

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Sodium Hypochlorite >=14 - <15%

Version 15.0

Print Date 2020/07/06

Revision date / valid from 2020/07/06

MSDS code: MSHY100

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

### 1.1. Product identifier

	Trade name Substance name CAS-No. EC-No. EU REACH-Reg. No. Synonyms and Other names		Sodium Hypochlorite sodium hypochlorite 7681-52-9 231-668-3 01-2119488154-34-3 DAIRY HYPOCHLO	, solution xxxx	
1.2.	Relevant identified uses of	of th	e substance or mixt	ure and uses advised	against
	Use of the Substance/Mixture	:	Identified use: See t overview of identifie	able in front of appendi d uses.	x for a complete
	Uses advised against	:	At this moment we h against	have not identified any ι	uses advised
1.3.	Details of the supplier of	the	safety data sheet		
	Company	:	Jem Products Unit 20, Sycamore T Blackpool Lancashire FY4 3RL	Frading Estate	
1.4.	Emergency telephone nu	mbe	r		
	Emergency telephone number		NHS 111 or 999		
SEC	TION 2: Hazards identifi	catio	on		
2.1.	Classification of the subs	tand	ce or mixture		
	Classification according	to R	egulation (EC) No 12	72/2008	
[		RI	EGULATION (EC) N	No 1272/2008	
	Hazard class		Hazard category	Target Organs	Hazard statements
ĺ	Corrosive to metals		Category 1		H290

Skin corrosion	Category 1B	 H314
Serious eye damage	Category 1	 H318
Short-term (acute) aquatic hazard	Category 1	 H400
Long-term (chronic) aquatic hazard	Category 2	 H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

### Most important adverse effects

Human Health	:	See section 11 for toxicological information.
Physical and chemical	:	See section 9/10 for physicochemical information.
Potential environmental effects	:	See section 9/10 for physicochemical information. See section 12 for environmental information.

### 2.2. Label elements

### Labelling according to Regulation (EC) No 1272/2008

Hazard symbols	:			
Signal word	:	Danger		
Hazard statements	:	H290 H314 H410	May be corrosive to metals. Causes severe skin burns and eye damage. Very toxic to aquatic life with long lasting effects.	
Precautionary statements				
Prevention	:	P273 P260 P280	Avoid release to the environment. Do not breathe gas/ mist/ vapours/ spray. Wear protective gloves/ protective clothing/ eye protection/ face protection.	
Response	:	P301 + P330 + P3 P303 + P361 + P3 P304 + P340	NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF INHALED: Remove person to fresh air and keep comfortable for breathing.	
		P305 + P351 + P3	38 IF IN EYES: Rinse cautiously with	_
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	P308 + P310 P313	lenses, if present and rinsing.	
Disposal	: P501	Dispose of contents/ accordance with the local/regional/interna	
Additional Labelling:			
EUH031 Contact with acid	s liberates toxic gas		
Hazardous components w	hich must be listed	on the label:	
• sodium hypochlorite, solu	ution		
Other hazards For Results of PBT and vF CTION 3: Composition/info Substances			
For Results of PBT and vF		e <b>dients</b> on Class	ification EC) No 1272/2008)
For Results of PBT and vF CTION 3: Composition/info Substances	ormation on ingre	e <b>dients</b> on Class	
For Results of PBT and vF CTION 3: Composition/info Substances Chemical nature	<ul> <li>Aqueous solution</li> <li>Amount [%]</li> <li>&gt;= 14 - &lt;= 15</li> </ul>	edients on Class (REGULATION ( Hazard class / Hazard	EC) No 1272/2008)
For Results of PBT and vF CTION 3: Composition/info Substances Chemical nature Hazardous components sodium hypochlorite, solution Index-No. : 017-011-00-1 CAS-No. : 7681-52-9 EC-No. : 231-668-3 EU REACH- : 01-2119488154-34	<ul> <li>Aqueous solution</li> <li>Amount [%]</li> <li>&gt;= 14 - &lt;= 15</li> </ul>	edients on Class (REGULATION ( Hazard class / Hazard category Met. Corr.1 Skin Corr.1B Eye Dam.1 STOT SE3 Aquatic Acute1	EC) No 1272/2008) Hazard statements H290 H314 H318 H335 H400
For Results of PBT and vF CTION 3: Composition/info Substances Chemical nature Hazardous components sodium hypochlorite, solution Index-No. : 017-011-00-1 CAS-No. : 7681-52-9 EC-No. : 231-668-3 EU REACH- : 01-2119488154-34 Reg. No.	Formation on ingression of	edients on Class (REGULATION ( Hazard class / Hazard category Met. Corr.1 Skin Corr.1B Eye Dam.1 STOT SE3 Aquatic Acute1	EC) No 1272/2008) Hazard statements H290 H314 H318 H335 H400

### SECTION 4: First aid measures

4.1.	Description of first aid mea	asures	
	General advice	: Take off all contaminated clothing immediately.	
	If inhaled	: In case of accident by inhalation: remove casualty to fresh air and keep at rest. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.	
	In case of skin contact	: Wash off immediately with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician immediately.	
	In case of eye contact	: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Consult an eye specialist immediately. Go to an ophthalmic hospital if possible.	
	If swallowed	: Rinse mouth with water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a physician immediately.	
4.2.	Most important symptoms	and effects, both acute and delayed	
	Symptoms	: See Section 11 for more detailed information on health effects and symptoms. If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.	
	Effects	: See Section 11 for more detailed information on health effects and symptoms. Causes severe skin burns and eye damage.	
4.3.	Indication of any immediat	e medical attention and special treatment needed	
	Treatment	: Treat symptomatically.	
SEC	TION 5: Firefighting meas	sures	
5.1.	Extinguishing media		
	Suitable extinguishing media Unsuitable extinguishing	: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. The product itself does not burn.	
	Unsuitable extinguishing media	: High volume water jet	
5.2.	Special hazards arising fro	om the substance or mixture	
	Specific hazards during	: Heating or fire can release toxic gas.	
	Specific hazards during firefighting Hazardous combustion products	: Chlorine, Hydrogen chloride gas, chlorine oxides	
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### 5.3. Advice for firefighters

Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus.Wear appropriate body protection (full protective suit)
Further advice	:	Cool closed containers exposed to fire with water spray.Heating will cause a pressure rise - with risk of bursting.Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

### **SECTION 6: Accidental release measures**

### 6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Use personal protective equipment. Wear respiratory
		protection. Keep away unprotected persons. Provide
		adequate ventilation. Danger of slipping if spilled Avoid
		contact with skin, eyes and clothing. Do not breathe vapour.

### 6.2. Environmental precautions

Environmental precautions	Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration. If the product contaminates rivers
	and lakes or drains inform respective authorities. If material reaches soil inform authorities responsible for such cases.

### 6.3. Methods and materials for containment and cleaning up

Methods and materials for containment and cleaning up	:	Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders). Keep in suitable, closed containers for disposal. Do not keep the container sealed.
Further information	:	Treat recovered material as described in the section "Disposal considerations".

### 6.4. Reference to other sections

See Section 1 for emergency contact information. See Section 8 for information on personal protective equipment. See Section 13 for waste treatment information.

### **SECTION 7: Handling and storage**

### 7.1. Precautions for safe handling

Advice on safe handling	: Do not keep the container sealed. Handle and open container with care. Ensure adequate ventilation. Use personal protective equipment. Avoid contact with the skin and the eyes. Do not breathe vapours or spray mist. Use respirator with appropriate filter if vapours or aerosol are released. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity.	)
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eating and drinking should be prohibited in the application are Wash hands before breaks and at the end of workday. Take of all contaminated clothing immediately.         2. Conditions for safe storage areas and containers       : Keep in an area equipped with alkali resistant flooring. Keep only in the original container. Store in a receptacle equipped with a vent.         Advice on protection against fire and explosion       : The product is not flammable. Normal measures for preventive fire protection.         If Further information on storage areas and common storage       : Keep in a well-ventilated place. Protect against light. Store in cool place.         If Advice on common storage       : Keep away from food, drink and animal feedingstuffs. Do not storage         Suitable packaging materials       : Polyethylene, Polyvinylchloride         Suitable packaging materials       : Iron, Copper, Aluminium, Stainless steel         Specific use(s)       : No information available.         ECTION 8: Exposure controls/personal protection       1. Control parameters			
Requirements for storage areas and containers       : Keep in an area equipped with alkali resistant flooring. Keep only in the original container. Store in a receptacle equipped with a vent.         Advice on protection against fire and explosion       : The product is not flammable. Normal measures for preventive fire protection.         Further information on storage conditions       : Keep in a well-ventilated place. Protect against light. Store in cool place.         Advice on common storage       : Keep away from food, drink and animal feedingstuffs. Do not storage         Suitable packaging materials       : Polyethylene, Polyvinylchloride         Unsuitable packaging materials       : , Iron, Copper, Aluminium, Stainless steel         Specific end use(s)       : No information available.         ECTION 8: Exposure controls/personal protection       1. Control parameters         Divied No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)       DNEL         Workers, Acute - systemic effects, Acute - local effects, : 3.1 mg/m3       : 3.1 mg/m3		Hygiene measures	: Keep away from food, drink and animal feedingstuffs. Smoking, eating and drinking should be prohibited in the application area. Wash hands before breaks and at the end of workday. Take off all contaminated clothing immediately.
areas and containers       only in the original container. Store in a receptacle equipped with a vent.         Advice on protection against fire and explosion       : The product is not flammable. Normal measures for preventive fire protection.         Further information on storage conditions       : Keep in a well-ventilated place. Protect against light. Store in cool place.         Advice on common storage       : Keep away from food, drink and animal feedingstuffs. Do not store together with acids and ammonium salts.         Suitable packaging materials       : Polyethylene, Polyvinylchloride         Unsuitable packaging materials       : Iron, Copper, Aluminium, Stainless steel         Specific end use(s)       : No information available.         ECTION 8: Exposure controls/personal protection       1. Control parameters         Component:       sodium hypochlorite, solution       CAS-No. 7681-52         Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)       DNEL         DNEL       Workers, Acute - systemic effects, Acute - local effects, : 3.1 mg/m3         DNEL       NEL	2. (	Conditions for safe storage	e, including any incompatibilities
Imaginst fire and explosion       fire protection.         Imaginst fire and explosion       fire protection.         Imaginst fire and explosion       : Keep in a well-ventilated place. Protect against light. Store in cool place.         Imaginst fire and explosion       : Keep away from food, drink and animal feedingstuffs. Do not storage         Suitable packaging materials       : Polyethylene, Polyvinylchloride         Unsuitable packaging materials       : Iron, Copper, Aluminium, Stainless steel         3. Specific end use(s)       : No information available.         ECTION 8: Exposure controls/personal protection       1. Control parameters         Component:       sodium hypochlorite, solution       CAS-No. 7681-52         Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)       DNEL         Vorkers, Acute - systemic effects, Acute - local effects, is 3.1 mg/m3       Inhalation         DNEL       Workers, Acute - systemic effects, Acute - local effects, is 3.1 mg/m3			only in the original container. Store in a receptacle equipped
storage conditions       cool place.         Advice on common storage       : Keep away from food, drink and animal feedingstuffs. Do not store together with acids and ammonium salts.         Suitable packaging materials       : Polyethylene, Polyvinylchloride         Unsuitable packaging materials       : , Iron, Copper, Aluminium, Stainless steel         3. Specific end use(s)       : , No information available.         ECTION 8: Exposure controls/personal protection       : Control parameters         Component:       sodium hypochlorite, solution       CAS-No. 7681-52         Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)       DNEL         Workers, Acute - systemic effects, Acute - local effects, : 3.1 mg/m3 Inhalation       DNEL		Advice on protection against fire and explosion	: The product is not flammable. Normal measures for preventive fire protection.
storage       store together with acids and ammonium salts.         Suitable packaging       : Polyethylene, Polyvinylchloride         materials       Unsuitable packaging       : , Iron, Copper, Aluminium, Stainless steel         3. Specific end use(s)       Specific use(s)       : No information available.         ECTION 8: Exposure controls/personal protection       .         1. Control parameters       Component: sodium hypochlorite, solution       CAS-No. 7681-52         Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)       DNEL         Workers, Acute - systemic effects, Acute - local effects, : 3.1 mg/m3       .         DNEL       DNEL		Further information on storage conditions	
materials Unsuitable packaging : , Iron, Copper, Aluminium, Stainless steel materials  Specific end use(s) Specific use(s) : No information available.  ECTION 8: Exposure controls/personal protection  Control parameters  Component: sodium hypochlorite, solution CAS-No. 7681-52 Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)  DNEL  DNEL  Workers, Acute - systemic effects, Acute - local effects, : 3.1 mg/m3 Inhalation DNEL			: Keep away from food, drink and animal feedingstuffs. Do not store together with acids and ammonium salts.
materials			: Polyethylene, Polyvinylchloride
Specific use(s)       : No information available.         ECTION 8: Exposure controls/personal protection         I. Control parameters         Component:       sodium hypochlorite, solution         CAS-No. 7681-52         Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)         DNEL         Workers, Acute - systemic effects, Acute - local effects, : 3.1 mg/m3         Inhalation         DNEL			:, Iron, Copper, Aluminium, Stainless steel
Specific use(s)       : No information available.         ECTION 8: Exposure controls/personal protection         I. Control parameters         Component:       sodium hypochlorite, solution         CAS-No. 7681-52         Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)         DNEL         Workers, Acute - systemic effects, Acute - local effects, : 3.1 mg/m3         Inhalation         DNEL	2	Specific end use(s)	
Control parameters         Component:       sodium hypochlorite, solution         CAS-No. 7681-52         Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)         DNEL         Workers, Acute - systemic effects, Acute - local effects,       : 3.1 mg/m3         Inhalation         DNEL			: No information available.
Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)         DNEL       Workers, Acute - systemic effects, Acute - local effects, : 3.1 mg/m3         Inhalation       DNEL	1. (	Control parameters	
Workers, Acute - systemic effects, Acute - local effects, : 3.1 mg/m3 Inhalation DNEL			
		Workers, Acute - systemic	effects, Acute - local effects, : 3.1 mg/m3
effects, Inhalation		Workers, Long-term - syste	emic effects, Long-term - local : 1.55 mg/m3
DNEL Workers, Long-term - local effects, Skin contact : 0.5 %			effects, Skin contact : 0.5 %
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DNEL Consumers, Long-term - systemic effects, Long-term - local effects, Inhalation	:	1.55 mg/m3
DNEL Consumers, short-term, Inhalation	:	3.1 mg/m3
DNEL Consumers, Long-term - systemic effects, Ingestion	:	0.26 mg/kg bw/day

Predicted No Effect Concentration (PNEC)							
Fresh water	: 0.21 µg/l						
Marine water	: 0.042 µg/l						
Sewage treatment plant (STP)	: 0.03 mg/l						
Intermittent releases	: 0.26 µg/l						
Soil Exposition is not expected.	:						
Marine sediment Exposition is not expected.	:						
Fresh water sediment Exposition is not expected.	:						
Component: sodium hydroxide	Component:         sodium hydroxide         CAS-No. 1310-73-2						
Other Occupational Exposure	ELimit Values						
UK. EH40 Workplace Exposure Limits (WELs), as amended, Short Term Exposure Limit (STEL): 2 mg/m3 ELV (IE), Short Term Exposure Limit (STEL): 2 mg/m3, (15 minutes)							
Component: chlorine	CAS-No. 7782-50-5						
Other Occupational Exposure Limit Values							

UK. EH40 Workplace Exposure Limits (WELs), as amended, Short Term Exposure Limit (STEL): 0.5 ppm, 1.5 mg/m3

EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended, Short Term Exposure Limit (STEL): 0.5 ppm, 1.5 mg/m3

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Indicative

ELV (IE), Short Term Exposure Limit (STEL): 0.5 ppm, 1.5 mg/m3, (15 minutes) Indicative OELV

### 8.2. Exposure controls

### Appropriate engineering controls

Refer to protective measures listed in sections 7 and 8.

### Personal protective equipment

Respiratory protection

Advice	:	Use respirator with appropriate filter if vapours or aerosol are released. Respiratory protection complying with EN 141. Recommended Filter type: Combination filter:B-P2 Combination filter:B-P3 In case of intensive or longer exposure use self-contained breathing apparatus.	
Hand protection			
Advice	:	Protective gloves complying with EN 374. The glove material has to be impermeable and resistant to the product / the substance / the preparation. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). Protective gloves should be replaced at first signs of wear.	
Material Break through time Glove thickness	:	butyl-rubber 8 h 0.5 mm	
Material Break through time Glove thickness		Polyvinylchloride 8 h 0.5 mm	
Material Break through time Glove thickness	:	polychloroprene 8 h 0.5 mm	
Eye protection			
Advice	:	Tightly fitting safety goggles Ensure that eyewash stations and safety showers are close to the	
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I	workstation location.
Skin and body prot	ection
Advice	<ul> <li>Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work- place.</li> <li>Wear appropriate chemical resistant clothing and boots.</li> <li>alkali resistant protective clothing</li> </ul>
Environmental expo	osure controls
General advice	<ul> <li>Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration. If the product contaminates rivers and lakes or drains inform respective authorities. If material reaches soil inform authorities responsible for such cases.</li> </ul>

### SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Form	:	liquid	
Colour	:	yellow to green	
Odour	:	of Chlorine	
Odour Threshold	:	no data available	
∥ рН	:	> 11	
Melting point/range	:	ca3020 °C 13 - 16% solution	
Boiling point/boiling range	:	ca. 100 °C (1013 hPa) 13 - 16% solution	
Flash point	:	Not applicable	
Evaporation rate	:	no data available	
Flammability (solid, gas)	:	Not applicable	
Upper explosion limit	:	Not applicable	
Lower explosion limit	:	Not applicable	
Vapour pressure	:	ca. 20 hPa (20 °C) 13 - 16% solution	
Relative vapour density	:	no data available	
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Density		:	1.11 g/cm3 (20 °C) 10% solution 1.317 g/cm3 (20 °C) 15% solution 1.24 g/cm3 (20 °C) 20% solution	
Water solubility		:	completely miscible	
Partition coefficient: n-octa	nol/water	:	log Kow -3.42 (20 °C)	
Auto-ignition temperature		:	no data available	
Thermal decomposition		:	> 111 °C	
Viscosity, dynamic		:	3 - 4 mPa.s (20 °C) 13 - 16% solution	
Explosivity		:	Product is not explosive.	
Oxidizing properties		:	Oxidizing agents	
9.2. Other information				
Corrosion to metals		:	Corrosive to metals	
SECTION 10: Stability and rea	activity			
10.1. Reactivity	lotivity			
-				
Advice	: Contact	t w	ith acids liberates toxic gas.	
10.2. Chemical stability				
Advice		•	ses on heating. ses on exposure to light.	
10.3. Possibility of hazardous re	eactions			
Hazardous reactions	: May de	ve	lop chlorine if mixed with acidic solutions.	
10.4. Conditions to avoid				
Conditions to avoid	: Keep av	wa	y from open flames, hot surfaces and sources of	
Thermal decomposition	ignition. : > 111 °(	.ĸe C	eep away from direct sunlight.	
10.5. Incompatible materials				
Materials to avoid			monium compounds, Acetic anhydride, Organic Hydrogen peroxide, metal salts, Copper, Nickel, Iron	
10.6. Hazardous decomposition	products			
Hazardous decomposition products	: Hydroge	en	chloride gas, Chlorine, chlorine oxides	
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Sodium Hypochlorite >=14 - <=15%
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### SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

	Acute toxicity
	Oral
	Please find this information in the listing of the component/components below in this section.
	Inhalation
	Not classified based on the calculation method according to CLP regulation.
	Dermal
	Not classified based on the calculation method according to CLP regulation.
	Irritation
	Skin
Result	: Causes severe skin burns and eye damage.
	Eyes
Result	: Causes eye burns.
	Sensitisation
Result	: Not classified based on the calculation method according to CLP regulation.
	CMR effects
	CMR Properties
Carcinogenicity	: Not classified based on the calculation method according to CLP regulation.
Mutagenicity	: Not classified based on the calculation method according to CLP
Teratogenicity	<ul> <li>regulation.</li> <li>Not classified based on the calculation method according to CLP</li> </ul>
Reproductive toxicity	<ul><li>regulation.</li><li>Not classified based on the calculation method according to CLP regulation.</li></ul>
	Specific Target Organ Toxicity
	Single exposure
Remarks	: Not classified based on the calculation method according to CLP regulation.
	Repeated exposure

### Sodium Hypochlorite >=14 - <=15% Remarks Not classified based on the calculation method according to CLP ÷ regulation. Other toxic properties Repeated dose toxicity no data available Aspiration hazard Not applicable, sodium hypochlorite, solution CAS-No. 7681-52-9 **Component:** Acute toxicity Oral > 1100 mg/kg (Rat; Test substance: Chlorine) (OECD Test LD50 Guideline 401) Inhalation > 10.5 mg/l (Rat; 1 h; Test substance: Chlorine) (OECD Test LC50 Guideline 403) Dermal LD50 > 20000 mg/kg (Rabbit; Test substance: Chlorine) (OECD Test 5 Guideline 402) Irritation Skin : Severe skin irritation (Rabbit) (OECD Test Guideline 404) Result corrosive effects (human) Eyes Result : Causes serious eye damage. (Rabbit) (OECD - Guideline 405) Sensitisation Result 5 not sensitizing (Buehler Test; Guinea pig) (OECD Test Guideline 406) **CMR** effects 70000000233 / Version 15.0 12/52 ΕN

	CMR Properties						
Carcinogenicity Mutagenicity Teratogenicity Reproductive toxicity	<ul> <li>Animal testing did not show any carcinogenic effects.</li> <li>In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects</li> <li>Did not show teratogenic effects in animal experiments.</li> <li>Animal testing did not show any effects on fertility.</li> </ul>						
	Genotoxicity in vitro						
Result	<ul> <li>negative (Ames test; Salmonella typhimurium) (OECD Test Guideline 471) ambiguous (Chromosome aberration test in vitro; Chinese hamster fibroblasts) (OECD Test Guideline 473)</li> </ul>						
	Genotoxicity in vivo						
Result	<ul> <li>negative (Chromosome aberration test in vivo; Mouse) (OECD Test Guideline 474) negative (Chromosome aberration test in vivo; Mouse) (OECD Test Guideline 475) ambiguous (Effects on sperm morphology and melotic micronuclei; Mouse)</li> </ul>						
	Teratogenicity						
NOAEL Teratog.	: 5.7 mg/kg (Rat)Test substance Chlorine						
	Reproductive toxicity						
NOAEL Parent	: 5 mg/kg (Rat)(Oral)Effects on fertilityTest substance Chlorine						
	Specific Target Organ Toxicity						
Single exposure							
Inhalation	: Target Organs: Respiratory systemMay cause respiratory irritation.Experience with human exposure						
	Repeated exposure						
Remarks	: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.						
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Other toxic properties										
Repeated dose toxicity										
NOAEL :	50 mg/kg									
II	(Rat)(Oral; 90 Days) (OECD Test Guideline 408)									
Aspiration hazard										
II	No aspiration toxicity classification,									
	Further information									
Other relevant toxicity : information	If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.									
SECTION 12: Ecological inf	ormation									
Data for the product		r								
	Chronic toxicity									
	Long-term (chronic) aquatic hazard	ı								
Result :	Very toxic to aquatic life with long lasting effects.									
Component: se	odium hypochlorite, solution CAS-No. 7681-52-9									
	Acute toxicity									
	Fish	1								
LC50 : NOEC	0.06 mg/l (Salmo gairdneri; 96 h) 0.04 mg/l (Menidia peninsulae (tidewater silverside); 96 h)	•								
Toxicity to daphnia and other aquatic invertebrates										
EC50 :	0.141 mg/l (Daphnia magna (Water flea); 48 h)									
	algae	•								
NOEC :	0.0021 mg/l (algae; 7 Days) Fresh water									
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odium Hypochlor	ne >-14 - <-15%					
	Bacteria					
EC50	: > 3 mg/l (activated sludge; 3 h)					
	Chronic toxicity					
	Fish					
	: 0.04 mg/l (Menidia peninsulae (tidewater silverside); 28 d)					
	Aquatic invertebrates					
NOEC	0.007 mg/l (Eastern oyster (Crassostrea virginica); 15 d) Marine water					
	M-Factor					
M-Factor (Acute Aquat. Tox.)	: 10					
M-Factor (Chron. Aquat. Tox.) .2. Persistence and deg	: 1					
Component: sodium hypochlorite, solution CAS-No. 7681-52-9						
· · ·	Persistence and degradability					
	Persistence					
Result	<ul> <li>The product can be degraded by abiotic (e.g. chemical or photolytic) processes.</li> <li>decomposition by hydrolysis.</li> <li>Half-life in fresh-water &lt; 1 day</li> </ul>					
Biodegradability						
Result	: The methods for determining the biological degradability are not applicable to inorganic substances.					
.3. Bioaccumulative pot	tential					
Component:	sodium hypochlorite, solution CAS-No. 7681-52-9					
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### **Bioaccumulation**

	log Kow -3.42 (20 °C) Does not bioaccumulate.
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### 12.4. Mobility in soil

Component:	Component: sodium hypochlorite, solution				
	Mobility				
Water Soil Air	<ul> <li>The product is mobile in water enviromen</li> <li>Highly mobile in soils</li> <li>not volatile (Henry's Constant)</li> </ul>	nt.			

### 12.5. Results of PBT and vPvB assessment

Data for the product		
	Results of PBT and vPvB assessment	
Result	: This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.	
Component:	sodium hypochlorite, solution CAS-No. 7681-52-9	)
	Results of PBT and vPvB assessment	
Result	: The PBT or vPvB criteria of Annex XIII to the REACH Regulation does not apply to inorganic substances.	
12.6. Other adverse effects		
Component:	sodium hypochlorite, solution CAS-No. 7681-52-9	)
Component:	sodium hypochlorite, solutionCAS-No. 7681-52-5Additional ecological information	)
Component: Result		)
Result	Additional ecological information         : Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.	)
Result SECTION 13: Disposal co	Additional ecological information         : Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.         nsiderations	
	Additional ecological information         : Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.         nsiderations	

Contaminated packaging	:	Dispose of contaminated packaging in the same way as the product. In accordance with local and national regulations. Empty containers retain residue and can be dangerous.
European Waste Catalogue Number	:	No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

### **SECTION 14: Transport information**

### 14.1. UN number

1791

### 14.2. UN proper shipping name

ADR RID IMDG	: HYPOCHLORITE SOLUTION
RID	: HYPOCHLORITE SOLUTION
IMDG	: HYPOCHLORITE SOLUTION

### 14.3. Transport hazard class(es)

ADR-Class (Labels; Classification Code; Hazard Identification Number; Tunnel restriction code)	: 8
code)	8; C9; 80; (E)
RID-Class (Labels; Classification Code; Hazard Identification Number)	: 8
	8; C9; 80
IMDG-Class	: 8
(Labels; EmS)	8; F-A, S-B

### 14.4. Packaging group

ADR	:	II
RID	1	П
IMDG	:	II

### 14.5. Environmental hazards

Environmentally hazardous according to ADR	: yes
Environmentally hazardous according to RID	: yes
Marine Pollutant according to IMDG-Code	: yes

### 14.6. Special precautions for user

Not applicable.

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### 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

IMDG : Not applicable.

### **SECTION 15: Regulatory information**

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

### Data for the product

EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)	:	Point Nos.: , 3; Listed
EU. Directive 2012/18/EU (SEVESO III) Annex I	:	Lower-tier requirements: 100 tonnes; Part 1: Categories of dangerous substances; E1: Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1 Upper-tier requirements: 200 tonnes; Part 1: Categories of dangerous substances; E1: Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1 Lower-tier requirements: 200 tonnes; Part 1: Categories of dangerous substances; E2: Hazardous to the Aquatic Environment in Category Chronic 2 Upper-tier requirements: 500 tonnes; Part 1: Categories of dangerous substances; E2: Hazardous to the Aquatic Environment in Category Chronic 2 Upper-tier requirements: 500 tonnes; Part 1: Categories of dangerous substances; E2: Hazardous to the Aquatic Environment in Category Chronic 2
Component: soo	diun	n hypochlorite, solution CAS-No. 7681-52-9
EU. Regulation EU No. 649/2012 concerning the export and import of dangerous chemicals	:	; The substance/mixture does not fall under this legislation.
EU. REACH, Annex XVII,	:	Point Nos.: , 3; Listed
Marketing and Use Restrictions (Regulation 1907/2006/EC)		
<b>Restrictions</b> (Regulation	:	Lower-tier requirements: 100 tonnes; Part 1: Categories of dangerous substances; E1: Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1 Upper-tier requirements: 200 tonnes; Part 1: Categories of dangerous substances; E1: Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1

Sodium Hypochlori	te >=14 - <=15%	
Notification status sodium hypochlorite Regulatory List INSQ PHARM (JP) PICCS (PH) TSCA	, <b>solution:</b> Notification YES YES YES YES YES	Notification number
Component:	sodium hydroxide	CAS-No. 1310-73-2
Notification status sodium hydroxide: Regulatory List AICS DSL EINECS ENCS (JP) IECSC ISHL (JP) KECI (KR) KECI (KR) NZIOC PICCS (PH) TSCA	Notification YES YES YES YES YES YES YES YES YES YES	Notification number 215-185-5 (1)-410 (1)-410 97-1-136 KE-31487 HSR001547
15.2. Chemical safety asse	essment	
no data available		
SECTION 16: Other infor	mation	
Full text of H-Statem	ents referred to under section	ons 2 and 3.
H290 H314 H318 H335 H400 H410 H411	May be corrosive to metals. Causes severe skin burns a Causes serious eye damage May cause respiratory irritat Very toxic to aquatic life. Very toxic to aquatic life with Toxic to aquatic life with long	e. ion. n long lasting effects.
Abbreviations and A	cronyms	
BCF	bioconcentration fac	tor
BOD	biochemical oxygen	demand
CAS	Chemical Abstracts	Service
CLP	Classification, Label	ling and Packaging
CMR	carcinogenic, mutag	enic or toxic to reproduction
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COD	chemical oxygen demand
DNEL	derived no-effect level
EINECS	European Inventory of Existing Commercial Chemical Substan
ELINCS	European List of Notified Chemical Substances
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
LC50	median lethal concentration
LOAEC	lowest observed adverse effect concentration
LOAEL	lowest observed adverse effect level
LOEL	lowest observed effect level
NLP	no-longer polymer
NOAEC	no observed adverse effect concentration
NOAEL	no observed adverse effect level
NOEC	no observed effect concentration
NOEL	no observed effect level
OECD	Organisation for Economic Cooperation and Development
OEL	occupational exposure limit
PBT	persistent, bioaccumulative and toxic
<b>REACH Auth. No.:</b>	REACH Authorisation Number
REACH AuthAppC. No.	REACH Authorisation Application Consultation Number
PNEC	predicted no-effect concentration
STOT	specific target organ toxicity
SVHC	substance of very high concern
UVCB	substance of unknown or variable composition, complex reaction products or biological materials
vPvB	very persistent and very bioaccumulative
Further information	
Key literature references : and sources for data	Supplier information and data from the "Database of registered substances" of the European Chemicals Agency (ECHA) were used to create this safety data sheet.
Methods used for :	The classification for human health, physical and chemical
product classification	hazards and environmental hazards were derived from a
Hints for trainings :	combination of calculation methods and if available test data. The workers have to be trained regularly on the safe handling of the products based on the information provided in the Safet Data Sheet and the local conditions of the workplace. National regulations for the training of workers in the handling of hazardous materials must be adhered to.
Other information :	The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and
	does not constitute a legal relationship.

The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

|| Indicates updated section.

						Environm		
No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	ental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance	3	8	NA	1, 2, 3, 4, 8a, 8b, 9	1	NA	ES447
2	Formulation & (re)packing of substances and mixtures	3	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	2	NA	ES9179
3	Use in cleaning agents	3	4	35	5, 7, 8a, 9, 10, 13	6b	NA	ES9191
4	Use in cleaning agents	22	NA	35	5, 9, 10, 11, 13, 15	8a, 8b, 8d, 8e	NA	ES538
5	Use in sewage water treatment	3	23	20, 37	1, 2, 3, 4, 5, 8a, 8b, 9	6b	NA	ES9187
6	Use in paper industry	3	6b	26	1, 2, 3, 4, 5, 8a, 8b, 9	6b	NA	ES9189
7	Use as an intermediate	3	8, 9	19	1, 2, 3, 4, 8a, 8b, 9	6a	NA	ES9182
8	Use in textile industry	3	5	34	1, 2, 3, 4, 5, 8a, 8b, 9, 13	6b	NA	ES9185
9	Industrial use	3	4, 5, 6a, 6b, 8, 9, 10, 11	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 13, 14	6a, 6b, 6d	NA	ES523
10	Consumer use	21	NA	34, 35, 37	NA	8a, 8b, 8d, 8e	NA	ES653

### 1. Short title of Exposure Scenario 1: Manufacture of substance

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products)
Process categories	<ul> <li>PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</li> <li>PROC2: Use in closed, continuous process with occasional controlled exposure</li> <li>PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</li> <li>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</li> <li>PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities</li> <li>PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities</li> <li>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</li> </ul>
Environmental Release Categories	ERC1: Manufacture of substances

### 2.1 Contributing scenario controlling environmental exposure for: ERC1

Substance is a unique structure, Non-hydrophobic. , Low potential to bioaccumulate.

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.	
Amount used	Amounts used in the EU (tonnes/year)	999.999 ton(s)/year	
Frequency and duration of use	Continuous exposure	360 days/year	
Free days and the stars and	Flow rate of receiving surface water	18,000 m3/d	
Environment factors not influenced by risk management	Dilution Factor (River)	10	
initialities by this management	Dilution Factor (Coastal Areas)	100	
Technical conditions and	Air	Substance release to air can be excluded	
measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water	
Organizational measures to	Soil	Substance release to soil can be excluded	
prevent/limit release from the site			
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant	
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9			
Product characteristics	Concentration of the	Covers percentage substance in the product up to	
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	Substance in Mixture/Article	25 %.	
	Physical Form (at time of use)	Liquid, moderate fugacity	
-	Vapour pressure	25 hPa	
-	Process Temperature	0° C	
Frequency and duration of use	Exposure duration per day	8 h	
	Frequency of use	5 days/week	
	Body weight	70 kg	
Human factors not influenced by risk management	Respiration volume under conditions of use	10 m3/day	
	Light activity		
Other operational conditions	Indoor or outdoor use		
affecting workers exposure	Assumes activities are at ambient temperature.		
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Drain down system prior to equipment opening or maintenance.		
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Ensure containment of the emission source		
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus.		
Risk management measures are b			

### 3. Exposure estimation and reference to its source

#### Environment

Qualitative approach used to conclude safe use.

#### Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, Relevant for all PROCs: EU RAR

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
Relevant for all PROCs		Worker - inhalative, long- term - local and systemic.	0.705mg/m <sup>3</sup>	0.4548
PROC1, PROC2, PROC3, PROC4	General exposures	worker - inhalation, short- term - local and systemic	0.540mg/m <sup>3</sup>	0.1742
PROC1, PROC2, PROC3, PROC4	Laboratory activities	worker - inhalation, short- term - local and systemic	0.252mg/m <sup>3</sup>	0.081
PROC1, PROC2, PROC3, PROC4	Equipment maintenance	worker - inhalation, short- term - local and systemic	0.480mg/m <sup>3</sup>	0.155
PROC8a, PROC8b, worker - inhalation, short- term - local and systemic 0.498mg/m <sup>3</sup> 0.161				
Qualitative assessment dermal. Contact is only accidental. The exposure estimate represents the 90th percentile of the exposure distribution.				
A Guidance to Downstream User to evaluate whether he works inside the boundaries set by the				

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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ΕN

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Exposure values based on the EU Risk Assessment Report on chlorine (2007)

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented. Ensure that gas alarms are installed Change gloves, if duration of activity exceeds breakthrough time

#### 1. Short title of Exposure Scenario 2: Formulation & (re)packing of substances and mixtures SU 3: Industrial uses: Uses of substances as such or in preparations at industrial Main User Groups sites SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding Sectors of end-use alloys) PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition 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) Process categories PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation PROC15: Use as laboratory reagent **Environmental Release** ERC2: Formulation of preparations Categories

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

Substance is a unique structure, Non-hydrophobic. , Low potential to bioaccumulate.

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.	
Amount used	Amounts used in the EU (tonnes/year)	999.999 ton(s)/year	
Frequency and duration of use	Continuous exposure	360 days/year	
<b>F</b>	Flow rate of receiving surface water	18,000 m3/d	
Environment factors not influenced by risk management	Dilution Factor (River)	10	
initialized by lisk management	Dilution Factor (Coastal Areas)	100	
Technical conditions and	Air	Substance release to air can be excluded	
measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water	
Organizational measures to	Soil	Substance release to soil can be excluded	
prevent/limit release from the site			
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant	
	Flow rate of sewage treatment plant effluent	2,000 m3/d	
Conditions and measures related	Waste treatment	External treatment and disposal of waste should	
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to external treatment of waste for disposal  2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC5, PROC14, PROC15  2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC5, PROC14, PROC15  2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, Product characteristics  2.4 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, Process Temperature 90 °C  Frequency and duration of use  4.4  4.4  4.4  4.4  4.4  4.4  4.4  4	-						
PROC5, PROC6a, PROC24, PROC15           Concentration of the Substance in Mixture/Article         Concertage substance in the product up to 25 %.           Product characteristics         Physical Form (at time of use)         Liquid, moderate fugacity           Process Temperature         90 °C           Process Temperature         90 °C           Process Temperature         90 °C           Process Temperature         90 °C           Human factors not influenced by risk management         Respiration volume under conditions of use         10 m3/day           Human factors exposure         Assumes activities are at ambient temperature.         Indoor or outdoor use affecting workers exposure           Technical conditions from source towards the worker         Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).           Organisational measures to conditions and measures to control dispersion from source towards the worker         Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure that no influe aerosols are generated resure containment of the emission source           Conditions and measures are based on qualitative risk characterisation.         Wear protective of lows protective of							
Product characteristics         Concentration of the Substance in Muture/Article         Covers percentage substance in the product up to 25 %.           Product characteristics         Physical Form (at time of use)         Liquid, moderate fugacity           Process Temperature         90 °C           Frequency and duration of use         Exposure duration per day weight         8 h           Human factors not influenced by risk management         Body weight         70 kg           Other operational conditions affecting workers exposure         Indoor or outdoor use         10 m3/day           Erecting workers exposure         Assumes activities are at ambient temperature.         Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).           Drain down system prior to equipment opening or maintenance. Ensure samples are obtained under containment or extract ventilation.         Ensure that the task is not carried out overhead.           Organisational measures to prevent limit releases, dispersion and exposure         Ensure that the task is not carried out overhead.           Regular inspection and health evaluation         Ensure that the task is not carried out overhead.           Conditions and measures to prevent limit releases, dispersion and exposure         Ensure durative gloves/ protective clothing/ eye protection. In case of oldar gas atim or insufficient ventilation wear suitable respiratory in the case of hazardous fumes, wear self contained breathing apparatus.           Risk management measures are ba						OC1, PROC2, PROC	C3, PROC4,
use)       Liquid, inductation of use         Process Temperature       25 hPa         Process Temperature       90 °C         Exposure duration per day       8 h         Human factors not influenced by risk management       Body weight       70 kg         Human factors not influenced by risk management       Indoor or outdoor use       Assumes activities are at ambient temperature.         Process control dispersion from source towards the worker       Indoor or outdoor use       Assumes activities are at ambient temperature.         Prevent Jimit releases, dispersion from source towards the worker       Ensure standard of general ventilation (not less than 3 to 5 air changes per hour).         Organisational measures to per working in the task is not carried out overhead.       Ensure that no inhalable aerosols are generated Respiration worker set ontrol dispersion from source towards the worker         Conditions and measures to prevent Jimit releases, dispersion and maintenance of equipment and machines. Ensure that the task is not carried out overhead.         Ensure to control dispersion in the case of ohazardous furnes, wear self contained breathing apparatus.         Risk management measures to accold estimation and reference to its source         Conditions and measures to conclude safe use.         Workers         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC6b, PROC9, PROC14, PROC15: EU RAR         Contributing       Specific conditions	11000,11		Concentra Substance	ation of the e in	Covers pe	ercentage substance in	the product up to
Process Temperature         90 °C           Frequency and duration of use         Exposure duration per day         8 h           Human factors not influenced by risk management         Frequency of use         5 days/week           Human factors not influenced by risk management         Body weight         70 kg           Other operational conditions affecting workers exposure         Indoor or outdoor use         10 m3/day           Enchical conditions and measures to control dispersion from source towards the worker         Indoor or outdoor use         Assumes activities are at ambient temperature.           Organisational measures to prevent //imit releases, dispersion and exposure         Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).           Organisational measures to prevent //imit releases, dispersion and exposure         Fruster that no inhalable aerosols are generated Require inspection and maintenance of equipment and machines. Ensure containment of the emission source           Conditions and measures related to personal protection, hygien and health evaluation         Wear protective gloves/ protective clothing' yee protection/ face protection. In the case of dozur, gas alarm or insufficient ventilation wear suitable respiratory protection           Risk management measures are based on qualitative risk characterisation.         Start Change of the conditions and relative approach used to conclude safe use.           Workers         Specific conditions         Exposure routes         Level of Exposure	Product character	istics		Form (at time of	Liquid, m	oderate fugacity	
Frequency and duration of use         Exposure duration per day         8 h           Frequency of use         5 days/week           Human factors not influenced by risk management         Body weight         70 kg           Respiration volume under conditions of use         10 m3/day           Other operational conditions affecting workers exposure         Indoor or outdoor use           Assumes activities are at ambient temperature.           Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).           Drain down system prior to equipment opening or maintenance. Ensure samples are obtained under containment or extract ventilation.           Organisational measures to prevent limit releases, dispersion and exposure         Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure containment of the emission source           Conditions and measures releated to personal protection, hygiene and health evaluation         Ensure that the task is not carried coluting/ eye protection/ face protection. In the case of hazardous fumes, wear self contained breathing apparatus. <b>3. Exposure estimation and reference to its source</b> Evel of Exposure <b>BroC1</b> , PROC2, PROC3, PROC4, PROC5, PROC8, PROC8b, PROC6b, PROC9, PROC14, PROC15: EU RAR <b>Contributing</b> Specific conditions <b>Reposure routes</b> Level of Exposure           PROC1, PROC2, PROC3, PROC4, PROC5, PROC4, PROC65,			Vapour pr	essure	25 hPa		
Frequency and duration of use     day     0 II       Frequency and duration of use     Frequency of use     5 days/week       Human factors not influenced by risk management     Respiration volume under conditions of use     70 kg       Control     Respiration volume under conditions of use     10 m3/day       Idity     Light activity       Other operational conditions affecting workers exposure     Assumes activities are at ambient temperature.       Technical conditions and measures to control dispersion from source towards the worker     Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).       Organisational measures to prevent Jimit releases, dispersion and exposure     Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).       Conditions and measures to prevent Jimit releases, dispersion and exposure     Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).       Conditions and measures related and exposure     Regular inspection and maintenance of equipment and machines. Ensure containment of the emission source       Conditions and measures are based on qualitative risk characterisation.     Wear protective gloves/ protective clothing/ eye protection/ face protection. In the case of abardous fumes, wear self contained breathing apparatus.       Risk management measures are based on qualitative risk characterisation.     Seconario       PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15; EU RAR       Contributing     Spe			Process T	emperature	90 °C		
Body weight         70 kg           Human factors not influenced by risk management         Body weight         70 kg           Respiration volume under conditions of use         10 m3/day           Indoor or outdoor use         Assumes activities are at ambient temperature.           Assumes activities are at ambient temperature.         Assumes activities are at ambient temperature.           Technical conditions and measures to control dispersion from source towards the worker         Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).           Organisational measures to prevent /limit releases, dispersion and exposure         Provide a good standard of general ventilation extract ventilation.           Conditions and measures related to personal protection, hygiene and health evaluation         Ensure that the task is not carried out overhead. Ensure task is not carried out overhead.           Risk management measures are based on qualitative risk characterisation.         Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of doour, gas alarm or insufficient ventilation wear suitable respiratory protection           Risk management measures are based on qualitative risk characterisation.         The case of hazardous fumes, wear self contained breathing apparatus.           Risk management measures are based on qualitative risk characterisation.         Users           PROC1, PROC2, PROC3, PROC4, PROC5, PROC8, PROC8b, PROC9, PROC14, PROC15: EU RAR           Contributing Scenario         Sp	Frequency and du	iration of use		duration per	8 h		
Human factors not influenced by risk management       Respiration volume under conditions of use       10 m3/day         Contributing approximation of the task is a condition of use and the task is a condition of use a good standard of general ventilation (not less than 3 to 5 air changes per hour).       Indicor or outdoor use         Technical conditions and measures to control dispersion from source towards the worker       Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).         Organisational measures to prevent limit releases, dispersion and exposure       Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).         Conditions and measures related to personal protection, hygiene and exposure       Provide a good standard of general ventilation ventral demachines.         Ensure that the task is not carried out overhead.       Ensure that the task is not carried out overhead.         Ensure containment of the emission source       Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection and maintenance of equipment measures are based on qualitative risk characterisation.         3. Exposure estimation and reference to its source       Environment         Qualitative approach used to conclude safe use.       Uverker - inhalative, long-term - local and systemic.         PROC1, PROC2, PROC3, PROC4, PROC5, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15; EU RAR       Contributing Specific conditions Exposure routes Level of Exposure RCR			Frequency	y of use	5 days/we	ek	
risk management     conditions of use     10 m3/day       Light activity     Light activity       Other operational conditions affecting workers exposure     Indoor or outdoor use       affecting workers exposure     Assumes activities are at ambient temperature.       Technical conditions and measures to control dispersion from source towards the worker     Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).       Organisational measures to prevent /limit releases, dispersion from source towards the worker     Ensure that no inhalable aerosols are generated       Conditions and measures related to personal protection, hygiene and health evaluation     Ensure that the task is not carried out overhead. Ensure containment of the emission source       Wear protective gloves/ protective clothing/ eve protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection and maintenance of equipment and machines. Ensure that he case of hazardous fumes, wear self contained breathing apparatus.       Risk management measures are based on qualitative risk characterisation.       3. Exposure estimation and reference to its source       PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR       Contributing Specific conditions term - local and systemic.     0.705mg/m³     0.4548       PROC5, PROC8a, PROC4, PROC2, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR       PROC1, PROC2, PROC4, General exposures     Worker - inhalative, long-term - local and systemic.     0.705mg/m³     0			Body weig	ght	70 kg		
Other operational conditions affecting workers exposure         Indoor or outdoor use Assumes activities are at ambient temperature.           Technical conditions and measures to control dispersion from source towards the worker         Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Drain down system prior to equipment opening or maintenance. Ensure samples are obtained under containment or extract ventilation.           Organisational measures to prevent /limit releases, dispersion and exposure         Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Ensure containment of the emission source           Conditions and measures related to personal protection, hygiene and health evaluation         Wear protective gloves/ protective clothing/ eye protection/ In case of dodur, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus.           Risk management measures are based on qualitative risk characterisation.         3.           3.         Exposure estimation and reference to its source           Workers PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR           Contributing Scenario         Specific conditions           PROC1, PROC2, PROC4, PROC5, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR           PROC5, PROC4, PROC5, PROC6, PROC6b, PROC9, PROC14, PROC15: EU RAR           PROC68, PROC4, PROC5, PROC4, PROC5, PROC68, PROC59, PROC14, PROC15           PROC5, PRO		t influenced by			10 m3/day	/	
affecting workers exposure       Assumes activities are at ambient temperature.         Technical conditions and measures to control dispersion from source towards the worker       Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).         Organisational measures to prevent //imit releases, dispersion and exposure       Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).         Conditions and measures to prevent //imit releases, dispersion and exposure       Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Ensure containment of the emission source         Conditions and measures related to personal protection, hygiene and health evaluation       Wear protective (lower) protective (othing/ eye protective (othing/ eye protective) face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protective altive system protection.         Risk management measures are based on qualitative risk characterisation.       In the case of hazardous fumes, wear self contained breathing apparatus.         Risk management measures are based on qualitative risk characterisation.       Environment         Qualitative approach used to conclude safe use.       Vorkers         PROC1, PROC2, PROC3, PROC4, PROC5, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR       Contributing         Specific conditions       Exposure routes       Level of Exposure       RCR         PROC1, PROC2, PROC4, PROC5, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR			Light activ	vity			
Technical conditions and measures to control dispersion from source towards the worker       Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Drain down system prior to equipment opening or maintenance. Ensure samples are obtained under containment or extract ventilation.         Organisational measures to prevent /limit releases, dispersion and exposure       Ensure samples are obtained under containment or extract ventilation.         Conditions and measures related to personal protection, hygien and health evaluation       Ensure samples of odour, gas alarm or insufficient ventilation wear suitable respiratory protection in the case of hazardous fumes, wear self contained breathing apparatus.         Risk management measures are based on qualitative risk characterisation.       Sectific conditions         Qualitative approach used to conclude safe use.       Envire samples are obtained under contained breathing apparatus.         Workers       PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         Contributing Specific conditions       Exposure routes       Level of Exposure       RCR         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR       Orotos and systemic.       0.705mg/m³       0.4548         PROC1, PROC2, PROC3, PROC4, PROC5, PROC6a and systemic.       PROC10, PROC2, PROC4, General exposures       Worker - inhalative, long-term - local and systemic.       0.705mg/m³       0.4548							
Technical condutions and measures to control dispersion from source towards the worker       per hour).         Organisational measures to prevent /limit releases, dispersion and exposure       Ensure samples are obtained under containment or extract ventilation.         Conditions and measures related to personal protection, hygiene and health evaluation       Ensure that the task is not carried out overhead.         Basic Conditions and measures related to personal protection, hygiene and health evaluation       Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection         Bisk management measures are based on qualitative risk characterisation.       3.         Envire Management measures are based on qualitative risk characterisation.       3.         BroC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         Contributing Specific conditions       Exposure routes         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         PROC5, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         PROC5, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         PROC5, PROC4, PROC5, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         PROC5, PROC4, PROC5, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         PROC65, PROC4, PROC5, PROC4, PROC5, PROC8a, PROC4, PROC5, PROC4, PROC4, PROC5, PROC4, G	affecting workers	exposure					
Organisational measures ion prevent //imit releases, dispersion and exposure       Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Ensure that the task is not carried out overhead. Ensure that the task is not carried out overhead. Ensure containment of the emission source         Conditions and measures related to personal protection, hygiene and health evaluation       Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection         Risk management measures are based on qualitative risk characterisation.       In the case of hazardous fumes, wear self contained breathing apparatus.         Risk management measures are based on qualitative risk characterisation.       In the case of hazardous fumes, wear self contained breathing apparatus.         Risk management measures are based on qualitative risk characterisation.       In the case of hazardous fumes, wear self contained breathing apparatus.         Risk management measures are based on qualitative risk characterisation.       In the case of hazardous fumes, wear self contained breathing apparatus.         Regularitie approach used to conclude safe use.       Vorkers         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         Contributing       Specific conditions         Exposure routes       Level of Exposure         PROC1, PROC2, PROC3, PROC4, PROC5, PROC5, PROC6a, and systemic.       0.705mg/m³       0.4548         PROC1, PROC2, PROC	measures to contr	ol dispersion	per hour). Drain dow	vn system prior to	equipment	opening or maintenanc	e.
Containing and health evaluation       In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus.         Risk management measures are based on qualitative risk characterisation.         3. Exposure estimation and reference to its source         Environment         Qualitative approach used to conclude safe use.         Workers         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         Contributing       Specific conditions         Scenario       Vorker - inhalative, long-term - local and systemic.         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         PROC3, PROC4, PROC5, PROC8b, PROC9, PROC14, PROC15: EU RAR         PROC9, PROC14, PROC2, PROC2, PROC24, PROC25, PROC24, PROC25, PROC24, PROC25, PROC24, PROC25, PROC24, PROC25, PROC44, PROC25, PROC44, PROC25, PROC44,	prevent /limit relea		Regular ir Ensure th	nspection and main and main and the task is not a	intenance of carried out of	f equipment and machinoverhead.	nes.
Risk management measures are based on qualitative risk characterisation.         3. Exposure estimation and reference to its source         Environment         Qualitative approach used to conclude safe use.         Workers         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         Contributing Specific conditions         Scenario         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         Contributing Specific conditions         Scenario         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8a, PROC9, PROC14, PROC2, PROC3, PROC4, PROC5, PROC14, PROC2, PROC3, PROC4, PROC5, PROC3, PROC4, PROC5, PROC14, PROC2, PROC15         PROC1, PROC2, PROC2, PROC2, PROC15         Worker - inhalative, long-term - local and systemic.         0.705mg/m³       0.4548         PROC1, PROC2, PROC2, PROC4, General exposures         Worker - inhalation, short-term - local and systemic.       0.540mg/m³       0.1742	to personal protect	tion, hygiene	In case of protection	odour, gas alarm	or insufficio	ent ventilation wear suit	able respiratory
Environment         Qualitative approach used to conclude safe use.         Workers         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         Contributing Specific conditions       Exposure routes       Level of Exposure       RCR         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC1, PROC2, PROC3, PROC4, PROC5, PROC3, PROC4, PROC5, PROC68a,       Worker - inhalative, long-term - local and systemic.       0.705mg/m³       0.4548         PROC1, PROC2, PROC2, PROC3, PROC4, PROC5, PROC68a, PROC68a, PROC68a, PROC68a, PROC68a, PROC68b, PROC68b, PROC68b, PROC705       0.705mg/m³       0.4548         PROC15        Worker - inhalative, long-term - local and systemic.       0.705mg/m³       0.4548         PROC15        Worker - inhalative, long-term - local and systemic.       0.540mg/m³       0.1742							
Qualitative approach used to conclude safe use.         Workers         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         Contributing Scenario       Specific conditions       Exposure routes       Level of Exposure       RCR         PROC1, PROC2, PROC3, PROC4, PROC5, PROC5, PROC8a, PROC8b, PROC9, PROC15        Worker - inhalative, long- term - local and systemic.       0.705mg/m³       0.4548         PROC1, PROC2, PROC15       worker - inhalation, short- term - local and systemic.       0.540mg/m³       0.1742	3. Exposure e	stimation and	reference	e to its source			
Workers         PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         Contributing Scenario       Specific conditions       Exposure routes       Level of Exposure       RCR         PROC1, PROC2, PROC3, PROC4, PROC5, PROC5, PROC8a, PROC8b, PROC9, PROC9, PROC15        Worker - inhalative, long- term - local and systemic.       0.705mg/m³       0.4548         PROC15       PROC1, PROC2, PROC3, PROC4, PROC3, PROC4, PROC3, PROC4, PROC3, PROC4, PROC3, PROC4, PROC3, PROC4, PROC3, PROC4, PROC3, PROC4, PROC3, PROC4	Environment						
PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR         Contributing Scenario       Specific conditions       Exposure routes       Level of Exposure       RCR         PROC1, PROC2, PROC3, PROC4, PROC5, PROC5, PROC8a, PROC8b, PROC9, PROC9, PROC15        Worker - inhalative, long- term - local and systemic.       0.705mg/m³       0.4548         PROC15       PROC1, PROC2, PROC3, PROC4, PROC3, PROC4, PROC3, PROC4, PROC3, PROC4, PROC3, PROC4,       General exposures       worker - inhalation, short- term - local and systemic.       0.540mg/m³       0.1742	Qualitative approa	ach used to cond	lude safe u	se.			
Contributing ScenarioSpecific conditionsExposure routesLevel of ExposureRCRPROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15Worker - inhalative, long- term - local and systemic.0.705mg/m³0.45480.4548PROC1, PROC2, PROC3, PROC4, PROC3, PROC4, PROC3, PROC4,General exposuresworker - inhalation, short- term - local and systemic.0.540mg/m³0.1742	Workers						
ScenarioImage: ScenarioPROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15Worker - inhalative, long- term - local and systemic.0.705mg/m³0.705mg/m³0.45480.45480.705mg/m³0.4548	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15: EU RAR						
PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15        Worker - inhalative, long- term - local and systemic.       0.705mg/m³       0.4548         0.705mg/m³       0.4548		Specific con	ditions	Exposure r	outes	Level of Exposure	RCR
PROC3, PROC4, General exposures worker - Inhalation, short- term - local and systemic 0.540mg/m <sup>3</sup> 0.1742	PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9,					0.705mg/m³	0.4548
	PROC3, PROC4, General exposures worker - Inhalation, short- term - local and systemic 0.540mg/m <sup>3</sup> 0.1742						
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PROC1, PROC2, PROC3, PROC4, PROC5	worker - inhalation, short- term - local and systemic	0.252mg/m³	0.081
PROC1, PROC2, PROC3, PROC4, PROC5	worker - inhalation, short- term - local and systemic	0.480mg/m <sup>3</sup>	0.155
PROC8a, PROC8b, PROC9	 worker - inhalation, short- term - local and systemic	0.498mg/m³	0.161
PROC14	 Worker - inhalative, long- term	0.23mg/m <sup>3</sup>	0.15

Qualitative assessment dermal. Contact is only accidental. The exposure estimate represents the 90th percentile of the exposure distribution.

# 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Exposure values based on the EU Risk Assessment Report on chlorine (2007)

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented. Ensure that gas alarms are installed Change gloves, if duration of activity exceeds breakthrough time

### 1. Short title of Exposure Scenario 3: Use in cleaning agents

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Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industria sites	
Sectors of end-use	SU4: Manufacture of food products	
Chemical product category	PC35: Washing and cleaning products	
Process categories	<ul> <li>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)</li> <li>PROC7: Industrial spraying</li> <li>PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities</li> <li>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</li> <li>PROC10: Roller application or brushing</li> <li>PROC13: Treatment of articles by dipping and pouring</li> </ul>	
Environmental Release Categories	ERC6b: Industrial use of reactive processing aids	
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered	

### 2.1 Contributing scenario controlling environmental exposure for: ERC6b

Substance is a unique structure, Non-hydrophobic. , Low potential to bioaccumulate.

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.	
Amount used	Amounts used in the EU (tonnes/year)	999.999 ton(s)/year	
Frequency and duration of use	Continuous exposure	360 days/year	
	Flow rate of receiving surface water	18,000 m3/d	
Environment factors not influenced by risk management	Dilution Factor (River)	10	
initiation of a second s	Dilution Factor (Coastal Areas)	100	
Technical conditions and	Air	Substance release to air can be excluded	
measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water	
Organizational measures to	Soil	Substance release to soil can be excluded	
prevent/limit release from the site		1	
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant	
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
2.2 Contributing scenario controlling worker exposure for: PROC5, PROC7, PROC8a, PROC9, PROC10, PROC13			
Product characteristics	Concentration of the Substance in	Covers percentage substance in the product up to 25 %.	
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	Mixture/Article		
	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
	Process Temperature	90 °C	
Frequency and duration of use	Exposure duration per day	8 h	
	Frequency of use	5 days/week	
	Body weight	70 kg	
Human factors not influenced by risk management	Respiration volume under conditions of use	10 m3/day	
	Light activity		
Other operational conditions	Indoor use		
affecting workers exposure	Assumes activities are at ambient temperature., Outdoor location is covered by the worst case inside location		
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Drain down system prior to equipment opening or maintenance.		
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Ensure containment of the emission source		
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus.		
Risk management measures are b			

#### Environment

Qualitative approach used to conclude safe use.

#### Workers

#### PROC5, PROC7, PROC8a, PROC9, PROC10, PROC13: Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC5, PROC8a		Worker - inhalative, long- term - local	1.25mg/m <sup>3</sup>	0.81
PROC7		Worker - inhalative, long- term - local	1.20mg/m <sup>3</sup>	0.77
PROC9		Worker - inhalative, long- term - local	0.91mg/m <sup>3</sup>	0.59
PROC10		Worker - inhalative, long- term - local	1.00mg/m <sup>3</sup>	0.65
PROC13		Worker - inhalative, long- term - local	0.70mg/m <sup>3</sup>	0.45

The short-term exposure is covered by the assessment of long-term exposure. Qualitative assessment dermal. Qualitative approach used to conclude safe use.

# 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented. Ensure that gas alarms are installed Change gloves, if duration of activity exceeds breakthrough time

### 1. Short title of Exposure Scenario 4: Use in cleaning agents

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Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Chemical product category	PC35: Washing and cleaning products	
Process categories	<ul> <li>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)</li> <li>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</li> <li>PROC10: Roller application or brushing</li> <li>PROC11: Non industrial spraying</li> <li>PROC13: Treatment of articles by dipping and pouring</li> <li>PROC15: Use as laboratory reagent</li> </ul>	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems	

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8d, ERC8e

Substance is a unique structure, Non-hydrophobic. , Low potential to bioaccumulate.

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%
Amount used	Amounts used in the EU (tonnes/year)	999999 ton(s)/year
Frequency and duration of use	Continuous exposure	360 days/year
	Flow rate of receiving surface water	18,000 m3/d
Environment factors not influenced by risk management	Dilution Factor (River)	10
initiation by hist management	Dilution Factor (Coastal Areas)	100
Technical conditions and	Air	Substance release to air can be excluded
measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Do not let product enter drains., Onsite wastewater treatment required
releases to soil	Soil	Substance release to soil can be excluded
Organizational measures to prevent/limit release from the site		
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario co PROC15	ntrolling worker exposu	re for: PROC5, PROC9, PROC10, PROC13,
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%
	Physical Form (at time of	Liquid, moderate fugacity
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	use)			
	Vapour pressure	25 hPa		
	Exposure duration per	8 h		
Frequency and duration of use	day			
	Frequency of use	5 days/week		
Other operational conditions affecting workers exposure	Indoor or outdoor use			
Technical conditions and	Assumes activities are at ambient temperature.			
measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.			
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. The work place and work methods shall be organized in such a way that direct contact with the product is prevented or minimized.			
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection Personal measures have to be applied in case of potential exposure only.			
Risk management measures are b				
2.3 Contributing scenario co				
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0.05%		
	Physical Form (at time of use)	Liquid, moderate fugacity		
	Vapour pressure	25 hPa		
	Process Temperature	90 °C		
Amount used		0.005 kg		
Frequency and duration of use	Exposure duration	120 min		
rrequency and duration of use	Frequency of use	4 Times per day		
Other operational conditions	Indoor or outdoor use			
affecting workers exposure	Assumes activities are at ambient temperature.			
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.			
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. The work place and work methods shall be organized in such a way that direct contact with the product is prevented or minimized.			
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection			
Risk management measures are b	ased on qualitative risk char	acterisation.		
3. Exposure estimation and	reference to its source			
Environment				
Qualitative approach used to conc	lude safe use.			
Workers				
PROC11: EASE v2.0				

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Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
ROC11		Worker - inhalative, long- term - systemic	0.0017mg/m <sup>3</sup>	0.0011
	ssment dermal. Contact is on to Downstream User to e Scenario			aries set by the
	ased on assumed operating c to define appropriate site-spe			us, scaling may
dditional good	I practice advice beyond th	e REACH Chemical Safety	Assessment	
Ensure that gas	d basic standard of occupatio alarms are installed if duration of activity exceeds			

#### 1. Short title of Exposure Scenario 5: Use in sewage water treatment SU 3: Industrial uses: Uses of substances as such or in preparations at industrial Main User Groups sites Sectors of end-use SU23: Electricity, steam, gas water supply and sewage treatment PC20: Products such as pH-regulators, flocculants, precipitants, neutralization Chemical product category agents PC37: Water treatment chemicals PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises Process categories PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **Environmental Release** ERC6b: Industrial use of reactive processing aids Categories 2.1 Contributing scenario controlling environmental exposure for: ERC6b Concentration of the Covers percentage substance in the product up to **Product characteristics** Substance in 25 %. Mixture/Article Amounts used in the EU 999.999 ton(s)/year Amount used (tonnes/year) Frequency and duration of use Continuous exposure 360 days/year Flow rate of receiving 18,000 m3/d surface water Environment factors not Dilution Factor (River) 10 influenced by risk management **Dilution Factor (Coastal** 100 Areas) Technical conditions and Air Substance release to air can be excluded measures at process level to Risk from environmental exposure is driven by prevent release freshwater.. Do not release wastewater directly into Technical onsite conditions and Water environment., Onsite wastewater treatment measures to reduce or limit required, No discharge of substance into waste discharges, air emissions and water releases to soil Soil Substance release to soil can be excluded Organizational measures to prevent/limit release from the site Type of Sewage Municipal sewage treatment plant **Treatment Plant** Conditions and measures related to sewage treatment plant Flow rate of sewage 2.000 m3/d treatment plant effluent External treatment and disposal of waste should Conditions and measures related to external treatment of waste for Waste treatment comply with applicable local and/or national disposal regulations 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, 70000000233 / Version 15.0 35/52 EN

PROC5, PROC8a, PROC8b, PROC9						
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.				
	Physical Form (at time of use)	Liquid, moderate fugacity				
	Vapour pressure	25 hPa				
	Process Temperature	90 °C				
Frequency and duration of use	Exposure duration per day	8 h				
	Frequency of use	5 days/week				
	Body weight	70 kg				
Human factors not influenced by risk management	Respiration volume under conditions of use	10 m3/day				
	Light activity					
	Indoor use					
Other operational conditions affecting workers exposure	Assumes activities are at ambient temperature., Outdoor location is covered by the worst case inside location					
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Drain down system prior to equipment opening or maintenance.					
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead. Ensure containment of the emission source					
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus.					
Risk management measures are based on qualitative risk characterisation.						

### 3. Exposure estimation and reference to its source

### Environment

Qualitative approach used to conclude safe use.

#### Workers

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9: Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1		Worker - inhalative, long- term - local	0.02mg/m <sup>3</sup>	0.01
PROC2, PROC3		Worker - inhalative, long- term - local	1.10mg/m <sup>3</sup>	0.71
PROC4		Worker - inhalative, long- term - local	1.20mg/m <sup>3</sup>	0.77
PROC5, PROC8a, PROC8b		Worker - inhalative, long- term - local	1.25mg/m³	0.81
PROC9		Worker - inhalative, long- term - local	0.91mg/m <sup>3</sup>	0.59
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The short-term exposure is covered by the assessment of long-term exposure. Qualitative assessment dermal. Qualitative approach used to conclude safe use.

# 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Ensure that gas alarms are installed

Change gloves, if duration of activity exceeds breakthrough time

These measures involve good personal and housekeeping practices (i.e. regular cleaning), no eating and smoking at the workplace, wearing of standard working clothes and shoes.

## 1. Short title of Exposure Scenario 6: Use in paper industry

•			
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites		
Sectors of end-use	SU6b: Manufacture of pulp, paper and paper products		
Chemical product category	PC26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids		
Process categories	<ul> <li>PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</li> <li>PROC2: Use in closed, continuous process with occasional controlled exposure</li> <li>PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</li> <li>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</li> <li>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)</li> <li>PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities</li> <li>PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities</li> <li>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</li> </ul>		
Environmental Release Categories	ERC6b: Industrial use of reactive processing aids		

## 2.1 Contributing scenario controlling environmental exposure for: ERC6b

Substance is a unique structure, Non-hydrophobic. , Low potential to bioaccumulate.

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
Amount used	Amounts used in the EU (tonnes/year)	999.999 ton(s)/year
Frequency and duration of use	Continuous exposure	360 days/year
<b>F</b>	Flow rate of receiving surface water	18,000 m3/d
Environment factors not influenced by risk management	Dilution Factor (River)	10
initial de by hist management	Dilution Factor (Coastal Areas)	100
Technical conditions and	Air	Substance release to air can be excluded
measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water
Organizational measures to	Soil	Substance release to soil can be excluded
prevent/limit release from the site		·
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d
Conditions and measures related to external treatment of waste for	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national
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disposal		regulations.	
2.2 Contributing scenario co PROC5, PROC8a, PROC8		re for: PROC1, PROC2, PROC3, PROC4,	
	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.	
Product characteristics	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
	Process Temperature	90 °C	
Frequency and duration of use	Exposure duration per day	8 h	
	Frequency of use	5 days/week	
	Body weight	70 kg	
Human factors not influenced by risk management	Respiration volume under conditions of use	10 m3/day	
	Light activity		
Other operational conditions	Indoor use		
ffecting workers exposure Assumes activities are at ambient temperature., Outdoor location is covered the worst case inside location			
Technical conditions and measures to control dispersion from source towards the worker	per hour).	general ventilation (not less than 3 to 5 air changes equipment opening or maintenance.	
Organisational measures to prevent /limit releases, dispersion and exposure Ensure that the task is not carried out overhead. Ensure containment of the emission source			
Conditions and measures related to personal protection, hygiene and health evaluation Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus.			
Risk management measures are b	based on qualitative risk char	acterisation.	
3. Exposure estimation and	reference to its source		
<b>3.</b> Exposure estimation and	reference to its source		

### Environment

Qualitative approach used to conclude safe use.

## Workers

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9: Advanced REACH Tool (ART model)					
Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR	
PROC1		Worker - inhalative, long- term - local	0.02mg/m <sup>3</sup>	0.01	
PROC2, PROC3		Worker - inhalative, long- term - local	1.10mg/m <sup>3</sup>	0.71	
PROC4		Worker - inhalative, long- term - local	1.20mg/m <sup>3</sup>	0.77	
PROC5, PROC8a, PROC8b		Worker - inhalative, long- term - local	1.25mg/m³	0.81	
PROC9		Worker - inhalative, long-	0.91mg/m <sup>3</sup>	0.59	
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term - local					
The short-term exposure is covered by the assessment of long-term exposure. Qualitative assessment dermal. Qualitative approach used to conclude safe use.					
4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario					
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.					
Additional good practice advice beyond the REACH Chemical Safety Assessment					
Assumes a good basic standard of occupational hygiene is implemented. Ensure that gas alarms are installed Change gloves, if duration of activity exceeds breakthrough time These measures involve good personal and housekeeping practices (i.e. regular cleaning), no eating and smoking at the workplace, wearing of standard working clothes and shoes.					

### 1. Short title of Exposure Scenario 7: Use as an intermediate

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Chemical product category	PC19: Intermediate
Process categories	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental Release Categories	ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

### 2.1 Contributing scenario controlling environmental exposure for: ERC6a

Substance is a unique structure, Non-hydrophobic. , Low potential to bioaccumulate.

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.		
Amount used	Amounts used in the EU (tonnes/year)	999.999 ton(s)/year		
Frequency and duration of use	Continuous exposure	360 days/year		
	Flow rate of receiving surface water	18,000 m3/d		
Environment factors not influenced by risk management	Dilution Factor (River)	10		
initiachea by hist management	Dilution Factor (Coastal Areas)	100		
Technical conditions and	Air	Substance release to air can be excluded		
measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water		
Organizational measures to	Soil	Substance release to soil can be excluded		
prevent/limit release from the site				
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant		
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d		
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.		
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4,				
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## PROC8a, PROC8b, PROC9

PROC8a, PROC8b, PROC	:9		
	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.	
Product characteristics	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
	Process Temperature	90 °C	
Frequency and duration of use	Exposure duration per day	8 h	
	Frequency of use	5 days/week	
	Body weight	70 kg	
Human factors not influenced by risk management	Respiration volume under conditions of use	10 m3/day	
	Light activity		
Other operational conditions	Indoor use		
affecting workers exposure	Assumes activities are at ambient temperature., Outdoor location is covered by the worst case inside location		
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Drain down system prior to equipment opening or maintenance.		
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure that no inhalable aerosols are generated		
Conditions and measures related to personal protection, hygiene and health evaluation	<ul> <li>Wear protective gloves/ protective clothing/ eye protection/ face protection.</li> <li>In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection</li> <li>In the case of hazardous fumes, wear self contained breathing apparatus.</li> </ul>		
Risk management measures are b	based on qualitative risk char	acterisation.	

## 3. Exposure estimation and reference to its source

## Environment

Qualitative approach used to conclude safe use.

### Workers

PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9: Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR	
PROC1		Worker - inhalative, long- term - local	0.02mg/m <sup>3</sup>	0.01	
PROC2, PROC3		Worker - inhalative, long- term - local	1.10mg/m <sup>3</sup>	0.71	
PROC4		Worker - inhalative, long- term - local	1.20mg/m <sup>3</sup>	0.77	
PROC8a, PROC8b		Worker - inhalative, long- term - local	1.25mg/m <sup>3</sup>	0.81	
PROC9		Worker - inhalative, long- term - local	0.91mg/m <sup>3</sup>	0.59	
The short-term exposure is covered by the assessment of long-term exposure. Qualitative assessment dermal. Qualitative approach used to conclude safe use.					
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# 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented. Ensure that gas alarms are installed Change gloves, if duration of activity exceeds breakthrough time

#### 1. Short title of Exposure Scenario 8: Use in textile industry SU 3: Industrial uses: Uses of substances as such or in preparations at industrial Main User Groups sites Sectors of end-use SU5: Manufacture of textiles, leather, fur PC34: Textile dyes, finishing and impregnating products; including bleaches and Chemical product category other processing aids PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises Process categories PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13: Treatment of articles by dipping and pouring ERC6b: Industrial use of reactive processing aids **Environmental Release** Categories

### 2.1 Contributing scenario controlling environmental exposure for: ERC6b

Substance is a unique structure, Non-hydrophobic.

, Low potential to bioaccumulate.

Amount usedAmounts used in the EU (tonnes/year)999.999 ton(s)/yearFrequency and duration of useContinuous exposure360 days/yearEnvironment factors not influenced by risk managementFlow rate of receiving surface water18,000 m3/dTechnical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soilAirSubstance release to air can be excludedWaterWaterRisk from environmental exposure is driven by freshwater., Do not release wastewater directly environment., Onsite wastewater treatment required, No discharge of substance into waste waterConditions and measures to prevent/limit release from the siteSoilSubstance release to soil can be excludedType of Sewage treatment PlantType of Sewage treatment PlantMunicipal sewage treatment plantFlow rate of sewage treatment plantFlow rate of sewage treatment plant effluent2,000 m3/d	Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
Environment factors not influenced by risk managementFlow rate of receiving surface water18,000 m3/dDilution Factor (River)10Dilution Factor (Coastal Areas)100Technical conditions and measures at process level to prevent release Technical onsite conditions and 	Amount used	Amounts used in the EU	999.999 ton(s)/year
Environment factors not influenced by risk managementsurface water18,000 m3/dDilution Factor (River)10Dilution Factor (Coastal Areas)100Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soilAirSubstance release to air can be excludedWaterWaterRisk from environmental exposure is driven by freshwater., Do not release wastewater directly environment., Onsite wastewater treatment required, No discharge of substance into waste waterOrganizational measures to prevent/limit release from the siteType of Sewage Treatment PlantMunicipal sewage treatment plantTo be excludedFlow rate of sewage treatment plant effluent2,000 m3/d	Frequency and duration of use	Continuous exposure	360 days/year
Influenced by risk managementDilution Factor (River)10Dilution Factor (Coastal Areas)100Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the siteAirSubstance release to air can be excluded Risk from environmental exposure is driven by freshwater., Do not release wastewater directly environment., Onsite wastewater treatment required, No discharge of substance into waste waterSoilSoilSubstance release to soil can be excludedOrganizational measures to prevent/limit release from the siteType of Sewage Treatment PlantMunicipal sewage treatment plantFlow rate of sewage treatment plantFlow rate of sewage treatment plant effluent2,000 m3/d		5	18,000 m3/d
Dilution Factor (Coastal Areas)100Technical conditions and measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soilAirSubstance release to air can be excluded Risk from environmental exposure is driven by freshwater., Do not release wastewater directly environment., Onsite wastewater treatment required, No discharge of substance into waste waterOrganizational measures to prevent/limit release from the siteSoilSubstance release to soil can be excludedConditions and measures related to sewage treatment plantType of Sewage Treatment PlantMunicipal sewage treatment plantFlow rate of sewage treatment plant effluent2,000 m3/d		Dilution Factor (River)	10
AllSubstance release to all call be excludedmeasures at process level to prevent releaseRisk from environmental exposure is driven by freshwater., Do not release wastewater directly environment., Onsite wastewater treatment required, No discharge of substance into waste waterWaterSoilSubstance release to all call be excludedValueRisk from environmental exposure is driven by freshwater., Do not release wastewater directly environment., Onsite wastewater treatment required, No discharge of substance into waste waterOrganizational measures to prevent/limit release from the siteSoilSoilSubstance release to soil can be excludedType of Sewage Treatment PlantMunicipal sewage treatment plantFlow rate of sewage treatment plant effluent2,000 m3/d	initial agenteric	•	100
prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the siteWaterRisk from environmental exposure is driven by freshwater., Do not release wastewater directly environment., Onsite wastewater treatment required, No discharge of substance into waste waterConditions and measures related to sewage treatment plantSoilSubstance release to soil can be excludedType of Sewage treatment plantType of Sewage Treatment PlantMunicipal sewage treatment plantFlow rate of sewage treatment plant effluent2,000 m3/d		Air	Substance release to air can be excluded
Organizational measures to prevent/limit release from the site       Soil       Substance release to soil can be excluded         Conditions and measures related to sewage treatment plant       Type of Sewage Treatment Plant       Municipal sewage treatment plant         Flow rate of sewage treatment plant       Flow rate of sewage treatment plant effluent       2,000 m3/d	prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	Water	freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste
Conditions and measures related to sewage treatment plant       Type of Sewage Treatment Plant       Municipal sewage treatment plant         Flow rate of sewage treatment plant       Flow rate of sewage treatment plant       2,000 m3/d		Soil	Substance release to soil can be excluded
Conditions and measures related to sewage treatment plant     Treatment Plant     Municipal sewage treatment plant       Flow rate of sewage treatment plant     Flow rate of sewage treatment plant effluent     2,000 m3/d	prevent/limit release from the site		1
treatment plant effluent 2,000 m3/d	Conditions and measures related		Municipal sewage treatment plant
Conditions and measures related Waste treatment External treatment and disposal of waste should	to sewage treatment plant		2,000 m3/d
	Conditions and measures related	Waste treatment	External treatment and disposal of waste should
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PROC5, PROC8a, PROC8b, C Product characteristics F C Product characteristics F C F C F C S C S C S C S C S C S C S C	b, PROC9, PROC13 Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Process Temperature Exposure duration per day	re for: PROC1, PROC2, PROC3, PROC4,         Covers percentage substance in the product up to 25 %.         Liquid, moderate fugacity         25 hPa         90 °C         8 h	
Product characteristics F U V F E	Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Process Temperature Exposure duration per day	25 %. Liquid, moderate fugacity 25 hPa 90 °C	
F F	use) Vapour pressure Process Temperature Exposure duration per day	25 hPa 90 °C	
F	Process Temperature Exposure duration per day	90 °C	
E	Exposure duration per day		
	day	8 h	
	- ,		
F	Frequency of use	5 days/week	
E	Body weight	70 kg	
	Respiration volume under conditions of use	10 m3/day	
L	Light activity		
Other operational conditions	Indoor use		
affecting workers exposure	Assumes activities are at ambient temperature., Outdoor location is covered by the worst case inside location		
measures to control dispersion p	per hour).	general ventilation (not less than 3 to 5 air changes equipment opening or maintenance.	
prevent /limit releases, dispersion	Ensure that no inhalable as Regular inspection and mai Ensure that the task is not of Ensure containment of the	intenance of equipment and machines. carried out overhead.	
to personal protection, hygiene	In case of odour, gas alarm protection	otective clothing/ eye protection/ face protection. or insufficient ventilation wear suitable respiratory mes, wear self contained breathing apparatus.	
Risk management measures are bas	ased on qualitative risk chara	acterisation.	
3. Exposure estimation and re	reference to its source		

Qualitative approach used to conclude safe use.

### Workers

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13: Advanced REACH Tool (ART model)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1		Worker - inhalative, long- term - local	0.02mg/m <sup>3</sup>	0.01
PROC2, PROC3		Worker - inhalative, long- term - local	1.10mg/m <sup>3</sup>	0.71
PROC4		Worker - inhalative, long- term - local	1.20mg/m <sup>3</sup>	0.77
PROC5, PROC8a,		Worker - inhalative, long- term - local	1.25mg/m <sup>3</sup>	0.81
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PROC8b			
PROC9	 Worker - inhalative, long- term - local	0.91mg/m³	0.59
PROC13	 Worker - inhalative, long- term - local	0.70mg/m³	0.45

The short-term exposure is covered by the assessment of long-term exposure. Qualitative assessment dermal. Qualitative approach used to conclude safe use.

# 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented. Ensure that gas alarms are installed

Change gloves, if duration of activity exceeds breakthrough time

#### 1. Short title of Exposure Scenario 9: Industrial use SU 3: Industrial uses: Uses of substances as such or in preparations at industrial Main User Groups sites SU4: Manufacture of food products SU5: Manufacture of textiles, leather, fur SU6a: Manufacture of wood and wood products SU6b: Manufacture of pulp, paper and paper products Sectors of end-use SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding allovs) SU11: Manufacture of rubber products PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations Process categories and articles (multistage and/ or significant contact) PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) **Environmental Release** ERC6b: Industrial use of reactive processing aids Categories ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers Note: this Exposure Scenario is only relevant for an appropriated use according to Activity the quality grade of the substance delivered

### 2.1 Contributing scenario controlling environmental exposure for: ERC6a, ERC6b, ERC6d

Substance is a unique structure, Non-hydrophobic. , Low potential to bioaccumulate.

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 15%
Amount used	Amounts used in the EU (tonnes/year)	999999 ton(s)/year
Frequency and duration of use	Continuous exposure	360 days/year
F	Flow rate of receiving surface water	18,000 m3/d
Environment factors not influenced by risk management	Dilution Factor (River)	10
Initialities by tisk management	Dilution Factor (Coastal Areas)	100
Technical conditions and measures at process level to	Air	Substance release to air can be excluded
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prevent release		Risk from environmental exposure is driven by		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water		
Organizational measures to prevent/limit release from the site	Soil	Substance release to soil can be excluded		
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant		
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d		
Conditions and measures related to external treatment of waste for disposal	Waste treatment Waste treatment and disposal of waste comply with applicable local and/or nation regulations.			
2.2 Contributing scenario co PROC5, PROC8a, PROC8		re for: PROC1, PROC2, PROC3, PROC4, OC14		
	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 15%		
Product characteristics	Physical Form (at time of use) Liquid, moderate fugacity			
	Vapour pressure	25 hPa		
	Process Temperature	90 °C		
Frequency and duration of use	Exposure duration per day	8 h		
	Frequency of use	5 days/week		
Other operational conditions	Indoor or outdoor use			
affecting workers exposure	Assumes activities are at a	mbient temperature.		
Technical conditions and measures to control dispersion	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).			
from source towards the worker	Ensure that no inhalable as	equipment opening or maintenance.		
Organisational measures to prevent /limit releases, dispersion and exposure	Regular inspection and ma Ensure that the task is not	intenance of equipment and machines. carried out overhead.		
	Ensure containment of the emission source			
Conditions and measures related to personal protection, hygiene and health evaluation	Wear protective gloves/ protective clothing/ eye protection/ face protection. In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection			
		imes, wear self contained breathing apparatus.		
Risk management measures are b	•			
2.3 Contributing scenario co		re for: PROC8a, PROC8b, PROC9		
	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 5%		
Product characteristics	Physical Form (at time of use)	Liquid, moderate fugacity		
	Vapour pressure	25 hPa		
	Process Temperature	90 °C		
Frequency and duration of use	Exposure duration per day	8 h		
	Frequency of use	5 days/week		
		Exposed skin area   Two hands 820 cm <sup>2</sup>		
Human factors not influenced by risk management	Exposed skin area	Two hands 820 cm <sup>2</sup>		

Other operationa affecting workers		Indoor or outdoor use				
Technical conditions and measures to control dispersionProvi per h			Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).			
Organisational measures to prevent /limit releases, dispersion and exposure			Drain down system prior to equipment opening or maintenance. Ensure that no inhalable aerosols are generated Regular inspection and maintenance of equipment and machines. Ensure that the task is not carried out overhead.			
Conditions and measures related p to personal protection, hygiene In and health evaluation V		Ensure containment of the emission source In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection In the case of hazardous fumes, wear self contained breathing apparatus. Wear protective gloves/ protective clothing/ eye protection/ face protection. Wear chemically resistant gloves. (Efficiency: 90 %)				
Risk managemer	nt measures are b		alitative risk characterisation			
3. Exposure e	estimation and	reference	e to its source			
Environment						
Qualitative appro	each used to conc	lude safe u	se.			
Workers						
	II PROCs: EU RA		<b>F</b>		505	
Contributing Scenario	Specific con	ditions	Exposure routes	Level of Exposure	RCR	
Relevant for all PROCs			Worker - inhalative, long- term - local and systemic.	0.705mg/m <sup>3</sup>	0.4548	
Qualitative asses the exposure dis		ontact is or	ly accidental. The exposure	estimate represents the	90th percentile of	
<ol> <li>Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario</li> </ol>						
•	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Exposure values based on the EU Risk Assessment Report on chlorine (2007)					
Guidance is ba	o define appropria	ate site-spe	cific risk management measu	ires.		
Guidance is ba be necessary t Exposure value	o define appropriates based on the E	ate site-spe U Risk Ass	cific risk management measu	ires. (2007)		
Guidance is ba be necessary to Exposure value Additional good Assumes a good Ensure that gas	o define appropria es based on the E practice advice I basic standard o alarms are install	te site-spe U Risk Ass beyond th of occupatic ed	cific risk management measu essment Report on chlorine e REACH Chemical Safety nal hygiene is implemented.	ires. (2007)		
Guidance is ba be necessary to Exposure value Additional good Assumes a good Ensure that gas	o define appropria es based on the E practice advice I basic standard o alarms are install	te site-spe U Risk Ass beyond th of occupatic ed	cific risk management measu essment Report on chlorine e REACH Chemical Safety	ires. (2007)		
Guidance is ba be necessary to Exposure value Additional good Assumes a good Ensure that gas	o define appropria es based on the E practice advice I basic standard o alarms are install	te site-spe U Risk Ass beyond th of occupatic ed	cific risk management measu essment Report on chlorine e REACH Chemical Safety nal hygiene is implemented.	ires. (2007)		
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Guidance is ba be necessary to Exposure value Additional good Assumes a good Ensure that gas	o define appropria es based on the E practice advice I basic standard o alarms are install	te site-spe U Risk Ass beyond th of occupatic ed	cific risk management measu essment Report on chlorine e REACH Chemical Safety nal hygiene is implemented.	ires. (2007)		
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Guidance is ba be necessary to Exposure value Additional good Assumes a good Ensure that gas	o define appropria es based on the E practice advice I basic standard o alarms are install	te site-spe U Risk Ass beyond th of occupatic ed	cific risk management measu essment Report on chlorine e REACH Chemical Safety nal hygiene is implemented.	ires. (2007)		
Guidance is ba be necessary to Exposure value Additional good Assumes a good Ensure that gas	o define appropria es based on the E practice advice I basic standard o alarms are install	te site-spe U Risk Ass beyond th of occupatic ed	cific risk management measu essment Report on chlorine e REACH Chemical Safety nal hygiene is implemented.	ires. (2007)		

## 1. Short title of Exposure Scenario 10: Consumer use

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)		
Chemical product category	PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids PC35: Washing and cleaning products PC37: Water treatment chemicals		
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems		

## 2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8b, ERC8d, ERC8e

Substance is a unique structure, Non-hydrophobic.

, Low potential to bioaccumulate.

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%	
Amount used	Amounts used in the EU (tonnes/year)	999999 ton(s)/year	
Frequency and duration of use	Continuous exposure	360 days/year	
<b>F</b>	Flow rate of receiving surface water	18,000 m3/d	
Environment factors not influenced by risk management	Dilution Factor (River)	10	
	Dilution Factor (Coastal Areas)	100	
Technical conditions and	Air	Substance release to air can be excluded	
measures at process level to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Risk from environmental exposure is driven by freshwater., Do not release wastewater directly into environment., Onsite wastewater treatment required, No discharge of substance into waste water	
Organizational measures to prevent/limit release from the site			
Conditions and measures related	Type of Sewage Treatment Plant	Municipal sewage treatment plant	
to sewage treatment plant	Flow rate of sewage treatment plant effluent	2,000 m3/d	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
2.2 Contributing scenario co purpose cleaners, sanita		osure for: PC35: Cleaners, trigger sprays (all ners)	
	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 3%	
Product characteristics	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
Amount used	Amount used per event	0.005 kg	
Frequency and duration of use	Exposure duration	7.5 min	
י ובקטפווכץ מוע טעומווטוו טו עצפ	Frequency of use	4 Times per day	
70000000233 / Version 15.0	50/52	EN	

Other given energiand	Indoor use		
Other given operational conditions affecting consumers	Room size	4 m3	
exposure	Ventilation rate per hour	0.5	
2.3 Contributing scenario co	•	l	
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0,5%	
	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
Frequency and duration of use	Frequency of use	1 Times per day	
Human factors not influenced by risk management	Exposed skin area	Palm of one Hand 420 cm <sup>2</sup>	
Other given operational	Indoor use		
conditions affecting consumers	Room size	4 m3	
exposure	Ventilation rate per hour	0.5	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Wear impervious chemical resistant protective gloves.	
2.4 Contributing scenario co	ntrolling consumer expo	osure for: PC34	
	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0.05%	
Product characteristics	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
Frequency and duration of use	Frequency of use	2 days/week	
Human factors not influenced by risk management	Exposed skin area	Two hands 820 cm <sup>2</sup>	
Other given operational	Indoor use		
conditions affecting consumers	Room size	4 m3	
exposure	Ventilation rate per hour	0.5	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Wear impervious chemical resistant protective gloves.	
2.5 Contributing scenario co	ntrolling consumer expo	osure for: PC37	
	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0,1%	
Product characteristics	Physical Form (at time of use)	Liquid, moderate fugacity	
	Vapour pressure	25 hPa	
Amount used		2000 mL	
Frequency and duration of use	Frequency of use	1 Times per day	
3. Exposure estimation and	reference to its source		
Environment			

Qualitative approach used to conclude safe use.

## Consumers

PC34, PC35: EU RAR

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR	
PC34	Laundry bleaching/pre- treatment	Consumer - inhalative, long-term - systemic	1.68µg/m³	0.000108	
PC35	Hard surface cleaning	Consumer - inhalative, long-term - systemic	1.68µg/m³	0.000108	
PC34	Laundry bleaching/pre- treatment	Consumer - dermal, short-term - local	0.035mg/kg bw/day	< 1	
PC35	Hard surface cleaning	Consumer - dermal, short-term - local	0.002mg/kg bw/day	< 1	
	Drinking water, adult	Consumer oral, acute	0.0003mg/kg bw/day		
	Drinking water, adult	Consumer oral, long-term	0.003mg/kg bw/day	0.011	
	Drinking water, children	Consumer oral, acute	0.0007mg/kg bw/day		
	Drinking water, children	Consumer oral, long-term	0.0033mg/kg bw/day	0.011	

# 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES