SAFETY DATA SHEET

Methanol

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product Name	Methanol
Chemical Name	Methyl alcohol
Chemical Formula	CH_4O
CAS No.	67-56-1
EC No.	200-659-6
REACH Registration No.	01-2119433307-44-0254

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

Identified Use(s)	• Formulation and (re)packing of substances and mixtures • Use as a fuel in industrial settings • Use as a fuel in professional settings • Industrial use in cleaning agents
Uses Advised Against	None known.

1.3 Details of the supplier of the safety data sheet

Company Identification	Qatar Fuel Additives Company Ltd.
Address	Mesaieed Industrial City, PO Box 22700, Doha, State of Qatar.
Telephone	(+) 974-4477 3400
E-mail	info@qafac.com.qa
Only representative of a non-Community manufacturer	
Company Identification	MUNTAJAT B.V.
Address	Prinses Margrietplantsoen 78-A 2595 BR, La Haye Pays Bas
Telephone	+31(0)70 219 7000
E-mail	REACH@muntajatbv.com
Website	www.muntajatbv.com

1.4 Emergency telephone number

National Poisons Information Service (Birmingham Centre)	+44 (0) 111
For Spill, Leak, Fire, Exposure or Accident, Call CHEMTREC Day or Night	Within USA and Canada: 1-800-424-9300 Outside USA and Canada: +1 703-741-5970 and +1-703-527-3887 (collect calls accepted)

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Regulation (EC) No. 1272/2008 (CLP)	Flam. Liq. 2 :Highly flammable liquid and vapour. Acute Tox. 3 :Toxic if swallowed. Acute Tox. 3 :Toxic in contact with skin. Acute Tox. 3 :Toxic if inhaled. STOT SE 1 :Causes damage to organs.

2.2 Label elements

According to Regulation (EC) No. 1272/2008 (CLP)

Product Name: Methanol.

Hazard Pictogram(s)


GHS02


GHS06


GHS08

Signal Word(s): Danger

Hazard Statement(s)	H225: Highly flammable liquid and vapour. H301: Toxic if swallowed. H311: Toxic in contact with skin. H331: Toxic if inhaled. H370: Causes damage to organs.
Precautionary Statement(s)	P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P260: Do not breathe vapour. P280: Wear protective gloves/protective clothing/eye protection/face protection. P301+P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor. P308+P311: IF exposed or concerned: Call a POISON CENTER/doctor. P370+P378: In case of fire: Use water spray or fog, alcohol resistant foam, dry chemical or carbon dioxide to extinguish.

2.3 Other hazards

None known.

2.4 Additional Information

For full text of H/P Statements see section 16.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

HAZARDOUS INGREDIENT(S)	CAS No.	EC No.	%W/W	Hazard Statement(s)	Hazard Pictogram(s)
Methanol	67-56-1	200-659-6 01-2119433307-44-XXXX	≥99	Flam. Liq. 2 H225 Acute Tox. 3 H301 Acute Tox. 3 H311 Acute Tox. 3 H331 STOT SE 1 H370	GHS02 GHS06 GHS08
methyl acetate	79-20-9	201-185-2 01-2119459211-47-XXXX	<0.015	Flam. Liq. 2 H225 Eye Irrit. 2 H319 STOT SE 3 H336	GHS02 GHS07
acetic acid	64-19-7	200-580-7 01-2119475328-30-XXXX	<0.005	Flam. Liq. 3 H226 Skin Corr. 1A H314	GHS02 GHS05
Acetone	67-64-1	200-662-2 01-2119471330-49-XXXX	<0.003	Flam. Liq. 2 H225 Eye Irrit. 2 H319 STOT SE 3 H336	GHS02 GHS07
Ethanol	64-17-5	200-578-6 01-2119457610-43-XXXX	<0.005	Flam. Liq. 2 H225	GHS02
butanone	78-93-3	201-159-0 01-2119457290-43-XXXX	<0.001	Flam. Liq. 2 H225 Eye Irrit. 2 H319 STOT SE 3 H336	GHS02 GHS07

3.2 Mixtures

Not applicable.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation	Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
Skin Contact	Take off immediately all contaminated clothing. Rinse skin with water.
Eye Contact	Flush eyes with water for at least 15 minutes while holding eyelids open. If symptoms persist, obtain medical attention.
Ingestion	Rinse mouth. Immediately call a POISON CENTER/doctor.

4.2 Most important symptoms and effects, both acute and delayed

Toxic by inhalation, in contact with skin and if swallowed. Causes damage to organs.

4.3 Indication of any immediate medical attention and special treatment needed

IF exposed or concerned: Call a POISON CENTER/doctor.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media	Use water spray or fog, alcohol resistant foam, dry chemical or carbon dioxide to extinguish.
Unsuitable extinguishing media	Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Highly flammable liquid and vapour. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. Decomposes in a fire giving off toxic fumes: Carbon monoxide, Carbon dioxide.

5.3 Advice for firefighters

Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Evacuate the area and keep personnel upwind. If it is safe to do so, containers should be removed from fire area because they are likely to rupture under fire conditions. Water spray should be used to cool containers.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Remove all ignition sources. Do not breathe vapour. Wear appropriate personal protective equipment, avoid direct contact. Take off immediately all contaminated clothing and wash it before reuse. Wash hands and exposed skin thoroughly after handling.

6.2 Environmental precautions

Do not allow to enter drains, sewers or watercourses.

6.3 Methods and material for containment and cleaning up

Shut off leaks if without risk. Adsorb spillages onto sand, earth or any suitable adsorbent material. Transfer to a lidded container for disposal or recovery.

6.4 Reference to other sections

See Also Section 8, 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground and bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting/equipment. Use non-sparking tools. Take action to prevent static discharges. Use only outdoors or in a well-ventilated area. Do not breathe vapour. Wear protective gloves/protective clothing/eye protection/face protection. Wash hands and exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up.

Storage temperature	Ambient.
Storage life	Stable under normal conditions.
Incompatible materials	Strong oxidising agents.

7.3 Specific end use(s)

- Formulation and (re)packing of substances and mixtures
- Use as a fuel in industrial settings
- Use as a fuel in professional settings
- Industrial use in cleaning agents

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational Exposure Limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
Methanol	67-56-1	200	266	250	333	Sk
Methanol	67-56-1	200	260			IOELV, Skin
methyl acetate	79-20-9	200	616	250	770	
acetic acid	64-19-7	10	25	20	50	
acetic acid	64-19-7	10	25	20	50	IOELV
Acetone	67-64-1	500	1210	1500	3620	
Acetone	67-64-1	500	1210			IOELV
Ethanol	64-17-5	1000	1920			
butanone	78-93-3	200	600	300	899	Sk, BMGV
butanone	78-93-3	200	600	300	900	IOELV

Region Source

EU	EU Occupational Exposure Limits
United Kingdom	UK Workplace Exposure Limits EH40/2005 (Fourth edition, published 2020)

Remark	Notes
Sk	Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity.
IOELV	Indicative Occupational Exposure Limit Value
Skin	The possibility of significant uptake through the skin.
BMGV	Biological monitoring guidance values are listed in Table 2.

8.1.2 Biological limit value

Substances	CAS No.	Sampling	Tissues	Control parameters	Biological monitoring guidance value	Comments
butanone	78-93-3	70 µmol butan-2-one/L in urine	Post shift			

8.1.3 PNECs and DNELs

DNEL / DMEL	Oral	Inhalation	Dermal
Industry - Long Term - Local effects		130 mg/m³	
Industry - Long Term - Systemic effects		130 mg/m³	20 mg/kg bw/day
Industry - Short term - Local effects		130 mg/m³	
Industry - Short term - Systemic effects		130 mg/m³	20 mg/kg bw/day
Consumer - Long Term - Local effects		26 mg/m³	
Consumer - Long Term - Systemic effects	4 mg/kg bw/day	26 mg/m³	4 mg/kg bw/day
Consumer - Short term - Local effects		26 mg/m³	
Consumer - Short term - Systemic effects	4 mg/kg bw/day	26 mg/m³	4 mg/kg bw/day
Environment	PNEC		
Aquatic Compartment (including sediment)	Fresh water: 20.8 mg/l Intermittent release (Fresh water): 1540 mg/l Sea water: 2.08 mg/l Fresh water (Sediment): 77 mg/kg dw Sea water (Sediment): 7.7 mg/kg dw		
Terrestrial Compartment	Sewage Treatment Plant: 100 mg/l		
Atmospheric Compartment	Soil: 100 mg/kg dw		

8.2 Exposure controls

8.2.1. Appropriate engineering controls: Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Use with ventilation, local exhaust ventilation or breathing protection.

8.2.2. Personal protection equipment

Eye Protection: Wear protective eye glasses for protection against liquid splashes.

Skin protection: Wear suitable protective clothing and gloves.
Breakthrough time of the glove material: refer to the information provided by the gloves' producer.

Respiratory protection: Wear suitable respiratory protection.

Thermal hazards: Not applicable.

8.2.3. Environmental Exposure Controls: Do not allow to enter drains, sewers or watercourses.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Liquid. Colour : Clear, Colourless.
Odour	Mild, Characteristic.
Odour threshold	100 ppm

pH	5.9-6.0
Melting point/freezing point	-97.8°C
Initial boiling point and boiling range	64.6°C
Flash Point	15.6°C [Open cup]
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	6.7-36 Vol-%
Vapour pressure	12.8 kPa @ room temperature
Vapour density	1.1 (Air = 1)
Density (g/ml)	Not available.
Relative density	0.7928 @ 20°C
Solubility(ies)	Solubility (Water) : Miscible. Solubility (Other): Miscible with: Ethanol, Ether, Ketones, Benzene, Most organic solvents. Soluble in: Acetone, Chloroform.
Partition coefficient: n-octanol/water	Log Pow: -0.77
Auto-ignition temperature	464°C
Decomposition Temperature (°C)	Not available.
Viscosity	Kinematic Viscosity: 0.00737 cm^2/s @ 20°C
Explosive properties	Not explosive.
Oxidising properties	Not oxidising.

9.2 Other information

None.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Stable under normal conditions.

10.2 Chemical Stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

No hazardous reactions known if used for its intended purpose.

10.4 Conditions to avoid

Keep away from heat, sources of ignition and direct sunlight.

10.5 Incompatible materials

Strong oxidising agents.

10.6 Hazardous decomposition products

No hazardous decomposition products known.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity - Ingestion	Toxic if swallowed. LD50 (rat): 1187 mg/kg
Acute toxicity - Skin Contact	Toxic in contact with skin. LD50 (rabbit): 17100 mg/kg bw
Acute toxicity - Inhalation	Toxic if inhaled. LC50 (rat) (6 hour(s)): 43700 mg/m^3

The available experimental test data are reliable and suitable for classification purposes under Regulation (EC) No 1272/2008. Although the lethal dose of methanol is high for most experimental animals, these data are not employed for classification. The classification is only based upon the experiences in humans and classifies methanol as acutely toxic by oral, dermal and inhalative exposure and, furthermore, as capable of inducing serious irreversible effects upon single exposure by all of these routes. As a result, the substance is considered to be classified for acute toxicity category 3.

Skin corrosion/irritation	Not classified.
Serious eye damage/irritation	Not classified.
Skin sensitization data	It is not a skin sensitiser.
Respiratory sensitization data	Not classified.
Germ cell mutagenicity	There is no evidence of mutagenic potential.
Carcinogenicity	No evidence of carcinogenicity.
Reproductive toxicity	No evidence of reproductive effects.
Lactation	None anticipated.
STOT - single exposure	Causes damage to organs. No data.
STOT - repeated exposure	Not classified.
Aspiration hazard	None anticipated.

11.2 Other information

Not known.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity - Aquatic invertebrates	Low toxicity to invertebrates. Acute: EC50 (Daphnia magna)(96 hour): 18260 mg/l Chronic: NOEC (Daphnia magna): 208 mg/l
Toxicity - Fish	Low toxicity to fish. Acute: LC50 (Lepomis macrochirus)(96 hour): 15400 mg/l Chronic: NOEC (Pimephales promelas): 450 mg/l
Toxicity - Algae	Low toxicity to algae. EC50 (Pseudokirchneriella subcapitata) (96 hour): 22000 mg/l
Toxicity - Sediment Compartment	Not classified.
Toxicity - Terrestrial Compartment	Not classified.

12.2 Persistence and degradability

Readily biodegradable. Unlikely to persist.

12.3 Bioaccumulative potential

The substance has low potential for bioaccumulation.
Bioconcentration factor (BCF): <10

12.4 Mobility in soil

Miscible with water. The substance is predicted to have high mobility in soil.

12.5 Results of PBT and vPvB assessment

Not classified as PBT or vPvB.

12.6 Other adverse effects

Not known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Dispose of this material and its container as hazardous waste. Dispose of empty containers and wastes safely. Decontaminate empty containers before recycling. Send to a licensed recycler, reclaimer or incinerator.

13.2 Additional Information

Disposal should be in accordance with local, state or national legislation.

SECTION 14: TRANSPORT INFORMATION

14.1 UN number

UN No.	1230

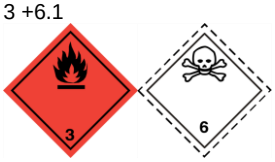
14.2 UN proper shipping name

UN proper shipping name	METHANOL

14.3 Transport hazard class(es)

ADR/RID	
ADR/RID Class	3
ADR Classification Code	FT1
Special Provisions	279
Limited Quantities	1 L
Excepted Quantities	E2
Emergency Action Code	•2WE
Mixed Packing Instructions for Packages	P001 IBC02
Special Packing Provisions for Packages	
Mixed Packing Instructions for Packages	MP19
Packing Instructions for Portable Tanks	T7
Special Provisions for Portable Tanks	TP2
Tank Code for Tanks	L4BH
Special Provisions for Tanks	TU15
Vehicle for Tank Carriage	FL
ADR Transport Category	2
Tunnel Restriction Code	D/E
Special Provisions for Carriage - Loading, Unloading and Handling	CV13 CV28

Special Provisions for Carriage - Operation	S2 S19
ADR HIN	336
IMDG	
IMDG Class	3
Special Provisions	279
Limited Quantities	1 L
Excepted Quantities	E2
Mixed Packing Instructions for Packages	P001 IBC02
Packing Instructions for Portable Tanks	T7
Special Provisions for Portable Tanks	TP2
IMDG EMS	F-E, S-D
Stowage and Handling	Category B SW2
ICAO/IATA	
IATA Proper Shipping Name	METHANOL
Excepted Quantities	E2
Passenger and Cargo Aircraft Limited Quantities Packing Instructions	Y341
Passenger and Cargo Aircraft Limited Quantities Max net Qty	1L
Passenger and Cargo Aircraft Packing Instructions	352
Passenger and Cargo Aircraft Max net Qty	1L
Cargo Aircraft Packing Instructions	364
Cargo Aircraft Max net Qty	60L
Special Provisions	A113
Emergency Response Guidebook (ERG) Code	3L
Labels	
Labels	3 +6.1



14.4 Packing group

Packing group: II

14.5 Environmental hazards

Environmental hazards: Not classified as a Marine Pollutant.

14.6 Special precautions for user

Special precautions for user: Not known.

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

No information available

SECTION 15: REGULATORY INFORMATION

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

European Regulations - Authorisations and/or Restrictions On Use

Candidate List of Substances of Very High Concern for Authorisation	Not listed
REACH: ANNEX XIV list of substances subject to authorisation	Not listed
REACH: Annex XVII Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	Methanol (67-56-1), methyl acetate (79-20-9), Acetone (67-64-1), Ethanol (64-17-5), butanone (78-93-3), acetic acid (64-19-7)
Community Rolling Action Plan (CoRAP)	Methanol (67-56-1), butanone (78-93-3)
Regulation (EC) N° 850/2004 of the European Parliament and of the Council on persistent organic pollutants	Not listed
Regulation (EC) N° 1005/2009 on substances that deplete the ozone layer	Not listed
Regulation (EU) N° 649/2012 of the European Parliament and of the Council concerning the export and import of hazardous chemicals	Not listed

National regulations

Other: Not known.

15.2 Chemical Safety Assessment

A REACH chemical safety assessment has been carried out.

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: 1-16

LEGEND

Hazard Pictogram(s)


GHS02


GHS06


GHS08

GHS05: GHS: Corrosion
GHS07: GHS: Exclamation mark

Hazard classification

Flam. Liq. 2 : Flammable liquid, Category 2
Flam. Liq. 3 : Flammable liquid, Category 3
Acute Tox. 3 : Acute toxicity, Category 3
Skin Corr. 1A : Skin corrosion/irritation, Category 1A
Eye Irrit. 2 : Serious eye damage/irritation, Category 2
STOT SE 3 : Specific target organ toxicity — single exposure, Category 3
STOT SE 1 : Specific target organ toxicity — single exposure, Category 1

Hazard Statement(s)

H225: Highly flammable liquid and vapour.
H226: Flammable liquid and vapour.
H301: Toxic if swallowed.
H311: Toxic in contact with skin.
H314: Causes severe skin burns and eye damage.
H319: Causes serious eye irritation.
H331: Toxic if inhaled.
H336: May cause drowsiness or dizziness.
H370: Causes damage to organs.

Precautionary Statement(s)

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 action to prevent static discharges.
P260: Do not breathe vapour.
P264: Wash hands and exposed skin thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P302+P352: IF ON SKIN: Wash with plenty of water.
P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+P311: IF exposed or concerned: Call a POISON CENTER/doctor.
P312: Call a POISON CENTER/doctor if you feel unwell.
P330: Rinse mouth.
P361+P364: Take off immediately all contaminated clothing and wash it before reuse.
P370+P378: In case of fire: Use water spray or fog, alcohol resistant foam, dry chemical or carbon dioxide to extinguish.
P403+P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.
P501: Dispose of contents in accordance with local, state or national legislation.

Acronyms

ADR : European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS : Chemical Abstracts Service
CLP : Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
DNEL : Derived No Effect Level

EC : European Community
IATA : International Air Transport Association
IBC : Intermediate Bulk Container
ICAO : International Civil Aviation Organization
IMDG : International Maritime Dangerous Goods
LTEL : Long term exposure limit
PBT : Persistent, Bioaccumulative and Toxic
PNEC : Predicted No Effect Concentration
REACH : Registration, Evaluation, Authorisation and Restriction of Chemicals
RID : Regulations concerning the International Carriage of Dangerous Goods by Rail
STEL : Short term exposure limit
STOT : Specific Target Organ Toxicity
UN : United Nations
vPvB : very Persistent and very Bioaccumulative

Key literature references and sources for data used to compile the SDS	Regulation (EC) No. 1272/2008 (CLP)
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Table of Contents

1. Exposure Scenario 1: Formulation and (re)packing of substance and mixtures

SECTION 1:	Title of exposure scenario
	Formulation and (re)packing of substance and mixtures

Contributing scenario controlling environmental exposure	
Formulation of preparations	ERC2
Contributing scenario controlling worker exposure	
Use in closed process, no likelihood of exposure	PROC1
Use in closed, continuous process with occasional controlled exposure	PROC2
Use in closed batch process (synthesis or formulation)	PROC3
Use in batch and other process (synthesis) where opportunity for exposure arises	PROC4
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC5
Transfer of chemicals from / to vessel / large containers at non-dedicated facilities	PROC8a
Transfer of chemicals from / to vessel / large containers at dedicated facilities	PROC8b
Transfer of chemicals into small containers (dedicated filling line)	PROC9
Use of laboratory reagents in small scale laboratories	PROC15

SECTION 2:	Conditions of use
2.1	**Contributing scenario controlling environmental exposure:** 1.1 Formulation of preparations (ERC 2)

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed

2.2	**Contributing scenario controlling worker exposure:** 1.2 Use in closed process, no likelihood of exposure (PROC 1)

Product characteristics

Percentage (w/w) of substance in mixture/article: 100 %
Physical form of the used product: Liquid
Dustiness: High

Human factors not influenced by risk management

Exposed skin surface, Long Term, Systemic effects: 240 cm²
Exposed skin surface, Short term, Systemic effects: 240 cm²

Frequency and duration of use

Duration of activity: > 4 hour(s) (default)
Frequency of use: 5 days / week(s)

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

Local exhaust ventilation: No

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

Respiratory protection: No
Dermal protection: No

Other given operational conditions affecting workers exposure

Place of use: Indoor
Domain: Industrial

2.3	**Contributing scenario controlling worker exposure:** 1.3 Use in closed, continuous process with occasional controlled exposure (PROC 2)

Product characteristics

Percentage (w/w) of substance in mixture/article: 100 %
Physical form of the used product: Liquid
Dustiness: High

Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 480 cm² Exposed skin surface, Short term, Systemic effects: 480 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.4	**Contributing scenario controlling worker exposure:** 1.4 Use in closed batch process (synthesis or formulation) (PROC 3)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 240 cm² Exposed skin surface, Short term, Systemic effects: 240 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.5	**Contributing scenario controlling worker exposure:** 1.5 Use in batch and other process (synthesis) where opportunity for exposure arises (PROC 4)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 480 cm² Exposed skin surface, Short term, Systemic effects: 480 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	

Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.6	**Contributing scenario controlling worker exposure:** 1.6 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC5)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 480 cm² Exposed skin surface, Short term, Systemic effects: 480 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.7	**Contributing scenario controlling worker exposure:** 1.7 Transfer of chemicals from / to vessel / large containers at non-dedicated facilities (PROC8a)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 960 cm² Exposed skin surface, Short term, Systemic effects: 960 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.8	**Contributing scenario controlling worker exposure:** 1.8 Transfer of chemicals from / to vessel / large containers at dedicated facilities (PROC 8b)

Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 960 cm² Exposed skin surface, Short term, Systemic effects: 960 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 95%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.9	**Contributing scenario controlling worker exposure:** 1.9 Transfer of chemicals into small containers (dedicated filling line) (PROC 9)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 480 cm² Exposed skin surface, Short term, Systemic effects: 480 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Place of use: Indoor Domain: Industrial	
2.9	**Contributing scenario controlling worker exposure:** 1.10 Use of laboratory reagents in small scale laboratories (PROC 15)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 240 cm² Exposed skin surface, Short term, Systemic effects: 240 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	

Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]

SECTION 3:	**1.11 Exposure estimation**

3.1. Environment

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed

3.2. Worker

Contributing scenario controlling worker exposure: Use in closed process, no likelihood of exposure (PROC 1)

Exposure route	Exposure estimate - Worker	DNEL	Risk quantification (RCR)
Inhalation, Systemic effects, Long Term	0.013351 mg/m³	130 mg/m³	0.000103
Inhalation, Systemic effects, Short term	0.053403 mg/m³	130 mg/m³	0.000411
Dermal, Systemic effects, Long Term	0.034286 mg/kg bw/day	20 mg/kg bw/day	0.001714
Dermal, Systemic effects, Short term	0.034286 mg/kg bw/day	20 mg/kg bw/day	0.001714
Combined routes, Systemic effects, Long Term	0.036193 mg/kg bw/day	-	0.001817
Combined routes, Systemic effects, Short term	0.041915 mg/kg bw/day	-	0.002125

Contributing scenario controlling worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)

Exposure route	Exposure estimate - Worker	DNEL	Risk quantification (RCR)
Dermal, Systemic effects, Long Term	0.274286 mg/kg bw/day	20 mg/kg bw/day	0.013174
Dermal, Systemic effects, Short term	0.274286 mg/kg bw/day	20 mg/kg bw/day	0.013174
Inhalation, Systemic effects, Long Term	3.338 mg/m³	130 mg/m³	0.025675
Inhalation, Systemic effects, Short term	13.351 mg/m³	130 mg/m³	0.102698
Combined routes, Systemic effects, Long Term	0.7511mg/kg bw/day	-	0.039389
Combined routes, Systemic effects, Short term	2.182 mg/kg bw/day	-	0.116413

Contributing scenario controlling worker exposure: Use in closed batch process (synthesis or formulation) (PROC 3)

Exposure route	Exposure estimate - Worker	DNEL	Risk quantification (RCR)
Dermal, Systemic effects, Long Term	0.137143 mg/kg bw/day	20 mg/kg bw/day	0.006857
Dermal, Systemic effects, Short term	0.137143 mg/kg bw/day	20 mg/kg bw/day	0.006857
Inhalation, Systemic effects, Long Term	6.675 mg/m³	130 mg/m³	0.051349
Inhalation, Systemic effects, Short term	26.702 mg/m³	130 mg/m³	0.205397

Combined routes, Systemic effects, Long Term	1.091 mg/kg bw/day	-	0.058206
Combined routes, Systemic effects, Short term	3.952 mg/kg bw/day	-	0.212254
Contributing scenario controlling worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC 4)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	20 mg/kg bw/day	0.068571
Dermal, Systemic effects, Short term	1.371 mg/kg bw/day	20 mg/kg bw/day	0.068571
Inhalation, Systemic effects, Long Term	13.351 mg/m³	130 mg/m³	0.102698
Inhalation, Systemic effects, Short term	53.403 mg/m³	130 mg/m³	0.410794
Combined routes, Systemic effects, Long Term	3.279 mg/kg bw/day	-	0.17127
Combined routes, Systemic effects, Short term	9 mg/kg bw/day	-	0.479365
Contributing scenario controlling worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC 5)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Dermal, Systemic effects, Short term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Inhalation, Systemic effects, Long Term	33.377 mg/m³	130 mg/m³	0.256746
Inhalation, Systemic effects, Short term	13.351 mg/m³	130 mg/m³	0.102698
Combined routes, Systemic effects, Long Term	7.511 mg/kg bw/day	-	0.393889
Combined routes, Systemic effects, Short term	4.65 mg/kg bw/day	-	0.239841
Contributing scenario controlling worker exposure: Transfer of chemicals from / to vessel / large containers at non-dedicated facilities (PROC 8a)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Dermal, Systemic effects, Short term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Inhalation, Systemic effects, Long Term	33.377 mg/m³	130 mg/m³	0.256746
Inhalation, Systemic effects, Short term	66.754 mg/m³	130 mg/m³	0.513492
Combined routes, Systemic effects, Long Term	7.511 mg/kg bw/day	-	0.393889
Combined routes, Systemic effects, Short term	12.279 mg/kg bw/day	-	0.650635
Contributing scenario controlling worker exposure: Transfer of chemicals from / to vessel / large containers at dedicated facilities (PROC 8b)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143

Dermal, Systemic effects, Short term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Inhalation, Systemic effects, Long Term	10.013 mg/m³	130 mg/m³	0.077024
Inhalation, Systemic effects, Short term	20.026 mg/m³	130 mg/m³	0.154048
Combined routes, Systemic effects, Long Term	4.173 mg/kg bw/day	-	0.214167
Combined routes, Systemic effects, Short term	5.604 mg/kg bw/day	-	0.29119
Contributing scenario controlling worker exposure: Transfer of chemicals into small containers (dedicated filling line) (PROC 9)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	20 mg/kg bw/day	0.068571
Dermal, Systemic effects, Short term	1.371 mg/kg bw/day	20 mg/kg bw/day	0.068571
Inhalation, Systemic effects, Long Term	26.702 mg/m³	130 mg/m³	0.205397
Inhalation, Systemic effects, Short term	53.403 mg/m³	130 mg/m³	0.410794
Combined routes, Systemic effects, Long Term	5.186 mg/kg bw/day	-	0.273968
Combined routes, Systemic effects, Short term	9 mg/kg bw/day	-	0.479365
Contributing scenario controlling worker exposure: Use of laboratory reagents in small scale laboratories (PROC 15)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	0.068571 mg/kg bw/day	20 mg/kg bw/day	0.003429
Dermal, Systemic effects, Short term	0.068571 mg/kg bw/day	20 mg/kg bw/day	0.003429
Inhalation, Systemic effects, Long Term	6.675 mg/m³	130 mg/m³	0.051349
Inhalation, Systemic effects, Short term	13.351 mg/m³	130 mg/m³	0.102698
Combined routes, Systemic effects, Long Term	1.022 mg/kg bw/day	-	0.054778
Combined routes, Systemic effects, Short term	1.976 mg/kg bw/day	-	0.106127

SECTION 4:	**1.12 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

4.1 Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling could be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use, additional RMMs or a site-specific chemical safety assessment is required.

2. Exposure Scenario 2: Use as a fuel in industrial settings

SECTION 1:	**Title of exposure scenario**
	Use as a fuel in industrial settings
Contributing scenario controlling environmental exposure	
Industrial use of substances in closed systems	ERC7
Contributing scenario controlling worker exposure	
Use in closed process, no likelihood of exposure	PROC1
Use in closed, continuous process with occasional controlled exposure	PROC2
Use in closed batch process (synthesis or formulation)	PROC3
Transfer of chemicals from / to vessel / large containers at non-dedicated facilities	PROC8a
Transfer of chemicals from / to vessel / large containers at dedicated facilities	PROC8b
Using material as fuel sources, limited exposure to unburned product to be expected	PROC16
Hand-mixing with intimate contact and only PPE available	PROC19

SECTION 2:	**Conditions of use**
2.1	**Contributing scenario controlling environmental exposure:** 1.1 Industrial use of substances in closed systems (ERC 7)
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed	
2.2	**Contributing scenario controlling worker exposure:** 1.2 Use in closed process, no likelihood of exposure (PROC 1)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 240 cm² Exposed skin surface, Short term, Systemic effects: 240 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: No	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: No	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.3	**Contributing scenario controlling worker exposure:** 1.3 Use in closed, continuous process with occasional controlled exposure (PROC 2)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 480 cm² Exposed skin surface, Short term, Systemic effects: 480 cm²	

Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.4	**Contributing scenario controlling worker exposure:** 1.4 Use in closed batch process (synthesis or formulation) (PROC 3)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 240 cm² Exposed skin surface, Short term, Systemic effects: 240 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.5	**Contributing scenario controlling worker exposure:** 1.5 Transfer of chemicals from / to vessel / large containers at non-dedicated facilities (PROC8a)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 960 cm² Exposed skin surface, Short term, Systemic effects: 960 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	

Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.6	**Contributing scenario controlling worker exposure:** 1.6 Transfer of chemicals from / to vessel / large containers at dedicated facilities (PROC 8b)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 960 cm² Exposed skin surface, Short term, Systemic effects: 960 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 95%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.7	**Contributing scenario controlling worker exposure:** 1.7 Using material as fuel sources, limited exposure to unburned product to be expected (PROC 16)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 240 cm² Exposed skin surface, Short term, Systemic effects: 240 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: No	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Place of use: Indoor Domain: Industrial	
2.8	**Contributing scenario controlling worker exposure:** 1.8 Hand-mixing with intimate contact and only PPE available (PROC 19)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 10% Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	

Exposed skin surface, Long Term, Systemic effects: 1980 cm²
Exposed skin surface, Short term, Systemic effects: 1980 cm²

Frequency and duration of use

Duration of activity: 1 - 4 hour(s)
Frequency of use: 5 days / week(s)

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

Local exhaust ventilation: No

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

Respiratory protection: No
Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]

SECTION 3:	**1.9 Exposure estimation**

3.1. Environment

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed

3.2. Worker

Contributing scenario controlling worker exposure: Use in closed process, no likelihood of exposure (PROC 1)

Exposure route	Exposure estimate - Worker	DNEL	Risk quantification (RCR)
Inhalation, Systemic effects, Long Term	0.013351 mg/m³	130 mg/m³	0.000103
Inhalation, Systemic effects, Short term	0.053403 mg/m³	130 mg/m³	0.000411
Dermal, Systemic effects, Long Term	0.034286 mg/kg bw/day	20 mg/kg bw/day	0.001714
Dermal, Systemic effects, Short term	0.034286 mg/kg bw/day	20 mg/kg bw/day	0.001714
Combined routes, Systemic effects, Long Term	0.036193 mg/kg bw/day	-	0.001817
Combined routes, Systemic effects, Short term	0.041915 mg/kg bw/day	-	0.002125

Contributing scenario controlling worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)

Exposure route	Exposure estimate - Worker	DNEL	Risk quantification (RCR)
Dermal, Systemic effects, Long Term	0.274286 mg/kg bw/day	20 mg/kg bw/day	0.013714
Dermal, Systemic effects, Short term	0.274286 mg/kg bw/day	20 mg/kg bw/day	0.013714
Inhalation, Systemic effects, Long Term	3.338 mg/m³	130 mg/m³	0.025675
Inhalation, Systemic effects, Short term	13.351 mg/m³	130 mg/m³	0.102698
Combined routes, Systemic effects, Long Term	0.7511mg/kg bw/day	-	0.039389
Combined routes, Systemic effects, Short term	2.182 mg/kg bw/day	-	0.116413

Contributing scenario controlling worker exposure: Use in closed batch process (synthesis or formulation) (PROC 3)

Exposure route	Exposure estimate - Worker	DNEL	Risk quantification (RCR)
Dermal, Systemic effects, Long Term	0.137143 mg/kg bw/day	20 mg/kg bw/day	0.006857
Dermal, Systemic effects, Short term	0.137143 mg/kg bw/day	20 mg/kg bw/day	0.006857

Inhalation, Systemic effects, Long Term	6.675 mg/m³	130 mg/m³	0.051349
Inhalation, Systemic effects, Short term	26.702 mg/m³	130 mg/m³	0.205397
Combined routes, Systemic effects, Long Term	1.091 mg/kg bw/day	-	0.058206
Combined routes, Systemic effects, Short term	3.952 mg/kg bw/day	-	0.212254
Contributing scenario controlling worker exposure: Transfer of chemicals from / to vessel / large containers at non-dedicated facilities (PROC 8a)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Dermal, Systemic effects, Short term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Inhalation, Systemic effects, Long Term	33.377 mg/m³	130 mg/m³	0.256746
Inhalation, Systemic effects, Short term	66.754 mg/m³	130 mg/m³	0.513492
Combined routes, Systemic effects, Long Term	7.511 mg/kg bw/day	-	0.393889
Combined routes, Systemic effects, Short term	12.279 mg/kg bw/day	-	0.650635
Contributing scenario controlling worker exposure: Transfer of chemicals from / to vessel / large containers at dedicated facilities (PROC 8b)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Dermal, Systemic effects, Short term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Inhalation, Systemic effects, Long Term	10.013 mg/m³	130 mg/m³	0.077024
Inhalation, Systemic effects, Short term	20.026 mg/m³	130 mg/m³	0.154048
Combined routes, Systemic effects, Long Term	4.173 mg/kg bw/day	-	0.214167
Combined routes, Systemic effects, Short term	5.604 mg/kg bw/day	-	0.29119
Contributing scenario controlling worker exposure: Using material as fuel sources, limited exposure to unburned product to be expected (PROC 16)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	0.068571 mg/kg bw/day	20 mg/kg bw/day	0.003429
Dermal, Systemic effects, Short term	0.041143 mg/kg bw/day	20 mg/kg bw/day	0.002057
Inhalation, Systemic effects, Long Term	33.377 mg/m³	130 mg/m³	0.256746
Inhalation, Systemic effects, Short term	80.105 mg/m³	130 mg/m³	0.61619
Combined routes, Systemic effects, Long Term	4.837 mg/kg bw/day	-	0.260175
Combined routes, Systemic effects, Short term	11.485 mg/kg bw/day	-	0.618248
Contributing scenario controlling worker exposure: Hand-mixing with intimate contact and only PPE available (PROC 19)			

Exposure route	Exposure estimate - Worker	DNEL	Risk quantification (RCR)
Dermal, Systemic effects, Long Term	1.697 mg/kg bw/day	20 mg/kg bw/day	0.084857
Dermal, Systemic effects, Short term	1.697 mg/kg bw/day	20 mg/kg bw/day	0.084857
Inhalation, Systemic effects, Long Term	20.062 mg/m³	130 mg/m³	0.154048
Inhalation, Systemic effects, Short term	66.754 mg/m³	130 mg/m³	0.513492
Combined routes, Systemic effects, Long Term	4.588 mg/kg bw/day	-	0.238905
Combined routes, Systemic effects, Short term	11.233 mg/kg bw/day	-	0.598349

SECTION 4:	1.10 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

4.1 Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling could be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use, additional RMMs or a site-specific chemical safety assessment is required.

3. Exposure Scenario 3: Use as a fuel in professional setting

SECTION 1:	Title of exposure scenario
	Use as a fuel in professional setting
Contributing scenario controlling environmental exposure	
Wide dispersive indoor use of reactive substances in open systems	ERC8b
Wide dispersive outdoor use of reactive substances in open systems	ERC8e
Contributing scenario controlling worker exposure	
Use in closed process, no likelihood of exposure	PROC1
Use in closed, continuous process with occasional controlled exposure	PROC2
Use in closed batch process (synthesis or formulation)	PROC3
Transfer of chemicals from / to vessel / large containers at non-dedicated facilities	PROC8a
Transfer of chemicals from / to vessel / large containers at dedicated facilities	PROC8b
Using material as fuel sources, limited exposure to unburned product to be expected	PROC16
Hand-mixing with intimate contact and only PPE available	PROC19

SECTION 2:	Conditions of use
2.1	**Contributing scenario controlling environmental exposure:** Industrial use of substances in closed systems (ERC 8b) Wide dispersive outdoor use of reactive substances in open systems (ERC 8e)
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed	
2.2	**Contributing scenario controlling worker exposure:** 1.2 Use in closed process, no likelihood of exposure (PROC 1)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 240 cm^2 Exposed skin surface, Short term, Systemic effects: 240 cm^2	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: No	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: No	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Professional	
2.3	**Contributing scenario controlling worker exposure:** 1.3 Use in closed, continuous process with occasional controlled exposure (PROC 2)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	

Exposed skin surface, Long Term, Systemic effects: 480 cm² Exposed skin surface, Short term, Systemic effects: 480 cm²
Frequency and duration of use
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)
Technical conditions and measures to control dispersion from source towards the worker
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 80%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Domain: Professional

2.4	**Contributing scenario controlling worker exposure:** 1.4 Use in closed batch process (synthesis or formulation) (PROC 3)

Product characteristics
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High
Human factors not influenced by risk management
Exposed skin surface, Long Term, Systemic effects: 960 cm² Exposed skin surface, Short term, Systemic effects: 960 cm²
Frequency and duration of use
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)
Technical conditions and measures to control dispersion from source towards the worker
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Domain: Professional

2.5	**Contributing scenario controlling worker exposure:** 1.5 Transfer of chemicals from / to vessel / large containers at non-dedicated facilities (PROC8a)

Product characteristics
Percentage (w/w) of substance in mixture/article: 5 % Physical form of the used product: Liquid Dustiness: High
Human factors not influenced by risk management
Exposed skin surface, Long Term, Systemic effects: 480 cm² Exposed skin surface, Short term, Systemic effects: 480 cm²
Frequency and duration of use
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)
Technical conditions and measures to control dispersion from source towards the worker
Local exhaust ventilation: No
Conditions and measures related to personal protection, hygiene and health evaluation

Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Professional	
2.6	**Contributing scenario controlling worker exposure:** 1.6 Transfer of chemicals from / to vessel / large containers at dedicated facilities (PROC 8b)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 5 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 960 cm² Exposed skin surface, Short term, Systemic effects: 960 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: No	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Professional	
2.7	**Contributing scenario controlling worker exposure:** 1.7 Using material as fuel sources, limited exposure to unburned product to be expected (PROC 16)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 240 cm² Exposed skin surface, Short term, Systemic effects: 240 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: No	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Professional	
2.8	**Contributing scenario controlling worker exposure:** 1.8 Hand-mixing with intimate contact and only PPE available (PROC 19)
Product characteristics	

Percentage (w/w) of substance in mixture/article: 10%
Physical form of the used product: Liquid
Dustiness: High

Human factors not influenced by risk management

Exposed skin surface, Long Term, Systemic effects: 1980 cm²
Exposed skin surface, Short term, Systemic effects: 1980 cm²

Frequency and duration of use

Duration of activity: 1 - 4 hour(s)
Frequency of use: 5 days / week(s)

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

Local exhaust ventilation: No

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

Respiratory protection: No
Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]

Other given operational conditions affecting workers exposure

Place of use: Indoor
Domain: Professional

SECTION 3:	**1.9 Exposure estimation**

3.1. Environment

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed

3.2. Worker

Contributing scenario controlling worker exposure: Use in closed process, no likelihood of exposure (PROC 1)

Exposure route	Exposure estimate - Worker	DNEL	Risk quantification (RCR)
Inhalation, Systemic effects, Long Term	0.0133508 mg/m³	130 mg/m³	0.001027
Inhalation, Systemic effects, Short term	0.534032 mg/m³	130 mg/m³	0.004108
Dermal, Systemic effects, Long Term	0.034286 mg/kg bw/day	20 mg/kg bw/day	0.001714
Dermal, Systemic effects, Short term	0.034286 mg/kg bw/day	20 mg/kg bw/day	0.001714
Combined routes, Systemic effects, Long Term	0.053358 mg/kg bw/day	-	0.002741
Combined routes, Systemic effects, Short term	0.110576 mg/kg bw/day	-	0.005822

Contributing scenario controlling worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)

Exposure route	Exposure estimate - Worker	DNEL	Risk quantification (RCR)
Dermal, Systemic effects, Long Term	0.274286 mg/kg bw/day	20 mg/kg bw/day	0.013174
Dermal, Systemic effects, Short term	0.274286 mg/kg bw/day	20 mg/kg bw/day	0.013174
Inhalation, Systemic effects, Long Term	13.351 mg/m³	130 mg/m³	0.102698
Inhalation, Systemic effects, Short term	53.403 mg/m³	130 mg/m³	0.410794
Combined routes, Systemic effects, Long Term	2.182 mg/kg bw/day	-	0.116413
Combined routes, Systemic effects, Short term	7.903 mg/kg bw/day	-	0.424508

Contributing scenario controlling worker exposure: Use in closed batch process (synthesis or formulation) (PROC 3)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	0.137143 mg/kg bw/day	20 mg/kg bw/day	0.006857
Dermal, Systemic effects, Short term	0.137143 mg/kg bw/day	20 mg/kg bw/day	0.006857
Inhalation, Systemic effects, Long Term	26.702 mg/m³	130 mg/m³	0.205397
Inhalation, Systemic effects, Short term	106.806 mg/m³	130 mg/m³	0.821587
Combined routes, Systemic effects, Long Term	3.952 mg/kg bw/day	-	0.212254
Combined routes, Systemic effects, Short term	15.395 mg/kg bw/day	-	0.828444
Contributing scenario controlling worker exposure: Transfer of chemicals from / to vessel / large containers at non-dedicated facilities (PROC 8a)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	0.137143 mg/kg bw/day	20 mg/kg bw/day	0.006857
Dermal, Systemic effects, Short term	0.137143 mg/kg bw/day	20 mg/kg bw/day	0.006857
Inhalation, Systemic effects, Long Term	33.377 mg/m³	130 mg/m³	0.256746
Inhalation, Systemic effects, Short term	66.754 mg/m³	130 mg/m³	0.513492
Combined routes, Systemic effects, Long Term	4.905 mg/kg bw/day	-	0.263603
Combined routes, Systemic effects, Short term	9.673 mg/kg bw/day	-	0.520349
Contributing scenario controlling worker exposure: Transfer of chemicals from / to vessel / large containers at dedicated facilities (PROC 8b)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	0.137143 mg/kg bw/day	20 mg/kg bw/day	0.006857
Dermal, Systemic effects, Short term	0.137143 mg/kg bw/day	20 mg/kg bw/day	0.006857
Inhalation, Systemic effects, Long Term	16.688 mg/m³	130 mg/m³	0.128373
Inhalation, Systemic effects, Short term	33.377 mg/m³	130 mg/m³	0.256746
Combined routes, Systemic effects, Long Term	2.521 mg/kg bw/day	-	0.13523
Combined routes, Systemic effects, Short term	4.905 mg/kg bw/day	-	0.263603
Contributing scenario controlling worker exposure: Using material as fuel sources, limited exposure to unburned product to be expected (PROC 16)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	0.068571 mg/kg bw/day	20 mg/kg bw/day	0.003429
Dermal, Systemic effects, Short term	0.041143 mg/kg bw/day	20 mg/kg bw/day	0.002057
Inhalation, Systemic effects, Long Term	66.754 mg/m³	130 mg/m³	0.513492

Inhalation, Systemic effects, Short term	112.147 mg/m³	130 mg/m³	0.862667
Combined routes, Systemic effects, Long Term	9.605 mg/kg bw/day	-	0.516921
Combined routes, Systemic effects, Short term	16.062 mg/kg bw/day	-	0.864724
Contributing scenario controlling worker exposure: Hand-mixing with intimate contact and only PPE available (PROC 19)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	1.697 mg/kg bw/day	20 mg/kg bw/day	0.084857
Dermal, Systemic effects, Short term	1.697 mg/kg bw/day	20 mg/kg bw/day	0.084857
Inhalation, Systemic effects, Long Term	40.052 mg/m³	130 mg/m³	0.308095
Inhalation, Systemic effects, Short term	13.351 mg/m³	130 mg/m³	0.102698
Combined routes, Systemic effects, Long Term	7.419 mg/kg bw/day	-	0.392952
Combined routes, Systemic effects, Short term	3.604 mg/kg bw/day	-	0.187556
SECTION 4:	**1.10 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**		
4.1 Health			
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.			
4.2 Environment			
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling could be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use, additional RMMs or a site-specific chemical safety assessment is required.			

4. Exposure Scenario 4: Industrial use in cleaning agent

SECTION 1:	**Title of exposure scenario**
	Industrial use in cleaning agent
Contributing scenario controlling environmental exposure	
Industrial use of processing aids	ERC4
Contributing scenario controlling worker exposure	
Use in closed process, no likelihood of exposure	PROC1
Use in closed, continuous process with occasional controlled exposure	PROC2
Use in closed batch process (synthesis or formulation)	PROC3
Use in batch and other process (synthesis) where opportunity for exposure arises	PROC4
Industrial spraying	PROC7
Transfer of chemicals from / to vessel / large containers at non-dedicated facilities	PROC8a
Transfer of chemicals from / to vessel / large containers at dedicated facilities	PROC8b
Roller application or brushing	PROC10
Treatment of articles by dipping and pouring	PROC13

SECTION 2:	**Conditions of use**
2.1	**Contributing scenario controlling environmental exposure:** Industrial use of processing aids (ERC 8b)
As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed	
2.2	**Contributing scenario controlling worker exposure:** 1.2 Use in closed process, no likelihood of exposure (PROC 1)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 240 cm^2 Exposed skin surface, Short term, Systemic effects: 240 cm^2	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: No	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: No	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.3	**Contributing scenario controlling worker exposure:** 1.3 Use in closed, continuous process with occasional controlled exposure (PROC 2)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	

Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 480 cm² Exposed skin surface, Short term, Systemic effects: 480 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.4	**Contributing scenario controlling worker exposure:** 1.4 Use in closed batch process (synthesis or formulation) (PROC 3)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 240 cm² Exposed skin surface, Short term, Systemic effects: 240 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.5	**Contributing scenario controlling worker exposure:** 1.5 Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 480 cm² Exposed skin surface, Short term, Systemic effects: 480 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	

Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.6	**Contributing scenario controlling worker exposure:** 1.6 Industrial spraying (PROC 7)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 25 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 1500 cm² Exposed skin surface, Short term, Systemic effects: 1500 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: No	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: Yes [Effectiveness, 90%] Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial Ventilation: Good (30%)	
2.7	**Contributing scenario controlling worker exposure:** 1.7 Transfer of chemicals from / to vessel / large containers at non-dedicated facilities (PROC 8a)
Product characteristics	
Percentage (w/w) of substance in mixture/article: 100 % Physical form of the used product: Liquid Dustiness: High	
Human factors not influenced by risk management	
Exposed skin surface, Long Term, Systemic effects: 960 cm² Exposed skin surface, Short term, Systemic effects: 960 cm²	
Frequency and duration of use	
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)	
Technical conditions and measures to control dispersion from source towards the worker	
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]	
Conditions and measures related to personal protection, hygiene and health evaluation	
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]	
Other given operational conditions affecting workers exposure	
Place of use: Indoor Domain: Industrial	
2.8	**Contributing scenario controlling worker exposure:** 1.8 Transfer of chemicals from / to vessel / large containers at dedicated facilities (PROC 8b)

Product characteristics
Percentage (w/w) of substance in mixture/article: 10% Physical form of the used product: Liquid Dustiness: High
Human factors not influenced by risk management
Exposed skin surface, Long Term, Systemic effects: 960 cm² Exposed skin surface, Short term, Systemic effects: 960 cm²
Frequency and duration of use
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)
Technical conditions and measures to control dispersion from source towards the worker
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 95%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Domain: Industrial

2.9	**Contributing scenario controlling worker exposure:** 1.9 Roller application or brushing (PROC 10)

Product characteristics
Percentage (w/w) of substance in mixture/article: 80% Physical form of the used product: Liquid Dustiness: High
Human factors not influenced by risk management
Exposed skin surface, Long Term, Systemic effects: 960 cm² Exposed skin surface, Short term, Systemic effects: 960 cm²
Frequency and duration of use
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)
Technical conditions and measures to control dispersion from source towards the worker
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Domain: Industrial

2.10	**Contributing scenario controlling worker exposure:** 1.10 Treatment of articles by dipping and pouring (PROC 13)

Product characteristics
Percentage (w/w) of substance in mixture/article: 100% Physical form of the used product: Liquid Dustiness: High
Human factors not influenced by risk management
Exposed skin surface, Long Term, Systemic effects: 480 cm² Exposed skin surface, Short term, Systemic effects: 480 cm²
Frequency and duration of use
Duration of activity: > 4 hour(s) (default) Frequency of use: 5 days / week(s)

Technical conditions and measures to control dispersion from source towards the worker
Local exhaust ventilation: Yes [Effectiveness, Inhalation: 90%]
Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory protection: No Dermal protection: Gloves APF 5 [Effectiveness, Dermal: 80%]
Other given operational conditions affecting workers exposure
Place of use: Indoor Domain: Industrial

SECTION 3:	**1.11 Exposure estimation**

3.1. Environment

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed

3.2. Worker

Contributing scenario controlling worker exposure: Use in closed process, no likelihood of exposure (PROC 1)

Exposure route	Exposure estimate - Worker	DNEL	Risk quantification (RCR)
Inhalation, Systemic effects, Long Term	0.013351 mg/m³	130 mg/m³	0.000103
Inhalation, Systemic effects, Short term	0.053403 mg/m³	130 mg/m³	0.000411
Dermal, Systemic effects, Long Term	0.034286 mg/kg bw/day	20 mg/kg bw/day	0.001714
Dermal, Systemic effects, Short term	0.034286 mg/kg bw/day	20 mg/kg bw/day	0.001714
Combined routes, Systemic effects, Long Term	0.036193 mg/kg bw/day	-	0.001817
Combined routes, Systemic effects, Short term	0.041915 mg/kg bw/day	-	0.002125

Contributing scenario controlling worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC 2)

Exposure route	Exposure estimate - Worker	DNEL	Risk quantification (RCR)
Dermal, Systemic effects, Long Term	0.274286 mg/kg bw/day	20 mg/kg bw/day	0.013174
Dermal, Systemic effects, Short term	0.274286 mg/kg bw/day	20 mg/kg bw/day	0.013174
Inhalation, Systemic effects, Long Term	3.338 mg/m³	130 mg/m³	0.025675
Inhalation, Systemic effects, Short term	13.351 mg/m³	130 mg/m³	0.102698
Combined routes, Systemic effects, Long Term	0.7511 mg/kg bw/day	-	0.039389
Combined routes, Systemic effects, Short term	2.182 mg/kg bw/day	-	0.116413

Contributing scenario controlling worker exposure: Use in closed batch process (synthesis or formulation) (PROC 3)

Exposure route	Exposure estimate - Worker	DNEL	Risk quantification (RCR)
Dermal, Systemic effects, Long Term	0.137143 mg/kg bw/day	20 mg/kg bw/day	0.006857
Dermal, Systemic effects, Short term	0.137143 mg/kg bw/day	20 mg/kg bw/day	0.006857
Inhalation, Systemic effects, Long Term	6.675 mg/m³	130 mg/m³	0.051349

Inhalation, Systemic effects, Short term	26.702 mg/m³	130 mg/m³	0.205397
Combined routes, Systemic effects, Long Term	1.091 mg/kg bw/day	-	0.058206
Combined routes, Systemic effects, Short term	3.952 mg/kg bw/day	-	0.212254
Contributing scenario controlling worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC 4)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	1.371 mg/kg bw/day	20 mg/kg bw/day	0.0068571
Dermal, Systemic effects, Short term	1.371 mg/kg bw/day	20 mg/kg bw/day	0.0068571
Inhalation, Systemic effects, Long Term	13.351 mg/m³	130 mg/m³	0.102698
Inhalation, Systemic effects, Short term	53.403 mg/m³	130 mg/m³	0.410794
Combined routes, Systemic effects, Long Term	3.279 mg/kg bw/day	-	0.17127
Combined routes, Systemic effects, Short term	9 mg/kg bw/day	-	0.479365
Contributing scenario controlling worker exposure: Industrial spraying (PROC 7)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	2.143 mg/kg bw/day	20 mg/kg bw/day	0.107143
Dermal, Systemic effects, Short term	2.143 mg/kg bw/day	20 mg/kg bw/day	0.107143
Inhalation, Systemic effects, Long Term	19.14 mg/m³	130 mg/m³	0.147231
Inhalation, Systemic effects, Short term	19.14 mg/m³	130 mg/m³	0.147231
Combined routes, Systemic effects, Long Term	4.877 mg/kg bw/day	-	0.254374
Combined routes, Systemic effects, Short term	4.877 mg/kg bw/day	-	0.254374
Contributing scenario controlling worker exposure: Transfer of chemicals from / to vessel / large containers at non-dedicated facilities (PROC 8a)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Dermal, Systemic effects, Short term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Inhalation, Systemic effects, Long Term	33.377 mg/m³	130 mg/m³	0.256746
Inhalation, Systemic effects, Short term	66.754 mg/m³	130 mg/m³	0.513492
Combined routes, Systemic effects, Long Term	7.511 mg/kg bw/day	-	0.393889
Combined routes, Systemic effects, Short term	12.279 mg/kg bw/day	-	0.650635
Contributing scenario controlling worker exposure: Transfer of chemicals from / to vessel / large containers at dedicated facilities (PROC 8b)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**

Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Dermal, Systemic effects, Short term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Inhalation, Systemic effects, Long Term	10.013 mg/m³	130 mg/m³	0.077024
Inhalation, Systemic effects, Short term	20.026 mg/m³	130 mg/m³	0.154048
Combined routes, Systemic effects, Long Term	4.173 mg/kg bw/day	-	0.214167
Combined routes, Systemic effects, Short term	5.604 mg/kg bw/day	-	0.29119
Contributing scenario controlling worker exposure: Roller application or brushing (PROC 10)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	4.389 mg/kg bw/day	20 mg/kg bw/day	0.219429
Dermal, Systemic effects, Short term	4.389 mg/kg bw/day	20 mg/kg bw/day	0.219429
Inhalation, Systemic effects, Long Term	26.702 mg/m³	130 mg/m³	0.205397
Inhalation, Systemic effects, Short term	53.403 mg/m³	130 mg/m³	0.410794
Combined routes, Systemic effects, Long Term	8.203 mg/kg bw/day	-	0.424825
Combined routes, Systemic effects, Short term	12.018 mg/kg bw/day	-	0.630222
Contributing scenario controlling worker exposure: Treatment of articles by dipping and pouring (PROC 13)			
Exposure route	**Exposure estimate - Worker**	**DNEL**	**Risk quantification (RCR)**
Dermal, Systemic effects, Long Term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Dermal, Systemic effects, Short term	2.743 mg/kg bw/day	20 mg/kg bw/day	0.137143
Inhalation, Systemic effects, Long Term	33.377 mg/m³	130 mg/m³	0.256746
Inhalation, Systemic effects, Short term	66.754 mg/m³	130 mg/m³	0.513492
Combined routes, Systemic effects, Long Term	7.511 mg/kg bw/day	-	0.393889
Combined routes, Systemic effects, Short term	12.279 mg/kg bw/day	-	0.650635

SECTION 4:	**1.12 Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

4.1 Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling could be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use, additional RMMs or a site-specific chemical safety assessment is required.