

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

 ■ **V5** – amendments in this revision ■

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING			
1.1 Product identifier			
Trade name	Formalin		
Synonyms	Formalin /37% solution of formaldehyde/		
1.2 Relevant identified uses of the substance or mixture and uses advised against			
Relevant identified uses:	- monomer - intermediate Note: see section 16 for the complete list of uses covered by ES in provided annex		
Uses advised against:	Not known It is recommended that uses be limited to those listed in section 16.		
1.3 Details of the supplier of the safety data sheet			
Manufacturer: Address: Tel.;fax: URL website: Email:	NEOCHIM PLC East Industrial Zone, Himkombinatska Str. 6403 Dimitrovgrad, Bulgaria +359 391 65 205; +359 391 60 555 http://www.neochim.bg neochim@neochim.bg		
Company e-mail for SDS	pto@neochim.bg		
1.4 Emergency telephone number			
National Toxicology Center - Pirogov	+ 359 2 915 42 33	24/24 h	7/7 d
	+ 359 2 915 43 46	24/24 h	7/7 d
NEOCHIM PLC (the information is available in Bulgarian, English and Turkish)	+359 2 809 20 30	24/24 h	7/7 d
SECTION 2: HAZARDS IDENTIFICATION			
Physical and chemical hazards	Highly volatile liquid. Easily release gas (formaldehyde), which can cause explosion and fire when mix with air and has lower explosion limit of 7% v/v and upper explosion limit of 73% v/v.		

Potential effects on health	Toxic product. The risk depends on the level and on the duration of exposure. Skin contact: Danger of absorption through the skin. Can cause irreversible damage. Possible skin sensitivity. Eye contact: The vapour causes redness, pain and blurred vision. Splashes may cause irreversible eye damage (blindness). Ingestion: Inflammation of the mucous membranes of the mouth, throat, oesophagus and gastrointestinal tract. Possible irreversible damage. Risk of perforation of the oesophagus and stomach. Inhalation: Possible irreversible damage. Inhalation can cause pulmonary oedema.	
2.1 Classification of the substance or mixture		
2.1.1 Classification according to Regulation (EC) No 1272/2008 (CLP)		
Acute toxicity (oral), hazard category 3 (Acute Tox 3), H301 Acute toxicity (dermal), hazard category 3 (Acute Tox 3), H311 Acute toxicity (Inhalation - vapour), hazard category 3 (Acute Tox 3), H331 Skin corrosion/irritation, hazard category 1B, H314 Skin sensitizer, hazard category 1, H317 Carcinogenicity, hazard category 2 , H351		
2.1.2 Classification according to Directive 1999/45/EC (DPD)		
T; R:23/24/25 C; R:34 R:43 Carcinogenicity, hazard category 3, R:40		
2.1.3 Additional information		
For full text of R- phrases and H statements: see section 16		
2.2 Label elements		
Labelling according to Regulation 1272/2008 (CLP)		
Hazard pictogram(s):		
Signal word	Danger	
Hazard statement(s):	H301 H311 H314 H317 H331 H351	Toxic if swallowed. Toxic in contact with skin. Causes severe skin burns and eye damage. May cause an allergic skin reaction. Toxic if inhaled. Suspected of causing cancer if inhaled.

Precautionary statement(s):	P202 P280 P301+P330+ P331 P303 + P361 + P353 P308 + P313 P363 P305 + P351 + P338 P304 + P340 P405 P271 P410+403 P411 P501	Do not handle until all safety precautions have been read and understood. Wear impervious chemical resistant protective gloves, protective clothing, protective goggles and gas filter. IF SWALLOWED: rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF exposed or concerned: Get medical advice/attention. Wash contaminated clothing before reuse. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Store locked up. Use only outdoors or in a well-ventilated area. Protect from sunlight. Store in a well-ventilated place. Store at temperatures to 30°C up 50°C. Dispose of contents/container in accordance with national and international regulations.
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SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS
3.1 Substances
3.2 Mixtures – aqueous solution of formaldehyde

CAS №	EC №	Index №	RECH registration №	Content, % (w/w)	Name	Classification according to 67/548/EEC	Classification according to Regulation (EC) No 1272/2008 (CLP)
50-00-0	200-001-8	605-001-00-5	01-2119488953-20-0017	37±0.5	formaldehyde	T; R23/24/25 C; R34 R43 Carc. Cat.3; R40	Acute tox. 3 ;H301 Acute tox. 3 ;H311 Acute tox. 3 ;H331 Skin corr. 1B; H314 Skin. Sens. 1; H317 Carc. 2; H351

						<i>Specific Conc. Limits:</i> ≥25 % T; R23/24/25 C; R34 ≥5-<25.0 Xn; R20/21/22 Xi; R 36/37/38 ≥0.2 R34	<i>Specific Conc. Limits:</i> ≥25 % Skin corr. 1B ≥5-<25.0 Skin Irrit. 2 Eye Irrit. 2 ≥5.0 STOT Single Exp. 3A ≥0.2 Skin Sens. 1
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SECTION 4: FIRST-AID MEASURES

4.1 Description of first aid measures

Eye contact:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Skin contact:	Immediately remove contaminated clothing and wash affected skin area thoroughly with plenty of water for at least 15 minutes. Get medical advice/attention.
Ingestion:	Do NOT induce vomiting. If the person is conscious, dilute or deactivate ingested formaldehyde by giving water, activated charcoal or antidote. Keep warm and at rest. Obtain immediately medical attention.
Inhalation:	Remove the victim to the fresh air. If not breathing, give artificial respiration (Warning: may be dangerous to first responders, because inhaled material is toxic, infectious and corrosive). If breathing is difficult, give oxygen. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Acute effects	Pulmonary oedema
Delayed effects	Pulmonary oedema can appear later

4.3 Indication of any immediate medical attention and special treatment needed

Note to physician: Wash stomach with water and charcoal, antidotes, ammonium carbonate 2%, urea 20 g - orally twice at an interval of 30 minutes.

SECTION 5: FIRE - FIGHTING MEASURES

5.1 Extinguishing media

Suitable:	Water spray, chemical foam, mechanical foam.
Not suitable:	not known

5.2 Special hazards arising from the substance or mixture

Flash point: 85° C. Highly volatile liquid easily released gas phase.

Evacuate personnel not engaged in fire fighting. Stop the leak if safely to do so then extinguish by type of materials that burn. Move containers filled with formalin from area. Keep containers cooled by spraying with large amounts of water from a safe distance.

Explosion:

Mixtures of formaldehyde and air in concentration limits of 7 - 73 % (v/v) are explosive. Containers may explode if involved in fire.

Hazardous combustion products: carbon dioxide, carbon oxide and formaldehyde.
 Warning: may burn with an invisible flame (methyl alcohol).

5.3 Advice for firefighters

In the event of fire, wear a self-contained breathing apparatus and a chemical protective suit.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Immediately take out the staff that is not occupied with the accident from the area. Eliminate all possible sources of the fire and provide adequate ventilation. Isolate source of leak as quickly and safe to do so. Extension of announcement depends on released amount.

■ V5 6.1.1 For non-emergency personnel

Wear impervious chemical resistant protective gloves, protective clothing, protective goggles and gas filter. ■

■ V5 6.1.2 For emergency responders

Wear a self-contained breathing apparatus and a chemical protective suit. ■

6.2 Environmental precautions

Do not discharge directly to a water sources. If accidental spillage or washings enter drains or watercourses contact local authority.

6.3 Methods and material for containment and cleaning up

Small spills - collect the liquid in an appropriate container or absorb with inert material (eg dry sand, earth) and place in a chemical waste container. Collect large spills by pumping. Do not use combustible materials such as sawdust. Do not discharge into drains. Use water to disperse vapors, if expired or spilled material has not ignited.

6.4 Reference to other sections

See section 8 for personal protective equipment and section 13 for waste disposal.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Ensure adequate ventilation of stores and work areas. Handle in accordance with good industrial hygiene and safety practice.

Protection against fire and explosion:

Take precautionary measures against static discharges. Vapours may form explosive mixture with air. Keep away from sources of ignition - No smoking.

7.2 Conditions for safe storage, including any incompatibilities

Store in a tightly closed container at temperatures from 30°C to 50°C. Protect from physical damage. Store in a cool, dry, well ventilated place away from an area where there is danger of fire. Preferred self-storage warehouse or separated by a wall. Separate from incompatible materials. Containers must be connected and grounded to remove the static electricity and prevent sparks.

In case of forming sludge of paraformaldehyde heat it up to 65°C without using open fire.

Suitable packaging materials: Stainless steel 1.4301 (V2), High density polyethylene (HDPE), Low density polyethylene (LDPE), Stainless steel 1.4401, aluminum.

Unsuitable packaging materials: paper, board, glass.

■ V5 Storage class: 6.1 A ■

7.2 Specific end use(s)

See exposure scenario(s) in the attachment to this safety data sheet.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION
8.1 Control parameters

Regulated occupational exposure limit values:	Workplace exposure limits according to EH40/2005 8 hours - 2.5 mg/m ³ 15 minutes - 2.5 mg/m ³
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Recommended occupational and consumer exposure limit values (following from the performed CSA)

■ V5 DNEL – Derived No Effect Level ■

Route of exposure	DN(M)ELs for workers				DN(M)ELs for consumers			
	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic
Oral	Not required				No-threshold effect	No-threshold effect	No-threshold effect	4.1 mg/kg bw/d
Inhalation	1 mg/m ³ , 0.8 ppm	No-threshold effect	0.5 mg/m ³	9 mg/m ³	No-threshold effect	No-threshold effect	0.1 mg/m ³	3.2 mg/m ³
Dermal	No-threshold effect	No-threshold effect	0.037 mg/cm ²	240 mg/kg bw/d	No-threshold effect	No-threshold effect	0.012 mg/cm ²	102 mg/kg bw/d

PNEC - Predicted No Effect Concentration

Components	PNEC
freshwater	0.47 mg/l
marine water	0.47 mg/l
intermittent releases	4.7 mg/l
sediment (freshwater)	2.44 mg/kg
sediment (marine water)	2.44 mg/kg
soil	0.21 mg/kg
STP	0.19 mg/l

8.2 Exposure controls
8.2.1 Appropriate engineering controls

General or local exhaust ventilation to control exposure.

Environmental exposure controls:	Dispose of rinse water in accordance with local and national regulations.
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8.2.2 Personal protective equipment

8.2.2.1 Eye and face protection Tightly fitting safety goggles (splash goggles) (e.g. EN 166)

 8.2.2.2 Skin protection
 Hand protection
 Chemical resistant protective gloves (EN 374)
 Suitable materials also with prolonged, direct contact (Recommended:
 Protective index 6, corresponding > 480 minutes of permeation time)

Other skin protection	according to EN 374): butyl rubber (butyl) - 0.7 mm coating thickness nitrile rubber (NBR) - 0.4 mm coating thickness Chemical protective suit (e.g. according to EN 14605)
8.2.2.3 Respiratory protection	Suitable respiratory protection for lower concentrations or short-term effect: Gas filter for gases/vapours of inorganic compounds (e.g. EN 14387 Type B) Suitable respiratory protection for higher concentrations or long-term effect: Self-contained breathing apparatus.
8.2.2.4 Thermal hazards	■ V5 Use appropriate thermal resistant clothing, if necessary ■
8.2.3 Environmental exposure control See annex of this safety data sheet (exposure scenarios)	
SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES	
9.1 Information on basic physical and chemical properties	
Appearance:	Clear, colourless liquid
Odour:	Pungent odour
Melting/Freezing temperature:	-16 °C at 1013hPa (25% aqueous solution)
Boiling temperature:	98.9 - 99.4 °C at 1013.25 hPa (aqueous solution)
Flash-point:	79.4 °C (50% aqueous solution of formaldehyde, methanol 1%) 85 °C (37% aqueous solution of formaldehyde, methanol 1%)
Flammability:	Highly flammable gas and not flammable aqueous solution when the formaldehyde content <45%.
Explosive properties:	No explosive properties
Oxidizing properties:	No oxidising properties
Vapour pressure:	1 hPa at 20 °C
Relative density (D4 (20)):	1.13 – 1.15 g/cm ³ at 18 °C (aqueous solution)
Solubility in water:	550 g/l at 20 °C
Partition coefficient n-octanol/water:	0.35 at 25 °C
Viscosity:	2.1 – 2.8 mPa at 20 °C
Auto ignition temperature:	430 °C at 1013 hPa
Surface tension:	Based on chemical structure, surface activity is not expected.
9.2 Other information Not available	
SECTION 10: STABILITY AND REACTIVITY	
10.1 Reactivity Aqueous solutions of formaldehyde are corrosive to carbon steel, while vapours of formaldehyde are not.	
10.2 Chemical stability Stable under recommended storage and handling conditions (see section 7, handling and storage). Peroxides: The product does not incline for the formation of peroxide.	
10.3 Possibility of hazardous reactions	

Reaction with peroxide, nitrogen dioxide and formic acid can cause an explosion (formaldehyde gas).	
10.4 Conditions to avoid	
Heat, flame, ignition sources and incompatible substances.	
10.5 Incompatible materials	
Incompatible with oxidizing agents and alkalis. Formaldehyde reacts explosively with nitrogen oxide in about 180 °C and it reacts violently with perchloric acid, mixtures of perchloric acid, aniline and nitromethane.	
10.6 Hazardous decomposition product	
Carbon dioxide, carbon monoxide and formaldehyde.	
SECTION 11: TOXICOLOGICAL INFORMATION	
11.1 Information on toxicological effects	
ACUTE TOXICITY	Toxic by inhalation, in contact with skin and if swallowed. The product has not been tested. The statement has been derived from the properties of the individual components.
Acute oral toxicity:	LD ₅₀ : 460-830 mg/kg bw ;(rat)
Acute dermal toxicity:	LD50: 270 mg/kg (rabbit)
Acute inhalation toxicity:	LC ₅₀ (4 h) rat = 588 mg/m ³ = 490 ppm LC ₅₀ (30 min) rat = 1000 mg/m ³ = 830 ppm
LOCAL EFFECTS	Depending on the concentration and duration of exposure, aqueous solutions can cause a strongly irritating or corrosive effect on the skin or eyes.
Skin irritation:	Corrosive (rabbit)
Eye irritation:	Irreversible damage (rabbit)
Skin sensitization:	Aqueous solutions can cause skin sensitization in animal experiments and in humans.
Carcinogenicity:	Formaldehyde is classified as carcinogenic category 2 (Carc. Cat.2), in accordance with Regulation 1272/2008 EC, Annex VI. After lifelong inhalation exposure to concentrations that were severely damaging to the nasal epithelium, nasal tumors were induced in rats; in other species these findings were not found or were considerably less pronounced. The International Agency for Research on Cancer (IARC) has classified formaldehyde as a Group 1 (known) human carcinogen based on epidemiological evidence linking formaldehyde exposure to occurrence of nasopharyngeal cancer and leukemia.
Toxicity to reproduction:	There is no evidence for adverse effects of formaldehyde on embryo and fetal development at dose levels inducing local maternal effects and secondary decrease in body weights and growth.
SECTION 12: ECOLOGICAL INFORMATION	
12.1 Toxicity	
Assessment of aquatic toxicity: Acutely harmful for aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations. The product has not been tested. The statement has been derived from products of a similar structure or composition.	
Fish:	96h LC ₅₀ : 41 mg/l (Brachydanio rerio)

Aquatic invertebrates:	24h EC ₅₀ : 42 mg/l, Daphnia magna (DIN 38412 Part 11)
Aquatic plants:	192h 2.5 mg/l, Scenedesmus subspicatus Limit concentration test only (LIMIT test).
Microorganisms/Effect on activated sludge:	16-h 14 mg/l, Pseudomonas putida EC20 (5 h) > 1,995 mg/l (DIN EN ISO 8192-OECD 209-88/302/EEC,P. C) The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.
12.2 Persistence and degradability	
Biodegradation:	On the basis of the data available concerning eliminability/degradation and bioaccumulation potential, longer-term harm to the environment is improbable.
Assessment of stability in water:	According to structural properties, hydrolysis is not expected.
12.3 Bioaccumulative potential Insignificantly accumulate in organisms.	
Octanol-water partition coefficient (K _{ow}):	Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.
12.4 Mobility in soil The substance will not evaporate into the atmosphere from the water surface. Adsorption to solid soil phase is not expected.	
12.5 Results of PBT and vPvB assessment According to Annex XIII of Regulation 1907/2006(EC): not fulfilling vPvB criteria.	
Additional information: Adsorbable organically-bound halogen (AOX): This product contains no organically-bound halogen. Other ecotoxicological advice: The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.	
SECTION 13: DISPOSAL CONSIDERATIONS	
Contents/container to be transferred to the licensed disposal companies	
SECTION 14: TRANSPORT INFORMATION	

Land transport
ADR

Hazard class: 8
 Packing group: III
 ID number: UN 2209
 Hazard label: 8
 Proper shipping name: FORMALDEHYDE SOLUTION

RID

Hazard class: 8
 Packing group: III
 ID number: UN 2209
 Hazard label: 8
 Proper shipping name: FORMALDEHYDE SOLUTION

Inland waterway transport
ADN

Hazard class: 8
 Packing group: III
 ID number: UN 2209
 Hazard label: 8
 Proper shipping name: FORMALDEHYDE SOLUTION

Sea transport
IMDG

Hazard class: 8
 Packing group: III
 ID number: UN 2209
 Hazard label: 8
 Marine pollutant: NO
 Proper shipping name: FORMALDEHYDE SOLUTION

Air transport
IATA/ICAO

Hazard class: 8
 Packing group: III
 ID number: UN 2209
 Hazard label: 8
 Proper shipping name: FORMALDEHYDE SOLUTION

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulation/legislation specific for the substance or mixture:	Regulation EC 1907/2006 (REACH), Directive 67/548/EEC and 1999/45/EC , Regulation EC 1272/2008 (CLP), Regulation (EC) 453/2010,
15.2 Chemical safety assessment:	In accordance with REACH Article 14, a Chemical Safety Assessment has been carried out for this product.

16. OTHER INFORMATION

Full texts of all R-phrases and H-hazards used in Sections 2.1 and 3**R phrases**

R23/24/25: Toxic by inhalation, in contact with skin and if swallowed.

R34: Causes burns.

R43: May cause sensitization by skin contact.

R40: Limited evidence of a carcinogenic effect.

H statement

H301: Toxic if swallowed.

H311: Toxic in contact with skin.

H314: Causes severe skin burns and eye damage.

H317: May cause an allergic skin reaction.

H331: Toxic if inhaled.

H351: Suspected of causing cancer if inhaled.

According to Directive 67/548/EEC or 1999/45/EC

T- Toxic

C- Corrosive

Carc. Cat. 3 - Category 3: Substances which cause concern for man due to possible carcinogenic effects, however, since sufficient information is not available a satisfactory assessment cannot be made.

List of abbreviations

PBT – persistent, bioaccumulative and toxic

vPvB - very persistent and very bioaccumulative

NOAEL - no observed adverse effect level

NOAEC - no observed adverse effect concentration

DNEL - derived no-effect level

PNEC - predicted no-effect concentration

PEC - predicted environmental concentration

LOEC - lowest observed effect concentration

NOEC - no observed effect concentration

OECD - Organisation for Economic Cooperation and Development

LC_x - lethal concentration

EC_x - effective concentration

LD_x - lethal dose

List of attached exposure scenarios

ES1: Manufacturing of formaldehyde and an aqueous solution of formaldehyde. Use as an intermediate product, including as a monomer

ES2: Use in/as formulation

ES 3-1: Production of fertilizers

ES 3-2: Industrial use of formaldehyde based products: production of foams, use in adhesives, production of bonded particulates (casting, molding), use in coatings, rubber production and processing, production of firelighters, use in leather tanning, finishing, impregnation

ES 3-3: Industrial use of formaldehyde based products: production of wood based materials (panels, bricks, etc), production of impregnated paper, production of paper, use in textile finishing, production of bonded fibers or fiber mats

ES 3-4: Industrial use of products containing formaldehyde up to 1.5%: production of adhesives, foams, bonded particulates (casting, molding), use in coatings, rubber production and processing, production of firelighters, use in leather tanning, finishing, impregnation

ES 3-5: Industrial use of products containing formaldehyde up to 1%: production of wood based materials (panels, bricks, etc), impregnated paper, paper, use in textile finishing, production of bonded fibers or fiber mats

ES 4-1: Professional use of products containing formaldehyde up to 1.5%: adhesives, foams, coatings, firelighters and cleaning agents

ES 4-2: Professional use of products containing formaldehyde up to 1%: resins in wood applications (eg. glues)

ES 5: Consumer use of formaldehyde based products: adhesives, coatings, firelighters and cleaning agents

The information above is on the basis of our knowledge about the product and represents the data currently available to us at the moment of safety data sheet issue. This document is intended as guidance for the appropriate precautionary handling with the product by a properly trained person using this product, and does not legally bind in no way manufacturer with guarantee for specific properties, qualities and applications. Neochim PLC does not grant, guarantee or implies any warranties of merchantability, fitness for a particular purpose with respect to the information set forth herein or the product to which the information refers. Neochim PLC does not carry any liability for damages resulting from the product use or reliance upon this information, data and recommendations for it. Users are responsible to make their own investigations to determine the suitability of the information and the product for their particular purposes, and to comply with applicable laws.

Annex: Exposure Scenarios

1. Short title of exposure scenario (ES1) - Manufacturing of formaldehyde and an aqueous solution of formaldehyde. Use as an intermediate product, including as a monomer

Use descriptors related to the life cycle stage	Sector of end use: SU3; SU8, SU9, SU10, SU12 Process category: PROC1/2/3/4/5/6/8a/8b/9/14/15 Environmental release category: ERC1/23/4/6a/6b/6c/6d/7
Name of contributing environmental scenario (1) and corresponding ERC	<ol style="list-style-type: none"> 1. Manufacture of substances (ERC1) 2. Formulation of mixture (ERC2) 3. Formulation in materials (ERC3) 4. Industrial use of processing aids in processes and products, not becoming part of articles (ERC4) 5. Industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a) 6. Industrial use of reactive processing aids (ERC6b) 7. Industrial use of monomers for manufacture of thermoplastics (ERC6c) 8. Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers (ERC6d) 9. Industrial use of substances in closed systems (ERC 7)
List of names of contributing worker scenarios (2) and corresponding PROC	<ol style="list-style-type: none"> 1. Use in closed process, no likelihood of exposure (<i>PROC1</i>) 2. Use in closed, continuous process with occasional controlled

	exposure (<i>PROC2</i>) 3. Use in closed batch process (synthesis or formulation) (<i>PROC3</i>) 4. Use in batch and other process (synthesis) where opportunity for exposure arises (<i>PROC4</i>) 5. Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (<i>PROC5</i>) 6. Calendering operations (<i>PROC6</i>) 7. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (<i>PROC8a</i>) 8. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (<i>PROC8b</i>) 9. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (<i>PROC9</i>) 10. Production of preparations or articles by tableting, compression, extrusion, pelettisation. (<i>PROC14</i>) 11. Use as laboratory reagent (<i>PROC15</i>)
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2. Contributing scenario controlling environmental exposure

Manufacture of substances (ERC1); Formulation of mixture (ERC2); Formulation in materials (ERC3); Industrial use of processing aids in processes and products, not becoming part of articles (ERC4); Industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a); Industrial use of reactive processing aids (ERC6b); Industrial use of monomers for manufacture of thermoplastics (ERC6c); Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers (ERC6d); Industrial use of substances in closed systems (ERC 7)

An environmental assessment has not been performed as the product does not meet the criteria for being classified

2.1 Contributing scenario (1) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC1: Use in closed process, no likelihood of exposure.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 100 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	1000 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Risk Management Measures	
Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m).	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 90 %
Wear chemically resistant gloves in combination with intensive management	Effectiveness: 98 %

supervision control.	
Personal measures have to be applied in case of potential exposure only.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.025 mg/m ³
	The exposure estimate represents the 75th percentile of the exposure distribution. The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachttool.com	

2.2 Contributing scenario (2) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. PROC3: Use in closed batch process (synthesis or formulation). (closed systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 100 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	1000 hPa
Process temperature	150 °C
Duration and Frequency of activity	360 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Personal measures have to be applied in case of potential exposure only.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01

Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.253 mg/m ³
Risk Characterization Ratio (RCR)	0.51
	The exposure estimate represents the 75th percentile of the exposure distribution. The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtol.com	

2.3 Contributing scenario (3) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. PROC3: Use in closed batch process (synthesis or formulation). Transfer of liquid products - falling liquids Submerged loading Dedicated facility (open systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	120 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Vapour recovery system	Effectiveness: 80 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.253 mg/m ³
Risk Characterization Ratio (RCR)	0.51

	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.4 Contributing scenario (4) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). (closed systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 100 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	1000 hPa
Process temperature	150 °C
Duration and Frequency of activity	360 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Personal measures have to be applied in case of potential exposure only.	
Exposure estimate and reference to its source	
PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4, PROC5	
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.293 mg/m ³
Risk Characterization Ratio (RCR)	0.59
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified

	version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.2 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4, PROC5	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Additional good practice advice	
Avoid skin contact. Avoid contact with eyes. Wash off any skin contamination immediately.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.5 Contributing scenario (5) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). Transfer of liquid products - falling liquids Submerged loading Dedicated facility (open systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 60\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Vapour recovery system	Effectiveness: 80 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	

PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4, PROC5	
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.293 mg/m ³
Risk Characterization Ratio (RCR)	0.59
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0.2 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4, PROC5	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Additional good practice advice	
Avoid skin contact. Avoid contact with eyes. Wash off any skin contamination immediately.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.6 Contributing scenario (6) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). (open systems) Activities with open liquid surfaces or open reservoirs - activity with agitated surfaces
Operational conditions	
Concentration of the substance	formaldehyde

	Content: $\geq 0\%$ - $\leq 60\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Open surface	0.1 m ²
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Provide extract ventilation to points where emissions occur (LEV).	Effectiveness: 90 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Wear suitable respiratory protection.	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	$< 0.1\text{ mg/kg bw/day}$
Risk Characterization Ratio (RCR)	< 0.01
PROC4, PROC5	
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.293 mg/m^3
Risk Characterization Ratio (RCR)	0.59
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.2 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4, PROC5	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Additional good practice advice	

Avoid skin contact. Avoid contact with eyes. Wash off any skin contamination immediately.
Guidance to Downstream Users
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)
For scaling see: http://www.advancedreachtool.com

2.7 Contributing scenario (7) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC6: Calendering operations
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 60\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	15.2 hPa
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).

Risk Management Measures

Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Wear suitable respiratory protection.	Effectiveness: 90 %

Exposure estimate and reference to its source

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.3 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.02
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.233 mg/m ³
Risk Characterization Ratio (RCR)	0.47
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	0.78 mg/m ³
Risk Characterization Ratio (RCR)	0.78
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)

2.8 Contributing scenario (8) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Aerosol formation is not covered within the CES
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.2 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.350 mg/m ³
Risk Characterization Ratio (RCR)	0.7
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	
2.9 Contributing scenario (9) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde

	Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	25 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Assumes use at not more than 20°C above ambient temperature.
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.2 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.26 mg/m ³
Risk Characterization Ratio (RCR)	0.52
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.10 Contributing scenario (10) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	25 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³

	Assumes use at not more than 20°C above ambient temperature.
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.076 mg/m ³
Risk Characterization Ratio (RCR)	0.15
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.11 Contributing scenario (11) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Assumes use at not more than 20°C above ambient temperature.
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Vapour recovery system	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %

Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Exposure estimate and reference to its source	
Assessment method	Qualitative assessment
	Worker - all relevant routes
	The use is assessed to be safe., In case the identified operational conditions and risk management measures are applied:
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.12 Contributing scenario (12) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 60\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Vapour recovery system	Effectiveness: 80 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	$< 0.1 \text{ mg/kg bw/day}$
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.230 mg/m^3
Risk Characterization Ratio (RCR)	0.46
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment

	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.13 Contributing scenario (13) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Submerged loading
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Amounts used	Amount per use 1,000 l

Risk Management Measures

Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Vapour recovery system	Effectiveness: 80 %

Exposure estimate and reference to its source

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.170 mg/m ³
Risk Characterization Ratio (RCR)	0.34
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.14 Contributing scenario (14) controlling worker exposure

Use descriptors covered	SU3: Industrial uses
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	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.25 mg/m ³
Risk Characterization Ratio (RCR)	0.5
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.15 Contributing scenario (15) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 60\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C

Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Outdoor
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 80 %
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Exposure estimate and reference to its source	
Assessment method	Qualitative assessment
	Worker - all relevant routes
	The use is assessed to be safe., In case the identified operational conditions and risk management measures are applied:
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.16 Contributing scenario (16) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 90 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Provide extract ventilation to points where emissions occur (LEV).	Effectiveness: 90 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified

	version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.120 mg/m ³
Risk Characterization Ratio (RCR)	0.24
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2., The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtol.com	

2.17 Contributing scenario (17) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Provide extract ventilation to points where emissions occur (LEV).	Effectiveness: 90 %

Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.085 mg/m ³
Risk Characterization Ratio (RCR)	0.17
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.18 Contributing scenario (18) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
Exposure estimate	Worker - dermal, long-term - systemic < 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
Exposure estimate	Worker - inhalative, long-term - systemic 0.25 mg/m ³
Risk Characterization Ratio (RCR)	0.5
Assessment method	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachttool.com	

2.19 Contributing scenario (19) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach ECETOC TRA modified version: Use of gloves has been considered additionally ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
Exposure estimate	Worker - dermal, long-term - systemic 0.04 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.233 mg/m ³
Risk Characterization Ratio (RCR)	0.47
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	0.78 mg/m ³
Risk Characterization Ratio (RCR)	0.78
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.20 Contributing scenario (20) controlling worker exposure

Use descriptors covered	SU3: Industrial uses, SU22: Professional uses PROC15: Use a laboratory reagent.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	100 m ³
Amounts used	Amount per use 0.1 l
Risk Management Measures	
Provide a good standard of controlled ventilation (10 to 15 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Perform task in a fume cupboard.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.3 mg/m ³

Risk Characterization Ratio (RCR)	0.6
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2. Short title of exposure scenario (ES 2) - Use in/as Formulation

Use descriptors related to the life cycle stag	Sector of end use: SU3, SU10 Process category: PROC1/2/3/4/5/6/8a/8b/9/14/15 Environmental release category: ERC/2/3
Name of contributing environmental scenario (1) and corresponding ERC	1 Formulation of mixture (ERC2) 2 Formulation in materials (ERC3)
List of names of contributing worker scenarios (2) and corresponding PROC	1 Use in closed process, no likelihood of exposure (<i>PROC1</i>) 2 Use in closed, continuous process with occasional controlled exposure (<i>PROC2</i>) 3 Use in closed batch process (synthesis or formulation) (<i>PROC3</i>) 4 Use in batch and other process (synthesis) where opportunity for exposure arises (<i>PROC4</i>) 5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (<i>PROC5</i>) 6 Calendering operations (<i>PROC6</i>) 7 Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (<i>PROC8a</i>) 8 Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (<i>PROC8b</i>) 9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (<i>PROC9</i>) 10 Production of preparations or articles by tableting, compression, extrusion, pelettisation (<i>PROC14</i>) 11 Use as laboratory reagent (<i>PROC15</i>)
2. Contributing scenario controlling environmental exposure	
Formulation of mixture (ERC2); Formulation in materials (ERC3) An environmental assessment has not been performed as the product does not meet the criteria for being classified	

2.1 Contributing scenario (1) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC1: Use in closed process, no likelihood of exposure.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 100 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	1000 hPa
Process temperature	150 °C

Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Risk Management Measures	
Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m).	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 90 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Personal measures have to be applied in case of potential exposure only.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.025 mg/m ³
	The exposure estimate represents the 75th percentile of the exposure distribution. The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.2 Contributing scenario (2) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. PROC3: Use in closed batch process (synthesis or formulation). (closed systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 100 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	1000 hPa
Process temperature	150 °C
Duration and Frequency of activity	360 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Risk Management Measures	

Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Personal measures have to be applied in case of potential exposure only.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.253 mg/m ³
Risk Characterization Ratio (RCR)	0.51
	The exposure estimate represents the 75th percentile of the exposure distribution. The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.3 Contributing scenario (3) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. PROC3: Use in closed batch process (synthesis or formulation). Transfer of liquid products - falling liquids Submerged loading Dedicated facility (open systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	120 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	

Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Vapour recovery system	Effectiveness: 80 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.253 mg/m ³
Risk Characterization Ratio (RCR)	0.51
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.4 Contributing scenario (4) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). (closed systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 100 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	1000 hPa
Process temperature	150 °C
Duration and Frequency of activity	360 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Personal measures have to be applied in	

case of potential exposure only.	
Exposure estimate and reference to its source	
PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4, PROC5	
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.293 mg/m ³
Risk Characterization Ratio (RCR)	0.59
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.2 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4, PROC5	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Additional good practice advice	
Avoid skin contact. Avoid contact with eyes. Wash off any skin contamination immediately.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachttool.com	

2.5 Contributing scenario (5) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). Transfer of liquid products - falling liquids Submerged loading Dedicated facility (open systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in	

case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Vapour recovery system	Effectiveness: 80 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4, PROC5	
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.293 mg/m ³
Risk Characterization Ratio (RCR)	0.59
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0.2 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4, PROC5	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Additional good practice advice	
Avoid skin contact. Avoid contact with eyes. Wash off any skin contamination immediately.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachttool.com	

2.6 Contributing scenario (6) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). (open systems) Activities with open liquid surfaces or open reservoirs - activity with agitated surfaces
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C

Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Open surface	0.1 m ²
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Provide extract ventilation to points where emissions occur (LEV).	Effectiveness: 90 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Wear suitable respiratory protection.	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4, PROC5	
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.293 mg/m ³
Risk Characterization Ratio (RCR)	0.59
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.2 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4, PROC5	

Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Additional good practice advice	
Avoid skin contact. Avoid contact with eyes. Wash off any skin contamination immediately.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.7 Contributing scenario (7) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC6: Calendering operations
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 60\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	15.2 hPa
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.3 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.02
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.233 mg/m ³
Risk Characterization Ratio (RCR)	0.47
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	0.78 mg/m ³
Risk Characterization Ratio (RCR)	0.78
	The use is assessed to be safe.
Assessment method	Qualitative assessment

	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.8 Contributing scenario (8) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Aerosol formation is not covered within the CES.
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 60\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.2 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.350 mg/m ³
Risk Characterization Ratio (RCR)	0.7
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.9 Contributing scenario (9) controlling worker exposure

 The latest version can be found on: http://www.neochim.bg/files/sds_formalin_en.pdf

Use descriptors covered	SU3: Industrial uses PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	25 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Assumes use at not more than 20°C above ambient temperature.
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.2 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.26 mg/m ³
Risk Characterization Ratio (RCR)	0.52
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.10 Contributing scenario (10) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Submerged loading.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Liquid, moderate fugacity

Vapour pressure of the substance during use	15.2 hPa
Process temperature	25 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
Amounts used	Assumes use at not more than 20°C above ambient temperature. Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
Exposure estimate	Worker - dermal, long-term - systemic < 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
Exposure estimate	Worker - inhalative, long-term - systemic 0.076 mg/m ³
Risk Characterization Ratio (RCR)	0.15
Assessment method	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution. Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.11 Contributing scenario (11) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
Amounts used	Assumes use at not more than 20°C above ambient temperature. Amount per use 1,000 l

Risk Management Measures	
Vapour recovery system	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Exposure estimate and reference to its source	
Assessment method	Qualitative assessment
	Worker - all relevant routes
	The use is assessed to be safe., In case the identified operational conditions and risk management measures are applied:
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.12 Contributing scenario (12) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Vapour recovery system	Effectiveness: 80 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic

Exposure estimate	0.230 mg/m ³
Risk Characterization Ratio (RCR)	0.46
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.13 Contributing scenario (13) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Vapour recovery system	Effectiveness: 80 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.170 mg/m ³
Risk Characterization Ratio (RCR)	0.34
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.

Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtol.com	

2.14 Contributing scenario (14) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Submerged loading
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Amounts used	Amount per use 1,000 l

Risk Management Measures

Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %

Exposure estimate and reference to its source

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.25 mg/m ³
Risk Characterization Ratio (RCR)	0.5
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtol.com	

2.15 Contributing scenario (15) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Submerged loading
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 60\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Outdoor
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 80 %
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Exposure estimate and reference to its source	
Assessment method	Qualitative assessment
	Worker - all relevant routes
	The use is assessed to be safe., In case the identified operational conditions and risk management measures are applied:
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.16 Contributing scenario (16) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 60\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 90 %
Wear chemically resistant gloves in combination with intensive management	Effectiveness: 98 %

supervision control.	
Provide extract ventilation to points where emissions occur (LEV).	Effectiveness: 90 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.120 mg/m ³
Risk Characterization Ratio (RCR)	0.24
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.17 Contributing scenario (17) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Provide extract ventilation to points where	Effectiveness: 90 %

emissions occur (LEV).	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.085 mg/m ³
Risk Characterization Ratio (RCR)	0.17
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachttool.com	

2.18 Contributing scenario (18) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Submerged loading
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic

Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.25 mg/m ³
Risk Characterization Ratio (RCR)	0.5
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.19 Contributing scenario (19) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.04 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.233 mg/m ³
Risk Characterization Ratio (RCR)	0.47
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a

	linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	0.78 mg/m ³
Risk Characterization Ratio (RCR)	0.78
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.20 Contributing scenario (20) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses, SU22: Professional uses PROC15: Use a laboratory reagent.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	100 m ³
Amounts used	Amount per use 0.1 l
Risk Management Measures	
Provide a good standard of controlled ventilation (10 to 15 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Perform task in a fume cupboard.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.3 mg/m ³
Risk Characterization Ratio (RCR)	0.6
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

3. Short title of exposure scenario (ES 3-1) - Production of Fertilizers

Use descriptors related to the life cycle stage	Sector of end use: SU3; SU8 Process category: PROC1/2 Environmental release category: ERC 5
Name of contributing environmental scenario (1) and corresponding ERC	Industrial use resulting in inclusion into or onto a matrix (ERC5)
List of names of contributing worker scenarios (2) and corresponding PROC	1. Use in closed process, no likelihood of exposure (PROC1) 2. Use in closed, continuous process with occasional controlled exposure (PROC2)

2. Contributing scenario controlling environmental exposure

Industrial use resulting in inclusion into or onto a matrix (ERC5)

An environmental assessment has not been performed as the product does not meet the criteria for being classified.

2.1 Contributing scenario (1) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure.
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC1, PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
Exposure estimate	Worker - dermal, long-term - systemic
Risk Characterization Ratio (RCR)	< 0.1 mg/kg bw/day
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
Exposure estimate	Worker - inhalative, long-term - systemic
Risk Characterization Ratio (RCR)	< 0.001 mg/m ³
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
Exposure estimate	Worker - inhalative, short-term - systemic
Risk Characterization Ratio (RCR)	< 0.01 mg/m ³
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified

	version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.188 mg/m ³
Risk Characterization Ratio (RCR)	0.38
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.2 Contributing scenario (2) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC1, PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	< 0.001 mg/m ³
Risk Characterization Ratio (RCR)	< 0.01
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	< 0.01 mg/m ³
Risk Characterization Ratio (RCR)	< 0.01
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified

	version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.125 mg/m ³
Risk Characterization Ratio (RCR)	0.25
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.3 Contributing scenario (3) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. (closed systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 100 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	1000 hPa
Process temperature	150 °C
Duration and Frequency of activity	360 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Personal measures have to be applied in case of potential exposure only.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.253 mg/m ³
Risk Characterization Ratio (RCR)	0.51
	The exposure estimate represents the 75th percentile of the exposure

	distribution. The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.4 Contributing scenario (4) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. Transfer of liquid products - falling liquids Submerged loading Dedicated facility (open systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 60\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	120 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Vapour recovery system	Effectiveness: 80 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	$< 0.1 \text{ mg/kg bw/day}$
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.253 mg/m^3
Risk Characterization Ratio (RCR)	0.51
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal

	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

4. Short title of exposure scenario (ES 3-2) - Industrial use of formaldehyde based products: production of foams, use in adhesives, production of bonded particulates (casting, molding), use in coatings, rubber production and processing, production of firelighters, use in leather tanning, finishing, impregnation

Use descriptors related to the life cycle stage	Sector of end use: SU2a, SU3, SU5, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU17, SU19 Process category: PROC1/2/3/4/5/6/7/8a/8b/9/10/13/14/16/21/22/23/24/25 Environmental release category: ERC/2/3/5/6d
Name of contributing environmental scenario (1) and corresponding ERC	<ol style="list-style-type: none"> 1 Formulation of mixture (ERC2) 2 Formulation in materials (ERC3) 3 Industrial use resulting in inclusion into or onto a matrix (ERC5) 4 Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers (ERC6d)
List of names of contributing worker scenarios (2) and corresponding PROC	<ol style="list-style-type: none"> 1 Use in closed process, no likelihood of exposure (<i>PROC1</i>) 2 Use in closed, continuous process with occasional controlled exposure (<i>PROC2</i>) 3 Use in closed batch process (synthesis or formulation) (<i>PROC3</i>) 4 Use in batch and other process (synthesis) where opportunity for exposure arises (<i>PROC4</i>) 5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (<i>PROC5</i>) 6 Calendering operations (<i>PROC6</i>) 7 Industrial spraying (<i>PROC7</i>) 8 Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (<i>PROC8a</i>) 9 Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (<i>PROC8b</i>) 10 Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (<i>PROC9</i>) 11 Roller application and brushing (<i>PROC10</i>) 12 Treatment of articles by dipping and pouring (<i>PROC13</i>) 13 Production of preparations or articles by tableting, compression, extrusion, pelettisation. (<i>PROC14</i>) 14 Using material as fuel sources, limited exposure to unburned to be expected (<i>PROC16</i>) 15 Low energy manipulation of substances bound in materials and/or articles (<i>PROC21</i>) 16 Potentially closed processing with minerals/metals at elevated temperature (<i>PROC22</i>) Industrial setting 17 Open processing and transfer with minerals/ metals at elevated temperature (<i>PROC23</i>)

	18 High (mechanical) energy work- up of substances bound in materials and/or articles (PROC24) 19 Other hot work operations with metals (PROC25)
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2. Contributing scenario controlling environmental exposure

Formulation of mixture (ERC2); Formulation in materials (ERC3); Industrial use resulting in inclusion into or onto a matrix (ERC5); Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers (ERC6d)

An environmental assessment has not been performed as the product does not meet the criteria for being classified.

2.1 Contributing scenario (1) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC1: Use in closed process, no likelihood of exposure.
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

Risk Management Measures

Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
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Exposure estimate and reference to its source

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
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Exposure estimate	Worker - dermal, long-term - systemic < 0.1 mg/kg bw/day
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Risk Characterization Ratio (RCR)	< 0.01
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Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
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Exposure estimate	Worker - inhalative, long-term - systemic < 0.001 mg/m ³
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Risk Characterization Ratio (RCR)	< 0.01
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The use is assessed to be safe.

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
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Exposure estimate	Worker - inhalative, short-term - systemic < 0.01 mg/m ³
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Risk Characterization Ratio (RCR)	< 0.01
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Assessment method	Qualitative assessment
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Worker - dermal

The use is assessed to be safe.

Assessment method	Qualitative assessment
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Worker - contact with eyes

The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.2 Contributing scenario (2) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. Transfer of liquid products - falling liquids Submerged loading
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	Dedicated facility (open systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 60\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	120 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Vapour recovery system	Effectiveness: 80 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.253 mg/m ³
Risk Characterization Ratio (RCR)	0.51
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.3 Contributing scenario (3) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. PROC3: Use in closed batch process (synthesis or formulation).
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Liquid, moderate fugacity

Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC2, PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.06 mg/m ³
Risk Characterization Ratio (RCR)	< 0.13
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.156 mg/m ³
Risk Characterization Ratio (RCR)	0.31
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC2, PROC3	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC2, PROC3	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.4 Contributing scenario (4) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 5 %
Physical state	Liquid, high fugacity

Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Use suitable eye protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
PROC4, PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.125 mg/m ³
Risk Characterization Ratio (RCR)	0.25
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.313 mg/m ³
Risk Characterization Ratio (RCR)	0.63
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC4, PROC5	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC4, PROC5	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.5 Contributing scenario (5) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC6: Calendering operations PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring. PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation. PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde

	Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.313 mg/m ³
Risk Characterization Ratio (RCR)	0.63
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.6 Contributing scenario (6) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC7: Industrial spraying Aerosol formation is not covered within the CES
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified

	version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.156 mg/m ³
Risk Characterization Ratio (RCR)	0.31
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	0.78 mg/m ³
Risk Characterization Ratio (RCR)	0.78
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.7 Contributing scenario (7) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Submerged loading PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 1 % - <= 5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Outdoor
Risk Management Measures	
Vapour recovery system	Effectiveness: 80 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	Qualitative assessment
	Worker - all relevant routes
	The use is assessed to be safe., In case the identified operational conditions and risk management measures are applied:
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.8 Contributing scenario (8) controlling worker exposure

Use descriptors covered	SU3: Industrial uses
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	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 97 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.094 mg/m ³
Risk Characterization Ratio (RCR)	0.19
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.8 Contributing scenario (8) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 2.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 97 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.047 mg/m ³
Risk Characterization Ratio (RCR)	0.09
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.9 Contributing scenario (9) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC16: Using material as fuel sources, limited exposure to unburned product to be expected.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Perform task in a fume cupboard.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.313 mg/m ³
Risk Characterization Ratio (RCR)	0.63
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.

Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.10 Contributing scenario (10) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC21: Low energy manipulation of substances bound in materials and/or articles PROC22: Potentially closed processing operations (with minerals) at elevated temperature PROC23: Open processing and transfer operations (with minerals) at elevated temperature
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Solid
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures

Risk Management Measures

Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %

Exposure estimate and reference to its source

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally. ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic

Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic

Exposure estimate	0.05 mg/m ³
Risk Characterization Ratio (RCR)	0.1

The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.

Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.

Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.11 Contributing scenario (11) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles
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Operational conditions

Concentration of the substance	formaldehyde Content: >= 0 % - <= 5 %
Physical state	Solid
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally. ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.10 mg/m ³
Risk Characterization Ratio (RCR)	0.2
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.12 Contributing scenario (12) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC25: Other hot work operations with metals
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 5 %
Physical state	Solid
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day

Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
Exposure estimate	Worker - inhalative, long-term - systemic
Risk Characterization Ratio (RCR)	0.25 mg/m ³
Assessment method	0.5
Assessment method	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
Assessment method	Worker - dermal
Assessment method	The use is assessed to be safe.
Assessment method	Qualitative assessment
Assessment method	Worker - contact with eyes
Assessment method	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

5. Short title of exposure scenario (ES 3-3) - Industrial use of formaldehyde based products: production of wood based materials (panels, bricks, etc), production of impregnated paper, production of paper and use in textile finishing, production of bonded fibers or fiber mats

Use descriptors related to the life cycle stage	Sector of end use: SU3, SU5, SU6a, SU66, SU10, SU11, SU12, SU13, SU18, SU19 Process category: PROC1/2/3/4/5/6/7/8a/8b/9/10/13/14/16/21/22/23/24/25 Environmental release category: ERC2/3/5/6d
Name of contributing environmental scenario (1) and corresponding ERC	<ol style="list-style-type: none"> 1. Formulation of mixture (ERC2) 2. Formulation in materials (ERC3) 3. Industrial use resulting in inclusion into or onto a matrix (ERC5) 4. Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers (ERC6d)
List of names of contributing worker scenarios (2) and corresponding PROC	<ol style="list-style-type: none"> 1. Use in closed process, no likelihood of exposure (<i>PROC1</i>) 2. Use in closed, continuous process with occasional controlled exposure (<i>PROC2</i>) 3. Use in closed batch process (synthesis or formulation) (<i>PROC3</i>) 4. Use in batch and other process (synthesis) where opportunity for exposure arises (<i>PROC4</i>) 5. Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (<i>PROC5</i>) 6. Calendering operations (<i>PROC6</i>) 7. Industrial spraying (<i>PROC7</i>) 8. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (<i>PROC8a</i>) 9. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (<i>PROC8b</i>) 10. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (<i>PROC9</i>) 11. Roller application and brushing (<i>PROC10</i>) 12. Treatment of articles by dipping and pouring (<i>PROC13</i>) 13. Production of preparations or articles by tableting, compression,

	extrusion, pelettisation. (PROC14) 14. Using material as fuel sources, limited exposure to unburned to be expected (PROC16) 15. Low energy manipulation of substances bound in materials and/or articles (PROC21) 16. Potentially closed processing with minerals/metals at elevated temperature (PROC22) Industrial setting 17. Open processing and transfer with minerals/ metals at elevated temperature (PROC23) 18. High (mechanical) energy work- up of substances bound in materials and/or articles (PROC24) 19. Other hot work operations with metals (PROC25)
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2. Contributing scenario controlling environmental exposure

Formulation of mixture (ERC2); Formulation in materials (ERC3); Industrial use resulting in inclusion into or onto a matrix (ERC5); Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers (ERC6d)

An environmental assessment has not been performed as the product does not meet the criteria for being classified.

2.1 Contributing scenario (1) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure.
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 2.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC1, PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
Exposure estimate	Worker - dermal, long-term - systemic
Risk Characterization Ratio (RCR)	< 0.1 mg/kg bw/day
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
Exposure estimate	Worker - inhalative, long-term - systemic
Risk Characterization Ratio (RCR)	< 0.001 mg/m ³
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
Exposure estimate	Worker - inhalative, short-term - systemic
Risk Characterization Ratio (RCR)	< 0.01 mg/m ³
Risk Characterization Ratio (RCR)	< 0.01

PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.313 mg/m ³
Risk Characterization Ratio (RCR)	0.63
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.2 Contributing scenario (2) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. Transfer of liquid products - falling liquids Submerged loading Dedicated facility (open systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	120 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Vapour recovery system	Effectiveness: 80 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day

Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.253 mg/m ³
Risk Characterization Ratio (RCR)	0.51
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.3 Contributing scenario (3) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC3: Use in closed batch process (synthesis or formulation). PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 2.5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC3, PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.078 mg/m ³
Risk Characterization Ratio (RCR)	< 0.16
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.

PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.063 mg/m ³
Risk Characterization Ratio (RCR)	0.13
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC3, PROC4	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC3, PROC4	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.4 Contributing scenario (4) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC6: Calendering operations PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 2.5 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.156 mg/m ³

Risk Characterization Ratio (RCR)	0.31
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.5 Contributing scenario (5) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC7: Industrial spraying Aerosol formation is not covered within the CES
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 2.5\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	$< 0.1 \text{ mg/kg bw/day}$
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.235 mg/m^3
Risk Characterization Ratio (RCR)	0.47
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	0.78 mg/m^3
Risk Characterization Ratio (RCR)	0.78
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.6 Contributing scenario (6) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 2.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 97 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.047 mg/m ³
Risk Characterization Ratio (RCR)	0.09
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.7 Contributing scenario (7) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring. PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation.
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 2.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week

Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.156 mg/m ³
Risk Characterization Ratio (RCR)	0.31
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.8 Contributing scenario (8) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC16: Using material as fuel sources, limited exposure to unburned product to be expected.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 2.5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Perform task in a fume cupboard.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a

	linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.156 mg/m ³
Risk Characterization Ratio (RCR)	0.31
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.9 Contributing scenario (9) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC21: Low energy manipulation of substances bound in materials and/or articles PROC22: Potentially closed processing operations (with minerals) at elevated temperature PROC23: Open processing and transfer operations (with minerals) at elevated temperature PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles PROC25: Other hot work operations with metals
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 2.5 %
Physical state	Solid
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC21, PROC22, PROC23, PROC24, PROC25	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC21, PROC22, PROC23, PROC24	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.25 mg/m ³
Risk Characterization Ratio (RCR)	0.5
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC21, PROC22, PROC23, PROC24, PROC25	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC21, PROC22, PROC23, PROC24, PROC25	
Assessment method	Qualitative assessment
	Worker - contact with eyes

	The use is assessed to be safe.
PROC25	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
Exposure estimate	Worker - inhalative, long-term - systemic
Risk Characterization Ratio (RCR)	0.125 mg/m ³
	0.25
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

6. Short title of exposure scenario (ES 3-4) - Industrial use of products containing formaldehyde up to 1.5%: production of adhesives, foams, bonded particulates (casting, molding), use in coatings, rubber production and processing, production of firelighters, use in leather tanning, finishing, impregnation

Use descriptors related to the life cycle stage	Sector of end use: SU2a, SU3, SU5, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU17, SU19 Process category: PROC1/2/3/4/5/6/7/8a/8b/9/10/13/14/16/21/22/23/24/25 Environmental release category: ERC/2/3/5/6d
Name of contributing environmental scenario (1) and corresponding ERC	<ol style="list-style-type: none"> 1. Formulation of mixture (ERC2) 2. Formulation in materials (ERC3) 3. Industrial use resulting in inclusion into or onto a matrix (ERC5) 4. Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers (ERC6d)
List of names of contributing worker scenarios (2) and corresponding PROC	<ol style="list-style-type: none"> 1. Use in closed process, no likelihood of exposure (<i>PROC1</i>) 2. Use in closed, continuous process with occasional controlled exposure (<i>PROC2</i>) 3. Use in closed batch process (synthesis or formulation) (<i>PROC3</i>) 4. Use in batch and other process (synthesis) where opportunity for exposure arises (<i>PROC4</i>) 5. Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (<i>PROC5</i>) 6. Calendering operations (<i>PROC6</i>) 7. Industrial spraying (<i>PROC7</i>) 8. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (<i>PROC8a</i>) 9. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (<i>PROC8b</i>) 10. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (<i>PROC9</i>) 11. Roller application and brushing (<i>PROC10</i>) 12. Treatment of articles by dipping and pouring (<i>PROC13</i>) 13. Production of preparations or articles by tableting, compression, extrusion, pelettisation. (<i>PROC14</i>) 14. Using material as fuel sources, limited exposure to unburned to be expected (<i>PROC16</i>) 15. Low energy manipulation of substances bound in materials

	and/or articles (<i>PROC21</i>) 16. Potentially closed processing with minerals/metals at elevated temperature (<i>PROC22</i>) Industrial setting 17. Open processing and transfer with minerals/ metals at elevated temperature (<i>PROC23</i>) 18. High (mechanical) energy work- up of substances bound in materials and/or articles (<i>PROC24</i>) 19. Other hot work operations with metals (<i>PROC25</i>)
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2. Contributing scenario controlling environmental exposure

Formulation of mixture (ERC2); Formulation in materials (ERC3); Industrial use resulting in inclusion into or onto a matrix (ERC5); Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers (ERC6d)

An environmental assessment has not been performed as the product does not meet the criteria for being classified.

2.1 Contributing scenario (1) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure.
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC1, PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	< 0.001 mg/m ³
Risk Characterization Ratio (RCR)	< 0.01
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	< 0.01 mg/m ³
Risk Characterization Ratio (RCR)	< 0.01
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.

	Worker - inhalative, long-term - systemic
Exposure estimate	0.188 mg/m ³
Risk Characterization Ratio (RCR)	0.38
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.2 Contributing scenario (2) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. (closed systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 100 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	1000 hPa
Process temperature	150 °C
Duration and Frequency of activity	360 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Personal measures have to be applied in case of potential exposure only.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.253 mg/m ³
Risk Characterization Ratio (RCR)	0.51
	The exposure estimate represents the 75th percentile of the exposure distribution. The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.

Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.3 Contributing scenario (3) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. Transfer of liquid products - falling liquids Submerged loading Dedicated facility (open systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 60\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	120 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Vapour recovery system	Effectiveness: 80 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	$< 0.1 \text{ mg/kg bw/day}$
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.253 mg/m^3
Risk Characterization Ratio (RCR)	0.51
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2., The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

For scaling see: <http://www.advancedreachtool.com>

2.4 Contributing scenario (4) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC3: Use in closed batch process (synthesis or formulation). PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises.
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

Risk Management Measures

Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
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Exposure estimate and reference to its source

PROC3, PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	$< 0.1 \text{ mg/kg bw/day}$
Risk Characterization Ratio (RCR)	< 0.01

PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.469 mg/m^3
Risk Characterization Ratio (RCR)	0.94
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.

PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.375 mg/m^3
Risk Characterization Ratio (RCR)	0.75
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.

PROC3, PROC4	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.

PROC3, PROC4	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.5 Contributing scenario (5) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC6: Calendering operations PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.094 mg/m ³
Risk Characterization Ratio (RCR)	0.19
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.6 Contributing scenario (6) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC7: Industrial spraying Aerosol formation is not covered within the CES
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	

Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.230 mg/m ³
Risk Characterization Ratio (RCR)	0.47
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.7 Contributing scenario (7) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Submerged loading PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 1 % - <= 5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Outdoor
Risk Management Measures	
Vapour recovery system	Effectiveness: 80 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	Qualitative assessment
	Worker - all relevant routes
	The use is assessed to be safe., In case the identified operational conditions and risk management measures are applied:
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.8 Contributing scenario (8) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 97 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.028 mg/m ³
Risk Characterization Ratio (RCR)	0.06
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.9 Contributing scenario (9) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring. PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation.
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	

Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.094 mg/m ³
Risk Characterization Ratio (RCR)	0.19
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.10 Contributing scenario (10) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC16: Using material as fuel sources, limited exposure to unburned product to be expected.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Perform task in a fume cupboard.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic

Exposure estimate	0.094 mg/m ³
Risk Characterization Ratio (RCR)	0.19
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.11 Contributing scenario (11) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC21: Low energy manipulation of substances bound in materials and/or articles PROC22: Potentially closed processing operations (with minerals) at elevated temperature PROC23: Open processing and transfer operations (with minerals) at elevated temperature PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles PROC25: Other hot work operations with metals
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Solid
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC21, PROC22, PROC23, PROC24, PROC25	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC21, PROC22, PROC23, PROC24	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.15 mg/m ³
Risk Characterization Ratio (RCR)	0.3
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC21, PROC22, PROC23, PROC24, PROC25	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC21, PROC22, PROC23, PROC24, PROC25	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
PROC25	

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
Exposure estimate	Worker - inhalative, long-term - systemic 0.075 mg/m ³
Risk Characterization Ratio (RCR)	0.15
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

7. Short title of exposure scenario (ES 3-5) - Industrial use of products containing formaldehyde up to 1%: production of wood based materials (panels, bricks, etc), impregnated paper, paper, use in textile finishing, production of bonded fibers or fiber mats

Use descriptors related to the life cycle stage	Sector of end use SU3, SU5, SU6a, SU6b, SU10, SU11, SU12, SU13, SU18, SU19 Process category: PROC1/2/3/4/5/6/7/8a/8b/9/10/13/14/16/21/22/23/24/25 Environmental release category: ERC/2/3/5/6d
Name of contributing environmental scenario (1) and corresponding ERC	<ol style="list-style-type: none"> 1. Formulation of mixture (ERC2) 2. Formulation in materials (ERC3) 3. Industrial use resulting in inclusion into or onto a matrix (ERC5) 4. Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers (ERC6d)
List of names of contributing worker scenarios (2) and corresponding PROC	<ol style="list-style-type: none"> 1. Use in closed process, no likelihood of exposure (<i>PROC1</i>) 2. Use in closed, continuous process with occasional controlled exposure (<i>PROC2</i>) 3. Use in closed batch process (synthesis or formulation) (<i>PROC3</i>) 4. Use in batch and other process (synthesis) where opportunity for exposure arises (<i>PROC4</i>) 5. Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (<i>PROC5</i>) 6. Calendaring operations (<i>PROC6</i>) 7. Industrial spraying (<i>PROC7</i>) 8. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (<i>PROC8a</i>) 9. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (<i>PROC8b</i>) 10. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (<i>PROC9</i>) 11. Roller application and brushing (<i>PROC10</i>) 12. Treatment of articles by dipping and pouring (<i>PROC13</i>) 13. Production of preparations or articles by tableting, compression, extrusion, pelettisation. (<i>PROC14</i>) 14. Using material as fuel sources, limited exposure to unburned to be expected (<i>PROC16</i>) 15. Low energy manipulation of substances bound in materials and/or articles (<i>PROC21</i>) 16. Potentially closed processing with minerals/metals at elevated

	temperature (<i>PROC22</i>) Industrial setting 17. Open processing and transfer with minerals/ metals at elevated temperature (<i>PROC23</i>) 18. High (mechanical) energy work- up of substances bound in materials and/or articles (<i>PROC24</i>) 19. Other hot work operations with metals (<i>PROC25</i>)
2. Contributing scenario controlling environmental exposure	
Formulation of mixture (ERC2); Formulation in materials (ERC3); Industrial use resulting in inclusion into or onto a matrix (ERC5); Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers (ERC6d)	
An environmental assessment has not been performed as the product does not meet the criteria for being classified.	

2.1 Contributing scenario (1) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC1: Use in closed process, no likelihood of exposure.
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 100\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	1000 hPa
Process temperature	150 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature ($> 20^{\circ}\text{C}$ above ambient temperature).
Risk Management Measures	
Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m).	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 90 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Personal measures have to be applied in case of potential exposure only.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.025 mg/m ³
	The exposure estimate represents the 75th percentile of the exposure distribution. The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.

Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)
 For scaling see: <http://www.advancedreachtool.com>

2.2 Contributing scenario (2) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC1: Use in closed process, no likelihood of exposure.
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

Risk Management Measures

Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
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Exposure estimate and reference to its source

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic

Exposure estimate	$< 0.1 \text{ mg/kg bw/day}$
Risk Characterization Ratio (RCR)	< 0.01

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic

Exposure estimate	$< 0.001 \text{ mg/m}^3$
Risk Characterization Ratio (RCR)	< 0.01

The use is assessed to be safe.

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic

Exposure estimate	$< 0.01 \text{ mg/m}^3$
Risk Characterization Ratio (RCR)	< 0.01

Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.

Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.3 Contributing scenario (3) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure.
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 2.5\%$
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Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC1, PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	< 0.001 mg/m ³
Risk Characterization Ratio (RCR)	< 0.01
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	< 0.01 mg/m ³
Risk Characterization Ratio (RCR)	< 0.01
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.313 mg/m ³
Risk Characterization Ratio (RCR)	0.63
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.4 Contributing scenario (4) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %

Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC1, PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	< 0.001 mg/m ³
Risk Characterization Ratio (RCR)	< 0.01
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	< 0.01 mg/m ³
Risk Characterization Ratio (RCR)	< 0.01
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.188 mg/m ³
Risk Characterization Ratio (RCR)	0.38
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
2.5 Contributing scenario (5) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1 %

Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC1, PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	< 0.001 mg/m ³
Risk Characterization Ratio (RCR)	< 0.01
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	< 0.01 mg/m ³
Risk Characterization Ratio (RCR)	< 0.01
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.125 mg/m ³
Risk Characterization Ratio (RCR)	0.25
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC1, PROC2	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.6 Contributing scenario (6) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. (closed systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 100 %

Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	1000 hPa
Process temperature	150 °C
Duration and Frequency of activity	360 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient temperature).
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Personal measures have to be applied in case of potential exposure only.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.253 mg/m ³
Risk Characterization Ratio (RCR)	0.51
	The exposure estimate represents the 75th percentile of the exposure distribution. The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.7 Contributing scenario (7) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. Transfer of liquid products - falling liquids Submerged loading Dedicated facility (open systems)
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 60 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	15.2 hPa
Process temperature	150 °C
Duration and Frequency of activity	120 min 5 days per week
Indoor/Outdoor	Indoor
Room size	300 m ³
	Operation is carried out at elevated temperature (> 20°C above ambient

	temperature).
Amounts used	Amount per use 1,000 l
Risk Management Measures	
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	
Use suitable eye protection.	
Personal measures have to be applied in case of potential exposure only.	
Handle substance within closed system.	Effectiveness: 99 %
Wear chemically resistant gloves in combination with intensive management supervision control.	Effectiveness: 98 %
Vapour recovery system	Effectiveness: 80 %
Wear suitable respiratory protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	Advanced REACH Tool v1.0
	Worker - inhalative, long-term - systemic
Exposure estimate	0.253 mg/m ³
Risk Characterization Ratio (RCR)	0.51
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2. The exposure estimate represents the 75th percentile of the exposure distribution.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	
For scaling see: http://www.advancedreachtool.com	

2.8 Contributing scenario (8) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC2: Use in closed, continuous process with occasional controlled exposure. PROC3: Use in closed batch process (synthesis or formulation).
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC2, PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a

	linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.06 mg/m ³
Risk Characterization Ratio (RCR)	< 0.13
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.156 mg/m ³
Risk Characterization Ratio (RCR)	0.31
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC2, PROC3	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC2, PROC3	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.9 Contributing scenario (9) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC3: Use in closed batch process (synthesis or formulation). PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 2.5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC3, PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been

	considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.078 mg/m ³
Risk Characterization Ratio (RCR)	< 0.16
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.063 mg/m ³
Risk Characterization Ratio (RCR)	0.13
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC3, PROC4	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC3, PROC4	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.10 Contributing scenario (10) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC3: Use in closed batch process (synthesis or formulation). PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC3, PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.

	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.469 mg/m ³
Risk Characterization Ratio (RCR)	0.94
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.375 mg/m ³
Risk Characterization Ratio (RCR)	0.75
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC3, PROC4	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC3, PROC4	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.11 Contributing scenario (11) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 5 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Use suitable eye protection.	Effectiveness: 90 %
Exposure estimate and reference to its source	
PROC4, PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic

Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC4	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.125 mg/m ³
Risk Characterization Ratio (RCR)	0.25
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.313 mg/m ³
Risk Characterization Ratio (RCR)	0.63
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC4, PROC5	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC4, PROC5	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.12 Contributing scenario (12) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC6: Calendering operations PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 2.5 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic

Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.156 mg/m ³
Risk Characterization Ratio (RCR)	0.31
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.13 Contributing scenario (13) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC6: Calendering operations PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.094 mg/m ³
Risk Characterization Ratio (RCR)	0.19
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal

	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.14 Contributing scenario (14) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC6: Calendering operations PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

Risk Management Measures

Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %

Exposure estimate and reference to its source

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
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Exposure estimate	Worker - dermal, long-term - systemic < 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
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Exposure estimate	Worker - inhalative, long-term - systemic 0.063 mg/m ³
Risk Characterization Ratio (RCR)	0.13

The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.

Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.

Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.15 Contributing scenario (15) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC6: Calendering operations PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC10: Roller application or brushing PROC13: Treatment of
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	articles by dipping and pouring. PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation. PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.313 mg/m ³
Risk Characterization Ratio (RCR)	0.63
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.16 Contributing scenario (16) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC7: Industrial spraying Aerosol formation is not covered within the CES
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in	Effectiveness: 95 %

combination with specific activity training	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.156 mg/m ³
Risk Characterization Ratio (RCR)	0.31
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	0.78 mg/m ³
Risk Characterization Ratio (RCR)	0.78
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.17 Contributing scenario (17) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC7: Industrial spraying Aerosol formation is not covered within the CES
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 2.5 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	240 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.235 mg/m ³
Risk Characterization Ratio (RCR)	0.47
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	0.78 mg/m ³
Risk Characterization Ratio (RCR)	0.78
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.18 Contributing scenario (18) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC7: Industrial spraying Aerosol formation is not covered within the CES
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.230 mg/m ³
Risk Characterization Ratio (RCR)	0.47
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.

Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.19 Contributing scenario (19) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC7: Industrial spraying Aerosol formation is not covered within the CES
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.156 mg/m ³
Risk Characterization Ratio (RCR)	0.31
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.20 Contributing scenario (20) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities Submerged loading PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde

	Content: $\geq 1\%$ - $\leq 5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Outdoor
Risk Management Measures	
Vapour recovery system	Effectiveness: 80 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	Qualitative assessment
	Worker - all relevant routes
	The use is assessed to be safe., In case the identified operational conditions and risk management measures are applied:
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.21 Contributing scenario (21) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 97 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.094 mg/m ³
Risk Characterization Ratio (RCR)	0.19
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

 For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.22 Contributing scenario (22) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 2.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

Risk Management Measures

Local exhaust ventilation	Effectiveness: 97 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %

Exposure estimate and reference to its source

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
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Exposure estimate	Worker - dermal, long-term - systemic < 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
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Exposure estimate	Worker - inhalative, long-term - systemic 0.047 mg/m ³
Risk Characterization Ratio (RCR)	0.09

The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.

Assessment method	Qualitative assessment
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Worker - dermal

The use is assessed to be safe.

Assessment method	Qualitative assessment
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Worker - contact with eyes

The use is assessed to be safe.

Guidance to Downstream Users

 For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.23 Contributing scenario (23) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

Risk Management Measures	
Local exhaust ventilation	Effectiveness: 97 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.028 mg/m ³
Risk Characterization Ratio (RCR)	0.06
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.24 Contributing scenario (24) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 97 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified

	version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.019 mg/m ³
Risk Characterization Ratio (RCR)	0.04
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.25 Contributing scenario (25) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring. PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 2.5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.156 mg/m ³
Risk Characterization Ratio (RCR)	0.31
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes

	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.26 Contributing scenario (26) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring. PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation.
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

Risk Management Measures

Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %

Exposure estimate and reference to its source

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.094 mg/m ³
Risk Characterization Ratio (RCR)	0.19
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.27 Contributing scenario (27) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring. PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation.
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
Exposure estimate	Worker - dermal, long-term - systemic < 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
Exposure estimate	Worker - inhalative, long-term - systemic 0.063 mg/m ³
Risk Characterization Ratio (RCR)	0.13
Assessment method	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment Worker - dermal The use is assessed to be safe.
Assessment method	Qualitative assessment Worker - contact with eyes The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.28 Contributing scenario (28) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC16: Using material as fuel sources, limited exposure to unburned product to be expected.
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Perform task in a fume cupboard.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been

	considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.313 mg/m ³
Risk Characterization Ratio (RCR)	0.63
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.29 Contributing scenario (29) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC16: Using material as fuel sources, limited exposure to unburned product to be expected.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 2.5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Perform task in a fume cupboard.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.156 mg/m ³
Risk Characterization Ratio (RCR)	0.31
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes

	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.30 Contributing scenario (30) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC16: Using material as fuel sources, limited exposure to unburned product to be expected.
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training Perform task in a fume cupboard.	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
Exposure estimate	Worker - dermal, long-term - systemic
Risk Characterization Ratio (RCR)	< 0.1 mg/kg bw/day
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
Exposure estimate	Worker - inhalative, long-term - systemic
Risk Characterization Ratio (RCR)	0.094 mg/m ³
Assessment method	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
Assessment method	Worker - dermal
Assessment method	The use is assessed to be safe.
Assessment method	Qualitative assessment
Assessment method	Worker - contact with eyes
Assessment method	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.31 Contributing scenario (31) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC21: Low energy manipulation of substances bound in materials and/or articles PROC22: Potentially closed processing operations (with minerals) at elevated temperature PROC23: Open processing and transfer operations (with minerals) at elevated temperature
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Solid
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Assessment method	Operation is carried out at ambient or elevated temperatures

Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.05 mg/m ³
Risk Characterization Ratio (RCR)	0.1
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.32 Contributing scenario (32) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC21: Low energy manipulation of substances bound in materials and/or articles PROC22: Potentially closed processing operations (with minerals) at elevated temperature PROC23: Open processing and transfer operations (with minerals) at elevated temperature PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles PROC25: Other hot work operations with metals
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 2.5 %
Physical state	Solid
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC21, PROC22, PROC23, PROC24, PROC25	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01

PROC21, PROC22, PROC23, PROC24	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.25 mg/m ³
Risk Characterization Ratio (RCR)	0.5
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC21, PROC22, PROC23, PROC24, PROC25	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC21, PROC22, PROC23, PROC24, PROC25	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
PROC25	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.125 mg/m ³
Risk Characterization Ratio (RCR)	0.25
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.33 Contributing scenario (33) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC21: Low energy manipulation of substances bound in materials and/or articles PROC22: Potentially closed processing operations (with minerals) at elevated temperature PROC23: Open processing and transfer operations (with minerals) at elevated temperature PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles PROC25: Other hot work operations with metals
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Solid
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC21, PROC22, PROC23, PROC24, PROC25	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC21, PROC22, PROC23, PROC24	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified

	version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.15 mg/m ³
Risk Characterization Ratio (RCR)	0.3
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC21, PROC22, PROC23, PROC24, PROC25	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC21, PROC22, PROC23, PROC24, PROC25	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
PROC25	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.075 mg/m ³
Risk Characterization Ratio (RCR)	0.15
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.34 Contributing scenario (34) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 5 %
Physical state	Solid
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.10 mg/m ³
Risk Characterization Ratio (RCR)	0.2

	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.35 Contributing scenario (35) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1\%$
Physical state	Solid
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %

Exposure estimate and reference to its source

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.10 mg/m ³
Risk Characterization Ratio (RCR)	0.2
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

 For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.36 Contributing scenario (36) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC25: Other hot work operations with metals
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 5\%$
Physical state	Solid
Duration and Frequency of activity	480 min 5 days per week

Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.25 mg/m ³
Risk Characterization Ratio (RCR)	0.5
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

8. Short title of exposure scenario (ES 4-1) - Professional use of products containing formaldehyde up to 1.5%: adhesives, foams, coatings, firelighters and cleaning agents

Use descriptors related to the life cycle stage	Sector of end use: SU22; Process category: PROC 5/8a/8b/10/11/13/15/16/19/21/22/23/24/25 ■ V5 Chemical product category: PC9a/39/13/31/35 ■ Environmental release category: ERC/2/3/5/8a/8b/8c/8d/8f
Name of contributing environmental scenario (1) and corresponding ERC	<ol style="list-style-type: none"> 1 Formulation of mixture (ERC2) 2 Formulation in materials (ERC3) 3 Industrial use resulting in inclusion into or onto a matrix (ERC5) 4 Wide dispersive indoor use of processing aids in open systems (ERC8a) 5 Wide dispersive indoor use of reactive substances in open systems (ERC8b) 6 Wide dispersive indoor use resulting in inclusion into or onto a matrix (ERC8c) 7 Wide dispersive outdoor use of processing aids in open systems (ERC8d) 8 Wide dispersive outdoor use resulting in inclusion into or onto a matrix (ERC8f)
List of names of contributing worker scenarios (2) and corresponding PROC	<ol style="list-style-type: none"> 1 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC5)

	2 Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (<i>PROC8a</i>) 3 Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (<i>PROC8b</i>) 4 Roller application and brushing (<i>PROC10</i>) 5 Non industrial spraying (<i>PROC11</i>) 6 Treatment of articles by dipping and pouring (<i>PROC13</i>) 7 Use as laboratory reagent (<i>PROC15</i>) 8 Using material as fuel sources, limited exposure to unburned to be expected (<i>PROC16</i>) 9 Hand-mixing with intimate contact and only PPE available (<i>PROC19</i>) 10 Low energy manipulation of substances bound in materials and/or articles (<i>PROC21</i>) 11 Potentially closed processing with minerals/metals at elevated temperature (<i>PROC22</i>) Industrial setting 12 Open processing and transfer with minerals/ metals at elevated temperature (<i>PROC23</i>) 13 High (mechanical) energy work- up of substances bound in materials and/or articles (<i>PROC24</i>) 14 Other hot work operations with metals (<i>PROC25</i>)
List of names of corresponding <i>PC</i>	1. Coating and paints, thinners, paint removal (<i>PC9a</i>) 2. Fillers, putties, plasters, modelling clay (<i>PC9b</i>) 3. Finger paints (<i>PC9c</i>) 4. Fuels (<i>PC13</i>) 5. Polishes and wax blends (<i>PC31</i>) 6. Washing and cleaning products (including solvent based products) (<i>PC35</i>) 7. Cosmetics, personal care products (<i>PC39</i>)

2. Contributing scenario controlling environmental exposure

Formulation of mixture (*ERC2*); Formulation in materials (*ERC3*); Industrial use resulting in inclusion into or onto a matrix (*ERC5*); Wide dispersive indoor use of processing aids in open systems (*ERC8a*); Wide dispersive indoor use of reactive substances in open systems (*ERC8b*); Wide dispersive indoor use resulting in inclusion into or onto a matrix (*ERC8c*); Wide dispersive outdoor use of processing aids in open systems (*ERC8d*); Wide dispersive outdoor use resulting in inclusion into or onto a matrix (*ERC8f*)

An environmental assessment has not been performed as the product does not meet the criteria for being classified.

2.1 Contributing scenario (1) controlling worker exposure

Use descriptors covered	SU22: Professional uses PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Wear a half face respirator conforming to	Effectiveness: 90 %

EN140 Type A filter or better.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.188 mg/m ³
Risk Characterization Ratio (RCR)	0.38
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.2 Contributing scenario (2) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.094 mg/m ³
Risk Characterization Ratio (RCR)	0.19

	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.3 Contributing scenario (3) controlling worker exposure

Use descriptors covered	SU3: Industrial uses PROC11: Non industrial spraying Aerosol formation is not covered within the CES
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Operational conditions

Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1.5\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor

Risk Management Measures

Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Wear a half face respirator conforming to EN140 Type A filter or better.	Effectiveness: 90 %

Exposure estimate and reference to its source

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
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	Worker - dermal, long-term - systemic
Exposure estimate	$< 0.1 \text{ mg/kg bw/day}$
Risk Characterization Ratio (RCR)	< 0.01

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
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	Worker - inhalative, long-term - systemic
Exposure estimate	0.113 mg/m^3
Risk Characterization Ratio (RCR)	0.23

Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.

Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
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	Worker - inhalative, short-term - systemic
Exposure estimate	0.38 mg/m^3
Risk Characterization Ratio (RCR)	0.38

Guidance to Downstream Users

For scaling see: <http://www.ecetoc.org/tra> Please note that a modified version has been used (see exposure estimates)

2.4 Contributing scenario (4) controlling worker exposure	
Use descriptors covered	SU22: Professional uses PROC15: Use a laboratory reagent. PROC16: Using material as fuel sources, limited exposure to unburned product to be expected.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Perform task in a fume cupboard.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.188 mg/m ³
Risk Characterization Ratio (RCR)	0.38
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.5 Contributing scenario (5) controlling worker exposure	
Use descriptors covered	SU3: Industrial uses PROC19: Hand-mixing with intimate contact and only PPE available.
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Perform task in a fume cupboard.	

Wear a half face respirator conforming to EN140 Type A filter or better.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.113 mg/m ³
Risk Characterization Ratio (RCR)	0.23
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, short-term - systemic
Exposure estimate	0.38 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.38
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.6 Contributing scenario (6) controlling worker exposure

Use descriptors covered	SU22: Professional uses PROC21: Low energy manipulation of substances bound in materials and/or articles PROC23: Open processing and transfer operations (with minerals) at elevated temperature PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles PROC25: Other hot work operations with metals
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1.5 %
Physical state	Solid
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
	Operation is carried out at ambient or elevated temperatures
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
PROC21, PROC23, PROC24, PROC25	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
PROC21, PROC23, PROC24	

Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
Exposure estimate	Worker - inhalative, long-term - systemic
Risk Characterization Ratio (RCR)	0.30 mg/m ³
	0.6
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
PROC21, PROC23, PROC24, PROC25	
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
PROC21, PROC23, PROC24, PROC25	
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
PROC25	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
Exposure estimate	Worker - inhalative, long-term - systemic
Risk Characterization Ratio (RCR)	0.15 mg/m ³
	0.3
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

9. Short title of exposure scenario (ES 4-2) - Professional use of products containing formaldehyde up to 1%: resins in wood applications (eg. glues)

Use descriptors related to the life cycle stage	Sector of end use: SU22 Process category: PROC 5/8a/8b/10/15 Product category: PC1 Environmental release category: ERC1/2/3/4/6a/6b/6c/6d/7 Article category: AC11
Name of contributing environmental scenario (1) and corresponding ERC	<ol style="list-style-type: none"> 1. Manufacture of substances(ERC1) 2. Formulation of mixture (ERC2) 3. Formulation in materials(ERC3) 4. Industrial use of processing aids in processes and products, not becoming part of articles (ERC4) 5. Industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a) 6. Industrial use of reactive processing aids (ERC6b) 7. Industrial use of monomers for manufacture of thermoplastics (ERC6c) 8. Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers (ERC6d) 9. Industrial use of substances in closed systems (ERC7)
List of names of contributing worker scenarios (2) and corresponding PROC	<ol style="list-style-type: none"> 1. Mixing or blending in batch processes for formulation of mixture and articles (multistage and/or significant contact) (PROC5) 2. Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a)

	3. Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b) 4. Roller application or brushing (PROC10) 5. Use as laboratory reagent (PROC15)
List of names of corresponding PC	Adhesives, sealants (PC1)

2. Contributing scenario controlling environmental exposure

Manufacture of substances(ERC1); Formulation of mixture (ERC2); Formulation in materials(ERC3); Industrial use of processing aids in processes and products, not becoming part of articles (ERC4); Industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a); Industrial use of reactive processing aids (ERC6b); Industrial use of monomers for manufacture of thermoplastics (ERC6c); Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers (ERC6d); Industrial use of substances in closed systems (ERC7)

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

2.1 Contributing scenario (1) controlling worker exposure for:

Use descriptors covered	SU22: Professional uses PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC10: Roller application or brushing PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: >= 0 % - <= 1 %
Physical state	Liquid, high fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 80 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
Exposure estimate	Worker - dermal, long-term - systemic < 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
Exposure estimate	Worker - inhalative, long-term - systemic 0.25 mg/m ³
Risk Characterization Ratio (RCR)	0.5
Assessment method	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment Worker - dermal
Assessment method	The use is assessed to be safe.
Assessment method	Qualitative assessment

	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.2 Contributing scenario (2) controlling worker exposure for:	
Use descriptors covered	SU3: Industrial uses PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally, ECETOC TRA modified version: Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.063 mg/m ³
Risk Characterization Ratio (RCR)	0.13
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

2.3 Contributing scenario (3) controlling worker exposure for:	
Use descriptors covered	SU22: Professional uses PROC15: Use a laboratory reagent.
Operational conditions	
Concentration of the substance	formaldehyde Content: $\geq 0\%$ - $\leq 1\%$
Physical state	Liquid, moderate fugacity
Vapour pressure of the substance during use	14 hPa

use	
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with specific activity training	Effectiveness: 95 %
Perform task in a fume cupboard.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	< 0.1 mg/kg bw/day
Risk Characterization Ratio (RCR)	< 0.01
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: The concentration of the substance has been considered using a linear approach.
	Worker - inhalative, long-term - systemic
Exposure estimate	0.125 mg/m ³
Risk Characterization Ratio (RCR)	0.25
	The short-term exposure value corresponds to the long-term value multiplied by a factor of 2.
Assessment method	Qualitative assessment
	Worker - dermal
	The use is assessed to be safe.
Assessment method	Qualitative assessment
	Worker - contact with eyes
	The use is assessed to be safe.
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

10. Short title of exposure scenario (ES5) - Consumer use of formaldehyde based products: adhesives, coatings, firelighters and cleaning agents

Use descriptors related to the life cycle stage	Sector of end use: SU21 ■ V5 Chemical product category: PC1/3/9a/9b/9c/13/15/18/21/23/31/32/35/37/39 ■ Environmental release category: ERC8a/8b/8c/8d/8f/10a/11a
Name of contributing environmental scenario (1) and corresponding ERC	<ol style="list-style-type: none"> 1. Wide dispersive indoor use of processing aids in open systems (<i>ERC8a</i>) 2. Wide dispersive indoor use of reactive substances in open systems (<i>ERC8b</i>) 3. Wide dispersive indoor use resulting in inclusion into or onto a matrix (<i>ERC8c</i>) 4. Wide dispersive outdoor use of processing aids in open systems (<i>ERC8d</i>) 5. Wide dispersive outdoor use resulting in inclusion into or onto a matrix (<i>ERC8f</i>) 6. Wide dispersive outdoor use of long-life articles and materials with low release (<i>ERC10a</i>) 7. Wide dispersive indoor use of long-life articles and materials with low release (<i>ERC11a</i>)
List of names of corresponding PC	<ol style="list-style-type: none"> 1. Adhesives, sealants (PC1) 2. Air care products (PC3)

	<ol style="list-style-type: none">3. Coatings and paints, thinners, paint removers (PC9a)4. Fillers, putties, plasters, modeling clay (PC9b)5. Finger paints (PC9c)6. Fuels (PC13)7. Non-metal-surface treatment products (PC15)8. Ink and toners (PC18)9. Laboratory chemicals (PC21)10. Leather tanning (PC23)11. Polishes and wax blends (PC31)12. Polymer preparations and compounds (PC32)13. Washing and cleaning products (including solvent based products) (PC35)14. Water treatment chemicals (PC37)15. Cosmetics, personal care products (PC39)
<p>In accordance to the Article 14 (2a-f) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterization needs not to be performed if the substance in a preparation is less than 0.1%.</p>	