ol (CAS 78-83-1)	
Fish (Short-term toxicity)	
LC50 (96h)	1430 mg/L - *Pimephales promelas* (Method according to Brooke LT et al. (1984))
Fish (Long-term toxicity)	
The hazard assessment of iso-butanol reveals neither a need to classify the substance as dangerous for the environment, nor is it a PBT or vPvB substance. Therefore, and for reasons of animal welfare, a long-term toxicity study in fish is not provided.	
Aquatic invertebrates (Short-term toxicity)	
EC50 (48 h)	1100 mg/L - *Daphnia pulex* (ASTM Methods (1984))
Aquatic invertebrates (Long-term toxicity)	
NOEC (21 d)	20 mg/L - *Daphnia magna* (provisional procedure proposed by the Federal Environmental Agency)
Algae and aquatic plants	
EC50 (96 h)	1799 mg/L- Pseudokirchnerella subcapitata(OECD Guideline 201,EU Method C.3, EPA OTS 797.1050)
NOEC (72h)	53 mg/L test(OECD Guideline 201,EU Method C.3, EPA OTS 797.1050)
Toxicity to aquatic micro-organisms	
IC50 (16h)	>1000 mg/L- sewage, industrial (Inhibition Control)

12.2. Persistence and degradability

Abiotic degradation:	Abiotic hydrolysis: study scientifically unjustified, substance is readily biodegradable Phototransformation in air: After evaporation or exposure to the air, the product will be slowly degraded by photochemical processes. Half-life (DT50): 56 h
Biodegradation	Substance is readily biodegradable % Degradation of test substance: 70 — 80 after 28 d (O2 consumption) 90 — 100 after 14 d (O2 consumption) (OECD Guideline 301 D, OECD Guideline 301 C)
Persistence and degradability	The substance is readily biodegradable according to OECD criteria.

12.3. Bioaccumulative potential

Aquatic bioaccumulation:	Regarding the 1-octanol/water partition coefficient, accumulation of the test substance in organisms is not to be expected.
Secondary poisoning:	The substance is readily biodegradable and has a low logKow. Secondary poisoning is not an issue of concern for this substance.

12.4. Mobility in soil

Biodegradation in soil:	The substance is readily biodegradable and has a low potential for adsorption (log Kow = 1).

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 treatment methods: Must be disposed of or incinerated in accordance with local regulations. Contaminated packaging: Contaminated packaging should be emptied as far as possible; then it can be passed on for recycling after being thoroughly cleaned. DO NOT CUT, DRILL, GRIND, WELD OR PERFORM SIMILAR OPERATIONS ON OR NEAR CONTAINERS EVEN WHEN EMPTY.
European List of Waste (LoW) code	Not available.

SECTION 14. TRANSPORT INFORMATION

14.1. Land transport (ADR/ RID)

UN-No.	1212
Proper Shipping Name:	ISOBUTANOL (ISOBUTYL ALCOHOL)
Hazard class:	3
Packing group:	III
Hazard label:	
Classification Code:	F1
Hazard identification number (HIN):	30
Tunnel restriction code (ADR)	3(D/E)
Environmental hazard:	No

14.2. Inland waterway transport (ADN)

UN-No.	1212
Proper Shipping Name:	ISOBUTANOL (ISOBUTYL ALCOHOL)
Hazard class:	3
Packing group:	III
Hazard label:	
Classification Code:	F1
Hazard identification number (HIN):	30
Environmental hazard:	No

14.3. Sea transport (IMDG)

UN-No.	1212
Proper Shipping Name:	ISOBUTANOL (ISOBUTYL ALCOHOL)
Hazard class:	3

Packing group: III
Hazard label: 

EmS-No. (Fire) F-E
EmS-No. (Spillage) S-D
Marine pollutant: No

14.4. Air transport (IATA/ICAO)

UN-No. 1212
Proper Shipping Name: ISOBUTANOL (ISOBUTYL ALCOHOL)
Hazard class: 3
Packing group: III
Hazard label: 

Environmental hazard: No

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-methyl-propan-1-ol (CAS 78-83-1) is not on the REACH Candidate List.
2-methyl-propan-1-ol (CAS 78-83-1) 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):
Physical Hazard – P5b - Flammable liquids.

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, vom 18. April 2017)	WGK- 1 (low danger for water pollution)

15.2. Chemical safety assessment

Chemical Safety Report has been performed for 2-methyl-propan-1-ol (CAS 78-83-1).

SECTION 16. OTHER INFORMATION

16.1. Indication of changes

Version	Date of change	Section	Description of changes
1	16/03/2010	ALL	Version created according to Regulations (EC) No 1907/2006 (Article 31.1)
2.1	07/02/2011	ALL	Version created according to Regulation (EC) No 1272/2008 (Regulation CLP) & 453/2010
2.2	07/04/2011	Appendix II	Appendix II was fully updated.
2.3	11/07/2011	3; 7; 8; 13; 15; 16. Appendix II; III	1. Index No (CLP) for hazard impurities was added to Section 3. 2. Section 8 was fully updated 3. The link to Appendix II was added to Section 7, 8 4. The link to Appendix III was added to Section 13 5. Appendix II was renamed into Appendix III. 6. Appendix II to the eSDS was added. 7. Section 15, 16 were fully updated
2.4	11/01/2014	APPENDIX II	The dossier was updated by the Lead Registrant This update contains an updated CSR including revised exposure scenarios.
3.0	03/04/2018	1-16, Annex	SDS has been corrected in according to new data of Registration dossier, Chemical Safety Report, and new Transport information.

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
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:

H226	Flammable Liquid, Category 3	Flammable liquid and vapour.
H315	Skin Irrit., Category 2	Causes skin irritation.
H318	Eye Dam., Category 1	Causes serious eye damage.
H335	STOT Single Exp., Category 3	May cause respiratory irritation. *Affected organs: respiratory tract.*
H336	STOT Single Exp. , Category 3	May cause drowsiness or dizziness. *Affected organs: central nervous system.*
H302	Acute Toxicity (oral), Category 4	Harmful if swallowed
H319	Eye Irrit., Category 2	Causes serious eye irritation
H412	Aquatic Chronic, Category 3	Harmful to aquatic life with long-lasting effects

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

ES1	Distribution of substances, p.19
ES2	Distribution of substances (professional), p.24
ES3	Formulation & (re)packing of substances and mixtures, p.29
ES4	Manufacture of substances,p.34
ES5	Metal working fluids / rolling oils, p. 38
ES6	Metal working fluids / rolling oils (professional), p.44
ES7	Production of iso-butanol, p.51
ES8	Use as consumer care product , p. 52
ES9	Use as intermediate, p.53
ES10	Use in cleaning agents, p.57
ES11	Use in cleaning agents (consumer), p.63
ES12	Use in cleaning agents (professional), p.71

ES13	Use in Coatings (paint, ink, toners, adhesives), p.77
ES14	Use in Coatings (paints, ink, toners, adhesives), consumer, p. 84
ES15	Use in Coatings (paints, ink, toners, adhesives), professional, p.96
ES16	Use in Laboratories, p.104
ES17	Use in lubricants, p.106
ES18	Use in Lubricants (consumer), p.114
ES19	Use in Lubricants (professional), p.121

16.5. Key literature references and sources

DOCUMENTS, PROVIDED BY FERC CONSORTIUM:

CHEMICAL SAFETY REPORT to 2-methyl-propan-1-ol (CAS 78-83-1).

EU DIRECTIVES

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.

Regulations. Commission regulation (EU) no 2015/830 of 31 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

Training advice

Personnel handling the product has to be acquainted demonstrably with its hazardous properties, with health and environmental protection principles related to the product and first aid principles.

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

Exposure Scenario 1 (ES1): Distribution of substances

Free short title	Distribution of substances
Systematic title based on use descriptor	ERC 1, 2; PROC 1, 2, 3, 4, 8A, 8B, 9, 15
Name of contributing environmental scenario and corresponding ERC	ERC 1 Production of chemicals 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 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	
Contributing Scenario (2) 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	medium
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.

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 95 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no

Exposure Scenario 2 (ES2): Distribution of substances (professional)

Free short title	Distribution of substances (professional)
Systematic title based on use descriptor	ERC 2, 1; PROC 1, 2, 3, 4, 8A, 8B, 9, 15
Name of contributing environmental scenario and corresponding ERC	ERC 2 Formulation of preparations 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 2	
Contributing Scenario (2) 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	medium
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.

Dermal	Use suitable chemically resistant gloves.
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	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	no
Contributing Scenario (9) controlling professional worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (10) controlling professional worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no

Exposure Scenario 3 (ES3): Formulation & (re)packing of substances and mixtures

Free short title	Formulation & (re)packing of substances and mixtures
Systematic title based on use descriptor	ERC 2; PROC 1, 2, 3, 4, 5, 8A, 8B, 9, 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 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	medium
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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

Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.

Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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 95 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no

Exposure Scenario 4 (ES4): Manufacture of substances

Free short title	Manufacture of substances
Systematic title based on use descriptor	ERC 1, 6A, 4; PROC 1, 2, 3, 4, 8A, 8B, 15
Name of contributing environmental scenario and corresponding ERC	ERC 1 Production of chemicals ERC 6a Industrial use of intermediates 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 15 - Use of laboratory reagents in small scale laboratories
Contributing Scenario (1) controlling environmental exposure for ERC 1	
Contributing Scenario (2) controlling environmental exposure for ERC 6A	
Contributing Scenario (3) 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	medium
Frequency and duration of use	
Duration of activity	>4 hours (default)
Frequency of use	5 days / week
Contributing Scenario (4) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 2	
Name of contributing scenario	2 - Use in closed, continuous process with occasional controlled exposure
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 3	
Name of contributing scenario	3 - Use in closed batch process (synthesis or formulation)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 4	
Name of contributing scenario	4 - Use in batch and other process (synthesis) where opportunity for exposure arises
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.

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 95 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no

Exposure Scenario 5 (ES5): Metal working fluids / rolling oils

Free short title	Metal working fluids / rolling oils
Systematic title based on use descriptor	ERC 4; PROC 1, 2, 3, 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 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 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	medium
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (5) controlling industrial worker exposure for PROC 5	
Name of contributing scenario	5 - Mixing or blending in batch processes (multistage and/or significant contact)

Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 7	
Name of contributing scenario	7 - Industrial spraying
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m). Ensure that a spraying booth is used. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Regular inspection and maintenance of equipment and machines.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves. Avoid frequent and direct contact with substance.
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	
Respiratory protection	no
Use of external/measured value inhalation	Calculated with Stoffenmanager 6
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
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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 95 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.

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	
Respiratory protection	no
Contributing Scenario (10) controlling industrial worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (12) controlling industrial worker exposure for PROC 17	
Name of contributing scenario	17 - Lubrication at high energy conditions and in partly open process
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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	elevated Temp.
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no

Exposure Scenario 6 (ES6): Metal working fluids / rolling oils (professional)

Free short title	Metal working fluids / rolling oils (professional)
Systematic title based on use descriptor	ERC 8A; PROC 1, 2, 3, 5, 8A, 8B, 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 10 - Roller application or brushing PROC 11 - Non industrial spraying 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 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	medium
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)

Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	no
Contributing Scenario (8) controlling professional worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (9) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying
Scenario subtitle	Automatic
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Ensure that a spraying booth is used. Clean equipment and the work area every day. Regular inspection and maintenance of equipment and machines.

Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves. Avoid frequent and direct contact with substance.
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	
Respiratory protection	no
Use of external/measured value inhalation	Calculated with Stoffenmanager 6
Contributing Scenario (10) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying
Scenario subtitle	Manual
Qualitative Risk Assessment	
General	Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Use equipment with a fixed capturing hood exhaust ventilation. In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves. Avoid frequent and direct contact with substance.
Product characteristics	
Physical state	liquid
Concentration in substance	10 %, concentration has been considered linearly *(justification: ART input value: max. concentration* *Application rate < 3L/min (surface spraying)* *Room size >= 300m³ (large workrooms))*
Fugacity / Dustiness	medium
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	
Respiratory protection	no
Use of external/measured value inhalation	Calculated with ART v1.5

Contributing Scenario (11) controlling professional worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (13) controlling professional worker exposure for PROC 17	
Name of contributing scenario	17 - Lubrication at high energy conditions and in partly open process
Scenario subtitle	elevated Temp.
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance. In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Process temperature	108 °C
Fugacity / Dustiness	high
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
Ventilation	good (30%)
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	
Respiratory protection	no

Exposure Scenario 7 (ES7): Production of iso-butanol

Free short title	Production of iso-butanol
Systematic title based on use descriptor	ERC 1; PROC 1
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
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.	
Contributing Scenario (2) controlling industrial worker exposure for PROC 1	
Name of contributing scenario	1 - Use in closed process, no likelihood of exposure
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
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	
Respiratory protection	no

Exposure Scenario 8 (ES8): Use as consumer care product

Free short title	Use as consumer care product
Systematic title based on use descriptor	ERC 8A, 8D; PC 28, 39
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 28 Perfumes, Fragrances PC 39 Cosmetics
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 28	
Name of contributing scenario	PC 28 Perfumes, Fragrances
This scenario has not been calculated. Justification:	In accordance to the Article 14 (5b) of the REACh Regulation (EC) No 1907/2006, exposure estimation and risk characterisation needs not to be performed for end uses in cosmetic products within the scope of Directive 76/768/EEC.
Contributing Scenario (4) controlling consumer exposure for PC 39	
Name of contributing scenario	PC 39 Cosmetics
This scenario has not been calculated. Justification:	In accordance to the Article 14 (5b) of the REACh Regulation (EC) No 1907/2006, exposure estimation and risk characterisation needs not to be performed for end uses in cosmetic products within the scope of Directive 76/768/EEC.

Exposure Scenario 9 (ES9): Use as intermediate

Free short title	Use as intermediate
Systematic title based on use descriptor	ERC 6A; PROC 1, 2, 3, 4, 8A, 8B, 9
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 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 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	medium
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.

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 95 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no

Exposure Scenario 10 (ES10): Use in cleaning agents

Free short title	Use in cleaning agents
Systematic title based on use descriptor	ERC 4; PROC 1, 2, 3, 4, 7, 8A, 8B, 9, 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 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
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	medium
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (6) controlling industrial worker exposure for PROC 7	
Name of contributing scenario	7 - Industrial spraying
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m). Ensure that a spraying booth is used. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Regular inspection and maintenance of equipment and machines.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves. Avoid frequent and direct contact with substance.
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	
Respiratory protection	no
Use of external/measured value inhalation	Calculated with Stoffenmanager 6
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
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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 95 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.

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	
Respiratory protection	no
Contributing Scenario (10) controlling industrial worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no

Exposure Scenario 11 (ES11): Use in cleaning agents (consumer)

Free short title	Use in cleaning agents (consumer)
Systematic title based on use descriptor	ERC 8A, 8D; PC 4, 9a, 9c, 24, 35, 38
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 4 Anti-Freeze and De-icing products PC 4 Anti-Freeze and De-icing products PC 4 Anti-Freeze and De-icing products PC 9a Coatings and Paints, thinners, paint removers PC 9a Coatings and Paints, thinners, paint removers PC 9a Coatings and Paints, thinners, paint removers PC 9a Coatings and Paints, thinners, paint removers PC 9c Face and finger paints PC 24 Lubricants, Greases and Release 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 38 Welding and soldering products, flux 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 4	
Name of contributing scenario	PC 4 Anti-Freeze and De-icing products
Scenario subtitle	Refill antifreeze
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
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Amounts used	
Inhalation	2,000 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	1.5 1/h
Contributing Scenario (4) controlling consumer exposure for PC 4	
Name of contributing scenario	PC 4 Anti-Freeze and De-icing products
Scenario subtitle	Lock de-icing
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
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	50 %
Amounts used	
Inhalation	4 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	1.5 1/h
Contributing Scenario (5) controlling consumer exposure for PC 4	
Name of contributing scenario	PC 4 Anti-Freeze and De-icing products
Scenario subtitle	Washing car windows
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
Product characteristics	
Spray application	no
Product ingredient fraction by weight	50 %
Amounts used	
Inhalation	15 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	1.5 1/h
Contributing Scenario (6) controlling consumer exposure for PC 9a	
Name of contributing scenario	PC 9a Coatings and Paints, thinners, paint removers
Calculation model	ConsExpo water borne paint - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per year

Exposure time	132 min
Application duration	120 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	1.5 %
Mol weight matrix	45 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	1,250 g
Human factors not influenced by risk management	
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	20 °C
Contributing Scenario (7) controlling consumer exposure for PC 9a	
Name of contributing scenario	PC 9a Coatings and Paints, thinners, paint removers
Calculation model	ConsExpo high solid paint - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per year
Exposure time	132 min
Application duration	120 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	2 %
Mol weight matrix	550 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	1,300 g
Human factors not influenced by risk management	
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	20 °C
Contributing Scenario (8) controlling consumer exposure for PC 9a	
Name of contributing scenario	PC 9a Coatings and Paints, thinners, paint removers
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	2 per year
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	25 %
Amounts used	
Inhalation	400 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	1.5 1/h
Contributing Scenario (9) controlling consumer exposure for PC 9a	
Name of contributing scenario	PC 9a Coatings and Paints, thinners, paint removers
Calculation model	ConsExpo Glue remover - 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	240 min
Application duration	240 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	3 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	2,000 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	

Room volume	30 m^3
Ventilation rate	1.5 1/h
Release area increases over time	
Release area	5.00E4 cm^2
Release temperature	20 °C
Contributing Scenario (10) controlling consumer exposure for PC 9c	
Name of contributing scenario	PC 9c Face and finger paints
Calculation model	Ecetoc TRA
Frequency and duration of use	
Frequency of use	365 times/year (Frequent)
Product characteristics	
Product ingredient fraction by weight	50 %
Human factors not influenced by risk management	
Skin surface area dermal	hands
Skin surface area oral	-
Tranfer factor dermal	100 %
Transfer factor ingestion	100 %
Other given operational conditions affecting consumers exposure	
Contributing Scenario (11) controlling consumer exposure for PC 24	
Name of contributing scenario	PC 24 Lubricants, Greases and Release Products
This scenario has not been calculated. Justification:	Exposure of the consumer can be ruled out. Use in closed system is assumed
Contributing Scenario (12) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)
Calculation model	Ecetoc TRA
Product subcategory	Laundry and dish washing products
Frequency and duration of use	
Frequency of use	365 times/year (Frequent)
Exposure time	1 h
Product characteristics	
Spray application	no
Product ingredient fraction by weight	5 %
Amounts used	
Amounts used	15 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	100.0 %
Contributing Scenario (13) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)
Scenario subtitle	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	104 per year
Exposure time	0.750 min
Application duration	0.300 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	50 %
Mol weight matrix	22 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	500 g
Human factors not influenced by risk management	
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	20 °C
Contributing Scenario (14) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)
Scenario subtitle	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	104 per year
Exposure time	240 min
Application duration	30 min
Product characteristics	
Spray application	no

Product ingredient fraction by weight	4 %
Mol weight matrix	18 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	880 g
Human factors not influenced by risk management	
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	20 °C
Contributing Scenario (15) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)
Calculation model	ConsExpo Bathroom cleaning spray - Application: cleaning
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	52 per year
Exposure time	25 min
Application duration	20 min
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	20 %
Mol weight matrix	36 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	30 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	10 m^3
Ventilation rate	2 1/h
Release are is constant	
Release area	6.40E4 cm^2
Release temperature	20 °C
Contributing Scenario (16) controlling consumer exposure for PC 38	
Name of contributing scenario	PC 38 Welding and soldering products, flux 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
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Amounts used	
Inhalation	12 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	20 m^3
Ventilation rate	0.600 1/h

Exposure Scenario 12 (ES12): Use in cleaning agents (professional)

Free short title	Use in cleaning agents (professional)
Systematic title based on use descriptor	ERC 8A, 8D; PROC 1, 2, 3, 4, 8A, 8B, 9, 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 9 - Transfer of chemicals into small containers (dedicated filling line) PROC 10 - Roller application or brushing PROC 11 - Non industrial spraying 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	medium
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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

Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.

Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	no
Contributing Scenario (9) controlling professional worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (10) controlling professional worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (11) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Ensure that a spraying booth is used. Clean equipment and the work area every day. Regular inspection and maintenance of equipment and machines.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves. Avoid frequent and direct contact with substance.
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	
Respiratory protection	no
Use of external/measured value inhalation	Calculated with Stoffenmanager 6
Contributing Scenario (12) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying
Qualitative Risk Assessment	
General	Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Use equipment with a fixed capturing hood exhaust ventilation. In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves. Avoid frequent and direct contact with substance.
Product characteristics	
Physical state	liquid

Concentration in substance	10 %, concentration has been considered linearly *(justification: ART input value: max. concentration* *Application rate < 3L/min (surface spraying)* *Room size >= 300m³ (large workrooms))*
Fugacity / Dustiness	medium
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	
Respiratory protection	no
Use of external/measured value inhalation	Calculated with ART v1.5
Contributing Scenario (13) controlling professional worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no

Exposure Scenario 13 (ES13): Use in Coatings (paint,ink,toners,adhesives)

Free short title	Use in Coatings (paint,ink,toners,adhesives)
Systematic title based on use descriptor	ERC 4; PROC 1, 2, 3, 4, 5, 7, 8A, 8B, 9, 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 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 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	medium
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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

Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 7	
Name of contributing scenario	7 - Industrial spraying
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m). Ensure that a spraying booth is used. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Regular inspection and maintenance of equipment and machines.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves. Avoid frequent and direct contact with substance.
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	
Respiratory protection	no
Use of external/measured value inhalation	Calculated with Stoffenmanager 6
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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 95 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (11) controlling industrial worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (13) controlling industrial worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no

Exposure Scenario 14 (ES14): Use in Coatings (paints, ink, toners,adhesives), consumer

Free short title	Use in Coatings (paints, ink, toners,adhesives), consumer
Systematic title based on use descriptor	ERC 8F, 8C, 8A, 8D; PC 1, 4, 9a, 9c, 15, 18, 23, 24, 31
Name of contributing environmental scenario and corresponding ERC	ERC 8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC 8c Wide dispersive indoor use resulting in inclusion into or onto a matrix 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 1 Adhesives, Sealants PC 1 Adhesives, Sealants PC 1 Adhesives, Sealants PC 1 Adhesives, Sealants PC 4 Anti-Freeze and De-icing products PC 4 Anti-Freeze and De-icing products PC 4 Anti-Freeze and De-icing products PC 9a Coatings and Paints, thinners, paint removers PC 9a Coatings and Paints, thinners, paint removers PC 9a Coatings and Paints, thinners, paint removers PC 9a Coatings and Paints, thinners, paint removers PC 9c Face and finger paints PC 15 Non-metal-surface treatment products PC 15 Non-metal-surface treatment products PC 15 Non-metal-surface treatment products PC 15 Non-metal-surface treatment products PC 18 Ink and Toners PC 23 Leather tanning, dye, finishing, impregnation and care products PC 24 Lubricants, Greases and Release Products PC 31 Polishes and Wax Blends PC 31 Polishes and Wax Blends
Contributing Scenario (1) controlling environmental exposure for ERC 8F	
Contributing Scenario (2) controlling environmental exposure for ERC 8C	
Contributing Scenario (3) controlling environmental exposure for ERC 8A	
Contributing Scenario (4) controlling environmental exposure for ERC 8D	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Contributing Scenario (5) controlling consumer exposure for PC 1	
Name of contributing scenario	PC 1 Adhesives, Sealants
Calculation model	Ecetoc TRA
Product subcategory	Glues, hobby use
Frequency and duration of use	
Frequency of use	365 times/year (Frequent)
Exposure time	4 h
Product characteristics	
Spray application	no
Product ingredient fraction by weight	30 %
Amounts used	
Amounts used	9 g

Human factors not influenced by risk management	
Skin surface area dermal	fingertips
Skin surface area oral	-
Tranfer factor dermal	100 %
Other given operational conditions affecting consumers exposure	
Room volume	20 m^3
Release fraction to air	100.0 %
Contributing Scenario (6) controlling consumer exposure for PC 1	
Name of contributing scenario	PC 1 Adhesives, Sealants
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
Product characteristics	
Spray application	no
Product ingredient fraction by weight	2 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	9,000 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	58 m^3
Ventilation rate	2.5 1/h
Release are is constant	
Release area	4.00E4 cm^2
Release temperature	20 °C
Contributing Scenario (7) controlling consumer exposure for PC 1	
Name of contributing scenario	PC 1 Adhesives, Sealants
Calculation model	ConsExpo Spray glue - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	12 per year

Exposure time	240 min
Application duration	3 min
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	6 %
Mol weight matrix	100 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	204 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	20 m^3
Ventilation rate	0.600 1/h
Release are is constant	
Release area	2.00E4 cm^2
Release temperature	20 °C
Contributing Scenario (8) controlling consumer exposure for PC 1	
Name of contributing scenario	PC 1 Adhesives, Sealants
Calculation model	ConsExpo Joint sealant - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	3 per year
Exposure time	45 min
Application duration	30 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	12 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	75 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	10 m^3
Ventilation rate	2 1/h
Release area increases over time	

Release area	250 cm^2
Release temperature	20 °C
Contributing Scenario (9) controlling consumer exposure for PC 4	
Name of contributing scenario	PC 4 Anti-Freeze and De-icing products
Scenario subtitle	Refill antifreeze
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
Product characteristics	
Spray application	no
Product ingredient fraction by weight	10 %
Amounts used	
Inhalation	2,000 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	1.5 1/h
Contributing Scenario (10) controlling consumer exposure for PC 4	
Name of contributing scenario	PC 4 Anti-Freeze and De-icing products
Scenario subtitle	Lock de-icing
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
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	50 %
Amounts used	
Inhalation	4 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	1.5 1/h
Contributing Scenario (11) controlling consumer exposure for PC 4	
Name of contributing scenario	PC 4 Anti-Freeze and De-icing products

Scenario subtitle	Washing car windows
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
Product characteristics	
Spray application	no
Product ingredient fraction by weight	50 %
Amounts used	
Inhalation	15 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	1.5 1/h
Contributing Scenario (12) controlling consumer exposure for PC 9a	
Name of contributing scenario	PC 9a Coatings and Paints, thinners, paint removers
Calculation model	ConsExpo water borne paint - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per year
Exposure time	132 min
Application duration	120 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	1.5 %
Mol weight matrix	45 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	1,250 g
Human factors not influenced by risk management	
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	20 °C
Contributing Scenario (13) controlling consumer exposure for PC 9a	
Name of contributing scenario	PC 9a Coatings and Paints, thinners, paint removers
Calculation model	ConsExpo high solid paint - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per year
Exposure time	132 min
Application duration	120 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	2 %
Mol weight matrix	550 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	1,300 g
Human factors not influenced by risk management	
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	20 °C
Contributing Scenario (14) controlling consumer exposure for PC 9a	
Name of contributing scenario	PC 9a Coatings and Paints, thinners, paint removers
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	2 per year
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	25 %
Amounts used	
Inhalation	400 g
Human factors not influenced by risk management	

Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	1.5 1/h
Contributing Scenario (15) controlling consumer exposure for PC 9a	
Name of contributing scenario	PC 9a Coatings and Paints, thinners, paint removers
Calculation model	ConsExpo Glue remover - 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	240 min
Application duration	240 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	3 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	2,000 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	30 m^3
Ventilation rate	1.5 1/h
Release area increases over time	
Release area	5.00E4 cm^2
Release temperature	20 °C
Contributing Scenario (16) controlling consumer exposure for PC 9c	
Name of contributing scenario	PC 9c Face and finger paints
Calculation model	Ecetoc TRA
Frequency and duration of use	
Frequency of use	365 times/year (Frequent)
Product characteristics	
Product ingredient fraction by weight	15 %
Human factors not influenced by risk management	
Skin surface area dermal	hands
Skin surface area oral	-
Tranfer factor dermal	100 %

Transfer factor ingestion	100 %
Other given operational conditions affecting consumers exposure	
Contributing Scenario (17) controlling consumer exposure for PC 15	
Name of contributing scenario	PC 15 Non-metal-surface treatment products
Scenario subtitle	Waterborn paint
Calculation model	ConsExpo water borne paint - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per year
Exposure time	132 min
Application duration	120 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	1.5 %
Mol weight matrix	45 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	1,250 g
Human factors not influenced by risk management	
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	20 °C
Contributing Scenario (18) controlling consumer exposure for PC 15	
Name of contributing scenario	PC 15 Non-metal-surface treatment products
Scenario subtitle	High solid point
Calculation model	ConsExpo high solid paint - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	1 per year
Exposure time	132 min
Application duration	120 min
Product characteristics	

Spray application	no
Product ingredient fraction by weight	2 %
Mol weight matrix	550 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	1,300 g
Human factors not influenced by risk management	
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	20 °C
Contributing Scenario (19) controlling consumer exposure for PC 15	
Name of contributing scenario	PC 15 Non-metal-surface treatment products
Scenario subtitle	Spray paint
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	2 per year
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	25 %
Amounts used	
Inhalation	400 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	34 m^3
Ventilation rate	1.5 1/h
Contributing Scenario (20) controlling consumer exposure for PC 15	
Name of contributing scenario	PC 15 Non-metal-surface treatment products
Scenario subtitle	Removers (glue remover as worst case)
Calculation model	ConsExpo Glue remover - 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	240 min
Application duration	240 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	3 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	2,000 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	30 m^3
Ventilation rate	1.5 1/h
Release area increases over time	
Release area	5.00E4 cm^2
Release temperature	20 °C
Contributing Scenario (21) controlling consumer exposure for PC 18	
Name of contributing scenario	PC 18 Ink and Toners
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
Product characteristics	
Spray application	no
Product ingredient fraction by weight	4 %
Amounts used	
Inhalation	40 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	20 m^3
Ventilation rate	0.600 1/h
Contributing Scenario (22) controlling consumer exposure for PC 23	
Name of contributing scenario	PC 23 Leather tanning, dye, finishing, impregnation and care products
Scenario subtitle	includes spray applications
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
Emission duration	240 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	30 %
Amounts used	
Inhalation	150 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	58 m^3
Ventilation rate	0.600 1/h
Contributing Scenario (23) controlling consumer exposure for PC 24	
Name of contributing scenario	PC 24 Lubricants, Greases and Release Products
This scenario has not been calculated. Justification:	Exposure of the consumer can be ruled out. Use in closed system is assumed
Contributing Scenario (24) controlling consumer exposure for PC 31	
Name of contributing scenario	PC 31 Polishes and Wax Blends
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 year
Exposure time	240 min
Application duration	90 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	20 %
Mol weight matrix	272 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	550 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	58 m^3

Ventilation rate	2.5 1/h
Release area increases over time	
Release area	2.20E5 cm^2
Release temperature	20 °C
Contributing Scenario (25) controlling consumer exposure for PC 31	
Name of contributing scenario	PC 31 Polishes and Wax Blends
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 year
Exposure time	240 min
Application duration	90 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	20 %
Mol weight matrix	272 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	550 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	58 m^3
Ventilation rate	2.5 1/h
Release area increases over time	
Release area	2.20E5 cm^2
Release temperature	20 °C

Exposure Scenario 15(ES15): Use in Coatings (paints, ink, toners,adhesives), professional

Free short title	Use in Coatings (paints, ink, toners,adhesives), professional
Systematic title based on use descriptor	ERC 8F, 8A, 8C, 8D; PROC 1, 2, 3, 4, 5, 8A, 8B, 9, 10, 11, 13, 15, 19
Name of contributing environmental scenario and corresponding ERC	ERC 8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix 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
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 11 - Non industrial spraying PROC 13 - Treatment of articles by dipping and pouring 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 8F	
Contributing Scenario (2) controlling environmental exposure for ERC 8A	
Contributing Scenario (3) controlling environmental exposure for ERC 8C	
Contributing Scenario (4) 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	medium
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.

Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	no
Conditions and measures related to personal protection, hygiene and health evaluation	
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)

Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (13) controlling professional worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (14) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying
Scenario subtitle	Automatic
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Ensure that a spraying booth is used. Clean equipment and the work area every day. Regular inspection and maintenance of equipment and machines.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves. Avoid frequent and direct contact with substance.
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	
Respiratory protection	no
Use of external/measured value inhalation	Calculated with Stoffenmanager 6
Contributing Scenario (15) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying
Scenario subtitle	Manual
Qualitative Risk Assessment	
General	Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Use equipment with a fixed capturing hood exhaust ventilation. In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves. Avoid frequent and direct contact with substance.
Product characteristics	
Physical state	liquid
Concentration in substance	10 %, concentration has been considered linearly *(justification: ART input value: max. concentration* *Application rate < 3L/min (surface spraying)* *Room size >= 300m³ (large workrooms))*
Fugacity / Dustiness	medium
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	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	
Respiratory protection	no
Use of external/measured value inhalation	Calculated with ART v1.5
Contributing Scenario (16) controlling professional worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	95 %

Exposure Scenario 16 (ES16): Use in Laboratories

Free short title	Use in Laboratories
Systematic title based on use descriptor	ERC 8A; PROC 10, 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 10 - Roller application or brushing 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.	
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Fugacity / Dustiness	medium
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 10	
Name of contributing scenario	10 - Roller application or brushing
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (3) controlling professional worker exposure for PROC 15	
Name of contributing scenario	15 - Use of laboratory reagents in small scale laboratories
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.

Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no

Exposure Scenario 17 (ES17): Use in lubricants

Free short title	Use in lubricants
Systematic title based on use descriptor	ERC 7, 4; PROC 1, 2, 3, 4, 7, 8A, 8B, 9, 10, 13, 17, 18
Name of contributing environmental scenario and corresponding ERC	ERC 7 Industrial use of substances in closed systems 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 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 17 - Lubrication at high energy conditions and in partly open process PROC 18 - Greasing at high energy conditions PROC 18 - Greasing at high energy conditions
Contributing Scenario (1) controlling environmental exposure for ERC 7	
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	medium
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (7) controlling industrial worker exposure for PROC 7	
Name of contributing scenario	7 - Industrial spraying
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m). Ensure that a spraying booth is used. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Regular inspection and maintenance of equipment and machines.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves. Avoid frequent and direct contact with substance.
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	
Respiratory protection	no
Use of external/measured value inhalation	Calculated with Stoffenmanager 6
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

Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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 95 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.

Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (11) controlling industrial worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (14) controlling industrial worker exposure for PROC 17	
Name of contributing scenario	17 - Lubrication at high energy conditions and in partly open process
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Process temperature	108 °C
Fugacity / Dustiness	high
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	
Respiratory protection	no
Contributing Scenario (15) controlling industrial worker exposure for PROC 18	
Name of contributing scenario	18 - Greasing at high energy conditions
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (16) controlling industrial worker exposure for PROC 18	
Name of contributing scenario	18 - Greasing at high energy conditions
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Process temperature	108 °C
Fugacity / Dustiness	high
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	
Respiratory protection	no

Exposure Scenario 18 (ES18): Use in Lubricants (consumer)

Free short title	Use in Lubricants (consumer)
Systematic title based on use descriptor	ERC 9B, 9A, 8A, 8D; PC 1, 24, 31, 35
Name of contributing environmental scenario and corresponding ERC	ERC 9b Wide dispersive outdoor use of substances in closed systems ERC 9a Wide dispersive indoor use of substances in closed systems 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 1 Adhesives, Sealants PC 1 Adhesives, Sealants PC 1 Adhesives, Sealants PC 1 Adhesives, Sealants PC 24 Lubricants, Greases and Release Products PC 31 Polishes and Wax Blends PC 31 Polishes and Wax Blends 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 9B	
Contributing Scenario (2) controlling environmental exposure for ERC 9A	
Contributing Scenario (3) controlling environmental exposure for ERC 8A	
Contributing Scenario (4) controlling environmental exposure for ERC 8D	
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.	
Contributing Scenario (5) controlling consumer exposure for PC 1	
Name of contributing scenario	PC 1 Adhesives, Sealants
Calculation model	Ecetoc TRA
Product subcategory	Glues, hobby use
Frequency and duration of use	
Frequency of use	365 times/year (Frequent)
Exposure time	4 h
Product characteristics	
Spray application	no
Product ingredient fraction by weight	30 %
Amounts used	
Amounts used	9 g
Human factors not influenced by risk management	
Skin surface area dermal	fingertips
Skin surface area oral	-
Tranfer factor dermal	100 %
Other given operational conditions affecting consumers exposure	
Room volume	20 m^3
Release fraction to air	100.0 %
Contributing Scenario (6) controlling consumer exposure for PC 1	
Name of contributing scenario	PC 1 Adhesives, Sealants

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
Product characteristics	
Spray application	no
Product ingredient fraction by weight	2 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	9,000 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	58 m^3
Ventilation rate	2.5 1/h
Release are is constant	
Release area	4.00E4 cm^2
Release temperature	20 °C
Contributing Scenario (7) controlling consumer exposure for PC 1	
Name of contributing scenario	PC 1 Adhesives, Sealants
Calculation model	ConsExpo Spray glue - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	12 per year
Exposure time	240 min
Application duration	3 min
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	6 %
Mol weight matrix	100 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	204 g

Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	20 m^3
Ventilation rate	0.600 1/h
Release are is constant	
Release area	2.00E4 cm^2
Release temperature	20 °C
Contributing Scenario (8) controlling consumer exposure for PC 1	
Name of contributing scenario	PC 1 Adhesives, Sealants
Calculation model	ConsExpo Joint sealant - Application
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	3 per year
Exposure time	45 min
Application duration	30 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	12 %
Mol weight matrix	3,000 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	75 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	10 m^3
Ventilation rate	2 1/h
Release area increases over time	
Release area	250 cm^2
Release temperature	20 °C
Contributing Scenario (9) controlling consumer exposure for PC 24	
Name of contributing scenario	PC 24 Lubricants, Greases and Release Products
This scenario has not been calculated. Justification:	Exposure of the consumer can be ruled out. Use in closed system is assumed
Contributing Scenario (10) controlling consumer exposure for PC 31	
Name of contributing scenario	PC 31 Polishes and Wax Blends
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 year
Exposure time	240 min
Application duration	90 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	20 %
Mol weight matrix	272 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	550 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	58 m^3
Ventilation rate	2.5 1/h
Release area increases over time	
Release area	2.20E5 cm^2
Release temperature	20 °C
Contributing Scenario (11) controlling consumer exposure for PC 31	
Name of contributing scenario	PC 31 Polishes and Wax Blends
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 year
Exposure time	240 min
Application duration	90 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	20 %
Mol weight matrix	272 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	550 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	

Inhalation	
Room volume	58 m^3
Ventilation rate	2.5 1/h
Release area increases over time	
Release area	2.20E5 cm^2
Release temperature	20 °C
Contributing Scenario (12) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)
Calculation model	Ecetoc TRA
Product subcategory	Laundry and dish washing products
Frequency and duration of use	
Frequency of use	365 times/year (Frequent)
Exposure time	1 h
Product characteristics	
Spray application	no
Product ingredient fraction by weight	5 %
Amounts used	
Amounts used	15 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	100.0 %
Contributing Scenario (13) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)
Scenario subtitle	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	104 per year
Exposure time	0.750 min
Application duration	0.300 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	50 %
Mol weight matrix	22 g/mol

Mass transfer rate	- m/min
Amounts used	
Inhalation	500 g
Human factors not influenced by risk management	
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	20 °C
Contributing Scenario (14) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)
Scenario subtitle	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	104 per year
Exposure time	240 min
Application duration	30 min
Product characteristics	
Spray application	no
Product ingredient fraction by weight	4 %
Mol weight matrix	18 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	880 g
Human factors not influenced by risk management	
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	20 °C
Contributing Scenario (15) controlling consumer exposure for PC 35	
Name of contributing scenario	PC 35 Washing and Cleaning Products (including solvent based products)

Calculation model	ConsExpo Bathroom cleaning spray - Application: cleaning
Frequency and duration of use	
Inhalation	
Exposure calculation result type	Mean concentration on day of exposure
Frequency of use	52 per year
Exposure time	25 min
Application duration	20 min
Product characteristics	
Spray application	yes
Product ingredient fraction by weight	20 %
Mol weight matrix	36 g/mol
Mass transfer rate	- m/min
Amounts used	
Inhalation	30 g
Human factors not influenced by risk management	
Other given operational conditions affecting consumers exposure	
Inhalation	
Room volume	10 m^3
Ventilation rate	2 1/h
Release are is constant	
Release area	6.40E4 cm^2
Release temperature	20 °C

Exposure Scenario 19 (ES19): Use in Lubricants (professional)

Free short title	Use in Lubricants (professional)
Systematic title based on use descriptor	ERC 9B, 9A, 8A, 8D; PROC 1, 2, 3, 4, 8A, 8B, 9, 10, 13, 17, 18, 20, 11
Name of contributing environmental scenario and corresponding ERC	ERC 9b Wide dispersive outdoor use of substances in closed systems ERC 9a Wide dispersive indoor use of substances in closed systems 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 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 PROC 20 - Heat and pressure transfer fluids (closed systems) in dispersive use PROC 17 - Lubrication at high energy conditions and in partly open process PROC 18 - Greasing at high energy conditions PROC 11 - Non industrial spraying PROC 11 - Non industrial spraying
Contributing Scenario (1) controlling environmental exposure for ERC 9B	
Contributing Scenario (2) controlling environmental exposure for ERC 9A	
Contributing Scenario (3) controlling environmental exposure for ERC 8A	
Contributing Scenario (4) 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	medium
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	In case of potential exposure: Use suitable eye protection.

Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
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
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (9) controlling professional worker exposure for PROC 8A	
Name of contributing scenario	8a - Transfer of chemicals from/to vessels/ large containers at non dedicated facilities
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no

Contributing Scenario (10) controlling professional worker exposure for PROC 8B	
Name of contributing scenario	8b - Transfer of chemicals from/to vessels/ large containers at dedicated facilities
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	no
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	no
Contributing Scenario (11) controlling professional worker exposure for PROC 9	
Name of contributing scenario	9 - Transfer of chemicals into small containers (dedicated filling line)
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (12) controlling professional worker exposure for PROC 10	
Name of contributing scenario	10 - Roller application or brushing
Qualitative Risk Assessment	

General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (13) controlling professional worker exposure for PROC 13	
Name of contributing scenario	13 - Treatment of articles by dipping and pouring
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (14) controlling professional worker exposure for PROC 17	
Name of contributing scenario	17 - Lubrication at high energy conditions and in partly open process
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.

Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (15) controlling professional worker exposure for PROC 18	
Name of contributing scenario	18 - Greasing at high energy conditions
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (16) controlling professional worker exposure for PROC 20	
Name of contributing scenario	20 - Heat and pressure transfer fluids (closed systems) in dispersive use
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
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	
Respiratory protection	no
Contributing Scenario (17) controlling professional worker exposure for PROC 17	
Name of contributing scenario	17 - Lubrication at high energy conditions and in partly open process
Scenario subtitle	elevated Temp.
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance. In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.
Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Process temperature	108 °C
Fugacity / Dustiness	high
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	yes (inhalation 80 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	no
Contributing Scenario (18) controlling professional worker exposure for PROC 18	
Name of contributing scenario	18 - Greasing at high energy conditions
Scenario subtitle	elevated Temp.
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Avoid frequent and direct contact with substance. In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves.

Product characteristics	
Physical state	liquid
Concentration in substance	100 %
Process temperature	108 °C
Fugacity / Dustiness	high
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	yes (inhalation 80 %)
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection	no
Contributing Scenario (19) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying
Scenario subtitle	Automatic
Qualitative Risk Assessment	
General	Ensure minimization of manual phases. Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Ensure that a spraying booth is used. Clean equipment and the work area every day. Regular inspection and maintenance of equipment and machines.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves. Avoid frequent and direct contact with substance.
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	
Respiratory protection	no
Use of external/measured value inhalation	Calculated with Stoffenmanager 6
Contributing Scenario (20) controlling professional worker exposure for PROC 11	
Name of contributing scenario	11 - Non industrial spraying
Scenario subtitle	Manual
Qualitative Risk Assessment	

General	Supervision in place to check that the RMMs in place are being used correctly and OCs followed. Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Use equipment with a fixed capturing hood exhaust ventilation. In case no suitable local exhaust ventilation is present: Wear suitable respiratory protection.
Eyes	Use suitable eye protection.
Dermal	Use suitable chemically resistant gloves. Avoid frequent and direct contact with substance.
Product characteristics	
Physical state	liquid
Concentration in substance	10 %, concentration has been considered linearly *(justification: ART input value: max. concentration* *Application rate < 3L/min (surface spraying)* *Room size >= 300m³ (large workrooms))*
Fugacity / Dustiness	medium
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	
Respiratory protection	no
Use of external/measured value inhalation	Calculated with ART v1.5

END OF SAFETY DATA SHEET