

ANTIFROGEN N WATER-MIXTURE 39%	Page 1(208)
Substance key: SXR089061	Revision Date: 17.07.2017
Version : 6 - 2 / EU	Date of printing: 12.02.2019

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

1.1. Product identifier

Trade name ANTIFROGEN N WATER-MIXTURE 39%

Material number: 112063

Chemical nature:

Monoethylene glycol (1,2-ethane diol) and corrosion inhibitors in aqueous solution (39% active)

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

Relevant identified uses of the substance or mixtureIndustry sector :Functional FluidsType of use :Brine for refrigeration

Exposure scenarios: see annex

1.3. Details of the supplier of the safety data sheet

Identification of the company

Clariant Produkte (Deutschland) GmbH 65926 Frankfurt am Main Telephone no. : +49 69 305 18000

Information about the substance/mixture

BU Industrial & Consumer Specialties Product Stewardship e-mail: SDS.Europe@clariant.com

1.4. Emergency telephone number

00800-5121 5121 (24 h)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 4 H302: Harmful if swallowed.

Specific target organ toxicity - repeated exposure, Category 2

H373: May cause damage to organs through prolonged or repeated exposure.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



Signal word

Warning

:

Hazard statements

H302 Harmful if swallowed.



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	H373 May cause damage to organs through prolonged or repeated exposure.
Precautionary statements :	Prevention:
	 P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. P264 Wash skin thoroughly after handling. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
	Response:
	P314 Get medical advice/ attention if you feel unwell. P337 + P313 If eye irritation persists: Get medical advice/ attention.
	Disposal:
	P501 Dispose of contents/ container to an approved waste disposal plant.
2.3 Other hazards	

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.

No additional hazards are known except those derived from the labelling.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Hazardous components

Chemical name	CAS-No. EC-No.	Classification	Concentration (% w/w)
	Index-No. Registration number		
Ethanediol	107-21-1	STOT RE 2; H373	>= 30 - < 50
	203-473-3	Acute Tox. 4; H302	
	603-027-00-1		
	01-2119456816-28		
	01-2119456816-28-		
	0000		
	01-2119456816-28-		
	0003		
	01-2119456816-28-		
	0038		
	01-2119456816-28-		
	XXXX		
Ethanediol	107-21-1	STOT RE 2; H373	38 - 42
	203-473-3	Acute Tox. 4; H302	
	603-027-00-1		
	01-2119456816-28		
	01-2119456816-28-		
	0000		
	01-2119456816-28-		



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	0003 01-2119456816-28- 0038 01-2119456816-28- XXXX		

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice	:	Remove/Take off immediately all contaminated clothing.			
If inhaled	:	If inhaled, remove to fresh air. Get medical advice/ attention.			
In case of skin contact	:	In case of contact, immediately flush skin with plenty of water.			
In case of eye contact	:	In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.			
If swallowed	:	Get medical attention immediately.			
4.2 Most important symptoms and effects, both acute and delayed					

Symptoms	: No symptoms known currently	<i>'</i> .
Risks	: No hazards known at this time).

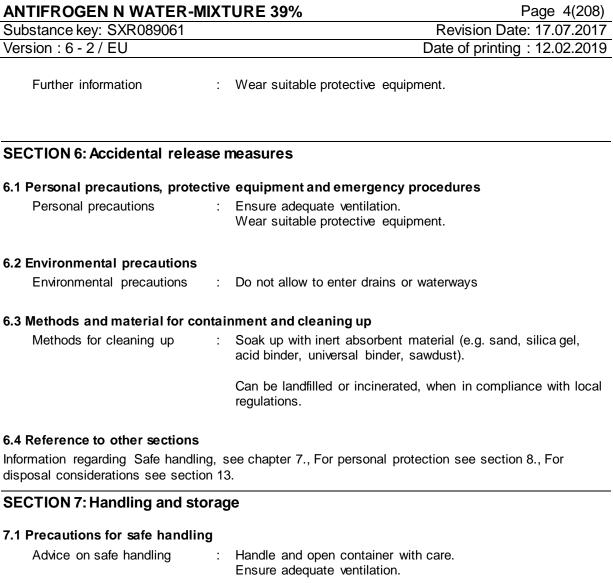
4.3 Indication of any immediate medical attention and special treatment needed

Treatment

: Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media Suitable extinguishing media	:	Not combustible. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
5.2 Special hazards arising from the Specific hazards during firefighting	the :	substance or mixture In case of fires, hazardous combustion gases are formed: Carbon monoxide (CO) Nitrogen oxides (NOx)
5.3 Advice for firefighters Special protective equipment for firefighters	:	Self-contained breathing apparatus



CLARIAN

		Ensure adequate ventilation.
Advice on protection against fire and explosion	:	Not combustible.
Hygiene measures	:	Keep away from food and drink.

7.2 Conditions for safe storage, including any incompatibilities

Further information on storage conditions	: Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care.

Other data	: Storage time: 24 months
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7.3 Specific end use(s)

Specific use(s)	:	No further recommendations.
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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis	
Ethanediol	107-21-1	TWA	20 ppm	2000/39/EC	
			52 mg/m3		
Further information	Identifies the possibility of significant uptake through the skin, Indicative				
		STEL	40 ppm	2000/39/EC	
			104 mg/m3		
Further information	Identifies the possibility of significant uptake through the skin, Indicative				

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value				
Ethanediol	Workers	Dermal	Long-term systemic	106 mg/kg				
CAS-No.: 107-21-1			effects	bw/day				
Remarks:	DNEL							
	Workers	Inhalation	Long-term local effects	35 mg/m3				
Remarks:	DNEL							
	General	Dermal	Long-term systemic	53 mg/kg				
	population		effects	bw/day				
Remarks:	DNEL							
	General	Inhalation	Long-term local	7 mg/m3				
	population		effects					
Hexanoic acid, 3,5,5-	Workers	Skin contact	Long-term systemic	2 mg/kg				
trimethyl-			effects	bw/day				
CAS-No.: 3302-10-1								
Remarks:	DNEL							
	Workers	Inhalation	Long-term systemic effects	7 mg/m3				
Remarks:	DNEL							
	Consumer use	Skin contact	Long-term systemic	1 mg/kg				
			effects	bw/day				
Remarks:	DNEL			· ·				
	Consumer use	Inhalation	Long-term systemic effects	2 mg/m3				
Remarks:	DNEL							
	Consumer use	Ingestion	Long-term systemic effects	1 mg/kg bw/day				
Remarks:	DNEL							
Ethanediol	Workers	Dermal	Long-term systemic	106 mg/kg				
CAS-No.: 107-21-1			effects	bw/day				
Remarks:	DNEL		L					
	Workers	Inhalation	Long-term local effects	35 mg/m3				
Remarks:	DNEL							
	General	Dermal	Long-term systemic	53 mg/kg				
	population		effects	bw/day				



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ersion : 6 - 2 / EU				Date of p	printing: 12.02.20
Remarks:	DNEL				
	General		Inhalation	Long-term loc	al 7 mg/m3
	populatio			effects	
Predicted No Effect	t Concentrat	ion (PN	IEC) according	to Regulation (EC) No. 1907/2006:
Substance name		Envir	onmental Comp	artment	Value
Ethanediol			h water		10 mg/l
CAS-No.: 107-21-1					- 5
		salt v	water		1 mg/l
		Wate	er (intermittent re	lease)	10 mg/l
		Fres	h water sediment		37 mg/kg dr
					weight (d.w.)
		Soil			1,53 mg/kg (
					weight (d.w.)
			age treatment pla	ant	199,5 mg/l
		Marii	ne sediment		3,7 mg/kg dr
			-		weight (d.w.)
Hexanoic acid, 3,5, CAS-No.: 3302-10-1		Fres	h water		0,068 mg/l
		Marii	ne water		0,0068 mg/l
		inter	mittent releases		1,36 mg/l
			age treatment pla		23 mg/l
			h water sediment		0,904 mg/kg
			ne sediment		0,0904 mg/k
		Soil			0,141 mg/kg
Ethanediol		Fres	h water		10 mg/l
CAS-No.: 107-21-1		<u> </u>			
		salt v			1 mg/l
			er (intermittent re	/	10 mg/l
		Fres	h water sediment	I	37 mg/kg dr
		- · ·			weight (d.w.)
		Soil			1,53 mg/kg o weight (d.w.)
			age treatment pla	ant	199,5 mg/l
		Marii	ne sediment		3,7 mg/kg dr weight (d.w.)

8.2 Exposure controls

Personal protective equipment Depending on the risk, wear sufficient eye protection (safety Eye protection : glasses with side protection or goggles, and if necessary, face shield.) Hand protection Break through time : 480 min Glove thickness : 0,7 mm : Long-term exposure Impervious butyl rubber gloves Remarks Break through time : 30 min Glove thickness : 0,4 mm Remarks For short-term exposure (splash protection): Nitrile rubber : gloves.



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Remarks :	These types of protective gloves are of manufacturers. Please note the manuf statements, especially about the minin minimum breakthrough time. Consider working conditions under which the glo	acturers' detailed num thickness and the also the particular		
Respiratory protection :	Use respiratory protection in case of in ventilation or prolonged exposure Full mask to standard DIN EN 136 Filter A (organic gases and vapours) t The use of filter apparatus presuppose atmosphere contains at least 17% oxy does not exceed the maximum gas co 0.5% by volume. Relevant guidelines include EN 136/141/143/371/372 as v regulations.	o standard DIN EN 141 es that the environment gen by volume, and ncentration, usually to be considered		
Protective measures :	Do not inhale vapours			

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	:	Liquid
Colour	:	light yellow
Odour	:	slightly perceptible
Odour Threshold	:	not tested.
рН	:	approx. 8 (20 °C) Concentration: 100 g/l Method: DIN 19268
Melting point	:	-26 °C Method: DIN 51583
Boiling point	:	106 ℃ (1.013 hPa) Method: ASTM D 1120
Flash point	:	Method: ASTM D6450 (closed cup) does not flash
Evaporation rate	:	not tested.
Burning number	:	Not applicable
Upper explosion limit	:	not tested.
Lower explosion limit	:	not tested.



:	
:	Method: Calculated by Syracuse.
	not tested.
:	1,0542 g/cm3 (20 °C) Method: DIN 51757
:	Not applicable
:	completely miscible (20 °C)
:	not tested. Solvent: fat
:	not determined
:	Method: DIN 51794 Not applicable for Liquids with Flash Point > 70 °C.
:	> 250 °C Method: DSC Measurement under nitrogen No decomposition up to 250 °C
:	3,05 mPa.s (20 °C)
:	2,89 mm2/s (20 °C) Method: DIN 51562
:	Not explosive Method: Expert judgement
:	The substance or mixture is not classified as oxidizing.
	Method: Expert judgement
:	Not applicable
:	< 6,25 mm/a
:	not tested.
:	Not applicable
:	Not applicable



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SECTION 10: Stability and r	eactivity	
I0.1 Reactivity See section 10.3. "Possibili	ty of hozordous, reactions"	
	ly of hazardous reactions	
0.2 Chemical stability Stable under normal conditi	ons	
0.3 Possibility of hazardous		
Hazardous reactions	: Incompatible with oxidizin	g agents.
0.4 Conditions to avoid		
Conditions to avoid	: None known.	
0.5 Incompatible materials		
Materials to avoid	: not known	
	information	
1.1. Information on toxicologi		
1.1 Information on toxicologi		
Acute toxicity		
-		
Acute toxicity <u>Product:</u>	cal effects	
Acute toxicity <u>Product:</u>	cal effects : Remarks: not tested. Acute toxicity estimate: 1.2 Method: Calculation metho	bd
Acute toxicity <u>Product:</u> Acute oral toxicity	cal effects : Remarks: not tested. Acute toxicity estimate: 1.2 Method: Calculation metho	od e
Acute toxicity Product: Acute oral toxicity Acute inhalation toxicity	cal effects : Remarks: not tested. Acute toxicity estimate: 1.2 Method: Calculation method : Remarks: no data available	od e
Acute toxicity Product: Acute oral toxicity Acute inhalation toxicity Acute dermal toxicity	cal effects : Remarks: not tested. Acute toxicity estimate: 1.2 Method: Calculation method : Remarks: no data available	od e
Acute toxicity Product: Acute oral toxicity Acute inhalation toxicity Acute dermal toxicity Components:	cal effects : Remarks: not tested. Acute toxicity estimate: 1.2 Method: Calculation method : Remarks: no data available	od e

Acute dermal toxicity : LD50 (Mouse, male and female): > 3.500 mg/kg Method: Other GLP: yes



ostance key: SXR089061		Revision Date: 17.07.201
rsion : 6 - 2 / EU		Date of printing : 12.02.201
Ethonodial		
Ethanediol:	. IDEO (Det male and for	
Acute oral toxicity	: LD50 (Rat, male and fer Method: Other GLP: no	nale): 22.000 mg/kg
Acute inhalation toxicity	: LC50 (Rat, male and fer Exposure time: 6 h Method: Other GLP: yes	male): > 2,5 mg/l
Acute dermal toxicity	: LD50 (Mouse, male and Method: Other GLP: yes	l female): > 3.500 mg/kg
Skin corrosion/irritation		
Product:		
Remarks: no data available		
Components:		
Ethanediol:		
Species: Rabbit Exposure time: 20 h Method: BASF test Result: No skin irritation GLP: no		
Ethanediol:		
Species: Rabbit Exposure time: 20 h Method: BASF test Result: No skin irritation GLP: no		
Serious eye damage/eye in	itation	
Product: Remarks: no data available		
Components:		
Ethanediol:		
Species: rabbit eye		
Exposure time: 24 h		
Method: BASF test		
Result: non-irritant GLP: no		



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Ethanediol:

Species: rabbit eye Exposure time: 24 h Method: BASF test Result: non-irritant GLP: no

Respiratory or skin sensitisation

Product:

Remarks: no data available

Components:

Ethanediol:

Test Type: Maximisation Test Exposure routes: Skin contact Species: Guinea pig Method: OECD Test Guideline 406 Result: Does not cause skin sensitisation. GLP: yes

Ethanediol:

Test Type: Maximisation Test Exposure routes: Skin contact Species: Guinea pig Method: OECD Test Guideline 406 Result: Does not cause skin sensitisation. GLP: yes

Germ cell mutagenicity

Product:

Germ cell mutagenicity-	:	No information available.
Assessment		

Components:

Ethanediol:		
Genotoxicity in vitro	:	Test Type: Ames test Species: Salmonella typhimurium Concentration: 33 - 5000 µg/plate Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative GLP: yes
	:	Test Type: Ames test Species: Escherichia coli Concentration: 33 - 5000 μg/plate Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

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bstance key: SXR089061		Revision Date: 17.07.201
rsion : 6 - 2 / EU		Date of printing : 12.02.201
	Result: negative GLP: yes	
Genotoxicity in vivo	: Test Type: Dominant letha Species: Rat (male and fer Strain: Fischer F344 Application Route: oral (fee Exposure time: 3 generatio Dose: 40 - 200 - 1000 mg/l Method: Other Result: negative GLP: no	nale) ed) m
Germ cell mutagenicity- Assessment	: It is concluded that the pro- evaluation of several muta	duct is not mutagenic based on genicity tests.
Ethanediol:		
Genotoxicity in vitro	: Test Type: Ames test Species: Salmonella typhir Concentration: 33 - 5000 µ Metabolic activation: with a Method: OECD Test Guide Result: negative GLP: yes	ug/plate and without metabolic activation
	 Test Type: Ames test Species: Escherichia coli Concentration: 33 - 5000 μ Metabolic activation: with a Method: OECD Test Guide Result: negative GLP: yes 	and without metabolic activation
Genotoxicity in vivo	: Test Type: Dominant letha Species: Rat (male and fer Strain: Fischer F344 Application Route: oral (fee Exposure time: 3 generatio Dose: 40 - 200 - 1000 mg/l Method: Other Result: negative GLP: no	nale) ed) m
Germ cell mutagenicity- Assessment	: It is concluded that the pro- evaluation of several muta	duct is not mutagenic based on genicity tests.
Carcinogenicity		
<u>Product:</u> Carcinogenicity - Assessment	: No information available.	



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<u>Components:</u>		
Ethanediol:		
Carcinogenicity - Assessment	: Not classifiable as a human carcinog	jen.
Ethanediol:		
Carcinogenicity - Assessment	: Not classifiable as a human carcinog	jen.
Reproductive toxicity		
Product:		
Reproductive toxicity - Assessment	: No information available. No information available.	
Components:		
Ethanediol:		
Effects on fertility	: Species: Rat, male and female Strain: Fischer F344 Application Route: oral (feed) Dose: 40 - 200 - 1000 General Toxicity - Parent: NOAEL: > General Toxicity F1: NOAEL: > 1.000 General Toxicity F2: NOAEL: > 1.000 Method: Other GLP: no	0 mg/kg body weight
Effects on foetal development	: Species: Rat Strain: Sprague-Dawley Application Route: oral (gavage) Dose: 150 - 500 - 1000 - 2500 mg/kg General Toxicity Maternal: NOAEL: Teratogenicity: NOAEL: 500 mg/kg k Method: Other GLP: yes	1.000 mg/kg body weight
Reproductive toxicity - Assessment	: No reproductive toxicity to be expect No teratogenic effects to be expected	
Ethanediol:		
Effects on fertility	 Species: Rat, male and female Strain: Fischer F344 Application Route: oral (feed) Dose: 40 - 200 - 1000 General Toxicity - Parent: NOAEL: > General Toxicity F1: NOAEL: > 1.000 General Toxicity F2: NOAEL: > 1.000 Method: Other GLP: no 	0 mg/kg body weight



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Effects on foetal development	: Species: Rat Strain: Sprague-Dawley Application Route: oral (gavag Dose: 150 - 500 - 1000 - 2500 General Toxicity Maternal: No Teratogenicity: NOAEL: 500 Method: Other GLP: yes	ge) 0 mg/kg OAEL: 1.000 mg/kg body weight
Reproductive toxicity - Assessment	: No reproductive toxicity to be No teratogenic effects to be e	
STOT - single exposure		
Product:		
Remarks: no data available		
Components:		
Ethanediol:		
Assessment: The substance exposure.	or mixture is not classified as spec	ific target organ toxicant, single
Ethanediol:		
Assessment: The substance exposure.	or mixture is not classified as spec	ific target organ toxicant, single
STOT - repeated exposure		
Product:		
Remarks: no data available		
Components:		
Ethanediol:		
Target Organs: Kidney Assessment: May cause dar	nage to organs through prolonged of	or repeated exposure.
Ethanediol:		
Target Organs: Kidney Assessment: May cause dar	nage to organs through prolonged of	or repeated exposure.
Repeated dose toxicity		
Product:		
Remarks: no data available		
Components:		

Ethanediol:



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Species: Rat, male NOAEL: 150 mg/kg Application Route: oral (feed) Exposure time: 16 w Number of exposures: daily Dose: 50 - 150 - 500 - 1000 mg/kg Group: yes Method: OECD Test Guideline 408 GLP: yes

Species: Dog, male NOAEL: ca. 2.200 mg/kg Application Route: Skin contact Exposure time: 4 w Number of exposures: daily Dose: 0,5 - 2 - 8 ml/kg Group: yes Method: OECD Test Guideline 410 GLP: yes

Ethanediol:

Species: Rat, male NOAEL: 150 mg/kg Application Route: oral (feed) Exposure time: 16 w Number of exposures: daily Dose: 50 - 150 - 500 - 1000 mg/kg Group: yes Method: OECD Test Guideline 408 GLP: yes

Species: Dog, male NOAEL: ca. 2.200 mg/kg Application Route: Skin contact Exposure time: 4 w Number of exposures: daily Dose: 0,5 - 2 - 8 ml/kg Group: yes Method: OECD Test Guideline 410 GLP: yes

Aspiration toxicity

Product: no data available

Components:

Ethanediol: No aspiration toxicity classification

Ethanediol:



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No aspiration toxicity classification

Further information

Product:

Remarks: Kidney injury may occur.

Remarks: Poisoning affects the central nervous system

Remarks: The data on toxicology refer to the active ingredient.

Remarks: The classification was made by the conventional (calculation) method of the CLP Regulation (EC) No 1272/2008.

SECTION 12: Ecological information

12.1 Toxicity

Product:

<u>Flouuci.</u>		
Toxicity to fish	:	LC0 (Leuciscus idus (Golden orfe)): 1.000 mg/l Remarks: By analogy with a product of similar composition
		LL50 (Danio rerio (zebra fish)): > 100 mg/l Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 203 GLP: yes Remarks: By analogy with a product of similar composition
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: no data available
Toxicity to algae	:	Remarks: no data available
Toxicity to microorganisms	:	Remarks: no data available
Components:		
Ethanediol:		
Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 72.860 mg/l Exposure time: 96 h Test Type: static test Analytical monitoring: yes Method: EPA GLP: no Remarks: The details of the toxic effect relate to the nominal concentration.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Test Type: static test



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	Analytical monitoring: yes Method: OECD Test Guideline 202 GLP: yes
Toxicity to algae	: EC50 (Pseudokirchneriella subcapitata (green algae)): 6.500 - 13.000 mg/l End point: Growth rate Exposure time: 7 d
	Test Type: static test Analytical monitoring: no data available Method: EPA GLP: No information available.
Toxicity to microorganisms	 EC20 (activated sludge, domestic): > 1.995 mg/l End point: Bacteria toxicity (respiration inhibition) Exposure time: 0,5 h Analytical monitoring: no Method: ISO 8192 GLP: no Remarks: By analogy with a product of similar composition
Toxicity to fish (Chronic toxicity)	 Chronic Toxicity Value: 2.629 mg/l End point: Other Exposure time: 30 d Species: Fish Method: Other GLP: no Remarks: The details of the toxic effect relate to the nominal concentration.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	 NOEC: 8.590 mg/l End point: Reproduction rate Exposure time: 7 d Species: Ceriodaphnia spec. Test Type: semi-static test Analytical monitoring: yes Method: Other GLP: No information available. Remarks: The details of the toxic effect relate to the nominal concentration.
Toxicity to soil dwelling organisms	: Remarks: The study is not necessary from a scientific perspective.
Plant toxicity	: Remarks: The study is not necessary from a scientific perspective.
Sediment toxicity	: Remarks: The study is not necessary from a scientific perspective.
Toxicity to terrestrial organisms	: Remarks: The study is not necessary from a scientific perspective.



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Etherne die b		
Ethanediol: Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 72.860 mg/l Exposure time: 96 h Test Type: static test Analytical monitoring: yes Method: EPA GLP: no Remarks: The details of the toxic effect relate to the nominal concentration.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 202 GLP: yes
Toxicity to algae	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 6.500 - 13.000 mg/l End point: Growth rate Exposure time: 7 d Test Type: static test Analytical monitoring: no data available Method: EPA GLP: No information available.
Toxicity to microorganisms	:	EC20 (activated sludge, domestic): > 1.995 mg/l End point: Bacteria toxicity (respiration inhibition) Exposure time: 0,5 h Analytical monitoring: no Method: ISO 8192 GLP: no Remarks: By analogy with a product of similar composition
Toxicity to fish (Chronic toxicity)	:	Chronic Toxicity Value: 2.629 mg/l End point: Other Exposure time: 30 d Species: Fish Method: Other GLP: no Remarks: The details of the toxic effect relate to the nominal concentration.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 8.590 mg/l End point: Reproduction rate Exposure time: 7 d Species: Ceriodaphnia spec. Test Type: semi-static test Analytical monitoring: yes Method: Other GLP: No information available. Remarks: The details of the toxic effect relate to the nominal concentration.



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Toxicity to soil dwelling organisms	:	Remarks: The study is not necessary from a scientific
Plant toxicity	:	perspective. Remarks: The study is not necessary from a scientific
i lant toxicity	•	perspective.
Sediment toxicity	:	Remarks: The study is not necessary from a scientific perspective.
Toxicity to terrestrial organisms	:	Remarks: The study is not necessary from a scientific perspective.
2.2 Persistence and degradab	oility	
Product:		
Biodegradability	:	Result: Readily biodegradable. Biodegradation: 90 % Method: OECD Test Guideline 302B
Components:		
Ethanediol:		
Biodegradability	:	Test Type: aerobic Inoculum: activated sludge Concentration: 53 mg/l Result: Readily biodegradable. Biodegradation: 90 - 100 % Related to: DOC decrease Exposure time: 10 d Method: OECD Test Guideline 301A GLP: yes
Ethanediol:		
Biodegradability	:	Test Type: aerobic Inoculum: activated sludge Concentration: 53 mg/l Result: Readily biodegradable. Biodegradation: 90 - 100 % Related to: DOC decrease Exposure time: 10 d Method: OECD Test Guideline 301A GLP: yes
2.3 Bioaccumulative potential		
Product:		
Bioaccumulation	:	Remarks: no data available
Components:		
Ethanediol:		



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Bioaccumulation	:	Remarks: Due to the low logPow bioaccumulation is not expected
Ethanediol:		
Bioaccumulation	:	Remarks: Due to the low logPow bioaccumulation is not expected
12.4 Mobility in soil		
Product:		
Distribution among environmental compartments	:	Remarks: no data available
Components:		
Ethanediol:		
Distribution among environmental compartments	:	Adsorption/Soil Medium: water - soil Koc: log Koc: 0 Method: other (calculated)
Ethanediol:		
Distribution among environmental compartments	:	Adsorption/Soil Medium: water - soil Koc: log Koc: 0 Method: other (calculated)
12.5 Results of PBT and vPvB as	ses	ssment
Product:		
Assessment	:	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
Components:		
Ethanediol:		
Assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT)
Ethanediol:		
Assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT)
12.6 Other adverse effects		
Product:		
Additional ecological	:	If handled correctly it causes no disturbance in treatment



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		Determined in the undilute	ed form
		The classification was main method of the CLP Regula	de by the conventional (calculation) ation (EC) No 1272/2008.
Components:			
Ethanediol:			
Environmental fate and pathways	:	not available	
Additional ecological information	:	Do not allow to enter grou	nd water, waterways or waste water.
Ethanediol:			
Environmental fate and pathways	:	not available	
Additional ecological information	:	Do not allow to enter grou	nd water, waterways or waste water.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	: Dispose of in accordance with local regulations.
Contaminated packaging	: Uncontaminated packaging may be reused Packaging that cannot be cleaned should be disposed of as product waste

SECTION 14: Transport information

Section 14.1. to 14.5.

ADR	not restricted
ADN	not restricted
RID	not restricted
ΙΑΤΑ	not restricted
IMDG	not restricted

14.6. Special precautions for user

See sections 6 to 8 of this Safety Data Sheet.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code (International Bulk Chemicals Code)



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No transport as bulk according IBC - Code.

SECTION 15: Regulatory information

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

Other regulations:

Apart from the data/regulations specified in this chapter, no further information is available concerning safety, health and environmental protection.

15.2 Chemical safety assessment

Chemical Safety Assessments (CSAs) are available for one or more of the component substances contained in this product.

SECTION 16: Other information

Full text of H-Statements

H302	:	Harmful if swallowed.
H373	:	May cause damage to organs through prolonged or repeated
		exposure if swallowed.

Full text of other abbreviations

Acute Tox.	:	Acute toxicity
STOT RE	:	Specific target organ toxicity - repeated exposure

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO -International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO -International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID -



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Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Other information : Observe national and local legal requirements

Classification of the mixtur	Classification procedure:	
Acute Tox. 4	H302	Calculation method
STOT RE 2	H373	Calculation method

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Exposure scenario

Number	Title
ES 1	Industrial use; Use as an intermediate
	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15 - ERC6a
	Ethane-1,2-diol
ES 2	Industrial use; Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15 - ERC4
	Ethane-1,2-diol
ES 3	Industrial use; Distribution of substance
	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15 - ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7
	Ethane-1,2-diol
ES 4	Industrial use; Formulation [mixing] of preparations and/or re-packaging
	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15 - ERC2
	Ethane-1,2-diol
ES 5	Industrial use; Use in polymer production
	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC15 - ERC6c
	Ethane-1,2-diol
ES 6	Industrial use; Coatings and paints, thinners, paint removers
	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC15 - ERC4
	Ethane-1,2-diol
ES 7	Professional use; Coatings and paints, thinners, paint removers, Adhesives, sealants, Foaming, Use in polymer processing
	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC19 - ERC8a, ERC8c, ERC8d, ERC8f
	Ethane-1,2-diol
ES 8	Consumer use; Coatings and paints, thinners, paint removers, Surface treatment
	PC9a, PC15, PC18, PC31, PC24, PC34 - ERC8a, ERC8c, ERC8d, ERC8f
	Ethane-1,2-diol
ES 9	Industrial use; Use in cleaning agents
	PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13 - ERC4
	Ethane-1,2-diol
ES 10	Professional use; Use in cleaning agents



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/ersion:6	,	
	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PRO- ERC8a, ERC8d	OC1:
	Ethane-1,2-diol	
ES 11	Consumer use; Use in cleaning agents	
	PC35 - ERC8a, ERC8d	
	Ethane-1,2-diol	
ES 12	Industrial use; Use in lubricants	
	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC PROC10, PROC13, PROC17, PROC18 - ERC4, ERC7	;9,
	Ethane-1,2-diol	
ES 13	Industrial use; Metal working fluids	
	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC PROC10, PROC13, PROC17 - ERC4	;9,
	Ethane-1,2-diol	
ES 14	Professional use; Metal working fluids	
	PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PRO PROC13, PROC17 - ERC8a, ERC8d	C11
	Ethane-1,2-diol	
ES 15	Professional use; Use in agrochemicals	
	PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC9, PROC11, PROC13 - EF ERC8d	≀C8a
	Ethane-1,2-diol	
ES 16	Industrial use; Use in functional fluids	
	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9 - ERC7	
	Ethane-1,2-diol	
ES 17	Professional use; Use in functional fluids	
	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC9, PROC20 - ERC9a, ERC9	b
	Ethane-1,2-diol	
ES 18	Consumer use; Heat transfer fluids, Hydraulic fluids	
	PC16, PC17 - ERC9a, ERC9b	
	Ethane-1,2-diol	
ES 19	Professional use; Anti-freeze and de-icing products	
	PROC1, PROC2, PROC8a, PROC8b, PROC11 - ERC8d	
	Ethane-1,2-diol	
ES 20	Consumer use; Anti-freeze and de-icing products	
	PC4 - ERC8d	
	Ethane-1,2-diol	
ES 21	Industrial use, Professional use; Use in laboratories	
	PROC15 - ERC8a	
	Ethane-1,2-diol	
ES 22	Industrial use; Use in water treatment agents	



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	PROC1, PROC2, PROC3, PROC4, PROC8a, PRO Ethane-1,2-diol	C8b, PROC13 - ERC3, ERC4
ES 23	Consumer use; Adhesives, sealants	
	PC1 - ERC8c, ERC8f	
	Ethane-1,2-diol	
ES 24	Industrial use; Manufacture of substance, A Use in coatings, Use in polymer production	
	PROC1, PROC2, PROC3, PROC4, PROC5, PROC PROC10, PROC13, PROC14, PROC15 - ERC2, EI	
	Ethane-1,2-diol	
ES 25	Consumer use; Insulation foams	
	PC32 - ERC8c, ERC8f	
	Ethane-1,2-diol	

1. ES 1: Industrial use; Use as an intermediate

1.1. Title section

Enviro	nment	
CS1:	Industrial use (Use of intermediate)	ERC6a
Worke	Prs	
CS2:	Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	PROC1
CS3:	Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	PROC2
CS4:	Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises)	PROC3, PROC4
CS5:	Industrial use (Mixing or blending in batch processes)	PROC5
CS6:	Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a
CS7:	Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	PROC8b, PROC9
CS8:	Industrial use (Use as laboratory reagent)	PROC15

1.2. ES 1 Conditions of use affecting exposure

1.2.1 ES1 - CS1: Control of environmental exposure: Industrial use (Use of intermediate) (ERC6a)



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Remarks		azard was identified no environmenta ssment and risk characterization was
1.2.2 ES1 - CS2: Control of wor refinery in closed process withou containment conditions) (PROC1	it likelihood of exposu	
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ris Dermal exposure Covers skin contact area up to	<pre>c management : Palm of one hand : 240 cm²</pre>	
Other operational conditions affectin Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures	likelihood of exposure containment conditions	r refinery in closed process without or processes with equivalent op or other system to avoid exposure
Additional good practice advice bey Additional good practice advice		I Safety Assessment
1.2.3 ES1 - CS3: Control of wor refinery in closed continuous pro processes with equivalent conta	ocess with occasional of	controlled exposure or
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	



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Human factors not influenced by ris	•
Dermal exposure	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Covers skin contact area up to	•
Other operational conditions affectir	ng workers exposure
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Note	: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions No specific measures identified.
Additional good practice advice beyon Additional good practice advice	ond the REACH Chemical Safety Assessment : Wear solely goggles.
	rker exposure: Industrial use (Manufacture or stry in closed batch processes with occasional

formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year
Human factors not influenced by ris	k management
Dermal exposure	: Palm of one hand
Covers skin contact area up to	: 240 cm ²
Remarks	: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
Dermal exposure	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Covers skin contact area up to	: 480 cm ²
Remarks	: Chemical production where opportunity for exposure arises
Other operational conditions affecti	ng workers exposure
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Technical conditions and measures	: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or

processes with equivalent containment condition



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Note	: Chemical production No specific measures	where opportunity for exposure arises identified.
Additional good practice advice beyon Additional good practice advice		
1.2.5 ES1 - CS5: Control of wor batch processes) (PROC5)	ker exposure: Indus	trial use (Mixing or blending in
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per yea	r
Human factors not influenced by risk Dermal exposure		ial dermal contact is limited to inside
Covers skin contact area up to	: 480 cm ²	
Other operational conditions affectin Outdoor / Indoor	ig workers exposure : Indoor use	
Risk Management Measures		
Exposure routes Personal protective measures	 Dermal Wear chemically resi combination with spe 	stant gloves (tested to EN374) in ecific activity training.
Effectiveness (of a measure)	: 90 %	
Additional good practice advice beyon Additional good practice advice		
1.2.6 ES1 - CS6: Control of wor or mixture (charging/discharging		
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per yea	r
Human factors not influenced by risk	managamant	



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		· · · · ·
Covers skin contact area up to	: 960 cm ²	
Other operational conditions affectin	ig workers exposure	
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Exposure routes	: inhalative	
Technical conditions and	: Local exhaust ventilation	
measures		
Effectiveness (of a measure)	: 90 %	
Personal protective measures		
	Wear suitable respiratory	protection.
Effectiveness (of a measure)	: 90 %	
Additional good practice advice beyo	ond the REACH Chemical S	afety Assessment
Additional good practice advice	: Wear solely goggles.	-
1.2.7 ES1 - CS7: Control of wor or mixture (charging/discharging mixture into small containers (de PROC9)) at dedicated facilities, 1	ransfer of substance or
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use)	: Low volatile liquid	

Frequency and duration of use

Vapour pressure

Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year

 Human factors not influenced by risk
 management

 Dermal exposure
 : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.

Covers skin contact area up to : 480 cm²

: 0,123 hPa

Other operational conditions affecting workers exposure Outdoor / Indoor : Indoor use

Risk Management Measures

Note : No specific measures identified.

Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

1.2.8 ES1 - CS8: Control of worker exposure: Industrial use (Use as laboratory reagent) (PROC15)

Product characteristics

Concentration of the Substance in \therefore <= 100 %



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Mixture/Article		
Physical Form (at time of use)	: Low volatile liquid	
•	. 0,123 hPa	
Amount used		
	: <1 kg, < 1 l	
-	0,	
Frequency and duration of use		
	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by risk	management	
Dermal exposure		mal contact is limited to inside
	hands / one hand / palm of	f hands.
Covers skin contact area up to	: 240 cm ²	
Other operational conditions affecting	y workers exposure	
	: Indoor use	
Risk Management Measures		
Note	: Use as laboratory reagent	
	No specific measures iden	tified.
Additional good practice advice beyo	nd the REACH Chemical Sa	afetv Assessment
	: Wear solely goggles.	

1.3. ES1 Exposure estimation and reference to its source

1.3.2 ES1 - CS2: Worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

1.3.3 ES1 - CS3: Worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)



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Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,08

1.3.4 ES1 - CS4: Worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,43

1.3.5 ES1 - CS5: Worker exposure: Industrial use (Mixing or blending in batch processes) (PROC5)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,38

1.3.6 ES1 - CS6: Worker exposure: Industrial use (Transfer of substance or mixture



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(charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,20

1.3.7 ES1 - CS7: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities	0,43
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	0,43

1.3.8 ES1 - CS8: Worker exposure: Industrial use (Use as laboratory reagent) (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,37

1.4. ES 1 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario



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ECHA guidance for downstream users Section 2

2. ES 2: Industrial use; Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

2.1. Title section

Environment				
CS1:	Industrial use (Use of non-reactive processing aid at industrial site (no	ERC4		
	inclusion into or onto article))			
Worke	rs			
CS2:	Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	PROC1		
CS3:	Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	PROC2		
CS4:	Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises)	PROC3, PROC4		
CS5:	Industrial use (Mixing or blending in batch processes)	PROC5		
CS6:	Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a		
CS7:	Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	PROC8b, PROC9		
CS8:	Industrial use (Treatment of articles by dipping and pouring)	PROC13		
CS9:	Industrial use (Tabletting, compression, extrusion, pelettisation, granulation)	PROC14		
CS10:	Industrial use (Use as laboratory reagent)	PROC15		

2.2. ES 2 Conditions of use affecting exposure

2.2.1 ES 2 - CS 1: Control of environmental exposure: Industrial use (Use of non-reactive processing aid at industrial site (no inclusion into or onto article)) (ERC4)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

2.2.2 ES 2 - CS 2: Control of worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent



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containment conditions) (PROC1)	
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by risk Dermal exposure Covers skin contact area up to	management : Palm of one hand : 240 cm ²	
Other operational conditions affecting Outdoor / Indoor	g workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures	: Chemical production or refinery likelihood of exposure or proce containment conditions Sample via a closed loop or oth	sses with equivalent
Additional good practice advice beyon Additional good practice advice		Assessment
2.2.3 ES 2 - CS 3: Control of wor refinery in closed continuous pro processes with equivalent contai	cess with occasional control	
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by risk Dermal exposure	 management Assumes that potential dermal hands / one hand / palm of har 	
Covers skin contact area up to	: 480 cm ²	
Other operational conditions affectin Outdoor / Indoor	g workers exposure : Indoor use	



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Version : 6 - 2 / EU		Date of printing : 12.02.2019
		Date of printing : 12.02.2010
Risk Management Measures Note		
Additional good practice advice bey Additional good practice advice		Safety Assessment
2.2.4 ES 2 - CS 4: Control of wo formulation in the chemical indu controlled exposure or processe production where opportunity fo	stry in closed batch proc s with equivalent contair	esses with occasional Iment condition, Chemical
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ris Dermal exposure Covers skin contact area up to Remarks	 Palm of one hand 240 cm² Manufacture or formulation batch processes with occ 	n in the chemical industry in closed asional controlled exposure or
Dermal exposure	 processes with equivalent Assumes that potential de hands / one hand / palm of hands / one hands /	ermal contact is limited to inside
Covers skin contact area up to Remarks	: 480 cm ² : Chemical production whe	re opportunity for exposure arises
Other operational conditions affecting Outdoor / Indoor	n g workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures		n in the chemical industry in closed asional controlled exposure or containment condition
Note	: Chemical production whe No specific measures ide	re opportunity for exposure arises ntified.
Additional good practice advice bey Additional good practice advice	ond the REACH Chemical S : Wear solely goggles.	afety Assessment

2.2.5 ES 2 - CS 5: Control of worker exposure: Industrial use (Mixing or blending in batch processes) (PROC5)



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		246 of printing 1 1210212010
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ris	c management	
Dermal exposure	: Assumes that potential derm hands / one hand / palm of h	
Covers skin contact area up to	: 480 cm ²	
Other operational conditions affecting Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures		
Exposure routes	: Dermal	
Personal protective measures	: Wear chemically resistant gl combination with specific ac	
Effectiveness (of a measure)	: 90 %	
Additional good practice advice bey Additional good practice advice		ety Assessment
2.2.6 ES 2 - CS 6: Control of wo or mixture (charging/discharging		
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ris	<pre>c management</pre>	
	· Accumac that natantial darm	al contract in limited to bondo
Dermal exposure Covers skin contact area up to	: 960 cm ²	nal contact is limited to hands.

Other operational conditions affecting workers exposure : Indoor use

Outdoor / Indoor

Risk Management Measures

Exposure routes : inhalative



ANTIFROGEN N WATER-MIXTU	JRE 39% Page 38(208)
Substance key: SXR089061	Revision Date: 17.07.2017
Version : 6 - 2 / EU	Date of printing : 12.02.2019
· · · · · · · · · · · · · · · · · · ·	 : Local exhaust ventilation : 90 % : If technical measures not practical: Wear suitable respiratory protection.
Effectiveness (of a measure)	: 90 %
	ond the REACH Chemical Safety Assessment : Wear solely goggles.
or mixture (charging/discharging)	ker exposure: Industrial use (Transfer of substance) at dedicated facilities, Transfer of substance or dicated filling line, including weighing)) (PROC8b,
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year
Human factors not influenced by risk Dermal exposure Covers skin contact area up to	 management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm²
Other operational conditions affecting Outdoor / Indoor	
Risk Management Measures Note	: No specific measures identified.
	ond the REACH Chemical Safety Assessment : Wear solely goggles.
2.2.8 ES 2 - CS 8: Control of work by dipping and pouring) (PROC13	ker exposure: Industrial use (Treatment of articles 3)
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use Exposure duration	: <= 480 min



Substance key: SXR089061	KTURE 39% Page 39(20 Revision Date: 17.07.20
/ersion : 6 - 2 / EU	Date of printing : 12.02.20
Frequency of use	: <= 240 days per year
luman factors not influenced by r	risk management
Dermal exposure	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Covers skin contact area up to	: 480 cm ²
Other operational conditions affect Outdoor / Indoor	cting workers exposure : Indoor use
tisk Management Measures	
Exposure routes	: Dermal
Personal protective measures	: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Effectiveness (of a measure)	: 90 %
dditional good practice advice be Additional good practice advice	eyond the REACH Chemical Safety Assessment : Wear solely goggles.
roduct characteristics	a i - 100 %
Product characteristics Concentration of the Substance in Mixture/Article	n : <= 100 %
Concentration of the Substance in	n : <= 100 % : Low volatile liquid : 0,123 hPa
Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure	: Low volatile liquid
Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration	: Low volatile liquid
Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration	 Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year risk management
Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure requency and duration of use Exposure duration Frequency of use	 Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year risk management Assumes that potential dermal contact is limited to inside
Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Trequency and duration of use Exposure duration Frequency of use	 Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year risk management
Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Trequency and duration of use Exposure duration Frequency of use Iuman factors not influenced by r Dermal exposure	 Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year risk management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm²
Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Trequency and duration of use Exposure duration Frequency of use Juman factors not influenced by r Dermal exposure Covers skin contact area up to Other operational conditions affec Outdoor / Indoor	 Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year risk management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² cting workers exposure Indoor use
Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Trequency and duration of use Exposure duration Frequency of use Numan factors not influenced by r Dermal exposure Covers skin contact area up to Other operational conditions affec Outdoor / Indoor	 Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year risk management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² cting workers exposure

Product characteristics Concentration of the Substance in : <= 100 %



ANTIFROGEN N WATER-MIX	TURE 39%	Page 40(208)
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Version : 6 - 2 / EU		Date of printing: 12.02.2019
Mixture/Article		
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Amount used		
Storage	: <1 kg, < 1 l	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ri	sk management	
Dermal exposure	: Assumes that potentia hands / one hand / pa	al dermal contact is limited to inside alm of hands.
Covers skin contact area up to	: 240 cm ²	
Other operational conditions affect	ing workers exposure	
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Note	: Use as laboratory rea	aent
	No specific measures	
Additional good practice advice be	vond the REACH Chemic	al Safety Assessment
Additional good practice advice		•

2.3. ES 2 Exposure estimation and reference to its source

2.3.2 ES 2 - CS 2: Worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

2.3.3 ES 2 - CS 3: Worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)



ANTIFROGEN N WATER-MIXTURE 39%

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Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,08

2.3.4 ES 2 - CS 4: Worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,43

2.3.5 ES 2 - CS 5: Worker exposure: Industrial use (Mixing or blending in batch processes) (PROC5)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,38

2.3.6 ES 2 - CS 6: Worker exposure: Industrial use (Transfer of substance or mixture



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(charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,20

2.3.7 ES 2 - CS 7: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities	0,43
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	0,43

2.3.8 ES 2 - CS 8: Worker exposure: Industrial use (Treatment of articles by dipping and pouring) (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,87 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,75

2.3.9 ES 2 - CS 9: Worker exposure: Industrial use (Tabletting, compression, extrusion, pelettisation, granulation) (PROC14)



ANTIFROGEN N WATER-MIXTURE 39% Substance key: SXR089061		
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Route of exposure and type	Exposure estimate	CR

of effects	Exposure estimate	NON
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	3,43 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03
combined routes	ECETOC TRA worker v2.0	0,40

2.3.10 ES 2 - CS 10: Worker exposure: Industrial use (Use as laboratory reagent) (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,37

2.4. ES 2 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

3. ES 3: Industrial use; Distribution of substance

3.1. Title section

Enviro	nment	
CS1:	Industrial use (Manufacture of the substance, Formulation into mixture, Formulation into solid matrix, Use of non-reactive processing aid at industrial site (no inclusion into or onto article), Use at industrial site leading to inclusion into/onto article, Use of intermediate, Use of reactive processing aid at industrial site (no inclusion into or onto article), Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article), Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article), Use of functional fluid at industrial site)	ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7
Worke	IS	
CS2:	Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	PROC1
CS3:	Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with	PROC2



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I	equivalent containment conditions)	
CS4:		
CS5:		arging) PROC8a
CS6:		
CS7:	Industrial use (Use as laboratory reagent)	PROC15

3.2. ES 3 Conditions of use affecting exposure

3.2.1 ES 3 - CS 1: Control of environmental exposure: Industrial use (Manufacture of the substance, Formulation into mixture, Formulation into solid matrix, Use of non-reactive processing aid at industrial site (no inclusion into or onto article), Use at industrial site leading to inclusion into/onto article, Use of intermediate, Use of reactive processing aid at industrial site (no inclusion into or onto article), Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article), Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article), Use of functional fluid at industrial site) (ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

3.2.2 ES 3 - CS 2: Control of worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by risk management		

	0
Dermal exposure	: Palm of one hand
Covers skin contact area up to	: 240 cm ²

Other operational conditions affecting workers exposure



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Outdoor / Indoor	: Indoor use
Risk Management Measures	
Technical conditions and measures	: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
	Sample via a closed loop or other system to avoid exposure
Additional good practice advice bey Additional good practice advice	rond the REACH Chemical Safety Assessment : Wear solely goggles.
refinery in closed continuous pro processes with equivalent conta	rker exposure: Industrial use (Chemical production o ocess with occasional controlled exposure or inment conditions) (PROC2)
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use	
Exposure duration Frequency of use	: <= 480 min : <= 240 days per year
Frequency of use	. <= 240 days per year
Human factors not influenced by ris	-
Dermal exposure	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Covers skin contact area up to	: 480 cm ²
Other operational conditions affection Outdoor / Indoor	ng workers exposure : Indoor use
Risk Management Measures	
Note	: Chemical production or refinery in closed continuous proce with occasional controlled exposure or processes with equivalent containment conditions No specific measures identified.
	ond the REACH Chemical Safety Assessment

3.2.4 ES 3 - CS 4: Control of worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Product characteristics Concentration of the Substance in : <= 100 % Mixture/Article



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Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by risk	management	
Dermal exposure	: Palm of one hand	
Covers skin contact area up to	: 240 cm ²	
Remarks		in the chemical industry in closed sional controlled exposure or containment condition
Dermal exposure	: Assumes that potential der hands / one hand / palm of	mal contact is limited to inside hands.
Covers skin contact area up to	: 480 cm ²	
Remarks	: Chemical production where	opportunity for exposure arises
Other operational conditions affecting Outdoor / Indoor	g workers exposure : Indoor use	
Risk Management Measures		
Technical conditions and measures		in the chemical industry in closed sional controlled exposure or containment condition
Note	: Chemical production where No specific measures ident	opportunity for exposure arises ified.
Additional good practice advice beyo Additional good practice advice		fety Assessment
3.2.5 ES 3 - CS 5: Control of work or mixture (charging/discharging)		
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use)	: Low volatile liquid	

Physical Form (at time of use): Low volatile liquidVapour pressure: 0,123 hPa

Frequency and duration of use

Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year

Human factors not influenced by risk management

Dermal exposure	:	Assumes that potential dermal contact is limited to hands.
Covers skin contact area up to	:	960 cm ²

Other operational conditions affecting workers exposure

Outdoor / Indoor :	Indoor use
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Substance key: SXR089061		Revision Date: 17.07.2017
Version : 6 - 2 / EU		Date of printing : 12.02.2019
Risk Management Measures		
Exposure routes	: inhalative	
Technical conditions and	: Local exhaust ventilation	
measures		
Effectiveness (of a measure)	: 90 %	
Personal protective measures	: If technical measures not	practical:
· · · · · · · · · · · · · · · · ·	Wear suitable respiratory	
Effectiveness (of a measure)	: 90 %	F
Additional good practice advice bey Additional good practice advice		afety Assessment
3.2.6 ES 3 - CS 6: Control of wo or mixture (charging/discharging mixture into small containers (de) at dedicated facilities, 1	ransfer of substance or
PROC9)		
Product characteristics		
Concentration of the Substance in	: <= 100 %	
Mixture/Article		
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ris	k management	
Dermal exposure		ermal contact is limited to inside
	hands / one hand / palm o	of hands.
Covers skin contact area up to	: 480 cm ²	
Other operational conditions affecting		
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Note	: No specific measures ide	ntified.
Additional good practice advice bey Additional good practice advice		afety Assessment
3.2.7 ES 3 - CS 7: Control of wo reagent) (PROC15)	rker exposure: Industrial	use (Use as laboratory
Product characteristics		

Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa
rapear precedere	. 0,120 m a



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Amount used		
Storage	: <1 kg, < 1 l	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	r
Human factors not influenced by ri	sk management	
Dermal exposure	: Assumes that potenti hands / one hand / pa	al dermal contact is limited to inside alm of hands.
Covers skin contact area up to	: 240 cm ²	
Other operational conditions affect	ing workers exposure	
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Note	: Use as laboratory rea	agent
	No specific measures	
Additional good practice advice be		cal Safety Assessment
Additional good practice advice	: Wear solely goggles.	

3.3. ES 3 Exposure estimation and reference to its source

3.3.2 ES 3 - CS 2: Worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

3.3.3 ES 3 - CS 3: Worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
- local and systemic		
Worker - dermal, long-term -	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01



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systemic		
combined routes	ECETOC TRA worker v2.0	0,08

3.3.4 ES 3 - CS 4: Worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,43

3.3.5 ES 3 - CS 5: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,20

3.3.6 ES 3 - CS 6: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Route of exposure and type	Exposure estimate	RCR
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of effects		
Worker - inhalative, long-term	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of	0,37
- local and systemic	substance or mixture (charging/discharging) at dedicated	
	facilities)	
Worker - dermal, long-term -	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer	0,06
systemic	of substance or mixture (charging/discharging) at	
	dedicated facilities)	
combined routes	ECETOC TRA worker v2.0, Transfer of substance or	0,43
	mixture (charging/discharging) at dedicated facilities	
Worker - inhalative, long-term	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of	0,37
- local and systemic	substance or mixture into small containers (dedicated	
	filling line, including weighing))	
Worker - dermal, long-term -	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer	0,06
systemic	of substance or mixture into small containers (dedicated	
	filling line, including weighing))	
combined routes	ECETOC TRA worker v2.0, Transfer of substance or	0,43
	mixture into small containers (dedicated filling line,	
	including weighing)	

3.3.7 ES 3 - CS 7: Worker exposure: Industrial use (Use as laboratory reagent) (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,37

3.4. ES 3 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

4. ES 4: Industrial use; Formulation [mixing] of preparations and/or re-packaging

4.1. Title section

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Environment
CS1: Industrial use (Formulation into mixture)
Workers
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ERC2





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Version	: 6 - 2 / EU Dat	e of printing : 12.02.2019
CS2:	Industrial use (Chemical production or refinery in closed process v likelihood of exposure or processes with equivalent containment conditions)	without PROC1
CS3:	Industrial use (Chemical production or refinery in closed continuou process with occasional controlled exposure or processes with equivalent containment conditions)	us PROC2
CS4:	Industrial use (Manufacture or formulation in the chemical industry closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical produc where opportunity for exposure arises)	
CS5:		PROC5
CS6:	Industrial use (Transfer of substance or mixture (charging/discharg at non dedicated-facilities)	ging) PROC8a
CS7:	Industrial use (Transfer of substance or mixture (charging/discharg at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	ging) PROC8b, PROC9
CS8:	Industrial use (Tabletting, compression, extrusion, pelettisation, granulation)	PROC14
CS9:	Industrial use (Use as laboratory reagent)	PROC15

4.2. ES 4 Conditions of use affecting exposure

4.2.1 ES 4 - CS 1: Control of environmental exposure: Industrial use (Formulation into mixture) (ERC2)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

4.2.2 ES 4 - CS 2: Control of worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by risk management		

numan ia	clors not innuenced by risk	п	lanagement
Dermal	exposure	:	Palm of one hand
Covers s	skin contact area up to	:	240 cm ²

Other operational conditions affecting workers exposure



Substance key: SXR089061	Revision Date: 17.07.201
Version : 6 - 2 / EU	Date of printing : 12.02.201
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Technical conditions and measures	: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
	Sample via a closed loop or other system to avoid exposur
Additional good practice advice bey Additional good practice advice	ond the REACH Chemical Safety Assessment : Wear solely goggles.
	rker exposure: Industrial use (Chemical production o ocess with occasional controlled exposure or inment conditions) (PROC2)
Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by risl	k management
Dermal exposure	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Covers skin contact area up to	: 480 cm ²
Other operational conditions affectir Outdoor / Indoor	ng workers exposure : Indoor use
Risk Management Measures	
Note	 Chemical production or refinery in closed continuous proce with occasional controlled exposure or processes with equivalent containment conditions No specific measures identified.

4.2.4 ES 4 - CS 4: Control of worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Product characteristics Concentration of the Substance in : <= 100 % Mixture/Article



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Substance key: SXR089061	Revi	sion Date: 17.07.2017
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Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
	-,	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by risk		
Dermal exposure	: Palm of one hand	
Covers skin contact area up to	: 240 cm ²	
Remarks	: Manufacture or formulation in the ch	
	batch processes with occasional cor	
	processes with equivalent containme	
Dermal exposure	: Assumes that potential dermal conta	act is limited to inside
	hands / one hand / palm of hands.	
Covers skin contact area up to	: 480 cm ²	
Remarks	: Chemical production where opportur	nity for exposure arises
Other operational conditions affectin Outdoor / Indoor	g workers exposure : Indoor use	
	. Indoor use	
Risk Management Measures		
Technical conditions and	: Manufacture or formulation in the ch	
measures	batch processes with occasional cor	
	processes with equivalent containme	ent condition
NI-4-		:
Note	: Chemical production where opportur	nity for exposure arises
	No specific measures identified.	
Additional good practice advice beyo	and the REACH Chemical Safety Asso	ssmant
Additional good practice advice bey	: Wear solely goggles.	, soment
raditional good practice addee	· ····································	
4.2.5 ES 4 - CS 5: Control of worker exposure: Industrial use (Mixing or blending in		
batch processes) (PROC5)		
Product characteristics		
Concentration of the Substance in	: <= 100 %	
Mixture/Article		
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	

Human factors not influenced by risk management

Dermal exposure	: Assumes that potential dermal contact is limited to inside
	hands / one hand / palm of hands.
Covers skin contact area up to	: 480 cm ²

Other operational conditions affecting workers exposure Outdoor / Indoor : Indoor use



Personal protective measures :	Dermal Wear chemically resistant glo combination with specific acti 90 % Ind the REACH Chemical Safe Wear solely goggles.	ivity training.
Exposure routes : Personal protective measures : Effectiveness (of a measure) : Additional good practice advice beyon Additional good practice advice	Wear chemically resistant glo combination with specific act 90 % Id the REACH Chemical Safe Wear solely goggles.	ivity training.
Exposure routes : Personal protective measures : Effectiveness (of a measure) : Additional good practice advice beyon Additional good practice advice	Wear chemically resistant glo combination with specific act 90 % Id the REACH Chemical Safe Wear solely goggles.	ivity training.
Effectiveness (of a measure) : Additional good practice advice beyon Additional good practice advice :	combination with specific acti 90 % In the REACH Chemical Safe Wear solely goggles.	ivity training.
Additional good practice advice beyon Additional good practice advice :	d the REACH Chemical Safe Wear solely goggles.	ty Assessment
Additional good practice advice :	Wear solely goggles.	ty Assessment
I.2.6 ES4 - CS6: Control of work	er exposure: Industrial us	
or mixture (charging/discharging)		
Product characteristics		
	<= 100 %	
	Low volatile liquid 0,123 hPa	
Frequency and duration of use		
	<= 480 min	
Frequency of use :	<= 240 days per year	
luman factors not influenced by risk າ		
	Assumes that potential derma	al contact is limited to hands.
Covers skin contact area up to :	960 cm ²	
Other operational conditions affecting	workers exposure	
Outdoor / Indoor :	Indoor use	
Risk Management Measures		
	inhalative	
	Local exhaust ventilation	
	90 %	
()	If technical measures not pra Wear suitable respiratory pro	
Effectiveness (of a measure) :	90 %	
Additional good practice advice beyon	d the REACH Chemical Safe	ty Assessment
	Wear solely goggles.	-
4.2.7 ES4 - CS7: Control of work		· /Trenefer of automat

mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Product characteristics Concentration of the Substance in : <= 100 % Mixture/Article



Substance key: SXR089061	Revis	sion Date: 17.07.2017
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		· · ·
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Uuman factore not influenced by ris	k managamant	
Human factors not influenced by ris Dermal exposure		not in limited to incide
Deimai exposure	: Assumes that potential dermal conta	
Covers, akin contact area, up to	hands / one hand / palm of hands. : 480 cm ²	
Covers skin contact area up to	. 460 CIII-	
Other operational conditions affection	ng workers exposure	
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Note	: No specific measures identified.	
	: Wear solely goggles. rker exposure: Industrial use (Tab ation, granulation) (PROC14)	letting,
compression, extrusion, pelettis Product characteristics	rker exposure: Industrial use (Tab ation, granulation) (PROC14)	letting,
4.2.8 ES 4 - CS 8: Control of wo compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article	rker exposure: Industrial use (Tab ation, granulation) (PROC14)	letting,
compression, extrusion, pelettis Product characteristics Concentration of the Substance in	rker exposure: Industrial use (Tab ation, granulation) (PROC14)	letting,
compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article	rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 %	letting,
compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid</pre>	letting,
compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa</pre>	letting,
Compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min</pre>	letting,
compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa</pre>	letting,
 compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use 	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management</pre>	
 compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use 	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year</pre>	
 compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris 	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management</pre>	
 compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris 	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contable</pre>	
 compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure Covers skin contact area up to 	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal conta hands / one hand / palm of hands. : 480 cm²</pre>	
 compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure Covers skin contact area up to 	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal conta hands / one hand / palm of hands. : 480 cm² mg workers exposure</pre>	
 compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure Covers skin contact area up to Other operational conditions affection 	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal conta hands / one hand / palm of hands. : 480 cm²</pre>	
 compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rise Dermal exposure Covers skin contact area up to Other operational conditions affecting Outdoor / Indoor 	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal conta hands / one hand / palm of hands. : 480 cm² mg workers exposure</pre>	
 compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affecting Outdoor / Indoor Risk Management Measures 	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal conta hands / one hand / palm of hands. : 480 cm² mg workers exposure : Indoor use</pre>	
 compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure Covers skin contact area up to Other operational conditions affection 	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal conta hands / one hand / palm of hands. : 480 cm² mg workers exposure</pre>	
 compression, extrusion, pelettis Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affecting Outdoor / Indoor Risk Management Measures Note 	<pre>rker exposure: Industrial use (Tab ation, granulation) (PROC14) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal conta hands / one hand / palm of hands. : 480 cm² mg workers exposure : Indoor use</pre>	act is limited to inside

4.2.9 ES 4 - CS 9: Control of worker exposure: Industrial use (Use as laboratory reagent) (PROC15)



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Version : 6 - 2 / EU		Date of printing : 12.02.2019
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Amount used Storage	: <1 kg, < 1 l	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by risk management Dermal exposure : Assumes that potential dermal contact is limited to ins hands / one hand / palm of hands. Covers skin contact area up to : 240 cm ²		
Other operational conditions affecting workers exposure Outdoor / Indoor : Indoor use		
Risk Management Measures Note	: Use as laboratory reagent No specific measures ider	
Additional good practice advice beyon Additional good practice advice		afety Assessment

4.3. ES 4 Exposure estimation and reference to its source

4.3.2 ES 4 - CS 2: Worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

4.3.3 ES 4 - CS 3: Worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)



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Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,08

4.3.4 ES 4 - CS 4: Worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,43

4.3.5 ES 4 - CS 5: Worker exposure: Industrial use (Mixing or blending in batch processes) (PROC5)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,38



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4.3.6 ES 4 - CS 6: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,20

4.3.7 ES 4 - CS 7: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities	0,43
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	0,43

4.3.8 ES 4 - CS 8: Worker exposure: Industrial use (Tabletting, compression, extrusion, pelettisation, granulation) (PROC14)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	3,43 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03
combined routes	ECETOC TRA worker v2.0	0,40

4.3.9 ES 4 - CS 9: Worker exposure: Industrial use (Use as laboratory reagent)



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(PROC15)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,37

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

ECHA guidance for downstream users Section 2

5. ES 5: Industrial use; Use in polymer production

5.1. Title section

Enviro	nment	
CS1:	Industrial use (Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article))	ERC6c
Worke	ers	
CS2:	Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	PROC1
CS3:	Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	PROC2
CS4:	Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises)	PROC3, PROC4
CS5:	Industrial use (Mixing or blending in batch processes)	PROC5
CS6:	Industrial use (Calendering operations)	PROC6
CS7:	Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a
CS8:	Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	PROC8b, PROC9
CS9:	Industrial use (Use as laboratory reagent)	PROC15

5.2. ES 5 Conditions of use affecting exposure



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5.2.1 ES 5 - CS 1: Control of environmental exposure: Industrial use (Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)) (ERC6c)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

5.2.2 ES 5 - CS 2: Control of worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by risk Dermal exposure Covers skin contact area up to	: Palm of one hand	
Other operational conditions affectin Outdoor / Indoor	g workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures	: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions Sample via a closed loop or other system to avoid exposu	
Additional good practice advice beyon Additional good practice advice	nd the REACH Chemical Safety Assessment : Wear solely goggles.	
5.2.3 ES 5 - CS 3: Control of worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)		
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	

Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa



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Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by ris	
Dermal exposure	: Assumes that potential dermal contact is limited to inside
Covers skin contact area up to	hands / one hand / palm of hands. : 480 cm ²
Other operational conditions affecti	
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Note	: Chemical production or refinery in closed continuous proces
	with occasional controlled exposure or processes with
	equivalent containment conditions No specific measures identified.
Additional good practice advice bey Additional good practice advice	yond the REACH Chemical Safety Assessment
	rker exposure: Industrial use (Manufacture or
formulation in the chemical induces controlled exposure or processes production where opportunity for Product characteristics	orker exposure: Industrial use (Manufacture or Istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4)
formulation in the chemical indu controlled exposure or processe production where opportunity fo	orker exposure: Industrial use (Manufacture or Istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4)
formulation in the chemical induces controlled exposure or processed production where opportunity for Product characteristics Concentration of the Substance in	orker exposure: Industrial use (Manufacture or Istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4)
formulation in the chemical induced controlled exposure or processed production where opportunity for Product characteristics Concentration of the Substance in Mixture/Article	erker exposure: Industrial use (Manufacture or istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4) : <= 100 %
formulation in the chemical indu controlled exposure or processe production where opportunity for Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use	 erker exposure: Industrial use (Manufacture or istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4) : <= 100 % : Low volatile liquid
formulation in the chemical indu controlled exposure or processe production where opportunity for Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration	<pre>orker exposure: Industrial use (Manufacture or istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4)</pre> : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min
formulation in the chemical indu controlled exposure or processe production where opportunity for Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use	 wrker exposure: Industrial use (Manufacture or instry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4) : <= 100 % : Low volatile liquid : 0,123 hPa
formulation in the chemical indu controlled exposure or processe production where opportunity for Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris	<pre>orker exposure: Industrial use (Manufacture or istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4)</pre> : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year sk management
formulation in the chemical indu controlled exposure or processe production where opportunity for Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure	<pre>vrker exposure: Industrial use (Manufacture or istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4)</pre> : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year sk management : Palm of one hand
formulation in the chemical indu controlled exposure or processe production where opportunity for Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure Covers skin contact area up to	<pre>vrker exposure: Industrial use (Manufacture or istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4)</pre> : <= 100 % : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year sk management : Palm of one hand : 240 cm ²
formulation in the chemical indu controlled exposure or processe production where opportunity for Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure	<pre>vrker exposure: Industrial use (Manufacture or istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4)</pre> : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year sk management : Palm of one hand
formulation in the chemical indu controlled exposure or processe production where opportunity for Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure Covers skin contact area up to	 wrker exposure: Industrial use (Manufacture or istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year sk management : Palm of one hand : 240 cm² : Manufacture or formulation in the chemical industry in close batch processes with occasional controlled exposure or processes with equivalent containment condition : Assumes that potential dermal contact is limited to inside
formulation in the chemical induces of the controlled exposure or processed production where opportunity for the product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rise Dermal exposure Covers skin contact area up to Remarks	 Prker exposure: Industrial use (Manufacture or istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 240 days per year Sk management : Palm of one hand : 240 cm² : Manufacture or formulation in the chemical industry in close batch processes with occasional controlled exposure or processes with equivalent containment condition
formulation in the chemical induces on trolled exposure or processed production where opportunity for the substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rise Dermal exposure Covers skin contact area up to Remarks Dermal exposure	 wrker exposure: Industrial use (Manufacture or istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year sk management : Palm of one hand : 240 cm² : Manufacture or formulation in the chemical industry in close batch processes with occasional controlled exposure or processes with equivalent containment condition : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
formulation in the chemical induc controlled exposure or processes production where opportunity for Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rise Dermal exposure Covers skin contact area up to Remarks Dermal exposure Covers skin contact area up to	 arker exposure: Industrial use (Manufacture or instry in closed batch processes with occasional es with equivalent containment condition, Chemical for exposure arises) (PROC3, PROC4) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year sk management : Palm of one hand : 240 cm² : Manufacture or formulation in the chemical industry in close batch processes with occasional controlled exposure or processes with equivalent containment condition : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm² : Chemical production where opportunity for exposure arises



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Risk Management Measures Technical conditions and measures	: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
Note	: Chemical production where opportunity for exposure arises No specific measures identified.
Additional good practice advice beyon Additional good practice advice	ond the REACH Chemical Safety Assessment : Wear solely goggles.
5.2.5 ES 5 - CS 5: Control of wor batch processes) (PROC5)	ker exposure: Industrial use (Mixing or blending in
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year
Human factors not influenced by risk Dermal exposure Covers skin contact area up to	 management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm²
Other operational conditions affectin Outdoor / Indoor	n g workers exposure : Indoor use
Risk Management Measures Exposure routes Personal protective measures Effectiveness (of a measure)	 Dermal Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. 90 %
Additional good practice advice beyon Additional good practice advice	ond the REACH Chemical Safety Assessment : Wear solely goggles.
5.2.6 ES 5 - CS 6: Control of wor operations) (PROC6)	ker exposure: Industrial use (Calendering
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa

Frequency and duration of use

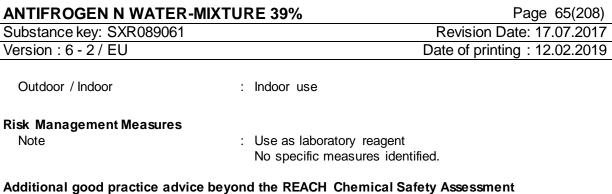


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	190 min
Exposure duration Frequency of use	: <= 480 min : <= 240 days per year
Frequency of use	. <= 240 days per year
Human factors not influenced by ris	sk management
Dermal exposure	: Assumes that potential dermal contact is limited to hands.
Covers skin contact area up to	: 960 cm ²
Other operational conditions affecti	ing workers exposure
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Exposure routes	: Dermal
Personal protective measures	: Wear chemically resistant gloves (tested to EN374) in
	combination with 'basic' employee training.
Effectiveness (of a measure)	: 90 %
Additional wood weating advice her	wand the DEACLL Chamical Safety Assessment
Additional good practice advice be	yond the REACH Chemical Safety Assessment
3	
5.2.7 ES 5 - CS 7: Control of wo	orker exposure: Industrial use (Transfer of substance
	g) at non dedicated-facilities) (PROC8a)
	5,
Product characteristics	
Concentration of the Substance in	: <= 100 %
Mixture/Article	
	· Lever a letter the stat
Physical Form (at time of use)	: Low volatile liquid : 0,123 hPa
Vapour pressure	: 0,123 NPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by ris	
Dermal exposure	: Assumes that potential dermal contact is limited to hands.
Covers skin contact area up to	: 960 cm ²
Other operational conditions affecti	ing workers exposure
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Exposure routes	: inhalative
Technical conditions and	: Local exhaust ventilation
measures	
Effectiveness (of a measure)	: 90 %
Personal protective measures	
	Wear suitable respiratory protection.
Effectiveness (of a measure)	: 90 %
	yond the REACH Chemical Safety Assessment
Additional good practice advice	: Wear solely goggles.



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5.2.8 ES5 - CS8: Control of wo or mixture (charging/discharging mixture into small containers (de PROC9)	 at dedicated facilities, T 	ransfer of substance or
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ris	k management	
Dermal exposure	: Assumes that potential de	rmal contact is limited to inside
Covers skin contact area up to	hands / one hand / palm c : 480 cm ²	f hands.
Other operational conditions affectin Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures Note	: No specific measures ider	ntified.
Additional good practice advice bey Additional good practice advice		afety Assessment
5.2.9 ES 5 - CS 9: Control of wo	rker exposure: Industrial	use (Use as laboratory
reagent) (PROC15)	·	
		ΥΥΥΥΥ Υ
reagent) (PROC15) Product characteristics Concentration of the Substance in		, , , , , , , , , , , , , , , , , , ,
reagent) (PROC15) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use)	: <= 100 % : Low volatile liquid	, , , , , , , , , , , , , , , , , , ,
reagent) (PROC15) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure	: <= 100 % : Low volatile liquid	ΥΥΥΥ Υ
reagent) (PROC15) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Storage	: <= 100 % : Low volatile liquid : 0,123 hPa	ΥΥΥΥ Υ
reagent) (PROC15) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used	: <= 100 % : Low volatile liquid : 0,123 hPa	ΥΥΥΥ Υ
reagent) (PROC15) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Storage Frequency and duration of use	: <= 100 % : Low volatile liquid : 0,123 hPa : <1 kg, < 1 l	, , , , , , , , , , , , , , , , , , ,
reagent) (PROC15) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Storage Frequency and duration of use Exposure duration Frequency of use	 : <= 100 % : Low volatile liquid : 0,123 hPa : <1 kg, < 1 l : <= 480 min : <= 240 days per year 	
reagent) (PROC15) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Storage Frequency and duration of use Exposure duration	 : <= 100 % : Low volatile liquid : 0,123 hPa : <1 kg, < 1 l : <= 480 min : <= 240 days per year k management 	rmal contact is limited to inside
reagent) (PROC15) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Storage Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris	 : <= 100 % : Low volatile liquid : 0,123 hPa : <1 kg, < 1 l : <= 480 min : <= 240 days per year k management 	rmal contact is limited to inside

Other operational conditions affecting workers exposure



CLARIAN

Additional good practice advice : Wear solely goggles.

5.3. ES 5 Exposure estimation and reference to its source

5.3.2 ES 5 - CS 2: Worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

5.3.3 ES 5 - CS 3: Worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,08

5.3.4 ES 5 - CS 4: Worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or	0,22



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- local and systemic	formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,43

5.3.5 ES 5 - CS 5: Worker exposure: Industrial use (Mixing or blending in batch processes) (PROC5)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,38

5.3.6 ES 5 - CS 6: Worker exposure: Industrial use (Calendering operations) (PROC6)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	2,74 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03
combined routes	ECETOC TRA worker v2.0	0,40

5.3.7 ES 5 - CS 7: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07



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Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,20

5.3.8 ES 5 - CS 8: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities	0,43
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	0,43

5.3.9 ES 5 - CS 9: Worker exposure: Industrial use (Use as laboratory reagent) (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,37

5.4. ES 5 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

6. ES 6: Industrial use; Coatings and paints, thinners, paint



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removers

6.1. Title section

_	Environment			
	Industrial use (Use of non-reactive processing aid at industrial site (no inclusion into or onto article))	ERC4		
Worker	S			
	Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	PROC1		
	Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	PROC2		
	Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises)	PROC3, PROC4		
CS5:	Industrial use (Mixing or blending in batch processes)	PROC5		
CS6:	Industrial use (Industrial spraying)	PROC7		
	Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a		
	Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities)	PROC8b		
CS9:	Industrial use (Roller application or brushing)	PROC10		
	Industrial use (Treatment of articles by dipping and pouring)	PROC13		
CS11:	Industrial use (Use as laboratory reagent)	PROC15		

6.2. ES 6 Conditions of use affecting exposure

6.2.1 ES 6 - CS 1: Control of environmental exposure: Industrial use (Use of non-reactive processing aid at industrial site (no inclusion into or onto article)) (ERC4)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

6.2.2 ES 6 - CS 2: Control of worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa



measureslikelihood of exposure of containment conditions Sample via a closed loopAdditional good practice advice beyond the REACH Chemical Additional good practice advice: Wear solely goggles.6.2.3 ES 6 - CS 3: Control of worker exposure: Industria refinery in closed continuous process with occasional co processes with equivalent containment conditions) (PRCProduct characteristics Concentration of the Substance in Wature/Article: <= 100 %	I use (Chemical production or ontrolled exposure or
Frequency and duration of use Exposure duration : <= 480 min Frequency of use : <= 240 days per year Human factors not influenced by risk management Dermal exposure : Palm of one hand Covers skin contact area up to : 240 cm² Other operational conditions affecting workers exposure Outdoor / Indoor : Indoor use Risk Management Measures Technical conditions and : Chemical production or measures Ikelihood of exposure o containment conditions sample via a closed loop Additional good practice advice beyond the REACH Chemical Additional good practice advice : Wear solely goggles. 6.2.3 ES 6 - CS 3: Control of worker exposure: Industria refinery in closed continuous process with occasional co processes with equivalent containment conditions) (PRC Product characteristics Concentration of the Substance in : <= 100 % Mixture/Article Physical Form (at time of use) : Low volatile liquid Vapour pressure : 0,123 hPa Frequency and duration of use :<= 240 days per year Exposure duration : <= 240 days per year	refinery in closed process without processes with equivalent o or other system to avoid exposure Safety Assessment I use (Chemical production or ontrolled exposure or
Exposure duration : <= 480 min	processes with equivalent o or other system to avoid exposure Safety Assessment I use (Chemical production or ontrolled exposure or
Exposure duration : <= 480 min	processes with equivalent o or other system to avoid exposure Safety Assessment I use (Chemical production or ontrolled exposure or
Human factors not influenced by risk management Dermal exposure Palm of one hand Covers skin contact area up to 240 cm² Other operational conditions affecting workers exposure Outdoor / Indoor Outdoor / Indoor Indoor use Risk Management Measures Technical conditions and Chemical production or likelihood of exposure or containment conditions Sample via a closed loop Additional good practice advice beyond the REACH Chemical Additional good practice advice Wear solely goggles. 6.2.3 ES 6 - CS 3: Control of worker exposure: Industriarefinery in closed continuous process with occasional corprocesses with equivalent containment conditions) (PRC Product characteristics Concentration of the Substance in : <= 100 %	processes with equivalent o or other system to avoid exposure Safety Assessment I use (Chemical production or ontrolled exposure or
Dermal exposure : Palm of one hand Covers skin contact area up to : 240 cm² Other operational conditions affecting workers exposure Outdoor / Indoor Outdoor / Indoor : Indoor use Risk Management Measures : Chemical production or likelihood of exposure or containment conditions Sample via a closed loop Additional good practice advice beyond the REACH Chemical Additional good practice advice : Wear solely goggles. 6.2.3 ES 6 - CS 3: Control of worker exposure: Industriate refinery in closed continuous process with occasional comprocesses with equivalent containment conditions) (PRC Product characteristics : Concentration of the Substance in in conditions) (PRC Product characteristics : Concentration of the Substance in in conditions) (PRC Product characteristics : Concentration of the Substance in in conditions) (PRC Product characteristics : Concentration of the Substance in in conditions) (PRC Product characteristics : Concentration of use Exposure duration in the of use : Low volatile liquid Vapour pressure : 0,123 hPa Frequency and duration of use : <= 480 min	processes with equivalent o or other system to avoid exposure Safety Assessment I use (Chemical production or ontrolled exposure or
Covers skin contact area up to : 240 cm² Other operational conditions affecting workers exposure Outdoor / Indoor : Indoor use Risk Management Measures Technical conditions and measures : Chemical production or likelihood of exposure of containment conditions Sample via a closed loop Additional good practice advice beyond the REACH Chemical Additional good practice advice : Wear solely goggles. 6.2.3 ES 6 - CS 3: Control of worker exposure: Industria refinery in closed continuous process with occasional co processes with equivalent containment conditions) (PRC Product characteristics Concentration of the Substance in Mixture/Article : <= 100 %	processes with equivalent o or other system to avoid exposure Safety Assessment I use (Chemical production or ontrolled exposure or
Other operational conditions affecting workers exposure Outdoor / Indoor Indoor use Risk Management Measures Technical conditions and measures Indoor use Risk Management Measures Chemical production or likelihood of exposure of containment conditions Sample via a closed loop Additional good practice advice beyond the REACH Chemical Additional good practice advice Wear solely goggles. 6.2.3 ES 6 - CS 3: Control of worker exposure: Industria refinery in closed continuous process with occasional co processes with equivalent containment conditions) (PRC Product characteristics Concentration of the Substance in Mixture/Article <= 100 %	processes with equivalent o or other system to avoid exposure Safety Assessment I use (Chemical production or ontrolled exposure or
Outdoor / Indoor : Indoor use Risk Management Measures : Chemical production or likelihood of exposure or containment conditions Sample via a closed loop Additional good practice advice beyond the REACH Chemical Additional good practice advice : Wear solely goggles. 6.2.3 ES 6 - CS 3: Control of worker exposure: Industriate refinery in closed continuous process with occasional corprocesses with equivalent containment conditions) (PRC Product characteristics Concentration of the Substance in : <= 100 %	processes with equivalent o or other system to avoid exposure Safety Assessment I use (Chemical production or ontrolled exposure or
Technical conditions and measures: Chemical production or likelihood of exposure of containment conditions Sample via a closed loopAdditional good practice advice beyond the REACH Chemical Additional good practice advice: Wear solely goggles.6.2.3 ES 6 - CS 3: Control of worker exposure: Industria refinery in closed continuous process with occasional co processes with equivalent containment conditions) (PRCProduct characteristics Concentration of the Substance in Wapour pressure: <= 100 %Frequency and duration of use Exposure duration Frequency of use: <= 480 min : <= 240 days per yearHuman factors not influenced by risk management Dermal exposure: Assumes that potential of hands / one hand / palm	processes with equivalent o or other system to avoid exposure Safety Assessment I use (Chemical production or ontrolled exposure or
Technical conditions and measures: Chemical production or likelihood of exposure or containment conditions Sample via a closed loopAdditional good practice advice beyond the REACH Chemical Additional good practice advice: Wear solely goggles.6.2.3 ES 6 - CS 3: Control of worker exposure: Industria refinery in closed continuous process with occasional co processes with equivalent containment conditions) (PRCProduct characteristics Concentration of the Substance in Wapour pressure: <= 100 %Frequency and duration of use Exposure duration Frequency of use: <= 480 min : <= 240 days per yearHuman factors not influenced by risk management Dermal exposure: Assumes that potential of hands / one hand / palm	processes with equivalent o or other system to avoid exposure Safety Assessment I use (Chemical production or ontrolled exposure or
measures likelihood of exposure of containment conditions Sample via a closed loop Additional good practice advice beyond the REACH Chemical Additional good practice advice : Wear solely goggles. 6.2.3 ES 6 - CS 3: Control of worker exposure: Industriat refinery in closed continuous process with occasional comprocesses with equivalent containment conditions) (PRC Product characteristics Concentration of the Substance in : <= 100 %	processes with equivalent o or other system to avoid exposure Safety Assessment I use (Chemical production or ontrolled exposure or
containment conditions Sample via a closed loop Additional good practice advice beyond the REACH Chemical Additional good practice advice Wear solely goggles. 6.2.3 ES 6 - CS 3: Control of worker exposure: Industria refinery in closed continuous process with occasional comprocesses with equivalent containment conditions) (PROProduct characteristics Concentration of the Substance in : <= 100 %	o or other system to avoid exposure Safety Assessment I use (Chemical production of ontrolled exposure or
Additional good practice advice beyond the REACH Chemical Additional good practice advice : Wear solely goggles. 6.2.3 ES 6 - CS 3: Control of worker exposure: Industriation refinery in closed continuous process with occasional comprocesses with equivalent containment conditions) (PRC Product characteristics Concentration of the Substance in : <= 100 %	Safety Assessment I use (Chemical production o ontrolled exposure or
Additional good practice advice : Wear solely goggles. 6.2.3 ES 6 - CS 3: Control of worker exposure: Industrial refinery in closed continuous process with occasional comprocesses with equivalent containment conditions) (PRC Product characteristics Concentration of the Substance in : <= 100 %	I use (Chemical production o ontrolled exposure or
6.2.3 ES 6 - CS 3: Control of worker exposure : Industriar refinery in closed continuous process with occasional co processes with equivalent containment conditions) (PRC Product characteristics Concentration of the Substance in : <= 100 % Mixture/Article Physical Form (at time of use) : Low volatile liquid Vapour pressure : 0,123 hPa Frequency and duration of use Exposure duration fuse : <= 480 min Frequency of use : <= 240 days per year Human factors not influenced by risk management Dermal exposure : Assumes that potential of hands / one hand / palm	ontrolled exposure or
refinery in closed continuous process with occasional comprocesses with equivalent containment conditions) (PRC Product characteristics Concentration of the Substance in : <= 100 % Mixture/Article Physical Form (at time of use) : Low volatile liquid Vapour pressure : 0,123 hPa Frequency and duration of use : <= 480 min Frequency of use : <= 240 days per year Human factors not influenced by risk management : Assumes that potential of hands / one hand / palm	ontrolled exposure or
Vapour pressure : 0,123 hPa Frequency and duration of use : <= 480 min Exposure duration : <= 240 days per year Human factors not influenced by risk management Dermal exposure : Assumes that potential of hands / one hand / palm	
Vapour pressure : 0,123 hPa Frequency and duration of use : <= 480 min	
Exposure duration: <= 480 min	
Frequency of use : <= 240 days per year	
Human factors not influenced by risk management Dermal exposure : Assumes that potential of hands / one hand / palm	
Dermal exposure : Assumes that potential of hands / one hand / palm	
hands / one hand / palm	
	dermal contact is limited to inside
Covers skin contact area up to : 480 cm ²	of hands.
Other operational conditions affecting workers exposure Outdoor / Indoor : Indoor use	
Risk Management Measures	<i>.</i>
	refinery in closed continuous proce
with occasional controlle equivalent containment	
No specific measures id	d exposure or processes with
	conditions
Additional good practice advice beyond the REACH Chemical Additional good practice advice : Wear solely goggles.	conditions entified.



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6.2.4 ES 6 - CS 4: Control of wo formulation in the chemical indu controlled exposure or processe production where opportunity fo	stry in closed batch process with equivalent contain	esses with occasional ment condition, Chemical
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ris Dermal exposure Covers skin contact area up to Remarks Dermal exposure Covers skin contact area up to Remarks	 Palm of one hand 240 cm² Manufacture or formulation batch processes with occuprocesses with equivalent Assumes that potential definands / one hand / palm of 480 cm² 	ermal contact is limited to inside
Other operational conditions affecti Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures		n in the chemical industry in closed asional controlled exposure or containment condition
Note	: Chemical production when No specific measures iden	re opportunity for exposure arises ntified.
Additional good practice advice bey Additional good practice advice	ond the REACH Chemical S : Wear solely goggles.	afety Assessment
6.2.5 ES 6 - CS 5: Control of wo	rker exposure: Industrial	use (Mixing or blending in

batch processes) (PROC5)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa



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		· · · · ·
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ris	k management	
Dermal exposure		al dermal contact is limited to inside
Bernar expectate	hands / one hand / pa	
Covers skin contact area up to	: 480 cm ²	
Other operational conditions affecti Outdoor / Indoor	ng workers exposure : Indoor use	
Pisk Management Measures		
Risk Management Measures Exposure routes	: Dermal	
Personal protective measures		tant gloves (tested to EN374) in
r ersonar protective measures	combination with spec	
Effectiveness (of a measure)	: 90 %	
Additional good practice advice bey	ond the REACH Chemic	al Safety Assessment
Additional good practice advice		
(PROC7)		
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Product characteristics Concentration of the Substance in Mixture/Article		
Product characteristics Concentration of the Substance in	: <= 100 % : Low volatile liquid : 0,123 hPa	
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure	: Low volatile liquid	
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure	: Low volatile liquid	
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amounts used Frequency and duration of use	: Low volatile liquid : 0,123 hPa : 0,6 L/min	
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amounts used Frequency and duration of use Exposure duration	 Low volatile liquid 0,123 hPa 0,6 L/min 360 min 	
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amounts used Frequency and duration of use	: Low volatile liquid : 0,123 hPa : 0,6 L/min	
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amounts used Frequency and duration of use Exposure duration	 Low volatile liquid 0,123 hPa 0,6 L/min 360 min <= 5 days per week 	
 Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amounts used Frequency and duration of use Exposure duration Frequency of use 	 Low volatile liquid 0,123 hPa 0,6 L/min 360 min <= 5 days per week 	
 Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amount used Amounts used Frequency and duration of use Exposure duration Frequency of use Other operational conditions affecti 	 Low volatile liquid 0,123 hPa 0,6 L/min 360 min <= 5 days per week ng workers exposure 	
 Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amount used Amounts used Frequency and duration of use Exposure duration Frequency of use Other operational conditions affecti Outdoor / Indoor Room size 	 Low volatile liquid 0,123 hPa 0,6 L/min 360 min <= 5 days per week ng workers exposure Indoor use 	
 Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amount used Amounts used Frequency and duration of use Exposure duration Frequency of use Other operational conditions affecti Outdoor / Indoor	 Low volatile liquid 0,123 hPa 0,6 L/min 360 min <= 5 days per week ng workers exposure Indoor use > 1000 m3 	on
 Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amount used Amounts used Frequency and duration of use Exposure duration Frequency of use Other operational conditions affecti Outdoor / Indoor Room size 	 Low volatile liquid 0,123 hPa 0,6 L/min 360 min <= 5 days per week ng workers exposure Indoor use 	on
 Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amount used Amounts used Frequency and duration of use Exposure duration Frequency of use Other operational conditions affecti Outdoor / Indoor Room size Risk Management Measures Technical conditions and measures 	 Low volatile liquid 0,123 hPa 0,6 L/min 360 min <= 5 days per week ng workers exposure Indoor use > 1000 m3 	on
 Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amount used Amounts used Frequency and duration of use Exposure duration Frequency of use Other operational conditions affecti Outdoor / Indoor	 Low volatile liquid 0,123 hPa 0,6 L/min 360 min <= 5 days per week ng workers exposure Indoor use > 1000 m3 Local exhaust ventilati 50 % 	on on of airflow is clearly away from the
 Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amount used Amounts used Frequency and duration of use Exposure duration Frequency of use Other operational conditions affecti Outdoor / Indoor	 Low volatile liquid 0,123 hPa 0,6 L/min 360 min <= 5 days per week mg workers exposure Indoor use > 1000 m3 Local exhaust ventilati 50 % Ensure that the directi worker. 	
 Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Amount used Amount used Frequency and duration of use Exposure duration Frequency of use Other operational conditions affecti Outdoor / Indoor Room size Risk Management Measures Technical conditions and measures Effectiveness (of a measure) Note 	 Low volatile liquid 0,123 hPa 0,6 L/min 360 min <= 5 days per week mg workers exposure Indoor use > 1000 m3 Local exhaust ventilati 50 % Ensure that the directi worker. 	on of airflow is clearly away from the stant gloves (tested to EN374) in



「URE 39%	Page 72(208)
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: Wear suitable protectiv Wear suitable coveralls	e clothing. to prevent exposure to the skin.
: 80 %	
: Ensure that the distanc m.	ce from worker to task is greater than
: Ensure that direction of downward.	f application is only horizontal or
: Regular cleaning of wo	ork area
: Regular cleaning of eq	uipment
: Ensure regular inspection equipment and machin	ion, cleaning and maintenance of es.
	 Wear suitable coveralls 80 % Ensure that the distance Ensure that direction of downward. Regular cleaning of work Regular cleaning of equilater the distance of the second s

Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

6.2.7 ES 6 - CS 7: Control of worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by ris Dermal exposure Covers skin contact area up to	: Assumes that potential dermal contact is limited to hands.
Other operational conditions affecting workers exposure	
Outdoor / Indoor	: Indoor use
Risk Management Measures Exposure routes Technical conditions and measures	: inhalative : Local exhaust ventilation



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Substance key: SXR089061		Revision Date: 17.07.2017
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Effectiveness (of a measure) Personal protective measures	: If technical measures not pract Wear suitable respiratory prote	
Effectiveness (of a measure)	: 90 %	
Additional good practice advice beyon Additional good practice advice	nd the REACH Chemical Safety : Wear solely goggles.	Assessment
6.2.8 ES 6 - CS 8: Control of work or mixture (charging/discharging)		
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
	: Low volatile liquid : 0,123 hPa	
	: <= 480 min	
Frequency of use	: <= 240 days per year	
	 management Assumes that potential dermal hands / one hand / palm of har 480 cm² 	
Other operational conditions affecting Outdoor / Indoor	j workers exposure : Indoor use	
Risk Management Measures		
	 Transfer of substance or mixtu dedicated facilities No specific measures identified 	
Additional good practice advice beyon Additional good practice advice	nd the REACH Chemical Safety : Wear solely goggles.	Assessment
6.2.9 ES 6 - CS 9: Control of work brushing) (PROC10)	er exposure: Industrial use	(Roller application or
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
	: Low volatile liquid : 0,123 hPa	
	: <= 480 min : <= 240 days per year	

Human factors not influenced by risk management



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Dermal exposure	: Assumes that potential dermal contact is limited to hands.
Covers skin contact area up to	: 960 cm ²
Other operational conditions affectin	a workers experies
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Exposure routes	: Dermal
Personal protective measures	: Wear chemically resistant gloves (tested to EN374) in
	combination with 'basic' employee training.
Effectiveness (of a measure)	: 90 %
	ond the REACH Chemical Safety Assessment
Additional good practice advice	: Wear solely goggles.
6210 ES6-CS10. Control of w	orker exposure: Industrial use (Treatment of articles
by dipping and pouring) (PROC13	• •
	- ,
Product characteristics	
Concentration of the Substance in	: <= 100 %
Mixture/Article	
Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa
Frequency and duration of use	
Frequency and duration of use Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by risk	
Dermal exposure	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Covers skin contact area up to	: 480 cm^2
Other operational conditions affectin	•
Outdoor / Indoor	: Indoor use
Pick Managament Maaguraa	
Risk Management Measures Exposure routes	: Dermal
Personal protective measures	: Wear chemically resistant gloves (tested to EN374) in
	combination with 'basic' employee training.
Effectiveness (of a measure)	: 90 %
Additional good practice advice have	and the REACH Chemical Safety Assessment
Additional good practice advice beyo	: Wear solely goggles.
6.2.11 ES 6 - CS 11: Control of w	orker exposure: Industrial use (Use as laboratory
	· · · · ·
reagent) (PROC15)	

Product characteristics

Concentration of the Substance in : <= 100 % Mixture/Article



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Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
	. 0,120 m a	
Amount used		
Storage	: < 1 kg, < 1 l	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by risk	managamant	
Dermal exposure	-	ermal contact is limited to inside
Deimai exposure	hands / one hand / palm	
Covers skin contact area up to	: 240 cm^2	or hands.
Other operational conditions affecting	g workers exposure	
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Note	: Use as laboratory reagen	t
	No specific measures ide	entified.
Additional good practice advice beyo		Safety Assessment
Additional good practice advice	: Wear solely goggles.	

6.3. ES 6 Exposure estimation and reference to its source

6.3.2 ES 6 - CS 2: Worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

6.3.3 ES 6 - CS 3: Worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)

Route of exposure and type	Exposure estimate	RCR
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of effects		
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,08

6.3.4 ES 6 - CS 4: Worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,43

6.3.5 ES 6 - CS 5: Worker exposure: Industrial use (Mixing or blending in batch processes) (PROC5)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,38

6.3.6 ES 6 - CS 6: Worker exposure: Industrial use (Industrial spraying) (PROC7)



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Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	9,79 mg/m ³ (Stoffenmanager v4.0)	0,28
Worker - dermal, long-term - systemic	54,6 mg/kg bw/day (RISKOFDERM v2.1)	0,52
combined routes	Not applicable	0,80

6.3.7 ES 6 - CS 7: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,20

6.3.8 ES 6 - CS 8: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities) (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0)	0,06
combined routes	ECETOC TRA worker v2.0	0,43

6.3.9 ES 6 - CS 9: Worker exposure: Industrial use (Roller application or brushing) (PROC10)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,87 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	2,74 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03
combined routes	ECETOC TRA worker v2.0	0,77

6.3.10 ES 6 - CS 10: Worker exposure: Industrial use (Treatment of articles by dipping and pouring) (PROC13)

Route of exposure and type	Exposure estimate	RCR
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of effects		
Worker - inhalative, long-term - local and systemic	25,87 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,75

6.3.11 ES 6 - CS 11: Worker exposure: Industrial use (Use as laboratory reagent) (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,37

6.4. ES 6 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

7. ES 7: Professional use; Coatings and paints, thinners, paint removers, Adhesives, sealants, Foaming, Use in polymer processing

7.1. Title section

Enviro	Environment		
CS1:	Professional use (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use leading to inclusion into/onto article (indoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor), Widespread use leading to inclusion into/onto article (outdoor))	ERC8a, ERC8c, ERC8d, ERC8f	
Worke	ers		
CS2:	Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	PROC1, PROC2, PROC3	



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CS3:	Professional use (Chemical production where opportunity for arises, Mixing or blending in batch processes)	exposure	PROC4, PROC5	
CS4:			PROC8a	
CS5: Professional use (Transfer of substance or mixture PROC8b, PROC9 (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))				
CS6:	Professional use (Roller application or brushing)		PROC10	
CS7:	Professional use (Non-industrial spraying)		PROC11	
CS8:	Professional use (Treatment of articles by dipping and pouring Tabletting, compression, extrusion, pelettisation, granulation)],	PROC13, PROC14	
CS9:	Professional use (Use as laboratory reagent)		PROC15	
CS10:	Professional use (Manual activities involving hand contact)		PROC19	

7.2. ES 7 Conditions of use affecting exposure

7.2.1 ES7 - CS1: Control of environmental exposure: Professional use (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use leading to inclusion into/onto article (indoor), Widespread use of nonreactive processing aid (no inclusion into or onto article, outdoor), Widespread use leading to inclusion into/onto article (outdoor)) (ERC8a, ERC8c, ERC8d, ERC8f)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

7.2.2 ES7 - CS2: Control of worker exposure: Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition) (PROC1, PROC2, PROC3)

Product characteristics Concentration of the Substance in Mixture/Article	:	<= 100 %
Physical Form (at time of use) Vapour pressure		Low volatile liquid 0,123 hPa
Frequency and duration of use		
Exposure duration	:	<= 480 min
Frequency of use	:	<= 240 days per year
Human factors not influenced by risl	k n	nanagement
Dermal exposure	:	Palm of one hand
Covers skin contact area up to	:	240 cm ²



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Remarks	likelihood of exposure containment condition chemical industry in c	or refinery in closed process without e or processes with equivalent ns, Manufacture or formulation in the closed batch processes with occasional or processes with equivalent containmen
Dermal exposure	hands / one hand / pa	al dermal contact is limited to inside alm of hands.
Covers skin contact area up to Remarks		or refinery in closed continuous process olled exposure or processes with ent conditions
Other operational conditions affect	ing workers exposure	
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Technical conditions and measures	likelihood of exposure containment conditior	or refinery in closed process without e or processes with equivalent ns loop or other system to avoid exposure.
Technical conditions and measures		or refinery in closed continuous process olled exposure or processes with ent conditions
Technical conditions and measures	batch processes with	lation in the chemical industry in closed occasional controlled exposure or alent containment condition rolled exposure

Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

7.2.3 ES 7 - CS 3: Control of worker exposure: Professional use (Chemical production where opportunity for exposure arises, Mixing or blending in batch processes) (PROC4, PROC5)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year
Human factors not influenced by risl	k management
Dermal exposure	: Assumes that potential dermal

Dermal exposure	:	Assumes that potential dermal contact is limited to inside
Covers skin contact area up to	:	hands / one hand / palm of hands. 480 cm ²



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Other operational conditions affecting Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Note	: No specific measures ide	ntified.
Additional good practice advice bey Additional good practice advice		afety Assessment
7.2.4 ES 7 - CS 4: Control of wo substance or mixture (charging/o		
Product characteristics		
Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Frequency and duration of use		
Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ris	k management	
Dermal exposure	: Assumes that potential de	ermal contact is limited to hands.
Covers skin contact area up to	: 960 cm ²	
Other operational conditions affecting		
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Exposure routes	: inhalative	
Technical conditions and measures	: Local exhaust ventilation	
Effectiveness (of a measure)	: 80 %	
Personal protective measures	: If technical measures not	
Effectiveness (of a measure)	Wear suitable respiratory : 80 %	protection.
Additional good practice advice bey	ond the REACH Chemical S	afety Assessment
Additional good practice advice		
7.2.5 ES7 - CS5: Control of wo	rkar avnosura: Professio	nal use (Transfer of
substance or mixture (charging/		
substance or mixture into small		

Product characteristics Concentration of the Substance in : <= 100 % Mixture/Article



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Physical Form (at time of use)	
Vapour pressure	: 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by ris	sk management
Dermal exposure	: Assumes that potential dermal contact is limited to inside
Donnar expectate	hands / one hand / palm of hands.
Covers skin contact area up to	
Other operational conditions affection	ng workers exposure
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Note	: No specific measures identified.
	yond the REACH Chemical Safety Assessment
Additional good practice advice	: Wear solely goggles.
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Live on footone wat influenced by sig	
Human factors not influenced by ris Dermal exposure	: Assumes that potential dermal contact is limited to hands.
Covers skin contact area up to	 Assumes that potential deman contact is infined to hands. 960 cm²
Other operational conditions affecti	ng workers exposure
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Exposure routes	: Dermal
Personal protective measures	: Wear chemically resistant gloves (tested to EN374) in
Effectiveness (of a measure)	combination with 'basic' employee training. : 90 %
Exposure routes	: inhalative
Technical conditions and	: Local exhaust ventilation
measures	. 90.9/
Effectiveness (of a measure)	: 80 %



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Personal protective measures		echnical measures not practical: ear suitable respiratory protection.
Effectiveness (of a measure)	: 80	
Additional good practice advice bey Additional good practice advice		e REACH Chemical Safety Assessment ear solely goggles.
7.2.7 ES 7 - CS 7: Control of wo spraying) (PROC11)	orker e	xposure: Professional use (Non-industrial
Product characteristics Concentration of the Substance in Mixture/Article	: <=	100 %
Physical Form (at time of use) Vapour pressure		w volatile liquid 23 hPa
Amount used		
Amounts used	: 0,0	95 L/min
Frequency and duration of use		
Exposure duration	: 15	0 min
Frequency of use	: <=	5 days per week
Other operational conditions affecti	ng wor	kers exposure
Outdoor / Indoor		loor use
Room size	: <=	1000 m3
Risk Management Measures		
Personal protective measures	: We	ear chemically resistant gloves (tested to EN374) in
		mbination with 'basic' employee training.
Effectiveness (of a measure)	: 90	%
Personal protective measures		ear suitable protective clothing.
Effectiveness (of a measure)	We : 80	ear suitable coveralls to prevent exposure to the skin.
Personal protective measures Effectiveness (of a measure)	: We : 40	ear a respirator conforming to EN140. %
Organisational measures to prevent /limit releases, dispersion and exposure		sure that direction of application is only horizontal or wnward.
Organisational measures to prevent /limit releases, dispersion and exposure	: En m.	sure that the distance from worker to task is greater thar
Organisational measures to prevent /limit releases, dispersion		sure that the direction of airflow is clearly away from the rker.
and exposure Note	: No	t applicable
	. 110	



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Organisational measures to prevent /limit releases, dispersion and exposure	: Provide enhanced gen	neral ventilation by mechanical means.
Organisational measures to prevent /limit releases, dispersion and exposure	: Regular cleaning of wo	ork area
Organisational measures to prevent /limit releases, dispersion and exposure	: Regular cleaning of ec	quipment
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure regular inspect equipment and maching	tion, cleaning and maintenance of nes.
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that the task is worker simultaneously	not carried out by more than one
Additional good practice advice bey Additional good practice advice		al Safety Assessment

7.2.8 ES7 - CS8: Control of worker exposure: Professional use (Treatment of articles by dipping and pouring, Tabletting, compression, extrusion, pelettisation, granulation) (PROC13, PROC14)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by ris	amanagement
Dermal exposure	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Covers skin contact area up to	: 480 cm ²
Other operational conditions affecting	g workers exposure
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Personal protective measures	: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Effectiveness (of a measure)	: 90 %

: Treatment of articles by dipping and pouring

Additional good practice advice beyond the REACH Chemical Safety Assessment

Note



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Additional good practice advice	: Wear solely goggles.	
7.2.9 ES 7 - CS 9: Control of wor reagent) (PROC15)	ker exposure: Profe	ssional use (Use as laboratory
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Amount used Storage	: <1 kg, < 1 l	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per yea	r
Human factors not influenced by risl Dermal exposure	: Assumes that potenti hands / one hand / pa	ial dermal contact is limited to inside alm of hands.
Covers skin contact area up to	: 240 cm ²	
Other operational conditions affectir Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures Note	: Use as laboratory rea No specific measures	•
Additional good practice advice bey Additional good practice advice	ond the REACH Chemic : Wear solely goggles.	cal Safety Assessment
7.2.10 ES 7 - CS 10: Control of v involving hand contact) (PROC1	vorker exposure: Pro	fessional use (Manual activities
Product characteristics Concentration of the Substance in Mixture/Article		
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <15 min : <= 240 days per yea	r
Human factors not influenced by risl Dermal exposure		al dermal contact is limited to hands ar



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Other operational conditions affecti Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures		
Personal protective measures	: Wear chemically resistant combination with 'basic' en	
Effectiveness (of a measure)	: 90 %	
Additional good practice advice bey	yond the REACH Chemical Sa	fety Assessment

Additional good practice advice : Wear solely goggles.

7.3. ES 7 Exposure estimation and reference to its source

7.3.2 ES7 - CS2: Worker exposure: Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition) (PROC1, PROC2, PROC3)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	0,003
combined routes	ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	0,004
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	0,01
combined routes	ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	0,38
Worker - inhalative, long-term	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or	0,22



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- local and systemic	formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003

	oonaliony	
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in	0,23
	the chemical industry in closed batch processes with	
	occasional controlled exposure or processes with	
	equivalent containment condition	

7.3.3 ES 7 - CS 3: Worker exposure: Professional use (Chemical production where opportunity for exposure arises, Mixing or blending in batch processes) (PROC4, PROC5)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,74
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,80
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0, Mixing or blending in batch processes)	0,74
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0, Mixing or blending in batch processes)	0,01
combined routes	ECETOC TRA worker v2.0, Mixing or blending in batch processes	0,75

7.3.4 ES 7 - CS 4: Worker exposure: Professional use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,50

7.3.5 ES 7 - CS 5: Worker exposure: Professional use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

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Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,74
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities	0,80
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,74
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	0,80

7.3.6 ES 7 - CS 6: Worker exposure: Professional use (Roller application or brushing) (PROC10)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	2,74 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03
combined routes	ECETOC TRA worker v2.0	0,40

7.3.7 ES 7 - CS 7: Worker exposure: Professional use (Non-industrial spraying) (PROC11)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	14,05 mg/m ³ (Stoffenmanager v4.0)	0,40
Worker - dermal, long-term - systemic	53,75 mg/kg bw/day (RISKOFDERM v2.1)	0,51
combined routes	Not applicable	0,91

7.3.8 ES 7 - CS 8: Worker exposure: Professional use (Treatment of articles by dipping and pouring, Tabletting, compression, extrusion, pelettisation, granulation) (PROC13, PROC14)



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Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term	25,88 mg/m ³ (ECETOC TRA worker v2.0, Treatment of	0,74
- local and systemic	articles by dipping and pouring)	
Worker - dermal, long-term -	1,37 mg/kg bw/day (ECETOC TRA worker v2.0,	0,01
systemic	Treatment of articles by dipping and pouring)	
combined routes	ECETOC TRA worker v2.0, Treatment of articles by	0,75
	dipping and pouring	
Worker - inhalative, long-term	25,88 mg/m ³ (ECETOC TRA worker v2.0, Tabletting,	0,74
- local and systemic	compression, extrusion, pelettisation, granulation)	
Worker - dermal, long-term -	3,43 mg/kg bw/day (ECETOC TRA worker v2.0,	0,03
systemic	Tabletting, compression, extrusion, pelettisation,	
	granulation)	
combined routes	ECETOC TRA worker v2.0, Tabletting, compression,	0,77
	extrusion, pelettisation, granulation	

7.3.9 ES 7 - CS 9: Worker exposure: Professional use (Use as laboratory reagent) (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,37

7.3.10 ES 7 - CS 10: Worker exposure: Professional use (Manual activities involving hand contact) (PROC19)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	6,47 mg/m ³ (ECETOC TRA worker v2.0)	0,18
Worker - dermal, long-term - systemic	14,14 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,31

7.4. ES 7 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2





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8. ES 8: Consumer use; Coatings and paints, thinners, paint removers, Surface treatment

8.1. Title section

	Coatings and paints, thinners, paint removers (PC9a) Non-metal surface treatment products (PC15)		
	d toners (PC18)		
	es and wax blends (PC31)		
	ants, greases, release products (PC24)		
Textile	e dyes and impregnating products (PC34)		
Enviro	nment		
CS1:	Consumer use (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use leading to inclusion into/onto article (indoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor), Widespread use leading to inclusion into/onto article (outdoor))	ERC8a, ERC8c, ERC8d, ERC8f	
Consu	mer		
CS2:	Consumer use (Coatings and paints, thinners, paint removers, Non- metal surface treatment products)	PC9a, PC15	
CS3:	Consumer use (Coatings and paints, thinners, paint removers, Non- metal surface treatment products)	PC9a, PC15	
CS4:	Consumer use (Ink and toners)	PC18	
CS5:		PC18	
CS6:	Consumer use (Polishes and wax blends)	PC31	

8.2. ES 8 Conditions of use affecting exposure

8.2.1 ES 8 - CS 1: Control of environmental exposure: Consumer use (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use leading to inclusion into/onto article (indoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor), Widespread use leading to inclusion into or onto article, outdoor), Widespread use leading to inclusion into/onto article (outdoor)) (ERC8a, ERC8c, ERC8d, ERC8f)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

8.2.2 ES 8 - CS 2: Control of consumer exposure: Consumer use (Coatings and paints, thinners, paint removers, Non-metal surface treatment products) (PC9a, PC15)

Remarks

: Waterborne paint Rolling, Brushing No spraying



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Concentration of the Substance in	: <= 5 %
Mixture/Article	
Molecular weight	: 45 g/mol
Physical Form (at time of use)	: Liquid
Vapour pressure	: 0,123 hPa
Amount used	
Amounts used	: 1,25 kg/day
Frequency and duration of use	
Application duration	: 120 min
Frequency of use	: 1 days per year
Exposure duration	: 132 min
Human factors not influenced by ris	sk management
Dermal exposure	: Assumes that potential dermal contact is limited to hands and
	forearms.
Covers skin contact area up to	
Dermal	: 0,00003 kg/min
Other given operational conditions	
Outdoor / Indoor	: Indoor use
Room size	: 20 m3
Temperature	: 25 °C
Ventilation rate per hour	: 0,6
Mass transfer rate	: 0,331 m/min
Release area	: 10 m2
	o protection of consumer (e.g. behavioural advice,
personal protection and hygiene) Consumer Measures	: No specific measures identified.
	·
	nsumer exposure: Consumer use (Coatings and s, Non-metal surface treatment products) (PC9a, PC15)
Remarks	: Spraying
Product characteristics	
Concentration of the Substance in	: <= 5 %
Mixture/Article	
Physical Form (at time of use)	: Liquid
Vapour pressure	: Liquid : 0,123 hPa
vapour pressure	. 0,123 IFa
Amount used	
Amounts used	: 0,0198 kg/min
Eroquonov and duration of use	
Frequency and duration of use	• 15 min
Application duration Frequency of use	: 15 min : 2 days per year
Exposure duration	: 2 days per year : 15 min



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Human factors not influenced by risk management

: Assumes that potential dermal contact is limited to hands and Dermal exposure forearms.

Covers skin contact area up to	: 1900 cm ²
Dermal	: 0,0001 kg/min
Uptake fraction, Oral	: 100 %

Other given operational conditions affecting consumers exposure

Outdoor / Indoor	:	Indoor use
Room size	:	34 m3
Temperature	:	25 °C
Ventilation rate per hour	:	1,5
Room height	:	2,25 m
Weight percent	:	30 %
Remarks	:	Non-Volatile
Density	:	1,5 g/cm3
Remarks	:	Non-Volatile
Airborne fraction	:	100 %
Remarks	:	Non-Volatile
Inhalation cut-off diameter	:	0,015 mm

Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)

Consumer Measures

: Ensure spraying away from persons.

8.2.4 ES 8 - CS 4: Control of consumer exposure: Consumer use (Ink and toners) (PC18)

Remarks	:	Refilling
Product characteristics Concentration of the Substance in Mixture/Article	:	<= 5 %
Molecular weight Physical Form (at time of use) Vapour pressure	:	22 g/mol Liquid 0,123 hPa
Amount used Amount per use	:	0,05 kg
Frequency and duration of use		
Application duration	:	0,3 min
Frequency of use	:	104 days per year
Exposure duration	:	0,75 min
Human factors not influenced by risk Dermal exposure		nanagement Palm of one hand

Covers skin contact area up to

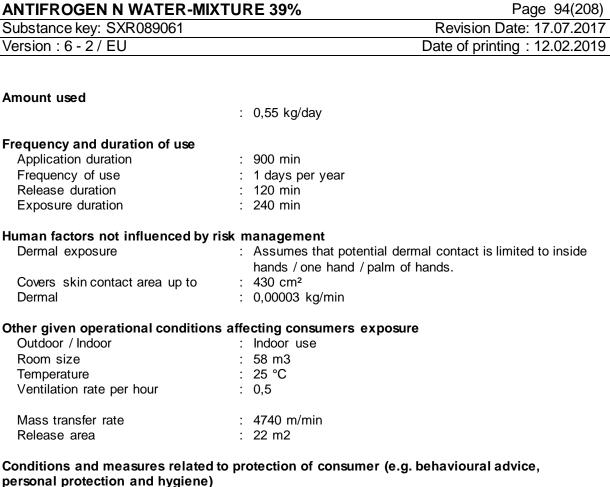
Other given operational conditions affecting consumers exposure

: 215 cm²



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: Indoor uso	
. 0,3	
: 0,331 m/min	
: 20 cm ²	
o protection of consumer (e.g. b	ehavioural advice,
: No specific measures identifie	ed.
nsumer exposure:Consume	r use (Ink and toners)
: Printing process	
· ~- 5 %	
: Liquid	
: 0,123 hPa	
: 0,016 kg/day	
: 600 min	
: 365 days per year	
affecting consumers exposure	
: Indoor use	
: 25 m3	
: 25 °C	
	 : 20 cm² protection of consumer (e.g. b) : No specific measures identified nsumer exposure: Consumer : Printing process : <= 5 % : Liquid : 0,123 hPa : 0,016 kg/day : 600 min : 365 days per year affecting consumers exposure : Indoor use

Remarks	:	No spraying
Product characteristics Concentration of the Substance in Mixture/Article	:	<= 2,5 %
Molecular weight Physical Form (at time of use) Vapour pressure	:	272 g/mol Liquid 0,123 hPa



Consumer Measures

: No specific measures identified.

8.3. ES 8 Exposure estimation and reference to its source

8.3.2 ES 8 - CS 2: Consumer exposure: Consumer use (Coatings and paints, thinners, paint removers, Non-metal surface treatment products) (PC9a, PC15)

Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long- term - local and systemic	0,72 mg/m ³ (Consexpo V4.1)	0,10
Chronic dermal systemic exposure	2,77 mg/kg bw/day (Consexpo V4.1)	0,05
Consumer - oral, long-term - systemic	Consexpo V4.1, Not applicable	
combined routes	Consexpo V4.1	0,15

8.3.3 ES 8 - CS 3: Consumer exposure: Consumer use (Coatings and paints, thinners, paint removers, Non-metal surface treatment products) (PC9a, PC15)





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Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long- term - local and systemic	0,26 mg/m ³ (Consexpo V4.1)	0,04
Chronic dermal systemic exposure	1,15 mg/kg bw/day (Consexpo V4.1)	0,02
Consumer - oral, long-term - systemic	0,13 mg/kg bw/day (Consexpo V4.1, Risk management measures are based on qualitative risk characterisation.)	
combined routes	Consexpo V4.1	0,06

8.3.4 ES 8 - CS 4: Consumer exposure: Consumer use (Ink and toners) (PC18)

Route of exposure and type of effects	Exposure estimate	RCR
Chronic dermal systemic exposure	0,008 mg/kg bw/day (Consexpo V4.1)	0,0002

8.3.5 ES 8 - CS 5: Consumer exposure: Consumer use (Ink and toners) (PC18)

Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long- term - local and systemic	1,29 mg/m ³ (Consexpo V4.1)	0,18

8.3.6 ES 8 - CS 6: Consumer exposure: Consumer use (Polishes and wax blends) (PC31)

Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long- term - local and systemic	3,93 mg/m ³ (Consexpo V4.1)	0,56
Chronic dermal systemic exposure	2,12 mg/kg bw/day (Consexpo V4.1)	0,04
combined routes	Consexpo V4.1	0,60

8.4. ES 8 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

9. ES 9: Industrial use; Use in cleaning agents



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9.1. Title section

— ·		
Enviro		
CS1:	Industrial use (Use of non-reactive processing aid at industrial site (no inclusion into or onto article))	ERC4
Worke	·//	
		00004
CS2:	Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	PROC1
CS3:	Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	PROC2
CS4:	Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises)	PROC3, PROC4
CS5:	Industrial use (Industrial spraying)	PROC7
CS6:	Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a
CS7:	Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities)	PROC8b
CS8:	Industrial use (Roller application or brushing)	PROC10
CS9:	Industrial use (Treatment of articles by dipping and pouring)	PROC13

9.2. ES 9 Conditions of use affecting exposure

9.2.1 ES 9 - CS 1: Control of environmental exposure: Industrial use (Use of non-reactive processing aid at industrial site (no inclusion into or onto article)) (ERC4)

Remarks	: As no environmental hazard was identified no environmental- related exposure assessment and risk characterization was performed.
Concentration of the Substance in Mixture/Article	: <= 100 %

9.2.2 ES 9 - CS 2: Control of worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa

Frequency and duration of use



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Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ris Dermal exposure Covers skin contact area up to	: Palm of one hand	
Other operational conditions affecti Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures	: Chemical production or refinery in closed pro likelihood of exposure or processes with equ containment conditions Sample via a closed loop or other system to	livalent
Additional good practice advice bey Additional good practice advice	rond the REACH Chemical Safety Assessment : Wear solely goggles.	:
	rker exposure: Industrial use (Chemical p ocess with occasional controlled exposu inment conditions) (PROC2)	
Product characteristics		
Concentration of the Substance in Mixture/Article	: <= 100 %	
	 : <= 100 % : Low volatile liquid : 0,123 hPa 	
Mixture/Article Physical Form (at time of use)	: Low volatile liquid	
Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration	 Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year k management Assumes that potential dermal contact is lim 	ited to inside
Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris	 Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year k management 	ited to inside
Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure	 Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year k management Assumes that potential dermal contact is lim hands / one hand / palm of hands. 480 cm² 	ited to inside

Additional good practice advice : Wear solely goggles.

9.2.4 ES 9 - CS 4: Control of worker exposure: Industrial use (Manufacture or



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formulation in the chemical indu controlled exposure or processe production where opportunity fo	es with equivalent conta	inment condition, Chemical
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ris Dermal exposure Covers skin contact area up to Remarks Dermal exposure Covers skin contact area up to Remarks	 Palm of one hand 240 cm² Manufacture or formulat batch processes with or processes with equivaler Assumes that potential hands / one hand / palm 480 cm² 	ion in the chemical industry in closed ccasional controlled exposure or nt containment condition dermal contact is limited to inside n of hands. here opportunity for exposure arises
Other operational conditions affecting Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures Note	batch processes with or processes with equivale	ion in the chemical industry in closed ccasional controlled exposure or nt containment condition here opportunity for exposure arises
Additional good practice advice bey Additional good practice advice		
9.2.5 ES 9 - CS 5: Control of wo (PROC7)	rker exposure: Industria	al use (Industrial spraying)
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	

Amount used

Amounts used : 0,6 L/min



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requency and duration of use		
Exposure duration	: 360 min	
Frequency of use	: <= 5 days per week	
r requeries of use		
Other operational conditions affect		
Outdoor / Indoor	: Indoor use	
Room size	: >1000 m3	
Risk Management Measures		
Technical conditions and	: Local exhaust ventil	ation
measures		
Effectiveness (of a measure)	: 50 %	
Note	: Ensure that the dire	ction of airflow is clearly away from the
	worker.	, ,
Personal protective measures	: Wear chemically res	sistant gloves (tested to EN374) in
		asic' employee training.
Effectiveness (of a measure)	: 90 %	
Personal protective measures	: Wear suitable prote	ctive clothing.
	Wear suitable cover	alls to prevent exposure to the skin.
Effectiveness (of a measure)	: 80 %	
Organisational measures to	: Ensure that the dist	ance from worker to task is greater than
prevent /limit releases, dispersion	m.	
and exposure		
Organisational measures to	: Ensure that direction	n of application is only horizontal or
prevent /limit releases, dispersion	downward.	
and exposure		
Organisational measures to	: Regular cleaning of	work area
prevent /limit releases, dispersion		
and exposure		
Organisational measures to	: Regular cleaning of	equipment
prevent /limit releases, dispersion	- 0	
and exposure		
Organisational measures to	: Ensure regular insp	ection, cleaning and maintenance of
prevent /limit releases, dispersion	equipment and mac	
and exposure		

Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

9.2.6 ES 9 - CS 6: Control of worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Product characteristics Concentration of the Substance in : <= 100 % Mixture/Article



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Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	r
Human factors not influenced by	risk management	
Dermal exposure		al dermal contact is limited to hands.
Covers skin contact area up to		
Other operational conditions affect	ting workers exposure	
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Exposure routes	: inhalative	
Technical conditions and measures	: Local exhaust ventilat	tion
Effectiveness (of a measure)	: 90 %	
Personal protective measures		not practical:
·	Wear suitable respira	tory protection.
Effectiveness (of a measure)	: 90 %	
Additional good practice advice b Additional good practice advice		cal Safety Assessment
	, , , , , , , , , , , , , , , , , , , ,	

9.2.7 ES 9 - CS 7: Control of worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities) (PROC8b)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by ris	 c management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Covers skin contact area up to	•
Other operational conditions affectin Outdoor / Indoor	ng workers exposure : Indoor use
Risk Management Measures Note	: Transfer of substance or mixture (charging/discharging) at dedicated facilities

No specific measures identified.



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Additional good practice advice bey		
Additional good practice advice	: Wear solely goggles.	
9.2.8 ES 9 - CS 8: Control of wo brushing) (PROC10)	rker exposure: Indus	trial use (Roller application or
Product characteristics Concentration of the Substance in	: <= 100 %	
Mixture/Article		
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per yea	r
Human factors not influenced by ris		
Dermal exposure Covers skin contact area up to		ial dermal contact is limited to hands.
Risk Management Measures Exposure routes Personal protective measures Effectiveness (of a measure)		istant gloves (tested to EN374) in sic' employee training.
Additional good practice advice bey Additional good practice advice		cal Safety Assessment
9.2.9 ES 9 - CS 9: Control of wo by dipping and pouring) (PROC1		trial use (Treatment of articles
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per yea	r
Human factors not influenced by ris		
Dermal exposure		ial dermal contact is limited to inside
Covers skin contact area up to	hands / one hand / pa : 480 cm ²	am or nanos.
Covers skin contact area up to	. 400 UIII-	



ANTIFROGEN N WATER-MIX	FURE 39% Page 102(208)
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Other operational conditions affecti	ing workers exposure
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Exposure routes	: Dermal
Personal protective measures	: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Effectiveness (of a measure)	: 90 %
Additional good practice advice be Additional good practice advice	yond the REACH Chemical Safety Assessment : Wear solely goggles.

9.3. ES 9 Exposure estimation and reference to its source

9.3.2 ES 9 - CS 2: Worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

9.3.3 ES 9 - CS 3: Worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,08

9.3.4 ES 9 - CS 4: Worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)



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Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,43

9.3.5 ES 9 - CS 5: Worker exposure: Industrial use (Industrial spraying) (PROC7)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	9,79 mg/m ³ (Stoffenmanager v4.0)	0,28
Worker - dermal, long-term - systemic	54,6 mg/kg bw/day (RISKOFDERM v2.1)	0,52
combined routes	Not applicable	0,80

9.3.6 ES 9 - CS 6: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,20

9.3.7 ES 9 - CS 7: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities) (PROC8b)



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Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0)	0,06
combined routes	ECETOC TRA worker v2.0	0,43

9.3.8 ES 9 - CS 8: Worker exposure: Industrial use (Roller application or brushing) (PROC10)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,87 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	2,74 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03
combined routes	ECETOC TRA worker v2.0	0,77

9.3.9 ES 9 - CS 9: Worker exposure: Industrial use (Treatment of articles by dipping and pouring) (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,87 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,75

9.4. ES 9 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

10. ES 10: Professional use; Use in cleaning agents

10.1. Title section

Environment



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	processing aid (no inclusion into or onto article, outdoor))	
Worke	ers	
CS2:	Professional use (Chemical production or refinery in closed proce without likelihood of exposure or processes with equivalent conta conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions, Manufacture or formulation in chemical industry in closed batch processes with occasional cont exposure or processes with equivalent containment condition)	ainment PROC3
CS3:	Professional use (Chemical production where opportunity for exparises)	posure PROC4
CS4:	Professional use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a
CS5:		PROC8b
CS6:	Professional use (Roller application or brushing)	PROC10
CS7:	Professional use (Non-industrial spraying)	PROC11
CS8:	Professional use (Treatment of articles by dipping and pouring)	PROC13

10.2. ES 10 Conditions of use affecting exposure

10.2.1 ES 10 - CS 1: Control of environmental exposure: Professional use (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)) (ERC8a, ERC8d)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

10.2.2 ES 10 - CS 2: Control of worker exposure: Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition) (PROC1, PROC2, PROC3)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year



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Human factors not influenced by risk	management	
Dermal exposure Covers skin contact area up to Remarks	 Palm of one hand 240 cm² Chemical production or likelihood of exposure of containment conditions chemical industry in clo controlled exposure or condition 	refinery in closed process without or processes with equivalent , Manufacture or formulation in the osed batch processes with occasional processes with equivalent containment
Dermal exposure	 Assumes that potential hands / one hand / pair 480 cm² 	dermal contact is limited to inside n of hands.
Covers skin contact area up to Remarks	: Chemical production or	refinery in closed continuous process ed exposure or processes with conditions
Other operational conditions affectin Outdoor / Indoor	g workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures	•	refinery in closed process without or processes with equivalent
	Sample via a closed loo	op or other system to avoid exposure.
Technical conditions and measures		refinery in closed continuous process ed exposure or processes with conditions
Technical conditions and measures	batch processes with o	tion in the chemical industry in closed ccasional controlled exposure or ent containment condition led exposure
Additional good practice advice bevo		

Additional good practice advice beyond the REACH Chemical Safety Assessment

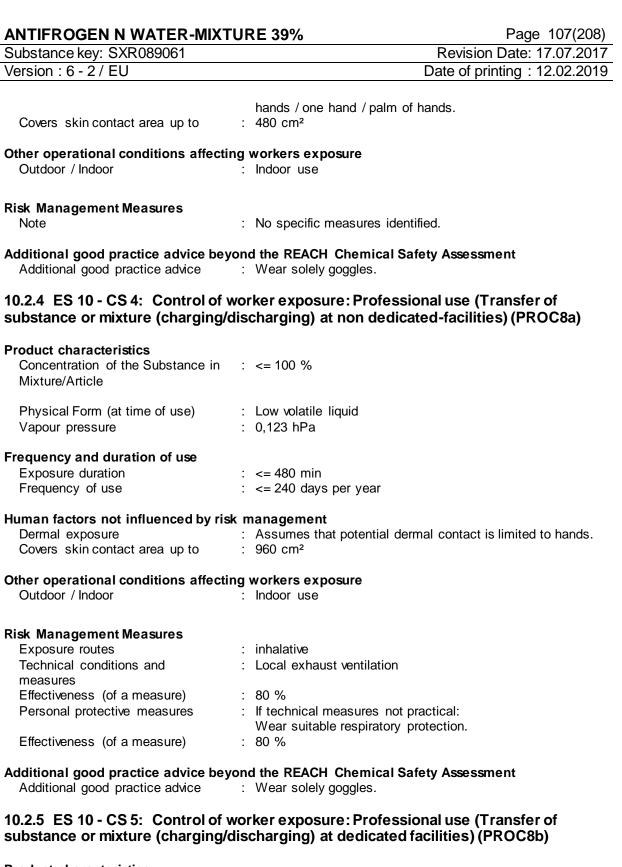
Additional good practice advice : Wear solely goggles.

10.2.3 ES 10 - CS 3: Control of worker exposure: Professional use (Chemical production where opportunity for exposure arises) (PROC4)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year

Human factors not influenced by risk management

Dermal exposure : Assumes that potential dermal contact is limited to inside



Product characteristics Concentration of the Substance in : <= 100 % Mixture/Article





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	· · · · · · · · · · · · · · · · · · ·
Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by ris	k management
Dermal exposure	: Assumes that potential dermal contact is limited to inside
	hands / one hand / palm of hands.
Covers skin contact area up to	•
Other operational conditions affectin	
Outdoor / Indoor	: Indoor use
Diele Management Magazine	
Risk Management Measures Note	: No specific measures identified.
NOLE	. No specific measures identified.
Additional good practice advice bey	ond the REACH Chemical Safety Assessment
Additional good practice advice	
or brushing) (PROC10) Product characteristics	worker exposure: Professional use (Roller application
or brushing) (PROC10)	
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use)	: <= 100 % : Low volatile liquid
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure	 : <= 100 % : Low volatile liquid : 0,123 hPa
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use	 : <= 100 % : Low volatile liquid : 0,123 hPa
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year sk management
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year sk management : Assumes that potential dermal contact is limited to hands. : 960 cm²
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affecting	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to hands. : 960 cm² ng workers exposure
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year sk management : Assumes that potential dermal contact is limited to hands. : 960 cm²
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affectin Outdoor / Indoor	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to hands. : 960 cm² ng workers exposure
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affectin Outdoor / Indoor Risk Management Measures	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to hands. : 960 cm² ng workers exposure : Indoor use
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affectin Outdoor / Indoor Risk Management Measures Exposure routes	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year sk management : Assumes that potential dermal contact is limited to hands. : 960 cm² ng workers exposure : Indoor use : inhalative
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affectin Outdoor / Indoor Risk Management Measures	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to hands. : 960 cm² ng workers exposure : Indoor use
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affectin Outdoor / Indoor Risk Management Measures Exposure routes Technical conditions and measures	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year sk management : Assumes that potential dermal contact is limited to hands. : 960 cm² ng workers exposure : Indoor use : inhalative
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affectint Outdoor / Indoor Risk Management Measures Exposure routes Technical conditions and measures Effectiveness (of a measure)	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to hands. : 960 cm² ng workers exposure : Indoor use : inhalative : Local exhaust ventilation : 80 %
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affectin Outdoor / Indoor Risk Management Measures Exposure routes Technical conditions and measures	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to hands. : 960 cm² ng workers exposure : Indoor use : inhalative : Local exhaust ventilation
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affectint Outdoor / Indoor Risk Management Measures Exposure routes Technical conditions and measures Effectiveness (of a measure)	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to hands. : 960 cm² ng workers exposure : Indoor use : inhalative : Local exhaust ventilation : 80 % : If technical measures not practical:
or brushing) (PROC10) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affectint Outdoor / Indoor Risk Management Measures Exposure routes Technical conditions and measures Effectiveness (of a measure) Personal protective measures	 : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to hands. : 960 cm² ng workers exposure : Indoor use : inhalative : Local exhaust ventilation : 80 % : If technical measures not practical: Wear suitable respiratory protection.



Substance key: SXR089061		Revision Date: 17.07.201
Version : 6 - 2 / EU		Date of printing : 12.02.2019
Personal protective measures	: Wear chemically resis combination with 'bas	stant gloves (tested to EN374) in ic' employee training.
Effectiveness (of a measure)	: 90 %	
Additional good practice advice bey Additional good practice advice		al Safety Assessment
10.2.7 ES 10 - CS 7: Control of v spraying) (PROC11)	worker exposure: Prof	essional use (Non-industrial
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Amount used		
Amounts used	: 0,05 L/min	
Frequency and duration of use		
Exposure duration	: 150 min	
Frequency of use	: <= 5 days per week	
Other operational conditions affecti	ng workers exposure	
Outdoor / Indoor	: Indoor use	
Room size	: <= 1000 m3	
Pisk Managamant Maasuras		
Risk Management Measures Personal protective measures	· Wear chemically resis	stant gloves (tested to EN374) in
	combination with 'bas	
Effectiveness (of a measure)	: 90 %	
Personal protective measures	: Wear suitable protecti	
Effectiveness (of a measure)	Wear suitable coverall : 80 %	Is to prevent exposure to the skin.
Ellectiveness (or a measure)	. 00 %	
Personal protective measures Effectiveness (of a measure)	: Wear a respirator con : 40 %	forming to EN140.
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that direction downward.	of application is only horizontal or
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that the distan m.	nce from worker to task is greater thar
Organisational measures to prevent /limit releases, dispersion	: Ensure that the direct worker.	ion of airflow is clearly away from the
and exposure Note	: Not applicable	
Note	. Not applicable	



ANTIFROGEN N WATER-MIX	FURE 39%	Page 110(208)
Substance key: SXR089061		Revision Date: 17.07.2017
Version : 6 - 2 / EU		Date of printing : 12.02.2019
Organisational measures to prevent /limit releases, dispersion and exposure	: Provide enhanced ger	neral ventilation by mechanical means
Organisational measures to prevent /limit releases, dispersion and exposure	: Regular cleaning of we	ork area
Organisational measures to prevent /limit releases, dispersion and exposure	: Regular cleaning of ec	quipment
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure regular inspec equipment and machir	tion, cleaning and maintenance of nes.
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that the task is worker simultaneously	not carried out by more than one

Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

10.2.8 ES 10 - CS 8: Control of worker exposure: Professional use (Treatment of articles by dipping and pouring) (PROC13)

Product characteristics Concentration of the Substance in Mixture/Article	:	<= 100 %
Concentration of the Substance in Mixture/Article	:	<= 100 %
Physical Form (at time of use) Vapour pressure		Low volatile liquid 0,123 hPa
Frequency and duration of use Exposure duration Frequency of use	-	<= 480 min <= 240 days per year
Human factors not influenced by ris	sk n	nanagement
Human factors not influenced by ris Dermal exposure		Assumes that potential dermal contact is limited to inside
	:	-
Dermal exposure Covers skin contact area up to Other operational conditions affecti	:	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm ²
Dermal exposure Covers skin contact area up to	: : ing	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm ²
Dermal exposure Covers skin contact area up to Other operational conditions affecti	: : ing	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm ² workers exposure
Dermal exposure Covers skin contact area up to Other operational conditions affection Outdoor / Indoor	ing	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm ² workers exposure



ANTIFROGEN N WATER-MIXTURE 39%	Page 111(208)
Substance key: SXR089061	Revision Date: 17.07.2017
Version : 6 - 2 / EU	Date of printing: 12.02.2019

Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

10.3. ES 10 Exposure estimation and reference to its source

10.3.2 ES 10 - CS 2: Worker exposure: Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition) (PROC1, PROC2, PROC3)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	0,003
combined routes	ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	0,004
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	0,01
combined routes	ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	0,38
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003



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Substance key: SXR089061	Revision Date: 17	.07.2017
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combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23

10.3.3 ES 10 - CS 3: Worker exposure: Professional use (Chemical production where opportunity for exposure arises) (PROC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0)	0,06
combined routes	ECETOC TRA worker v2.0	0,80

10.3.4 ES 10 - CS 4: Worker exposure: Professional use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,50

10.3.5 ES 10 - CS 5: Worker exposure: Professional use (Transfer of substance or mixture (charging/discharging) at dedicated facilities) (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,74
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities	0,80

10.3.6 ES 10 - CS 6: Worker exposure: Professional use (Roller application or brushing) (PROC10)

Route of exposure and type	Exposure estimate	RCR	
of effects			

combined routes



0,40

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Version : 6 - 2 / EU	Date of printing : 12	2.02.2019
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	2,74 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03

10.3.7 ES 10 - CS 7: Worker exposure: Professional use (Non-industrial spraying) (PROC11)

ECETOC TRA worker v2.0

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	14,05 mg/m ³ (Stoffenmanager v4.0)	0,40
Worker - dermal, long-term - systemic	53,75 mg/kg bw/day (RISKOFDERM v2.1)	0,51
combined routes	Not applicable	0,91

10.3.8 ES 10 - CS 8: Worker exposure: Professional use (Treatment of articles by dipping and pouring) (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0, Treatment of articles by dipping and pouring)	0,74
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0, Treatment of articles by dipping and pouring)	0,01
combined routes	ECETOC TRA worker v2.0, Treatment of articles by dipping and pouring	0,75

10.4. ES 10 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

11. ES 11: Consumer use; Use in cleaning agents

11.1. Title section

 Washing and cleaning products (PC35)

 Environment

 CS1:
 Consumer use (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use of non-reactive



ANTIFROGEN N WATER-MIXTURE 39%	Page 114(208)
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processing aid (no inclusion into or onto article, outdoor))	
Consumer	
CS2: Consumer use (Washing and cleaning products)	PC35
CS3: Consumer use (Washing and cleaning products)	PC35
CS4: Consumer use (Washing and cleaning products)	PC35
CS5: Consumer use (Washing and cleaning products)	PC35
CS6: Consumer use (Washing and cleaning products)	PC35
CS7: Consumer use (Washing and cleaning products)	PC35

11.2. ES 11 Conditions of use affecting exposure

11.2.1 ES 11 - CS 1: Control of environmental exposure: Consumer use (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)) (ERC8a, ERC8d)

Remarks	:	As no environmental hazard was identified no environmental- related exposure assessment and risk characterization was performed.
11.2.2 ES 11 - CS 2: Control of co cleaning products) (PC35)	on	sumer exposure: Consumer use (Washing and
Remarks	:	No spraying Default database: cleaning and washing/all purpose cleaner/liquid/mixing and loading
Product characteristics Concentration of the Substance in Mixture/Article	:	<= 20 %
Molecular weight Physical Form (at time of use) Vapour pressure	:	22 g/mol Liquid 0,123 hPa
Amount used Amounts used	:	0,5 kg/day
Frequency and duration of use		

riequency and daration of dee	
Application duration	: 0,3 min
Frequency of use	: 104 days per year
Exposure duration	: 0,75 min

Human factors not influenced by risk	m	nanagement
Dermal exposure	:	Palm of one hand
Covers skin contact area up to	:	215 cm ²

Other given operational conditions affecting consumers exposure



ANTIFROGEN N WATER-MIXT	JRE 39%	Page 115(208)
Substance key: SXR089061		Revision Date: 17.07.2017
Version : 6 - 2 / EU		Date of printing : 12.02.2019
Outdoor / Indoor Temperature Ventilation rate per hour Mass transfer rate	: Indoor use : 25 °C : 0,5 : 4740 m/min	
Release area	: 20 cm ²	
Conditions and measures related to personal protection and hygiene) Consumer Measures	protection of consumer (e.	-
11.2.3 ES 11 - CS 3: Control of co cleaning products) (PC35)	onsumer exposure: Con	sumer use (Washing and
Remarks	: No spraying Application	
Product characteristics Concentration of the Substance in Mixture/Article	: <= 4 %	
Molecular weight Physical Form (at time of use) Vapour pressure	: 18 g/mol : Liquid : 0,123 hPa	
Amount used Amounts used	: 0,4 kg/day	
Frequency and duration of use Application duration Frequency of use Exposure duration	: 20 min : 104 days per year : 240 min	
Human factors not influenced by risk Dermal exposure Covers skin contact area up to	 management Palm of one hand 215 cm² 	
Other given operational conditions a Outdoor / Indoor Room size Temperature Ventilation rate per hour	ffecting consumers exposu : Indoor use : 58 m3 : 25 °C : 0,5	ıre
Mass transfer rate Release area	: 4740 m/min : 10 m2	
Conditions and measures related to personal protection and hygiene) Consumer Measures	protection of consumer (e.	-

11.2.4 ES 11 - CS 4: Control of consumer exposure: Consumer use (Washing and cleaning products) (PC35)



Version: 6 - 2 / EU Remarks : Sprays Spraying Product characteristics Concentration of the Substance in Mixture/Article : <= 5 % Physical Form (at time of use) : Liquid Vapour pressure : 0,123 hPa Amount used Amount used : 0,0468 kg/min Frequency and duration of use Spray duration : 0,41 min Frequency of use Spray duration : 0,41 min Frequency of use Release duration : 2,6 s Human factors not influenced by risk management Dermal exposure : Assumes that poten forearms. Covers skin contact area up to Dermal : 1900 cm ² 0,000046 kg/min Uptake fraction, Oral : 100 % Other given operational conditions affecting consumers e Outdoor / Indoor : Indoor use 15 m3 Temperature	tial darmal contact is limited to bands and
Spraying Product characteristics Concentration of the Substance in : <= 5 % Mixture/Article Physical Form (at time of use) : Uiquid Vapour pressure : 0,123 hPa Amount used Amounts used : 0,0468 kg/min Frequency and duration of use Spray duration : 0,41 min Frequency of use : 365 days per year Exposure duration : 2,6 s Human factors not influenced by risk management Dermal exposure : Assumes that poten Covers skin contact area up to : 1900 cm² Dermal : 0,000046 kg/min Uptake fraction, Oral : 100 % Other given operational conditions affecting consumers e Outdoor / Indoor : Indoor use Room size : 15 m3 Temperature : 25 °C	tial darmal contact is limited to bands and
Concentration of the Substance in : <= 5 % Mixture/Article Physical Form (at time of use) : Liquid Vapour pressure : 0,123 hPa Amount used Amounts used : 0,0468 kg/min Frequency and duration of use Spray duration : 0,41 min Frequency of use : 365 days per year Exposure duration : 0,41 min Release duration : 2,6 s Human factors not influenced by risk management Dermal exposure : Assumes that poten forearms. Covers skin contact area up to : 1900 cm ² Dermal : 0,000046 kg/min Uptake fraction, Oral : 100 % Other given operational conditions affecting consumers e Outdoor / Indoor : Indoor use Room size : 15 m3 Temperature : 25 °C	tial darmal contact ic limited to bands an
Mixture/Article Physical Form (at time of use) : Liquid Vapour pressure : 0,123 hPa Amount used Amounts used : 0,0468 kg/min Frequency and duration of use Spray duration : 0,41 min Frequency of use : 365 days per year Exposure duration : 60 min Release duration : 2,6 s Human factors not influenced by risk management Dermal exposure : Assumes that poten forearms. Covers skin contact area up to : 1900 cm ² Dermal : 0,000046 kg/min Uptake fraction, Oral : 100 % Other given operational conditions affecting consumers e Outdoor / Indoor : Indoor use Room size : 25 °C	tial dermal contact is limited to bands and
Vapour pressure: 0,123 hPaAmount used: 0,0468 kg/minFrequency and duration of use: 0,0468 kg/minSpray duration: 0,41 minFrequency of use: 365 days per yearExposure duration: 60 minRelease duration: 2,6 sHuman factors not influenced by risk managementDermal exposure: Assumes that poten forearms.Covers skin contact area up to: 1900 cm²Dermal: 0,000046 kg/minUptake fraction, Oral: 100 %Other given operational conditions affecting consumers e Coudoor / Indoor: Indoor use indoor useRoom size: 15 m3 inferenceTemperature: 25 °C	tial dermal contact is limited to bands and
Amounts used: 0,0468 kg/minFrequency and duration of use Spray duration: 0,41 min : 365 days per year : 365 days per year : 60 min : 2,6 sHuman factors not influenced by risk Dermal exposuremanagement : 2,6 sHuman factors not influenced by risk Dermal exposuremanagement : 0,000046 kg/min : 1900 cm² : 0,000046 kg/min Uptake fraction, OralOther given operational conditions affecting consumers e Room size Temperature: 15 m3 : 25 °C	tial dormal contact is limited to bands and
Frequency and duration of useSpray duration: 0,41 minFrequency of use: 365 days per yearExposure duration: 60 minRelease duration: 2,6 sHuman factors not influenced by risk managementDermal exposure: Assumes that poten forearms.Covers skin contact area up to: 1900 cm²Dermal: 0,000046 kg/minUptake fraction, Oral: 100 %Other given operational conditions affecting consumers e Couddoor / Indoor: Indoor useRoom size: 15 m3 TemperatureTemperature: 25 °C	tial darmal contact is limited to bands and
Spray duration: 0,41 minFrequency of use: 365 days per yearExposure duration: 60 minRelease duration: 2,6 sHuman factors not influenced by risk managementDermal exposure: Assumes that poten forearms.Covers skin contact area up to: 1900 cm²Dermal: 0,000046 kg/minUptake fraction, Oral: 100 %Other given operational conditions affecting consumers e Couddoor / Indoor: Indoor useRoom size: 15 m3Temperature: 25 °C	tial darmal contact is limited to bands and
Frequency of use: 365 days per yearExposure duration: 60 minRelease duration: 2,6 sHuman factors not influenced by riskmanagementDermal exposure: Assumes that poten forearms.Covers skin contact area up to: 1900 cm²Dermal: 0,000046 kg/minUptake fraction, Oral: 100 %Other given operational conditions affecting consumers e Outdoor / Indoor: Indoor useRoom size: 15 m3Temperature: 25 °C	tial darmal contact is limited to bands and
Exposure duration: 60 minRelease duration: 2,6 sHuman factors not influenced by risk managementDermal exposure: Assumes that poten forearms.Covers skin contact area up to: 1900 cm² 0,000046 kg/minDermal: 0,000046 kg/min 100 %Uptake fraction, Oral: 100 %Other given operational conditions affecting consumers e Courdoor / Indoor: Indoor use 15 m3 Temperature	tial dormal contact is limited to bands and
Release duration: 2,6 sHuman factors not influenced by risk management Dermal exposure: Assumes that poten forearms.Covers skin contact area up to Dermal Uptake fraction, Oral: 1900 cm² to 0,000046 kg/min to 0,000046 kg/min 	tial dormal contact is limited to bands and
Human factors not influenced by risk management Dermal exposure : Assumes that poten forearms. Covers skin contact area up to : 1900 cm² Dermal : 0,000046 kg/min Uptake fraction, Oral : 100 % Other given operational conditions affecting consumers e Outdoor / Indoor : Indoor use Room size : 15 m3 Temperature : 25 °C	tial dormal contact is limited to bands and
Dermal exposure : Assumes that potent forearms. Covers skin contact area up to : 1900 cm² Dermal : 0,000046 kg/min Uptake fraction, Oral : 100 % Other given operational conditions affecting consumers e Outdoor / Indoor Room size : 15 m3 Temperature : 25 °C	tial darmal contact is limited to hands and
forearms.Covers skin contact area up to Dermal: 1900 cm² : 0,000046 kg/min : 100 %Uptake fraction, Oral: 100 %Other given operational conditions affecting consumers e Outdoor / Indoor Room size Temperature: Indoor use : 15 m3 : 25 °C	tial darmal contact is limited to bands and
Covers skin contact area up to Dermal: 1900 cm² : 0,000046 kg/minUptake fraction, Oral: 100 %Other given operational conditions affecting consumers e Outdoor / Indoor Room size Temperature: Indoor use : 15 m3 : 25 °C	
Dermal: 0,000046 kg/minUptake fraction, Oral: 100 %Other given operational conditions affecting consumers eOutdoor / Indoor: Indoor useRoom size: 15 m3Temperature: 25 °C	
Uptake fraction, Oral: 100 %Other given operational conditions affecting consumers e Outdoor / Indoor: Indoor useRoom size: 15 m3Temperature: 25 °C	
Outdoor / Indoor: Indoor useRoom size: 15 m3Temperature: 25 °C	
Outdoor / Indoor: Indoor useRoom size: 15 m3Temperature: 25 °C	cosure
Temperature : 25 °C	
Ventilation rate per hour : 2,5	
Room height : 2,5 m	
Weight percent : 5 %	
Remarks : Non-Volatile	
Density : 1,8 g/cm3	
Remarks : Non-Volatile	
Airborne fraction : 20 %	
Remarks : Non-Volatile	
Inhalation cut-off diameter : 0,015 mm	
Conditions and measures related to protection of consume	er (e.g. behavioural advice,
personal protection and hygiene)	
Consumer Measures : Ensure spraying aw	ay from persons.
11.2.5 ES 11 - CS 5: Control of consumer exposure: cleaning products) (PC35)	Consumer use (Washing and
Remarks : Sprays	
Remarks : Sprays Cleaning	
Cleaning	

Product characteristics Concentration of the Substance in : <= 5 %



Constrained Rey - Strictopool Techsion Pattern 1101/2011 Version : 6 - 2 / EU Date of printing : 12.02.2019 Mixture/Article Molecular weight : 22 g/mol Physical Form (at time of use) : Liquid Vapour pressure : 0,123 hPa Amount used	ANTIFROGEN N WATER-MIXTO Substance key: SXR089061		Page 117(208) Revision Date: 17.07.2017
Mixture/Article Mixture/Article Molecular weight : 22 g/mol Physical Form (at time of use) : Liquid Vapour pressure : 0,123 hPa Amount used : 0,0162 kg/day Frequency and duration of use Application duration of use Application duration : 10 min Frequency and duration : 60 min Human factors not influenced by risk management Demal exposure Demal exposure : Palm of one hand Covers skin contact area up to : 215 cm² Other given operational conditions affecting consumers exposure Outdoor / Indoor use Room size : 15 m3 Temperature : 25 °C Ventilation rate per hour : 2,5 Mass transfer rate : 17100 cm² Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene) Consumer Measures : No specific measures identified. 11.2.6 ES 11 - C S 6: Control of consumer exposure : Consumer use (Washing and cleaning products) (PC35) Remarks : Floor cleaning (liquids) Mixing operations (open systems) Loading of application equipment Product characteristics Concentration of the Substance in			
Molecular weight : 22 g/mol Physical Form (at time of use) : 1,1quid Vapour pressure : 0,123 hPa Amount used			Date of printing : 12.02.2010
Physical Form (at time of use) : Liquid Vapour pressure : 0,123 hPa Amount used . Amounts used : 0,0162 kg/day Frequency and duration of use : 00 min Application duration : 10 min Frequency of use : 365 days per year Exposure duration : 10 min Human factors not influenced by risk management Dermal exposure : Palm of one hand Covers skin contact area up to : 215 cm² Other given operational conditions affecting consumers exposure Outdoor Indoor Outdoor / Indoor : Indoor use Room size : 15 m3 Temperature : 2,5 Mass transfer rate : 4740 m/min Release area : 17100 cm² Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene) Consumer Measures : No specific measures identified. 11.2.6 ES 11 - CS 6: Control of consumer exposure: Consumer use (Washing and cleaning products) (PC35) Remarks : Floor cleaning (liquids) Mixing operations (open systems) Loading of application equipment Product characteristics <td< td=""><td>Mixture/Article</td><td></td><td></td></td<>	Mixture/Article		
Vapour pressure : 0,123 hPa Amount used : Amounts used : 0,0162 kg/day Frequency and duration of use : 10 min Application duration : 10 min Frequency of use : 365 days per year Exposure duration : 00 min Huma factors not influenced by risk management Dermal exposure Dermal exposure : Palm of one hand Covers skin contact area up to : 215 cm² Other given operational conditions affecting consumers exposure Outdoor / Indoor Outdoor / Indoor : Indoor use Room size : 15 m3 Temperature : 225 °C Ventilation rate per hour : 2,5 Mass transfer rate : 4740 m/min Release area : 17100 cm² Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene) Consumer Measures : No specific measures identified. 11.2.6 ES 11 - CS 6: Control of consumer exposure: Consumer use (Washing and cleaning products) (PC35) Remarks : Floor cleaning (liquids) Mixing operations (open systems) Loading of application equipment			
Amount used : 0,0162 kg/day Frequency and duration of use : 0 min Application duration : 10 min Frequency of use : 365 days per year Exposure duration : 0 min Human factors not influenced by risk management : Dermal exposure : Palm of one hand Covers skin contact area up to : 215 cm ² Other given operational conditions affecting consumers exposure : Outdoor : Indoor use Room size : 15 m3 Temperature : 25 °C Ventilation rate per hour : 2, 5 Mass transfer rate : 4740 m/min Release area : 17100 cm ² Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene) Consumer Measures : No specific measures identified. 11.2.6 ES 11 - CS 6: Control of consumer exposure: Consumer use (Washing and cleaning products) (PC35) Remarks : Floor cleaning (iquids) Mixing operations (open systems) :Loading of application equipment Product characteristics : Concentration of the Substance in : < <2,5 %			
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Substance key: SXR089061 Revision Date: 17.07.2017 Version : 6 - 2 / EU Date of printing : 12.02.2019 Human factors not influenced by risk management Dermal exposure Dermal exposure : Palm of one hand Covers skin contact area up to : 215 cm² Other given operational conditions affecting consumers exposure Outdoor / Indoor Outdoor / Indoor : Indoor use Temperature : 25 °C Ventilation rate per hour : 1,0 Mass transfer rate : 20 cm² Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene) Consumer Measures Consumer Measures : No specific measures identified. 11.2.7 ES 11 - CS 7: Control of consumer exposure: Consumer use (Washing and cleaning products) (PC35) Remarks : Floor cleaning (liquids) Application Product characteristics Concentration of the Substance in : <= 2,5 % Mixture/Article Master advector of use Amount used : 0,88 kg/day Frequency and duration of use : 0,88 kg/day Arequency and duration of use : 240 min Human factors not influenced by risk management Dermal exposure <	ANTIFROGEN N WATER-MIXT	URE 39%	Page 118(208)
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Covers skin contact area up to : 215 cm² Other given operational conditions affecting consumers exposure Outdoor / Indoor : Indoor use Room size : 58 m3 Temperature : 25 °C Ventilation rate per hour : 0,5 Mass transfer rate : 4740 m/min			
Other given operational conditions affecting consumers exposureOutdoor / Indoor: Indoor useRoom size: 58 m3Temperature: 25 °CVentilation rate per hour: 0,5Mass transfer rate: 4740 m/min	•		
Outdoor / Indoor: Indoor useRoom size: 58 m3Temperature: 25 °CVentilation rate per hour: 0,5Mass transfer rate: 4740 m/min	Covers skin contact area up to	: 215 cm ²	
Room size: 58 m3Temperature: 25 °CVentilation rate per hour: 0,5Mass transfer rate: 4740 m/min			osure
Temperature: 25 °CVentilation rate per hour: 0,5Mass transfer rate: 4740 m/min			
Ventilation rate per hour: 0,5Mass transfer rate: 4740 m/min			
Mass transfer rate : 4740 m/min			
	ventilation rate per nour	. 0,5	
Release area : 22 m2	Mass transfer rate	: 4740 m/min	
	Release area	: 22 m2	



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Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)

Consumer Measures

: No specific measures identified.

11.3. ES 11 Exposure estimation and reference to its source

11.3.2 ES 11 - CS 2: Consumer exposure: Consumer use (Washing and cleaning products) (PC35)

Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long- term - local and systemic	0,01 mg/m ³ (Consexpo V4.1)	0,001
Chronic dermal systemic exposure	0,03 mg/kg bw/day (Consexpo V4.1)	0,0006
Consumer - oral, long-term - systemic	Consexpo V4.1, Not applicable	
combined routes	Consexpo V4.1	0,002

11.3.3 ES 11 - CS 3: Consumer exposure: Consumer use (Washing and cleaning products) (PC35)

Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long- term - local and systemic	0,61 mg/m ³ (Consexpo V4.1)	0,09
Chronic dermal systemic exposure	11,70 mg/kg bw/day (Consexpo V4.1)	0,22
Consumer - oral, long-term - systemic	Consexpo V4.1, Not applicable	
combined routes	Consexpo V4.1	0,31

11.3.4 ES 11 - CS 4: Consumer exposure: Consumer use (Washing and cleaning products) (PC35)

Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long-	0,000011 mg/m ³ (Consexpo V4.1)	
term - local and systemic		
Chronic dermal systemic exposure	0,01 mg/kg bw/day (Consexpo V4.1)	0,0002
Consumer - oral, long-term - systemic	0,0006 mg/kg bw/day (Consexpo V4.1)	
combined routes	Consexpo V4.1	0,0002



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11.3.5 ES 11 - CS 5: Consumer exposure: Consumer use (Washing and cleaning products) (PC35)

Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long- term - local and systemic	0,11 mg/m ³ (Consexpo V4.1)	0,02
Chronic dermal systemic exposure	0,12 mg/kg bw/day (Consexpo V4.1)	0,002
Consumer - oral, long-term - systemic	Consexpo V4.1, Not applicable	
combined routes	Consexpo V4.1	0,02

11.3.6 ES 11 - CS 6: Consumer exposure: Consumer use (Washing and cleaning products) (PC35)

Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long-	0,01 mg/m ³ (Consexpo V4.1)	0,001
term - local and systemic		
Chronic dermal systemic	0,04 mg/kg bw/day (Consexpo V4.1)	0,0008
exposure		
Consumer - oral, long-term -	Consexpo V4.1, Not applicable	
systemic		
combined routes	Consexpo V4.1	0,002

11.3.7 ES 11 - CS 7: Consumer exposure: Consumer use (Washing and cleaning products) (PC35)

Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long- term - local and systemic	0,38 mg/m ³ (Consexpo V4.1)	0,05
Chronic dermal systemic exposure	7,31 mg/kg bw/day (Consexpo V4.1)	0,14
Consumer - oral, long-term - systemic	Consexpo V4.1, Not applicable	
combined routes	Consexpo V4.1	0,19

11.4. ES 11 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2



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12. ES 12: Industrial use; Use in lubricants

12.1. Title section

Environment			
CS1:	Industrial use (Use of non-reactive processing aid at industrial site (no inclusion into or onto article), Use of functional fluid at industrial site)	ERC4, ERC7	
Worke	rs		
CS2:	Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	PROC1	
CS3:	Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	PROC2	
CS4:	Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises)	PROC3, PROC4	
CS5:	Industrial use (Mixing or blending in batch processes)	PROC5	
CS6:	Industrial use (Industrial spraying)	PROC7	
CS7:	Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a	
CS8:	Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	PROC8b, PROC9	
CS9:	Industrial use (Roller application or brushing)	PROC10	
	Industrial use (Treatment of articles by dipping and pouring)	PROC13	
	Industrial use (Lubrication at high energy conditions in metal working operations, General greasing/lubrication at high kinetic energy conditions)	PROC17, PROC18	

12.2. ES 12 Conditions of use affecting exposure

12.2.1 ES 12 - CS 1: Control of environmental exposure: Industrial use (Use of nonreactive processing aid at industrial site (no inclusion into or onto article), Use of functional fluid at industrial site) (ERC4, ERC7)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

12.2.2 ES 12 - CS 2: Control of worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Note



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Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ris	k management	
Dermal exposure	: Palm of one hand	
Covers skin contact area up to	: 240 cm ²	
Other operational conditions affectin Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures	likelihood of exposure containment conditions	or refinery in closed process without or processes with equivalent s oop or other system to avoid exposure.
Additional good practice advice bey Additional good practice advice		al Safety Assessment
12.2.3 ES 12 - CS 3: Control of v or refinery in closed continuous processes with equivalent conta	process with occasion	al controlled exposure or
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ris	: Assumes that potentia	I dermal contact is limited to inside
Covers skin contact area up to	hands / one hand / pal : 480 cm ²	m of hands.
Other operational conditions affectin		
Risk Management Measures		r refinenc in closed continuous, process

: Chemical production or refinery in closed continuous process



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	with occasional controlled equivalent containment co No specific measures ider	
Additional good practice advice bey Additional good practice advice		Safety Assessment
2.2.4 ES 12 - CS 4: Control of w ormulation in the chemical indus controlled exposure or processe production where opportunity fo	stry in closed batch proc s with equivalent contain	esses with occasional ment condition, Chemical
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ris Dermal exposure	k management : Palm of one hand	
Covers skin contact area up to	: 240 cm ²	
Remarks	batch processes with occa processes with equivalent	
Dermal exposure	: Assumes that potential de hands / one hand / palm of	ermal contact is limited to inside of hands.
Covers skin contact area up to	: 480 cm ²	
Remarks	: Chemical production when	re opportunity for exposure arises
Other operational conditions affection Outdoor / Indoor	n g workers exposure : Indoor use	
Risk Management Measures Technical conditions and	· Manufactura, or formulation	n in the chemical inductor in clear
measures		n in the chemical industry in close asional controlled exposure or containment condition
Note	: Chemical production when No specific measures iden	re opportunity for exposure arises ntified.
Additional good practice advice bey Additional good practice advice	ond the REACH Chemical S : Wear solely goggles.	afety Assessment

12.2.5 ES 12 - CS 5: Control of worker exposure: Industrial use (Mixing or blending in batch processes) (PROC5)

Product characteristics



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Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by risk Dermal exposure	 management Assumes that potential derring hands / one hand / palm of 	nal contact is limited to inside hands.
Covers skin contact area up to	: 480 cm ²	
Other operational conditions affectin Outdoor / Indoor	g workers exposure : Indoor use	
Risk Management Measures Exposure routes Personal protective measures Effectiveness (of a measure)	 Dermal Wear chemically resistant g combination with specific ac 90 % 	
Additional good practice advice beyon Additional good practice advice		ety Assessment
12.2.6 ES 12 - CS 6: Control of w (PROC7)	orker exposure: Industrial	use (Industrial spraying)
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Amount used Amounts used	: 0,6 L/min	
Frequency and duration of use Exposure duration Frequency of use	: 360 min : <= 5 days per week	

Other operational conditions affecting workers exposure Outdoor / Indoor : Indoor use

Outdoor / Indoor	: Indoor use
Room size	: >1000 m3

Risk Management Measures

Technical conditions and	: Local exhaust ventilation
measures	
Effectiveness (of a measure)	: 50 %



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Note	: Ensure that the direction of ai worker.	rflow is clearly away from the
Personal protective measures	: Wear chemically resistant glo combination with 'basic' emplo	
Effectiveness (of a measure)	: 90 %	
Personal protective measures Effectiveness (of a measure)	 Wear suitable protective cloth Wear suitable coveralls to pre 80 % 	
Ellectiveness (or a measure)	. 80 %	
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that the distance from m.	worker to task is greater than 1
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that direction of applic downward.	ation is only horizontal or
Organisational measures to prevent /limit releases, dispersion and exposure	: Regular cleaning of work area	3
Organisational measures to prevent /limit releases, dispersion and exposure	: Regular cleaning of equipmer	ıt
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure regular inspection, cle equipment and machines.	eaning and maintenance of

Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

12.2.7 ES 12 - CS 7: Control of worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by ris	<pre>c management</pre>
Dermal exposure	: Assumes that potential dermal contact is limited to hands.
Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by risk	 : 0,123 hPa : <= 480 min : <= 240 days per year x management

Covers skin contact area up to : 960 cm²

Other operational conditions affecting workers exposure



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Outdoor / Indoor	: Indoor use
Risk Management Measures	
Exposure routes	: inhalative
Technical conditions and measures	: Local exhaust ventilation
Effectiveness (of a measure)	: 90 %
Effectiveness (of a measure) Personal protective measures	: If technical measures not practical: Wear suitable respiratory protection.
Effectiveness (of a measure)	: 90 %
Additional good practice advice bey	ond the REACH Chemical Safety Assessment
Additional good practice advice	-
(PROC8b, PROC9)	containers (dedicated filling line, including weighing))
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by ris Dermal exposure	k management : Assumes that potential dermal contact is limited to inside
Donnar oxpoodro	hands / one hand / palm of hands.
Covers skin contact area up to	: 480 cm ²
Other operational conditions affecti Outdoor / Indoor	ng workers exposure : Indoor use
Risk Management Measures Note	: No specific measures identified.
Additional good practice advice bey Additional good practice advice	vond the REACH Chemical Safety Assessment : Wear solely goggles.
12.2.9 ES 12 - CS 9: Control of y	worker exposure: Industrial use (Roller application or
brushing) (PROC10)	

Physical Form (at time of use) : Low volatile liquid



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Vapour pressure	: 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by ris	k management
Dermal exposure	· Assumes that notential dermal contact is limited to hands
Covers skin contact area up to	 k management : Assumes that potential dermal contact is limited to hands. : 960 cm²
Other operational conditions affection Outdoor / Indoor	
Risk Management Measures	
Exposure routes	: Dermal
Personal protective measures	: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Effectiveness (of a measure)	: 90 %
Additional good practice advice bev	ond the REACH Chemical Safety Assessment
Additional good practice advice	
articles by dipping and pouring)	of worker exposure: Industrial use (Treatment of (PROC13)
articles by dipping and pouring)	(PROC13)
articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article	(PROC13) : <= 100 %
articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article	(PROC13) : <= 100 %
articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure	<pre>(PROC13) : <= 100 % : Low volatile liquid</pre>
articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use	<pre>(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa</pre>
 articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration 	(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min
articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use	<pre>(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa</pre>
 articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist 	<pre>(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management</pre>
 articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use 	<pre>(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to inside</pre>
articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist	<pre>(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management</pre>
 articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by risk Dermal exposure Covers skin contact area up to 	<pre>(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm²</pre>
 articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by risk Dermal exposure Covers skin contact area up to Other operational conditions affecting	<pre>(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm² mg workers exposure</pre>
 articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by risk Dermal exposure Covers skin contact area up to 	<pre>(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm²</pre>
articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affectin Outdoor / Indoor Risk Management Measures	<pre>(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm² mg workers exposure</pre>
 articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by risk Dermal exposure Covers skin contact area up to Other operational conditions affectine Outdoor / Indoor	<pre>(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm² mg workers exposure</pre>
articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affectin Outdoor / Indoor Risk Management Measures	<pre>(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm² mg workers exposure : Indoor use : Dermal : Wear chemically resistant gloves (tested to EN374) in</pre>
articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Other operational conditions affectin Outdoor / Indoor Risk Management Measures Exposure routes	<pre>(PROC13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year k management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm² mg workers exposure : Indoor use : Dermal</pre>



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12.2.11 ES 12 - CS 11: Control of energy conditions in metal workin kinetic energy conditions) (PROC	g operations, General grea	
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
	 : <= 480 min : <= 240 days per year 	
Human factors not influenced by risk Dermal exposure	: Assumes that potential derma	L contact is limited to hands
Covers skin contact area up to	: 960 cm ²	
Other operational conditions affecting Outdoor / Indoor	g workers exposure : Indoor use	
Risk Management Measures		
Exposure routes	: inhalative	
Technical conditions and measures	: Local exhaust ventilation	
Effectiveness (of a measure)	: 90 %	
Exposure routes	: Dermal	
Personal protective measures	: Wear chemically resistant glo combination with 'basic' emplo	
Effectiveness (of a measure)	: 90 %	
Note	: Lubrication at high energy cor operations	nditions in metal working
Additional good practice advice beyo	nd the REACH Chemical Safet	y Assessment

Additional good practice advice : Wear solely goggles.

12.3. ES 12 Exposure estimation and reference to its source

12.3.2 ES 12 - CS 2: Worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Route of exposure and type	Exposure estimate	RCR	
of effects			



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Worker - inhalative, long-tern - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

12.3.3 ES 12 - CS 3: Worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,08

12.3.4 ES 12 - CS 4: Worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,43

12.3.5 ES 12 - CS 5: Worker exposure: Industrial use (Mixing or blending in batch processes) (PROC5)



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Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,38

12.3.6 ES 12 - CS 6: Worker exposure: Industrial use (Industrial spraying) (PROC7)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	9,79 mg/m ³ (Stoffenmanager v4.0)	0,28
Worker - dermal, long-term - systemic	54,6 mg/kg bw/day (RISKOFDERM v2.1)	0,52
combined routes	Not applicable	0,80

12.3.7 ES 12 - CS 7: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type Exposure estimate of effects		RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,20

12.3.8 ES 12 - CS 8: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities	0,43
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated	0,37



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	filling line, including weighing))	
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	0,43

12.3.9 ES 12 - CS 9: Worker exposure: Industrial use (Roller application or brushing) (PROC10)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,87 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	2,74 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03
combined routes	ECETOC TRA worker v2.0	0,77

12.3.10 ES 12 - CS 10: Worker exposure: Industrial use (Treatment of articles by dipping and pouring) (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,87 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,75

12.3.11 ES 12 - CS 11: Worker exposure: Industrial use (Lubrication at high energy conditions in metal working operations, General greasing/lubrication at high kinetic energy conditions) (PROC17, PROC18)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0, Lubrication at high energy conditions in metal working operations)	0,07
Worker - dermal, long-term - systemic	2,74 mg/kg bw/day (ECETOC TRA worker v2.0, Lubrication at high energy conditions in metal working operations)	0,03
combined routes	ECETOC TRA worker v2.0, Lubrication at high energy conditions in metal working operations	0,10
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0, General greasing/lubrication at high kinetic energy conditions)	0,07
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0, General greasing/lubrication at high kinetic energy conditions)	0,13



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combined routes	ECETOC TRA worker v2.0, General greasing/lubrication at high kinetic energy conditions	0,20

12.4. ES 12 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

13. ES 13: Industrial use; Metal working fluids

13.1. Title section

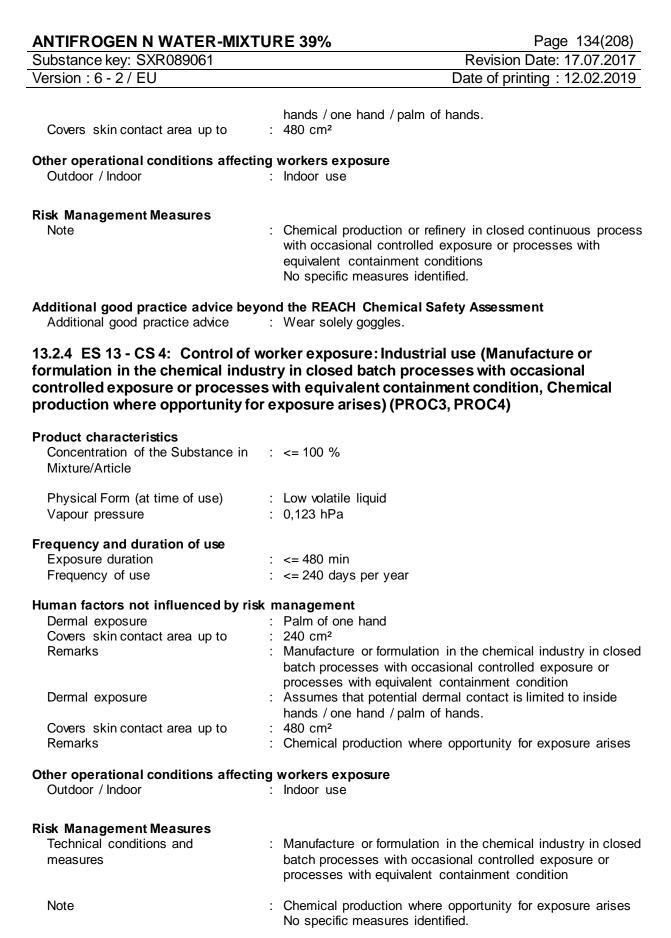
Enviror	nment	
CS1:	Industrial use (Use of non-reactive processing aid at industrial site (no inclusion into or onto article))	ERC4
Worke	rs	
CS2:	Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	PROC1
CS3:	Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	PROC2
CS4:	Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises)	PROC3, PROC4
CS5:	Industrial use (Mixing or blending in batch processes)	PROC5
CS6:	Industrial use (Industrial spraying)	PROC7
CS7:	Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a
CS8:	Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	PROC8b, PROC9
CS9:	Industrial use (Roller application or brushing)	PROC10
CS10:	Industrial use (Treatment of articles by dipping and pouring)	PROC13
CS11:	Industrial use (Lubrication at high energy conditions in metal working operations)	PROC17

13.2. ES 13 Conditions of use affecting exposure

13.2.1 ES 13 - CS 1: Control of environmental exposure: Industrial use (Use of non-reactive processing aid at industrial site (no inclusion into or onto article)) (ERC4)



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	related exposure assest performed.	sment and risk characterization was
13.2.2 ES 13 - CS 2: Control of v or refinery in closed process with equivalent containment condition	hout likelihood of expos	
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by risl Dermal exposure Covers skin contact area up to	: Palm of one hand	
Other operational conditions affectin Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures	likelihood of exposure o containment conditions	refinery in closed process without r processes with equivalent p or other system to avoid exposure.
Additional good practice advice bey Additional good practice advice	ond the REACH Chemical : Wear solely goggles.	Safety Assessment
13.2.3 ES 13 - CS 3: Control of v or refinery in closed continuous processes with equivalent conta	process with occasiona	l controlled exposure or
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by risl Dermal exposure		dermal contact is limited to inside



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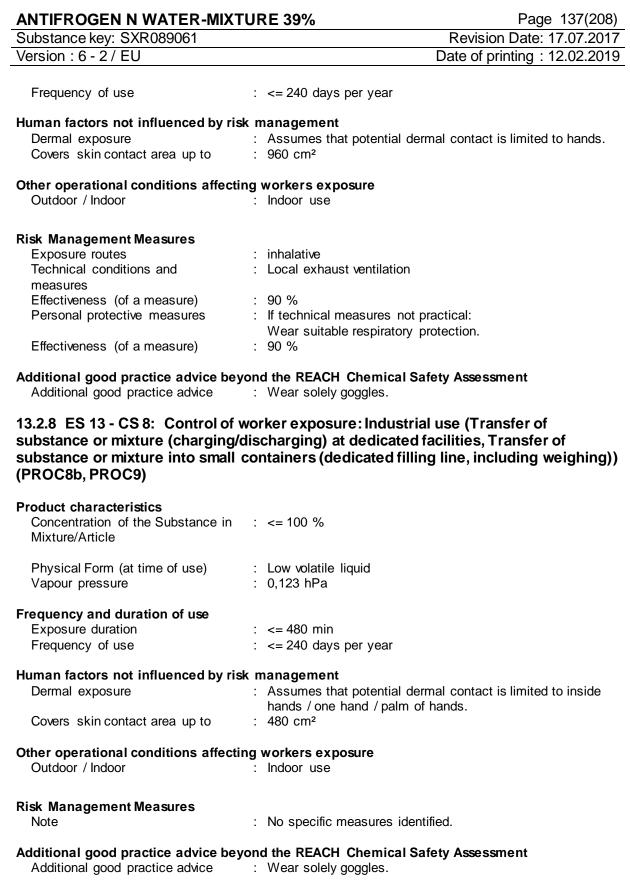
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Additional good practice advice bey Additional good practice advice		al Safety Assessment
13.2.5 ES 13 - CS 5: Control of v batch processes) (PROC5)	worker exposure: Indu	strial use (Mixing or blending ir
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use		
Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ris	k management	
Dermal exposure	: Assumes that potentia	al dermal contact is limited to inside
Covers skin contact area up to	hands / one hand / pa : 480 cm ²	im of hands.
Other operational conditions affecti Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures	Dama	
Exposure routes Personal protective measures		tant gloves (tested to EN374) in
Effectiveness (of a measure)	combination with spec : 90 %	cific activity training.
Additional good practice advice bey Additional good practice advice		al Safety Assessment
13.2.6 ES 13 - CS 6: Control of v (PROC7)	worker exposure: Indu	strial use (Industrial spraying)
Product characteristics		
Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use)	: Low volatile liquid : 0,123 hPa	
Vapour pressure		
Vapour pressure Amount used Amounts used	: 0,6 L/min	
Amount used	: 0,6 L/min : 360 min	



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Outdoor / Indoor		Indoor use
Room size	:	> 1000 m3
Risk Management Measures		
Technical conditions and measures	:	Local exhaust ventilation
Effectiveness (of a measure)		50 %
Note	:	Ensure that the direction of airflow is clearly away from the worker.
Personal protective measures	:	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Effectiveness (of a measure)	:	90 %
Personal protective measures	:	Wear suitable protective clothing.
Effectiveness (of a measure)	:	Wear suitable coveralls to prevent exposure to the skin. 80 %
Organisational measures to prevent /limit releases, dispersion and exposure	:	Ensure that the distance from worker to task is greater that m.
Organisational measures to prevent /limit releases, dispersion and exposure	:	Ensure that direction of application is only horizontal or downward.
Organisational measures to prevent /limit releases, dispersion and exposure	:	Regular cleaning of work area
Organisational measures to prevent /limit releases, dispersion and exposure	:	Regular cleaning of equipment
Organisational measures to prevent /limit releases, dispersion and exposure	:	Ensure regular inspection, cleaning and maintenance of equipment and machines.

13.2.7 ES 13 - CS 7: Control of worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use Exposure duration	: <= 480 min



CLARIAN

13.2.9 ES 13 - CS 9: Control of worker exposure: Industrial use (Roller application or



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brushing) (PROC10)		
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by risl Dermal exposure Covers skin contact area up to	: Assumes that potential	dermal contact is limited to hands.
Other operational conditions affectin Outdoor / Indoor	n g workers exposure : Indoor use	
Risk Management Measures Exposure routes Personal protective measures Effectiveness (of a measure)	 Dermal Wear chemically resistance combination with 'basic' 90 % 	ant gloves (tested to EN374) in employee training.
Additional good practice advice bey Additional good practice advice		Safety Assessment
13.2.10 ES 13 - CS 10: Control o articles by dipping and pouring)		ustrial use (Treatment of
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ris		dermal contact is limited to inside
Covers skin contact area up to	: 480 cm^2	
Other operational conditions affectin Outdoor / Indoor	ng workers exposure : Indoor use	

Risk Management Measures



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Exposure routes	: Dermal	
Personal protective measures		istant gloves (tested to EN374) in
Effectiveness (of a measure)	: 90 %	sic' employee training.
Additional good practice advice bey	and the REACH Chemi	ical Safaty Assassment
Additional good practice advice bey		
13.2.11 ES 13 - CS 11: Control o energy conditions in metal worki		ndustrial use (Lubrication at high C17)
Product characteristics		
Concentration of the Substance in	: <= 100 %	
Mixture/Article		
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per yea	ar
Human factors not influenced by ris	k managamant	
Dermal exposure	-	tial dermal contact is limited to hands.
Covers skin contact area up to		tial definal contact is infilted to hands.
Other operational conditions affecting		
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Exposure routes	: inhalative	
Technical conditions and	: Local exhaust ventila	ation
measures		
Effectiveness (of a measure)	: 90 %	
Exposure routes	: Dermal	
Personal protective measures	: Wear chemically res	istant gloves (tested to EN374) in
	combination with 'ba	sic' employee training.
Effectiveness (of a measure)	: 90 %	
Additional good practice advice bey	ond the REACH Chemi	cal Safety Assessment
Additional good practice advice bey	: Wear solely goggles	•
Additional good plactice advice		

13.3. ES 13 Exposure estimation and reference to its source

13.3.2 ES 13 - CS 2: Worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)



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Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

13.3.3 ES 13 - CS 3: Worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,08

13.3.4 ES 13 - CS 4: Worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,43



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13.3.5 ES 13 - CS 5: Worker exposure: Industrial use (Mixing or blending in batch processes) (PROC5)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,38

13.3.6 ES 13 - CS 6: Worker exposure: Industrial use (Industrial spraying) (PROC7)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	9,79 mg/m ³ (Stoffenmanager v4.0)	0,28
Worker - dermal, long-term - systemic	54,6 mg/kg bw/day (RISKOFDERM v2.1)	0,52
combined routes	Not applicable	0,80

13.3.7 ES 13 - CS 7: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,20

13.3.8 ES 13 - CS 8: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or	0,43



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	mixture (charging/discharging) at dedicated facilities	
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	0,43

13.3.9 ES 13 - CS 9: Worker exposure: Industrial use (Roller application or brushing) (PROC10)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,87 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	2,74 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03
combined routes	ECETOC TRA worker v2.0	0,77

13.3.10 ES 13 - CS 10: Worker exposure: Industrial use (Treatment of articles by dipping and pouring) (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,87 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,75

13.3.11 ES 13 - CS 11: Worker exposure: Industrial use (Lubrication at high energy conditions in metal working operations) (PROC17)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0, Lubrication at high energy conditions in metal working operations)	0,07
Worker - dermal, long-term - systemic	2,74 mg/kg bw/day (ECETOC TRA worker v2.0, Lubrication at high energy conditions in metal working operations)	0,03
combined routes	ECETOC TRA worker v2.0, Lubrication at high energy conditions in metal working operations	0,10



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13.4. ES 13 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

14. ES 14: Professional use; Metal working fluids

14.1. Title section

Enviro	Environment		
CS1:	Professional use (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor))	ERC8a, ERC8d	
Worke	ers		
CS2:	Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	PROC1, PROC2, PROC3	
CS3:	Professional use (Mixing or blending in batch processes)	PROC5	
CS4:	Professional use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a	
CS5:	Professional use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	PROC8b, PROC9	
CS6:	Professional use (Roller application or brushing)	PROC10	
CS7:	Professional use (Non-industrial spraying)	PROC11	
CS8:	Professional use (Treatment of articles by dipping and pouring)	PROC13	
CS9:	Professional use (Lubrication at high energy conditions in metal working operations)	PROC17	

14.2. ES 14 Conditions of use affecting exposure

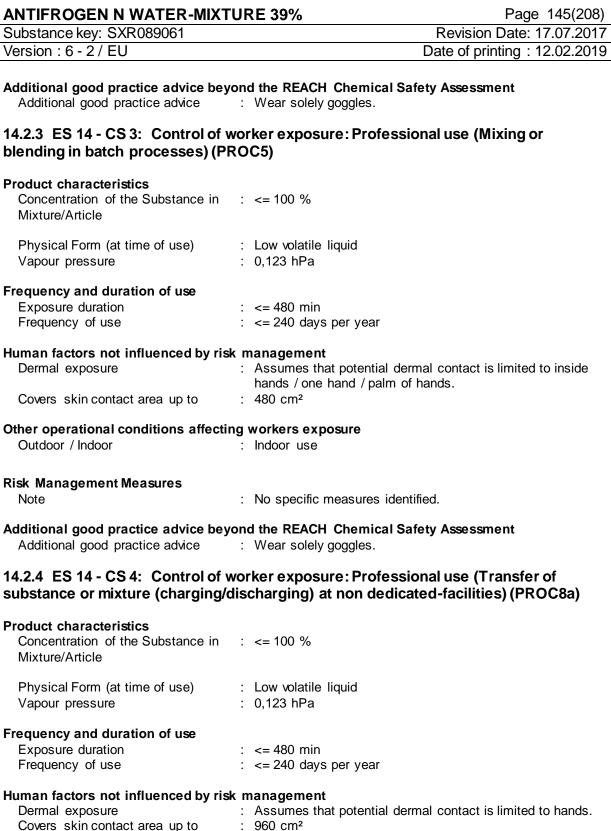
14.2.1 ES 14 - CS 1: Control of environmental exposure: Professional use (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)) (ERC8a, ERC8d)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.



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with equivalent containment con continuous process with occasio containment conditions, Manufa	process without li ditions, Chemical onal controlled ex cture or formulation controlled expos	kelihood of exposure or processes
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liqui : 0,123 hPa	d
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per	year
Human factors not influenced by ris Dermal exposure Covers skin contact area up to Remarks	 Palm of one hand 240 cm² Chemical product likelihood of experiment containment conta	d tion or refinery in closed process without osure or processes with equivalent ditions, Manufacture or formulation in the y in closed batch processes with occasional ure or processes with equivalent containmen
Dermal exposure	: Assumes that po	tential dermal contact is limited to inside d / palm of hands.
Covers skin contact area up to Remarks	 : 480 cm² : Chemical production with occasional of the second seco	tion or refinery in closed continuous process controlled exposure or processes with inment conditions
Other operational conditions affecti Outdoor / Indoor	n g workers exposur : Indoor use	e
Risk Management Measures Technical conditions and measures	likelihood of expo containment con	tion or refinery in closed process without osure or processes with equivalent ditions sed loop or other system to avoid exposure.
Technical conditions and measures	with occasional of	tion or refinery in closed continuous process controlled exposure or processes with inment conditions
Technical conditions and measures	batch processes processes with e	ormulation in the chemical industry in closed with occasional controlled exposure or equivalent containment condition controlled exposure



Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor use





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Risk Management Measures		
Exposure routes	: inhalative	
Technical conditions and	: Local exhaust ventilation	
measures	22 <i>24</i>	
Effectiveness (of a measure)	: 80 %	n re eti e el
Personal protective measures	: If technical measures not Wear suitable respiratory	
Effectiveness (of a measure)	: 80 %	protection.
Additional good practice advice bey	and the BEACH Chamical S	afatu Accacamant
Additional good practice advice be		
14.2.5 ES 14 - CS 5: Control of	worker exposure · Profess	ional use (Transfer of
substance or mixture (charging/		
substance or mixture into small		
(PROC8b, PROC9)		
(110000),110000)		
Product characteristics		
Concentration of the Substance in	: <= 100 %	
Mixture/Article		
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ris	k management	
Dermal exposure		rmal contact is limited to inside
	hands / one hand / palm c	of hands.
Covers skin contact area up to	: 480 cm ²	
Other operational conditions affecti	ng workers exposure	
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Note	: No specific measures ider	ntified.
	·	
Additional good practice advice bey Additional good practice advice		afety Assessment
14.2.6 ES 14 - CS 6: Control of or brushing) (PROC10)	worker exposure: Profess	ional use (Roller application
Product characteristics		
	100.0/	
Concentration of the Substance in Mixture/Article	: <= 100 %	

Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa
rapear precedere	. 0,120 m a



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Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by r	isk management	
Dermal exposure	: Assumes that potentia	I dermal contact is limited to hands.
Covers skin contact area up to	: 960 cm ²	
Other operational conditions affect	ting workers exposure	
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Risk Management Measures	: inhalative	
Risk Management Measures Exposure routes Technical conditions and measures	: inhalative : Local exhaust ventilation	on
Exposure routes Technical conditions and measures		on
Exposure routes Technical conditions and	: Local exhaust ventilation	
Exposure routes Technical conditions and measures Effectiveness (of a measure)	: Local exhaust ventilation	not practical:
Exposure routes Technical conditions and measures Effectiveness (of a measure)	: Local exhaust ventilation : 80 % : If technical measures	not practical:
Exposure routes Technical conditions and measures Effectiveness (of a measure) Personal protective measures	 : Local exhaust ventilation : 80 % : If technical measures Wear suitable respirator 	not practical:
Exposure routes Technical conditions and measures Effectiveness (of a measure) Personal protective measures Effectiveness (of a measure)	 : Local exhaust ventilation : 80 % : If technical measures Wear suitable respirato : 80 % : Dermal 	not practical: bry protection. tant gloves (tested to EN374) in

Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

14.2.7 ES 14 - CS 7: Control of worker exposure: Professional use (Non-industrial spraying) (PROC11)

Product characteristics Concentration of the Substance in Mixture/Article	: <=	= 100 %
Physical Form (at time of use) Vapour pressure		ow volatile liquid 123 hPa
Amount used Amounts used	: 0,	05 L/min
Frequency and duration of use Exposure duration Frequency of use		50 min = 5 days per week
Other operational conditions affecti Outdoor / Indoor Room size	: In	orkers exposure door use = 1000 m3
Risk Management Measures Personal protective measures	: W	/ear chemically resistant gloves (tested to

Personal protective measures	: Wear chemically resistant gloves (tested to EN374) in	
	combination with 'basic' employee training.	



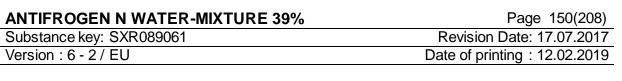
ubstance key: SXR089061		Revision Date: 17.07.201
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Effectiveness (of a measure)	: 90 %	
Personal protective measures	: Wear suitable protective clo Wear suitable coveralls to r	othing. prevent exposure to the skin.
Effectiveness (of a measure)	: 80 %	
Personal protective measures Effectiveness (of a measure)	: Wear a respirator conformin : 40 %	g to EN140.
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that direction of app downward.	lication is only horizontal or
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that the distance fro m.	m worker to task is greater tha
Organisational measures to prevent /limit releases, dispersion	: Ensure that the direction of worker.	airflow is clearly away from the
and exposure Note	: Not applicable	
Organisational measures to prevent /limit releases, dispersion and exposure	: Provide enhanced general v	entilation by mechanical mean
Organisational measures to prevent /limit releases, dispersion and exposure	: Regular cleaning of work ar	ea
Organisational measures to prevent /limit releases, dispersion and exposure	: Regular cleaning of equipm	ent
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure regular inspection, of equipment and machines.	cleaning and maintenance of
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that the task is not o worker simultaneously.	carried out by more than one

14.2.8 ES 14 - CS 8: Control of worker exposure: Professional use (Treatment of articles by dipping and pouring) (PROC13)

Product characteristics Concentration of the Substance in Mixture/Article	:	<= 100 %
Physical Form (at time of use)	:	Low volatile liquid



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Vapour pressure	: 0,123 hPa
Frequency and duration of use Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Covers skin contact area up to	: 480 cm ²
Other operational conditions affecting Outdoor / Indoor	g workers exposure : Indoor use
Risk Management Measures Personal protective measures	: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Effectiveness (of a measure)	: 90 %
	end the REACH Chemical Safety Assessment : Wear solely goggles.
14.2.9 ES 14 - CS 9: Control of we high energy conditions in metal w	orker exposure: Professional use (Lubrication at orking operations) (PROC17)
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
	: Low volatile liquid : 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by risk	management
Dermal exposure	: Assumes that potential dermal contact is limited to hands.
Covers skin contact area up to	: 960 cm ²
Other operational conditions affecting Outdoor / Indoor	g workers exposure : Indoor use
-	
Risk Management Measures Exposure routes	: inhalative
Technical conditions and	: Local exhaust ventilation
measures	
Effectiveness (of a measure)	: 90 %
Exposure routes	: Dermal
	: Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.



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Effectiveness (of a measure) : 90 %

Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

14.3. ES 14 Exposure estimation and reference to its source

14.3.2 ES 14 - CS 2: Worker exposure: Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition) (PROC1, PROC2, PROC3)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	0,003
combined routes	ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	0,004
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	0,01
combined routes	ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	0,38
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled	0,003



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	exposure or processes with equivalent containment condition)	
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23

14.3.3 ES 14 - CS 3: Worker exposure: Professional use (Mixing or blending in batch processes) (PROC5)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0, Mixing or blending in batch processes)	0,74
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0, Mixing or blending in batch processes)	0,01
combined routes	ECETOC TRA worker v2.0, Mixing or blending in batch processes	0,75

14.3.4 ES 14 - CS 4: Worker exposure: Professional use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,50

14.3.5 ES 14 - CS 5: Worker exposure: Professional use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,74
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities	0,80
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,74



ANTIFROGEN N WATER-MIXTURE 39%Page 152(208)Substance key: SXR089061Revision Date: 17.07.2017Version : 6 - 2 / EUDate of printing : 12.02.2019Worker - dermal, long-term -
systemic6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer
of substance or mixture into small containers (dedicated
filling line, including weighing))0,06combined routesECETOC TRA worker v2.0, Transfer of substance or
0,80

mixture into small containers (dedicated filling line,

14.3.6 ES 14 - CS 6: Worker exposure: Professional use (Roller application or brushing) (PROC10)

including weighing)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	2,74 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03
combined routes	ECETOC TRA worker v2.0	0,40

14.3.7 ES 14 - CS 7: Worker exposure: Professional use (Non-industrial spraying) (PROC11)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	14,05 mg/m ³ (Stoffenmanager v4.0)	0,40
Worker - dermal, long-term - systemic	53,75 mg/kg bw/day (RISKOFDERM v2.1)	0,51
combined routes	Not applicable	0,91

14.3.8 ES 14 - CS 8: Worker exposure: Professional use (Treatment of articles by dipping and pouring) (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,75

14.3.9 ES 14 - CS 9: Worker exposure: Professional use (Lubrication at high energy conditions in metal working operations) (PROC17)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37



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- local and systemic		
Worker - dermal, long-term -	2,74 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03
systemic		
combined routes	ECETOC TRA worker v2.0	0,40

14.4. ES 14 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

15. ES 15: Professional use; Use in agrochemicals

15.1. Title section

Enviro	nment	
CS1:	Professional use (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor))	ERC8a, ERC8d
Worke	ITS	
CS2:	Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	PROC1, PROC2
CS3:	Professional use (Chemical production where opportunity for exposure arises)	PROC4
CS4:	Professional use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a
CS5:	Professional use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	PROC8b, PROC9
CS6:	Professional use (Non-industrial spraying)	PROC11
CS7:	Professional use (Treatment of articles by dipping and pouring)	PROC13

15.2. ES 15 Conditions of use affecting exposure

15.2.1 ES 15 - CS 1: Control of environmental exposure: Professional use (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)) (ERC8a, ERC8d)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was



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	performed.	
15.2.2 ES 15 - CS 2: Control of production or refinery in closed with equivalent containment con continuous process with occasi containment conditions) (PROC	process without likelil nditions, Chemical pro ional controlled exposi	hood of exposure or processes
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ris Dermal exposure Covers skin contact area up to Remarks	 Palm of one hand 240 cm² Chemical production of likelihood of exposure containment condition chemical industry in of controlled exposure of condition 	or refinery in closed process without or processes with equivalent ns, Manufacture or formulation in the closed batch processes with occasional or processes with equivalent containment
Dermal exposure Covers skin contact area up to Remarks	hands / one hand / pa : 480 cm ² : Chemical production	or refinery in closed continuous proces olled exposure or processes with
Other operational conditions affect Outdoor / Indoor	ing workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures	likelihood of exposure containment condition	or refinery in closed process without or processes with equivalent oop or other system to avoid exposure.
Technical conditions and measures		or refinery in closed continuous proces blled exposure or processes with



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15.2.3 ES 15 - CS 3: Control of v production where opportunity fo		
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per yea	ar
Human factors not influenced by ris Dermal exposure	: Assumes that poten hands / one hand / p	tial dermal contact is limited to inside balm of hands.
Covers skin contact area up to		
Other operational conditions affecti Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures Note	: No specific measure	es identified.
Additional good practice advice bey Additional good practice advice		
15.2.4 ES 15 - CS 4: Control of substance or mixture (charging/		
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per yea	ar
Human factors not influenced by ris Dermal exposure		tial dermal contact is limited to hands.
	: 960 cm ²	
Covers skin contact area up to		
Other operational conditions affecti Outdoor / Indoor		
Covers skin contact area up to Other operational conditions affecti	ng workers exposure	



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measures Effectiveness (of a measure) Personal protective measures	 80 % If technical measures not practical: Wear suitable respiratory protection.
Effectiveness (of a measure)	: 80 %
Additional good practice advice bey Additional good practice advice	yond the REACH Chemical Safety Assessment : Wear solely goggles.
substance or mixture (charging/	worker exposure: Professional use (Transfer of discharging) at dedicated facilities, Transfer of containers (dedicated filling line, including weighing))
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year
Human factors not influenced by ris Dermal exposure Covers skin contact area up to	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Other operational conditions affecti Outdoor / Indoor	ng workers exposure : Indoor use
Risk Management Measures Note	: No specific measures identified.
Additional good practice advice bey Additional good practice advice	yond the REACH Chemical Safety Assessment : Wear solely goggles.
15.2.6 ES 15 - CS 6: Control of spraying) (PROC11)	worker exposure: Professional use (Non-industrial
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Amount used Amounts used	: 0,05 L/min



ubstance key: SXR089061 Regension: 6 - 2 / EU equency and duration of use Date Exposure duration : 150 min Frequency of use : <= 5 days per week her operational conditions affecting workers exposure Outdoor use Outdoor / Indoor : Indoor use Room size : <= 1000 m3 sk Management Measures : Wear chemically resistant gloves combination with 'basic' employee Effectiveness (of a measure) : 90 % Personal protective measures : Wear suitable protective clothing. Wear suitable coveralls to prevent Effectiveness (of a measure) : 80 % Personal protective measures : Wear a respirator conforming to E Effectiveness (of a measure) : 40 % Organisational measures to prevent /limit releases, dispersion : Ensure that direction of application downward.	e training. exposure to the skin.
Exposure duration: 150 minFrequency of use: <= 5 days per weekher operational conditions affecting workers exposureOutdoor / Indoor: Indoor useRoom size: <= 1000 m3sk Management MeasuresPersonal protective measures: Wear chemically resistant gloves combination with 'basic' employeeEffectiveness (of a measure): 90 %Personal protective measures: Wear suitable protective clothing. Wear suitable coveralls to preventEffectiveness (of a measure): 80 %Personal protective measures: Wear a respirator conforming to EEffectiveness (of a measure): 40 %Organisational measures to: Ensure that direction of application	e training. exposure to the skin.
Exposure duration: 150 minFrequency of use: <= 5 days per week	e training. exposure to the skin.
Frequency of use: <= 5 days per week	e training. exposure to the skin.
her operational conditions affecting workers exposureOutdoor / Indoor: Indoor useRoom size: <= 1000 m3	e training. exposure to the skin.
Outdoor / Indoor Room size: Indoor useRoom size: <= 1000 m3	e training. exposure to the skin.
Room size: <= 1000 m3sk Management Measures: Wear chemically resistant gloves combination with 'basic' employeePersonal protective measures: Wear chemically resistant gloves combination with 'basic' employeeEffectiveness (of a measure): 90 %Personal protective measures: Wear suitable protective clothing. Wear suitable coveralls to preventEffectiveness (of a measure): 80 %Personal protective measures: Wear a respirator conforming to EEffectiveness (of a measure): 40 %Organisational measures to: Ensure that direction of application	e training. exposure to the skin.
Personal protective measures: Wear chemically resistant gloves combination with 'basic' employeeEffectiveness (of a measure): 90 %Personal protective measures: Wear suitable protective clothing. Wear suitable coveralls to preventEffectiveness (of a measure): 80 %Personal protective measures: Wear a respirator conforming to EEffectiveness (of a measure): 40 %Organisational measures to: Ensure that direction of application	e training. exposure to the skin.
Personal protective measures: Wear chemically resistant gloves combination with 'basic' employeeEffectiveness (of a measure): 90 %Personal protective measures: Wear suitable protective clothing. Wear suitable coveralls to preventEffectiveness (of a measure): 80 %Personal protective measures: Wear a respirator conforming to EEffectiveness (of a measure): 40 %Organisational measures to: Ensure that direction of application	e training. exposure to the skin.
Effectiveness (of a measure): 90 %Personal protective measures: Wear suitable protective clothing. Wear suitable coveralls to preventEffectiveness (of a measure): 80 %Personal protective measures: Wear a respirator conforming to EEffectiveness (of a measure): 40 %Organisational measures to: Ensure that direction of application	e training. exposure to the skin.
Effectiveness (of a measure): 90 %Personal protective measures: Wear suitable protective clothing. Wear suitable coveralls to preventEffectiveness (of a measure): 80 %Personal protective measures Effectiveness (of a measure): Wear a respirator conforming to E : 40 %Organisational measures to: Ensure that direction of application	exposure to the skin.
Effectiveness (of a measure)Wear suitable coveralls to preventEffectiveness (of a measure): 80 %Personal protective measures: Wear a respirator conforming to EEffectiveness (of a measure): 40 %Organisational measures to: Ensure that direction of application	exposure to the skin.
Effectiveness (of a measure)Wear suitable coveralls to preventEffectiveness (of a measure): 80 %Personal protective measures: Wear a respirator conforming to EEffectiveness (of a measure): 40 %Organisational measures to: Ensure that direction of application	exposure to the skin.
Effectiveness (of a measure): 80 %Personal protective measures: Wear a respirator conforming to EEffectiveness (of a measure): 40 %Organisational measures to: Ensure that direction of application	
Effectiveness (of a measure): 40 %Organisational measures to: Ensure that direction of application	N140.
Effectiveness (of a measure): 40 %Organisational measures to: Ensure that direction of application	
	n is only horizontal or
and exposure	
Organisational measures to : Ensure that the distance from wor	ker to task is greater that
prevent /limit releases, dispersion m.	5
and exposure	
Organisational measures to : Ensure that the direction of airflow	is clearly away from the
prevent /limit releases, dispersion worker.	5 5
and exposure	
Note : Not applicable	
Organisational measures to : Provide enhanced general ventilat	tion by mechanical mean
prevent /limit releases, dispersion	
and exposure	
Organisational measures to : Regular cleaning of work area	
prevent /limit releases, dispersion	
and exposure	
Organisational measures to : Regular cleaning of equipment	
prevent /limit releases, dispersion	
and exposure	
Organisational measures to : Ensure regular inspection, cleaning	ng and maintenance of
prevent /limit releases, dispersion equipment and machines.	
and exposure	
Organisational measures to : Ensure that the task is not carried	out by more than one
prevent /limit releases, dispersion worker simultaneously.	
and exposure	



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Additional good practice advice be Additional good practice advice		I Safety Assessment
15.2.7 ES 15 - CS 7: Control of articles by dipping and pouring		ssional use (Treatment of
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ri Dermal exposure Covers skin contact area up to	: Assumes that potential hands / one hand / palm	dermal contact is limited to inside n of hands.
Other operational conditions affect Outdoor / Indoor	ting workers exposure : Indoor use	
Risk Management Measures Personal protective measures	: Wear chemically resista combination with 'basic	ant gloves (tested to EN374) in ' employee training.

15.3. ES 15 Exposure estimation and reference to its source

15.3.2 ES 15 - CS 2: Worker exposure: Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC1, PROC2)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	0,0007



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- local and systemic

systemic

combined routes

Worker - dermal, long-term -

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0.01

0,38

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Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	0,003
combined routes	ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	0,004
Worker - inhalative, long-term	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical	0,37

equivalent containment conditions)

production or refinery in closed continuous process with occasional controlled exposure or processes with

1,37 mg/kg bw/day (ECETOC TRA worker v2.0,

process with occasional controlled exposure or processes with equivalent containment conditions)

Chemical production or refinery in closed continuous

ECETOC TRA worker v2.0, Chemical production or

refinery in closed continuous process with occasional controlled exposure or processes with equivalent

15.3.3 ES 15 - CS 3: Worker exposure: Professional use (Chemical production where opportunity for exposure arises) (PROC4)

containment conditions

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0)	0,06
combined routes	ECETOC TRA worker v2.0	0,80

15.3.4 ES 15 - CS 4: Worker exposure: Professional use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,50

15.3.5 ES 15 - CS 5: Worker exposure: Professional use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Route of exposure and type	Exposure estimate	RCR
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of effects		
Worker - inhalative, long-term	25,88 mg/m ³ (ECETOC TRA worker v2.0, Transfer of	0,74
- local and systemic	substance or mixture (charging/discharging) at dedicated	
	facilities)	
Worker - dermal, long-term -	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer	0,06
systemic	of substance or mixture (charging/discharging) at	
	dedicated facilities)	
combined routes	ECETOC TRA worker v2.0, Transfer of substance or	0,80
	mixture (charging/discharging) at dedicated facilities	
Worker - inhalative, long-term	25,88 mg/m ³ (ECETOC TRA worker v2.0, Transfer of	0,74
- local and systemic	substance or mixture into small containers (dedicated	
	filling line, including weighing))	
Worker - dermal, long-term -	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer	0,06
systemic	of substance or mixture into small containers (dedicated	
	filling line, including weighing))	
combined routes	ECETOC TRA worker v2.0, Transfer of substance or	0,80
	mixture into small containers (dedicated filling line,	
	including weighing)	

15.3.6 ES 15 - CS 6: Worker exposure: Professional use (Non-industrial spraying) (PROC11)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	14,05 mg/m ³ (Stoffenmanager v4.0)	0,40
Worker - dermal, long-term - systemic	53,75 mg/kg bw/day (RISKOFDERM v2.1)	0,51
combined routes	Not applicable	0,91

15.3.7 ES 15 - CS 7: Worker exposure: Professional use (Treatment of articles by dipping and pouring) (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,75

15.4. ES 15 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2



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16. ES 16: Industrial use; Use in functional fluids

16.1. Title section

Enviro	Environment		
CS1:	Industrial use (Use of functional fluid at industrial site)	ERC7	
Worke	rs		
CS2:	Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	PROC1	
CS3:	Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	PROC2	
CS4:	Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises)	PROC3, PROC4	
CS5:		PROC8a	
CS6:	Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	PROC8b, PROC9	

16.2. ES 16 Conditions of use affecting exposure

16.2.1 ES 16 - CS 1: Control of environmental exposure: Industrial use (Use of functional fluid at industrial site) (ERC7)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

16.2.2 ES 16 - CS 2: Control of worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year



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Human factors not influenced by risk Dermal exposure Covers skin contact area up to	: Palm of one hand	
Other operational conditions affectin Outdoor / Indoor	g workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures	likelihood of exposure o containment conditions	refinery in closed process without r processes with equivalent p or other system to avoid exposure.
Additional good practice advice beyon Additional good practice advice		Safety Assessment
16.2.3 ES 16 - CS 3: Control of w or refinery in closed continuous p processes with equivalent contain	process with occasiona	I controlled exposure or
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by risk Dermal exposure Covers skin contact area up to	-	dermal contact is limited to inside of hands.
Other operational conditions affectin Outdoor / Indoor	g workers exposure : Indoor use	
Risk Management Measures Note		
Additional good practice advice beyo Additional good practice advice	ond the REACH Chemical : Wear solely goggles.	Safety Assessment

16.2.4 ES 16 - CS 4: Control of worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical



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production where opportunity for	exposure arises) (F	PROC3, PROC4)
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per yea	ar
Human factors not influenced by risk Dermal exposure Covers skin contact area up to Remarks Dermal exposure Covers skin contact area up to Remarks	 Palm of one hand 240 cm² Manufacture or form batch processes with processes with equi Assumes that poten hands / one hand / j 480 cm² 	nulation in the chemical industry in closed th occasional controlled exposure or valent containment condition tial dermal contact is limited to inside palm of hands.
Other operational conditions affectin Outdoor / Indoor	g workers exposure : Indoor use	
Risk Management Measures Technical conditions and measures	batch processes wit	nulation in the chemical industry in closed th occasional controlled exposure or valent containment condition
Note	: Chemical production No specific measure	n where opportunity for exposure arises es identified.
Additional good practice advice beyo Additional good practice advice	ond the REACH Chem : Wear solely goggles	
16.2.5 ES 16 - CS 5: Control of w substance or mixture (charging/d	-	•
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	

Frequency and duration of use

Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year

Human factors not influenced by risk management



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Dermal exposure	: Assumes that potential dermal contact is limited to hands.
Covers skin contact area up to	: 960 cm ²
Other operational conditions affection	ng workers exposure
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Exposure routes	: inhalative
Technical conditions and	: Local exhaust ventilation
measures	
Effectiveness (of a measure) Personal protective measures	: 90 %
Personal protective measures	
Effectiveness (of a measure)	Wear suitable respiratory protection.
Additional good practice advice bey	 Wear solely goggles.
PROC8b, PROC9)	
Product characteristics	100 %
	: <= 100 %
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use)	: Low volatile liquid
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use)	: Low volatile liquid
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa : Low volatile liquid
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use)	: Low volatile liquid : 0,123 hPa : Low volatile liquid
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Exposure duration	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year <= 480 min
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Exposure duration Frequency of use	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa 0,123 hPa <= 480 min <= 240 days per year
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Exposure duration Frequency of use	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa 0,123 hPa <= 480 min <= 240 days per year <= 480 min <= 240 days per year <= 240 days per year K management Assumes that potential dermal contact is limited to inside
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Exposure duration Frequency of use	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa 0,123 hPa <= 480 min <= 240 days per year
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa (-123 hPa) (-240 days per year (-240 days per year)
 Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure 	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa (-123 hPa) (-240 days per year) (
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa (-123 hPa) (-124 hPa) (
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Dermal exposure Covers skin contact area up to	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa 0,123 hPa <= 240 days per year K management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² Massumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
 Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Dermal exposure Covers skin contact area up to Determational conditions affecting Outdoor / Indoor 	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa 0,123 hPa <= 480 min <= 240 days per year K management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² Mg workers exposure Indoor use
Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Dermal exposure Covers skin contact area up to	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa 0,123 hPa <= 240 days per year K management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² Massumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
 Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Exposure duration Frequency of use Human factors not influenced by rist Dermal exposure Covers skin contact area up to Dermal exposure Covers skin contact area up to Determational conditions affecting Outdoor / Indoor 	 Low volatile liquid 0,123 hPa Low volatile liquid 0,123 hPa (-= 480 min <= 240 days per year <= 480 min <= 240 days per year <= 240 days per year K management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² Massumes that potential dermal contact is limited to inside hands / one hand / palm of hands. Indoor use



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Note

: No specific measures identified.

Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

16.3. ES 16 Exposure estimation and reference to its source

16.3.2 ES 16 - CS 2: Worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

16.3.3 ES 16 - CS 3: Worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,08

16.3.4 ES 16 - CS 4: Worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term -	0,34 mg/kg bw/day (ECETOC TRA worker v2.0,	0,003



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systemic	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,43

16.3.5 ES 16 - CS 5: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,20

16.3.6 ES 16 - CS 6: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,37
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities	0,43
combined routes	ECETOC TRA worker v2.0, Transfer of substance or	0,43



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	mixture (charging/discharging) at dedicated facilities	
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,37
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,06
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	0,43
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	0,43

16.4. ES 16 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

17. ES 17: Professional use; Use in functional fluids

17.1. Title section

Environment		
CS1:	Professional use (Widespread use of functional fluid (indoor),	ERC9a, ERC9b
	Widespread use of functional fluid (outdoor))	
Worke	ers	
CS2:	Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	PROC1, PROC2, PROC3
CS3:	Professional use (Chemical production where opportunity for exposure arises)	PROC4
CS4:	Professional use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a
CS5:	Professional use (Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	PROC9



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CS6: Professional use (Use of functional fluids in small devices)	PROC20

17.2. ES 17 Conditions of use affecting exposure

17.2.1 ES 17 - CS 1: Control of environmental exposure: Professional use (Widespread use of functional fluid (indoor), Widespread use of functional fluid (outdoor)) (ERC9a, ERC9b)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

17.2.2 ES 17 - CS 2: Control of worker exposure: Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition) (PROC1, PROC2, PROC3)

Product characteristics

Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa

Frequency and duration of use

Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year

Human factors not influenced by risk management

Dermal exposure	: Palm of one hand
Covers skin contact area up to	\therefore 240 cm ²
Remarks	: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
Dermal exposure	 Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Covers skin contact area up to	: 480 cm ²
Remarks	: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Other operational conditions affecting workers exposure

•		
Outdoor / Indoor	: Indoor use	



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Risk Management Measures		
Technical conditions and measures	likelihood of exposure of containment conditions	r refinery in closed process without or processes with equivalent op or other system to avoid exposure.
Technical conditions and measures	•	r refinery in closed continuous process led exposure or processes with t conditions
Technical conditions and measures	batch processes with o	tion in the chemical industry in closed occasional controlled exposure or ent containment condition lled exposure

Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice : Wear solely goggles.

17.2.3 ES 17 - CS 3: Control of worker exposure: Professional use (Chemical production where opportunity for exposure arises) (PROC4)

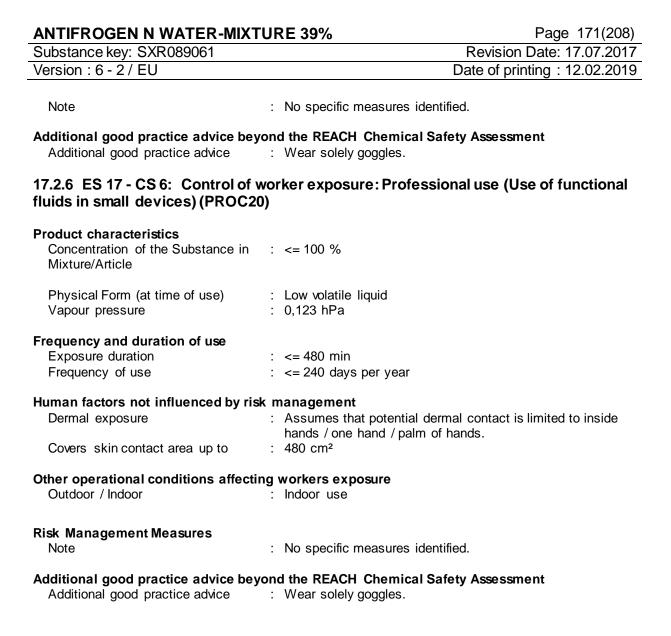
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ris	k management	
Dermal exposure	: Assumes that potential dermal contact is limited to inside	
Covers skin contact area up to	hands / one hand / palm of hands. : 480 cm ²	
Other operational conditions affecting	ng workers exposure	
Outdoor / Indoor	: Indoor use	
Risk Management Measures Note	: No specific measures identified.	
Additional good practice advice bey Additional good practice advice	ond the REACH Chemical Safety Assessment : Wear solely goggles.	
17.2.4 ES 17 - CS 4: Control of worker exposure: Professional use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)		

Product characteristics Concentration of the Substance in : <= 100 %



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		· · · · ·
Mixture/Article		
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ris		
		mal contact is limited to hands.
Covers skin contact area up to	: 960 cm ²	
Other operational conditions affectin		
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Exposure routes	: inhalative	
Technical conditions and	: Local exhaust ventilation	
measures		
Effectiveness (of a measure)		
Personal protective measures		
Effectiveness (of a measure)	Wear suitable respiratory p : 80 %	protection.
Ellectiveness (of a measure)	. 00 /0	
Additional good practice advice bey		fety Assessment
Additional good practice advice	. wear solely goggles.	
17.2.5 ES 17 - CS 5: Control of v substance or mixture into small ((PROC9)		
Product characteristics		
Concentration of the Substance in	: <= 100 %	
Mixture/Article		
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ris		
Dermal exposure		mal contact is limited to inside
	hands / one hand / palm of	
Covers skin contact area up to	: 480 cm ²	
Other operational conditions affecting		
Outdoor / Indoor	: Indoor use	

Risk Management Measures



CLARIAN

17.3. ES 17 Exposure estimation and reference to its source

17.3.2 ES 17 - CS 2: Worker exposure: Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition) (PROC1, PROC2, PROC3)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term	0,03 mg/m ³ (ECETOC TRA worker v2.0, Chemical	0,0007
- local and systemic	production or refinery in closed process without likelihood	



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	of exposure or processes with equivalent containment conditions)	
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	0,003
combined routes	ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	0,004
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	0,01
combined routes	ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	0,38
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23

17.3.3 ES 17 - CS 3: Worker exposure: Professional use (Chemical production where opportunity for exposure arises) (PROC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0)	0,06
combined routes	ECETOC TRA worker v2.0	0,80

17.3.4 ES 17 - CS 4: Worker exposure: Professional use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and typ	Exposure estimate	RCR
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of effects		
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,50

17.3.5 ES 17 - CS 5: Worker exposure: Professional use (Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC9)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,74
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	0,80

17.3.6 ES 17 - CS 6: Worker exposure: Professional use (Use of functional fluids in small devices) (PROC20)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	1,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,02
combined routes	ECETOC TRA worker v2.0	0,39

17.4. ES 17 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

18. ES 18: Consumer use; Heat transfer fluids, Hydraulic fluids

18.1. Title section



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Heat transfer fluids (PC16) Hydraulic fluids (PC17) Environment CS1: Consumer use (Widespread use of functional fluid (indoor), use of functional fluid (outdoor))	Widespread ERC9a, ERC9b
Consumer	
CS2: Consumer use (Heat transfer fluids, Hydraulic fluids)	PC16, PC17

18.2. ES 18 Conditions of use affecting exposure

18.2.1 ES 18 - CS 1: Control of environmental exposure: Consumer use (Widespread use of functional fluid (indoor), Widespread use of functional fluid (outdoor)) (ERC9a, ERC9b)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

18.2.2 ES 18 - CS 2: Control of consumer exposure: Consumer use (Heat transfer fluids, Hydraulic fluids) (PC16, PC17)

Remarks	: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities
Product characteristics Concentration of the Substance in Mixture/Article	: <= 30 %
Physical Form (at time of use) Vapour pressure	: Liquid : 0,123 hPa
Frequency and duration of use	
Exposure duration	: < 15 min
Human factors not influenced by ris	management
Dermal exposure	: Assumes that potential dermal contact is limited to hands.
Covers skin contact area up to	•
Other given operational conditions a	ffecting consumers exposure
Outdoor / Indoor	: Indoor use
Temperature	: 25 °C

Conditions and measures related to protection of consumer (e.g. behavioural advice,

personal protection and hygiene)

Consumer Measures : No specific measures identified.



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18.3. ES 18 Exposure estimation and reference to its source

18.3.2 ES 18 - CS 2: Consumer exposure: Consumer use (Heat transfer fluids, Hydraulic fluids) (PC16, PC17)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	1,93 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	0,28
Worker - dermal, long-term - systemic	4,11 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	0,08
Oral	Not applicable	
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at non dedicated-facilities	0,36

18.4. ES 18 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

19. ES 19: Professional use; Anti-freeze and de-icing products

19.1. Title section

Enviro	Environment				
CS1:	Professional use (Widespread use of non-reactive processing aid (no	ERC8d			
	inclusion into or onto article, outdoor))				
Worke	rs				
CS2:	Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	PROC1, PROC2			
CS3:	Professional use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a			
CS4:	Professional use (Transfer of substance or mixture (charging/discharging) at dedicated facilities)	PROC8b			
CS5:	Professional use (Non-industrial spraying)	PROC11			



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19.2. ES 19 Conditions of use affecting exposure

19.2.1 ES 19 - CS 1: Control of environmental exposure: Professional use (Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)) (ERC8d)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

19.2.2 ES 19 - CS 2: Control of worker exposure: Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC1, PROC2)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year
Human factors not influenced by risk	<pre>< management</pre>
Dermal exposure	: Palm of one hand
Covers skin contact area up to	: 240 cm ²
Remarks	: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
Dermal exposure	: Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Covers skin contact area up to Remarks	 : 480 cm² : Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
Other operational conditions affectir	ng workers exposure
Outdoor / Indoor	: Indoor use
Risk Management Measures Technical conditions and measures	: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent



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		containment conditions Sample via a closed loop or other system to avoid exposur
Technical conditions and measures		Chemical production or refinery in closed continuous proce with occasional controlled exposure or processes with equivalent containment conditions
Additional good practice advice bey Additional good practice advice		d the REACH Chemical Safety Assessment Wear solely goggles.
		ker exposure: Professional use (Transfer of charging) at non dedicated-facilities) (PROC8a)
Product characteristics		
Concentration of the Substance in Mixture/Article	:	<= 100 %
Physical Form (at time of use) Vapour pressure		Low volatile liquid 0,123 hPa
Frequency and duration of use		
Exposure duration		<= 480 min
Frequency of use	:	<= 240 days per year
Human factors not influenced by ris	k m	nanagement
Dermal exposure		Assumes that potential dermal contact is limited to hands.
Covers skin contact area up to	:	960 cm ²
Other operational conditions affectir	ng v	workers exposure
Outdoor / Indoor	-	Indoor use
Risk Management Measures		
Exposure routes		inhalative
Technical conditions and	:	Local exhaust ventilation
measures		22.24
Effectiveness (of a measure)		80 %
Personal protective measures		If technical measures not practical: Wear suitable respiratory protection.
Effectiveness (of a measure)		80 %
Additional good practice advice bey Additional good practice advice		d the REACH Chemical Safety Assessment Wear solely goggles.
		ker exposure: Professional use (Transfer of charging) at dedicated facilities) (PROC8b)
Product characteristics Concentration of the Substance in		

Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa



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Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ris		
Dermal exposure	•	al dermal contact is limited to inside
	hands / one hand / pa	alm of hands.
Covers skin contact area up to	: 480 cm ²	
Other operational conditions affecti Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures		
Note	: No specific measures	identified.
Additional good practice advice bey	ond the REACH Chemic	al Safety Assessment
Additional good practice advice		
19.2.5 ES 19 - CS 5: Control of v spraying) (PROC11)	worker exposure: Prof	fessional use (Non-industrial
Product characteristics		
Concentration of the Substance in	: <= 100 %	
Mixture/Article		
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Amount used		
Amounts used	: 0,05 L/min	
	. 0,00 L/mm	
Frequency and duration of use		
Exposure duration	: 150 min	
Frequency of use	: <= 5 days per week	
Other operational conditions affecti		
Outdoor / Indoor	: Indoor use	
Room size	: <= 1000 m3	
Risk Management Measures	Moor obseriably rest	atant daypa (tootad to EN1274) :-
Personal protective measures		stant gloves (tested to EN374) in
Effectiveness (of a massive)		sic' employee training.
Effectiveness (of a measure)	: 90 %	
Personal protective measures	: Wear suitable protect	ive clothing.
		Is to prevent exposure to the skin.
Effectiveness (of a measure)	: 80 %	
Personal protective measures	: Wear a respirator cor	nforming to EN140.
Effectiveness (of a measure)	: 40 %	5
Organisational measures to	: Ensure that direction	of application is only horizontal or



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prevent /limit releases, dispersion and exposure	downward.	
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that the distar m.	nce from worker to task is greater than 1
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that the direct worker.	ion of airflow is clearly away from the
Note	: Not applicable	
Organisational measures to prevent /limit releases, dispersion and exposure	: Provide enhanced ge	neral ventilation by mechanical means.
Organisational measures to prevent /limit releases, dispersion and exposure	: Regular cleaning of w	vork area
Organisational measures to prevent /limit releases, dispersion and exposure	: Regular cleaning of e	quipment
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure regular inspect equipment and maching	ction, cleaning and maintenance of nes.
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that the task is worker simultaneously	s not carried out by more than one y.
Additional good practice advice bey Additional good practice advice	ond the REACH Chemic : Wear solely goggles.	al Safety Assessment

19.3. ES 19 Exposure estimation and reference to its source

19.3.2 ES 19 - CS 2: Worker exposure: Professional use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC1, PROC2)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment	0,0007



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	conditions)	
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	0,003
combined routes	ECETOC TRA worker v2.0, Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	0,004
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	0,01
combined routes	ECETOC TRA worker v2.0, Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	0,38

19.3.3 ES 19 - CS 3: Worker exposure: Professional use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,50

19.3.4 ES 19 - CS 4: Worker exposure: Professional use (Transfer of substance or mixture (charging/discharging) at dedicated facilities) (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,88 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,74
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities	0,80

19.3.5 ES 19 - CS 5: Worker exposure: Professional use (Non-industrial spraying) (PROC11)



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Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	14,05 mg/m ³ (Stoffenmanager v4.0)	0,40
Worker - dermal, long-term - systemic	53,75 mg/kg bw/day (RISKOFDERM v2.1)	0,51
combined routes	Not applicable	0,91

19.4. ES 19 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

20. ES 20: Consumer use; Anti-freeze and de-icing products

20.1. Title section

Anti-fr	eeze and de-icing products (PC4)	
Enviro	nment	
CS1:	Consumer use (Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor))	ERC8d
Consu	mer	
CS2:	Consumer use (Anti-freeze and de-icing products)	PC4
CS3:	Consumer use (Anti-freeze and de-icing products)	PC4
CS4:	Consumer use (Anti-freeze and de-icing products)	PC4

20.2. ES 20 Conditions of use affecting exposure

20.2.1 ES 20 - CS 1: Control of environmental exposure: Consumer use (Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)) (ERC8d)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

20.2.2 ES 20 - CS 2: Control of consumer exposure: Consumer use (Anti-freeze and de-icing products) (PC4)

Remarks : De-icing of vehicles and similar equipment by spraying



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	Caravian	
	Spraying	
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Liquid : 0,123 hPa	
Amount used		
Amounts used	: 0,0468 kg/min	
Frequency and duration of use		
Spray duration	: 0,7 min	
Frequency of use	: 365 days per year	
Exposure duration	: 240 min	
Human factors not influenced by ris	<pre>c management</pre>	
Dermal exposure	: Assumes that potential of forearms.	dermal contact is limited to hands an
Covers skin contact area up to	: 1900 cm ²	
Dermal	: 0,000046 kg/min	
Uptake fraction, Oral	: 100 %	
Other given operational conditions	affecting consumers expos	sure
Outdoor / Indoor	: Indoor use	
Room size	: 58 m3	
Temperature	: 25 °C	
Ventilation rate per hour	: 0,5	
Room height	: 2,5 m	
Weight percent	: 100 %	
Remarks	: Non-Volatile	
Density	: 1,8 g/cm3	
Remarks	: Non-Volatile	
Airborne fraction	: 100 %	
Remarks Inhalation cut-off diameter	: Non-Volatile : 0,015 mm	
Conditions and measures related to personal protection and hygiene)	protection of consumer (e	.g. behavioural advice,
Consumer Measures	: Ensure spraying away fr	om persons.
20.2.3 ES 20 - CS 3: Control of o de-icing products) (PC4)	onsumer exposure:Co	nsumer use (Anti-freeze and
Remarks	-	similar equipment by spraying
	Cleaning	
Product characteristics		
Concentration of the Substance in	100.0/	

Concentration of the Substance in : <= 100 % Mixture/Article



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Physical Form (at time of use)	: Liquid	
Vapour pressure	: 0,123 hPa	
Amount used		
Amounts used	: 0,00029 kg/day	
Frequency and duration of use		
Frequency of use	: 365 days per year	
Human factors not influenced by r	isk management	
Dermal exposure	: Palm of one hand	
Covers skin contact area up to	: 215 cm ²	
Other given operational conditions	s affecting consumers exposu	re
Temperature	: 25 ℃	

20.2.4 ES 20 - CS 4: Control of consumer exposure: Consumer use (Anti-freeze and de-icing products) (PC4)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 30 %
Physical Form (at time of use) Vapour pressure	: Liquid : 0,123 hPa
Frequency and duration of use	
Exposure duration	: <15 min
Human factors not influenced by ris	k management
Dermal exposure	: Assumes that potential dermal contact is limited to hands.
Covers skin contact area up to	: 960 cm ²
Other given operational conditions	affecting consumers exposure
Outdoor / Indoor	: Indoor use
Temperature	: 25 °C
Conditions and measures related to personal protection and hygiene)	protection of consumer (e.g. behavioural advice,

Consumer Measures : No specific measures identified.

20.3. ES 20 Exposure estimation and reference to its source

20.3.2 ES 20 - CS 2: Consumer exposure: Consumer use (Anti-freeze and de-icing products) (PC4)



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Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long- term - local and systemic	0,0006 mg/m ³ (Consexpo V4.1)	0,0001
Chronic dermal systemic exposure	0,50 mg/kg bw/day (Consexpo V4.1)	0,009
Consumer - oral, long-term - systemic	0,005 mg/kg bw/day (Consexpo V4.1)	
combined routes	Consexpo V4.1	0,009

20.3.3 ES 20 - CS 3: Consumer exposure: Consumer use (Anti-freeze and de-icing products) (PC4)

Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long- term - local and systemic	Not applicable	
Chronic dermal systemic exposure	4,46 mg/kg bw/day (Consexpo V4.1)	0,08
Consumer - oral, long-term - systemic	Not applicable	
combined routes	Consexpo V4.1	0,08

20.3.4 ES 20 - CS 4: Consumer exposure: Consumer use (Anti-freeze and de-icing products) (PC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	1,93 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	0,28
Worker - dermal, long-term - systemic	4,11 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	0,08
Oral	Not applicable	
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at non dedicated-facilities	0,36

20.4. ES 20 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario



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laboratories

21.1. Title section

Enviro	Environment		
CS1:	Industrial use, Professional use (Widespread use of non-reactive	ERC8a	
	processing aid (no inclusion into or onto article, indoor))		
Worke	Workers		
CS2:	Industrial use, Professional use (Use as laboratory reagent)	PROC15	

21.2. ES 21 Conditions of use affecting exposure

21.2.1 ES 21 - CS 1: Control of environmental exposure: Industrial use, Professional use (Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)) (ERC8a)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

21.2.2 ES 21 - CS 2: Control of worker exposure: Industrial use, Professional use (Use as laboratory reagent) (PROC15)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year	
Human factors not influenced by ris Dermal exposure Covers skin contact area up to	k management : Palm of one hand	
Other operational conditions affectin Outdoor / Indoor		
Risk Management Measures Note	: No specific measures identified.	
Additional good practice advice beyond the REACH Chemical Safety Assessment		

Additional good practice advice : Wear solely goggles.



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21.3. ES 21 Exposure estimation and reference to its source

21.3.2 ES 21 - CS 2: Worker exposure: Industrial use, Professional use (Use as laboratory reagent) (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

21.4. ES 21 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

22. ES 22: Industrial use; Use in water treatment agents

22.1. Title section

Enviro	Environment			
CS1:	Industrial use (Formulation into solid matrix, Use of non-reactive processing aid at industrial site (no inclusion into or onto article))	ERC3, ERC4		
Worke	ITS			
CS2:	Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	PROC1		
CS3:	Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	PROC2		
CS4:	Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises)	PROC3, PROC4		
CS5:	Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a		
CS6:	Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities)	PROC8b		
CS7:	Industrial use (Treatment of articles by dipping and pouring)	PROC13		



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22.2. ES 22 Conditions of use affecting exposure

22.2.1 ES 22 - CS 1: Control of environmental exposure: Industrial use (Formulation into solid matrix, Use of non-reactive processing aid at industrial site (no inclusion into or onto article)) (ERC3, ERC4)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

22.2.2 ES 22 - CS 2: Control of worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Product characteristics Concentration of the Substance in : Mixture/Article	<= 100 %
•	Low volatile liquid 0,123 hPa
	<= 480 min <= 240 days per year
Human factors not influenced by risk in Dermal exposure : Covers skin contact area up to :	Palm of one hand
Other operational conditions affecting Outdoor / Indoor :	workers exposure Indoor use
Risk Management Measures Technical conditions and : measures	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions Sample via a closed loop or other system to avoid exposure.
Additional good practice advice beyon Additional good practice advice :	d the REACH Chemical Safety Assessment Wear solely goggles.

22.2.3 ES 22 - CS 3: Control of worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)

Product characteristics Concentration of the Substance in : <= 100 %



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Mixture/Article		
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by risk Dermal exposure	 management Assumes that potential derma hands / one hand / palm of hands / palm of h	
Covers skin contact area up to	: 480 cm ²	
Other operational conditions affectin Outdoor / Indoor	g workers exposure : Indoor use	
Risk Management Measures Note	: Chemical production or refine with occasional controlled ex equivalent containment condi No specific measures identifie	tions
Additional good practice advice beyon Additional good practice advice		ty Assessment
22.2.4 ES 22 - CS 4: Control of w formulation in the chemical indus controlled exposure or processes production where opportunity for	try in closed batch process s with equivalent containme	es with occasional Int condition, Chemical
Product characteristics		
Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by risk		
Dermal exposure	: Palm of one hand	
Covers skin contact area up to Remarks	 : 240 cm² : Manufacture or formulation in batch processes with occasion 	the chemical industry in closed onal controlled exposure or
Dermal exposure	processes with equivalent co : Assumes that potential derma hands / one hand / palm of ha	al contact is limited to inside

Covers skin contact area up to : 480 cm²

Remarks

: Chemical production where opportunity for exposure arises



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Other operational conditions affectir Outdoor / Indoor	: Indoor use
Risk Management Measures	
Technical conditions and	: Manufacture or formulation in the chemical industry in clo
measures	batch processes with occasional controlled exposure or
	processes with equivalent containment condition
Note	: Chemical production where opportunity for exposure arise
	No specific measures identified.
Additional good practice advice bey	ond the REACH Chemical Safety Assessment
Additional good practice advice	
2225 ES22-CS5: Control of w	vorker exposure: Industrial use (Transfer of
	discharging) at non dedicated-facilities) (PROC8a)
Product characteristics	
Concentration of the Substance in	: <= 100 %
Mixture/Article	
Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by risk	k management
	: Assumes that potential dermal contact is limited to hands.
Covers skin contact area up to	: 960 cm ²
Other operational conditions affectir	ng workers exposure
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Exposure routes	: inhalative
Technical conditions and	: Local exhaust ventilation
measures	: 90 %
Effectiveness (of a measure)	
	: If technical measures not practical:
Effectiveness (of a measure) Personal protective measures	Wear suitable respiratory protection.
Effectiveness (of a measure)	•
Effectiveness (of a measure) Personal protective measures Effectiveness (of a measure)	Wear suitable respiratory protection.

22.2.6 ES 22 - CS 6: Control of worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities) (PROC8b)

Product characteristics Concentration of the Substance in : <= 100 %



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Mixture/Article	
Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by ri	isk management
Dermal exposure	: Assumes that potential dermal contact is limited to inside
	hands / one hand / palm of hands.
Covers skin contact area up to	: 480 cm ²
Other operational conditions affect	ting workers exposure
Outdoor / Indoor	: Indoor use
Risk Management Measures	
Note	: Transfer of substance or mixture (charging/discharging) at
	dedicated facilities No specific measures identified.
22.2.7 ES 22 - CS 7: Control of	: Wear solely goggles.
22.2.7 ES 22 - CS 7: Control of by dipping and pouring) (PROC	worker exposure: Industrial use (Treatment of article
by dipping and pouring) (PROC	worker exposure: Industrial use (Treatment of article
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in	worker exposure: Industrial use (Treatment of article C13)
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article	worker exposure: Industrial use (Treatment of article C13) : <= 100 %
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use)	 worker exposure: Industrial use (Treatment of article C13) : <= 100 % : Low volatile liquid
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article	worker exposure: Industrial use (Treatment of article C13) : <= 100 %
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use	 worker exposure: Industrial use (Treatment of article C13) : <= 100 % : Low volatile liquid
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration	 worker exposure: Industrial use (Treatment of article C13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use	 worker exposure: Industrial use (Treatment of article C13) : <= 100 % : Low volatile liquid : 0,123 hPa
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use	 worker exposure: Industrial use (Treatment of article C13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration	 worker exposure: Industrial use (Treatment of article C13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ri	 i worker exposure: Industrial use (Treatment of article C13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year isk management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ri	 i worker exposure: Industrial use (Treatment of article C13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year isk management : Assumes that potential dermal contact is limited to inside
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ri Dermal exposure Covers skin contact area up to Other operational conditions affect	 i worker exposure: Industrial use (Treatment of article C13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year isk management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm² ting workers exposure
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ri Dermal exposure Covers skin contact area up to	 i worker exposure: Industrial use (Treatment of article C13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year isk management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm²
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ri Dermal exposure Covers skin contact area up to Other operational conditions affect Outdoor / Indoor	 i worker exposure: Industrial use (Treatment of article C13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year isk management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm² ting workers exposure
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ri Dermal exposure Covers skin contact area up to Other operational conditions affect Outdoor / Indoor	 i worker exposure: Industrial use (Treatment of article C13) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year isk management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm² ting workers exposure
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ri Dermal exposure Covers skin contact area up to Other operational conditions affect Outdoor / Indoor Risk Management Measures	 i worker exposure: Industrial use (Treatment of article 213) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year isk management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm² ting workers exposure : Indoor use
by dipping and pouring) (PROC Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ri Dermal exposure Covers skin contact area up to Other operational conditions affect Outdoor / Indoor Risk Management Measures Exposure routes	 i worker exposure: Industrial use (Treatment of article 213) : <= 100 % : Low volatile liquid : 0,123 hPa : <= 480 min : <= 240 days per year isk management : Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. : 480 cm² ting workers exposure : Indoor use : Dermal



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Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

22.3. ES 22 Exposure estimation and reference to its source

22.3.2 ES 22 - CS 2: Worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

22.3.3 ES 22 - CS 3: Worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,08

22.3.4 ES 22 - CS 4: Worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled	0,003



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	exposure or processes with equivalent containment condition)	
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,43

22.3.5 ES 22 - CS 5: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
combined routes	ECETOC TRA worker v2.0	0,20

22.3.6 ES 22 - CS 6: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities) (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0)	0,06
combined routes	ECETOC TRA worker v2.0	0,43

22.3.7 ES 22 - CS 7: Worker exposure: Industrial use (Treatment of articles by dipping and pouring) (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,87 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,75



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22.4. ES 22 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

23. ES 23: Consumer use; Adhesives, sealants

23.1. Title section

Adhes	ives, sealants (PC1)	
Enviro	nment	
CS1:	Consumer use (Widespread use leading to inclusion into/onto article (indoor), Widespread use leading to inclusion into/onto article (outdoor))	ERC8c, ERC8f
Consu	mer	
CS2:	Consumer use (Adhesives, sealants)	PC1

23.2. ES 23 Conditions of use affecting exposure

23.2.1 ES 23 - CS 1: Control of environmental exposure: Consumer use (Widespread use leading to inclusion into/onto article (indoor), Widespread use leading to inclusion into/onto article (outdoor)) (ERC8c, ERC8f)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

23.2.2 ES 23 - CS 2: Control of consumer exposure: Consumer use (Adhesives, sealants) (PC1)

Remarks	: Worst case assumption Mixing operations (open systems) Loading of application equipment
Product characteristics Concentration of the Substance in Mixture/Article	: <= 0,075 %
Molecular weight Physical Form (at time of use) Vapour pressure	: 3.000 g/mol : Liquid : 0,123 hPa
Amount used Amounts used	: 9 kg/day



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		· · · ·
Frequency and duration of use		
Application duration	: 75 min	
Frequency of use	: 0,25 days per year	
Exposure duration	: 75 min	
Human factors not influenced by risk	k management	
Covers skin contact area up to	-	
Dermal	: 0,00003 kg/min	
Other given operational conditions a	affecting consumers exposur	re
Outdoor / Indoor	: Indoor use	
Room size	: 58 m3	
Temperature	: 25 °C	
Ventilation rate per hour	: 0,5	
Mass transfer rate	: 4740 m/min	
Release area	: 4/40 m/mm	
Release alea	. 4 112	
Conditions and measures related to personal protection and hygiene)	protection of consumer (e.g	. behavioural advice,
Consumer Measures	: No specific measures ident	tified.

23.3. ES 23 Exposure estimation and reference to its source

23.3.2 ES 23 - CS 2: Consumer exposure: Consumer use (Adhesives, sealants) (PC1)

Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long- term - local and systemic	4,1 mg/m ³ (Consexpo V4.1)	0,59
Chronic dermal systemic exposure	0,26 mg/kg bw/day (Consexpo V4.1)	0,005
Consumer - oral, long-term - systemic	Not applicable	
combined routes	Consexpo V4.1	0,60

23.4. ES 23 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

24. ES 24: Industrial use; Manufacture of substance,



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Adhesives, sealants, Foaming, Use in coatings, Use in polymer production

24.1. Title section

- ·		
Environment		
CS1:	Industrial use (Formulation into mixture, Formulation into solid matrix, Use at industrial site leading to inclusion into/onto article, Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article))	ERC2, ERC3, ERC5, ERC6c
Worke	rs	
CS2:	Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions)	PROC1
CS3:	Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions)	PROC2
CS4:	Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises)	PROC3, PROC4
CS5:	Industrial use (Mixing or blending in batch processes)	PROC5
CS6:	Industrial use (Industrial spraying)	PROC7
CS7:	Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities)	PROC8a
CS8:	Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	PROC8b, PROC9
CS9:	Industrial use (Roller application or brushing)	PROC10
CS10:	Industrial use (Treatment of articles by dipping and pouring)	PROC13
	Industrial use (Tabletting, compression, extrusion, pelettisation, granulation)	PROC14
CS12:	Industrial use (Use as laboratory reagent)	PROC15

24.2. ES 24 Conditions of use affecting exposure

24.2.1 ES 24 - CS 1: Control of environmental exposure: Industrial use (Formulation into mixture, Formulation into solid matrix, Use at industrial site leading to inclusion into/onto article, Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)) (ERC2, ERC3, ERC5, ERC6c)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

24.2.2 ES 24 - CS 2: Control of worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with



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equivalent containment condition	s) (PROC1)		
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %		
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa		
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year		
Human factors not influenced by risk Dermal exposure Covers skin contact area up to	management : Palm of one hand : 240 cm ²		
Other operational conditions affecting Outdoor / Indoor	g workers exposure : Indoor use		
Risk Management Measures Technical conditions and measures	likelihood of exposure containment condition	or refinery in closed process without or processes with equivalent as oop or other system to avoid exposure.	
Additional good practice advice beyo Additional good practice advice	nd the REACH Chemic : Wear solely goggles.	al Safety Assessment	
24.2.3 ES 24 - CS 3: Control of worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)			
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %		
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa		
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year		
Human factors not influenced by risk		al dermal contact is limited to inside	

Dermal exposure: Assumes that potential dermal contact is limited to inside
hands / one hand / palm of hands.Covers skin contact area up to: 480 cm²

Other operational conditions affecting workers exposure

Outdoor / Indoor	: Indoor u	se
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Risk Management Measures Note	: Chemical production or refinery in closed continuous proces with occasional controlled exposure or processes with equivalent containment conditions No specific measures identified.
	yond the REACH Chemical Safety Assessment : Wear solely goggles.
formulation in the chemical indu controlled exposure or processe	worker exposure: Industrial use (Manufacture or Istry in closed batch processes with occasional es with equivalent containment condition, Chemical or exposure arises) (PROC3, PROC4)
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year
Human factors not influenced by ris Dermal exposure Covers skin contact area up to Remarks	 sk management Palm of one hand 240 cm² Manufacture or formulation in the chemical industry in close batch processes with occasional controlled exposure or processes with equivalent containment condition
Dermal exposure Covers skin contact area up to	 Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm²
Remarks	: Chemical production where opportunity for exposure arises
Other operational conditions affecti Outdoor / Indoor	i ng workers exposure : Indoor use
Risk Management Measures Technical conditions and	: Manufacture or formulation in the chemical industry in close batch processes with occasional controlled exposure or
measures	processes with equivalent containment condition

Additional good practice advice : Wear solely goggles.

24.2.5 ES 24 - CS 5: Control of worker exposure: Industrial use (Mixing or blending in batch processes) (PROC5)



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Product characteristics		
Concentration of the Substance in	: <= 100 %	
Mixture/Article		
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Frequency and duration of use		
Exposure duration	: <= 480 min	
Frequency of use	: <= 240 days per year	
Human factors not influenced by ris		
Dermal exposure	hands / one hand / pa	al dermal contact is limited to inside
Covers skin contact area up to	: 480 cm ²	
Other operational conditions affecti	na workers exposure	
Outdoor / Indoor	: Indoor use	
Risk Management Measures		
Exposure routes	: Dermal	stant downs (tested to $EN(274)$ in
Personal protective measures	combination with spec	stant gloves (tested to EN374) in cific activity training.
Effectiveness (of a measure)	: 90 %	
Additional good practice advice bey Additional good practice advice		al Safety Assessment
24.2.6 ES 24 - CS 6: Control of v (PROC7)	worker exposure : Indu	strial use (Industrial spraying)
Product characteristics		
Product characteristics Concentration of the Substance in	: <= 100 %	
Mixture/Article	. <= 100 /0	
Physical Form (at time of use)	: Low volatile liquid	
Vapour pressure	: 0,123 hPa	
Amount used		
Amounts used	: 0,6 L/min	
Frequency and duration of use		
Exposure duration	: 360 min	
Frequency of use	: <= 5 days per week	
Other operational conditions affecting		
Outdoor / Indoor	: Indoor use	
Room size	: >1000 m3	
Risk Management Measures		



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measures Effectiveness (of a measure) Note	50 %Ensure that the direction of ai worker.	rflow is clearly away from the
Personal protective measures	: Wear chemically resistant glo combination with 'basic' empl	
Effectiveness (of a measure)	: 90 %	
Personal protective measures Effectiveness (of a measure)	 Wear suitable protective cloth Wear suitable coveralls to pre 80 % 	
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that the distance from m.	worker to task is greater than
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure that direction of applic downward.	cation is only horizontal or
Organisational measures to prevent /limit releases, dispersion and exposure	: Regular cleaning of work area	3
Organisational measures to prevent /limit releases, dispersion and exposure	: Regular cleaning of equipmer	nt
Organisational measures to prevent /limit releases, dispersion and exposure	: Ensure regular inspection, cle equipment and machines.	eaning and maintenance of

Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

24.2.7 ES 24 - CS 7: Control of worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %		
Physical Form (at time of use)	: Low volatile liquid		
Vapour pressure	: 0,123 hPa		
Frequency and duration of use			
Exposure duration	: <= 480 min		
Frequency of use	: <= 240 days per year		
Human factors not influenced by risk management			
Dermal exposure	: Assumes that potential dermal contact is limited to hands.		
Covers skin contact area up to	: 960 cm ²		



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Other operational conditions affecting workers exposure

Outdoor / Indoor

: Indoor use

Risk Management Measures

Exposure routes	: inhalative
Technical conditions and	: Local exhaust ventilation
measures	
Effectiveness (of a measure)	: 90 %
Personal protective measures	: If technical measures not practical: Wear suitable respiratory protection.
Effectiveness (of a measure)	: 90 %

Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.

24.2.8 ES 24 - CS 8: Control of worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %		
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa		
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per year		
Human factors not influenced by ris Dermal exposure	: Assumes that potential dermal contact is limited to inside		
Covers skin contact area up to	hands / one hand / palm of hands. : 480 cm ²		
Other operational conditions affecting	ng workers exposure		
Outdoor / Indoor	: Indoor use		
Risk Management Measures			
Note	: No specific measures identified.		
Additional good practice advice beyond the REACH Chemical Safety Assessment Additional good practice advice : Wear solely goggles.			
24.2.9 ES 24 - CS 9: Control of worker exposure: Industrial use (Roller application or brushing) (PROC10)			
Product characteristics			

Concentration of the Substance in $$: <= 100 % Mixture/Article



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Physical Form (at time of use)	: Low volatile liquid
Vapour pressure	: 0,123 hPa
Frequency and duration of use	
Exposure duration	: <= 480 min
Frequency of use	: <= 240 days per year
Human factors not influenced by ris	sk management
Dermal exposure	: Assumes that potential dermal contact is limited to hands.
Covers skin contact area up to	
Other operational conditions affecti Outdoor / Indoor	ng workers exposure : Indoor use
Risk Management Measures	
Exposure routes	: Dermal
Personal protective measures	: Wear chemically resistant gloves (tested to EN374) in
	combination with 'basic' employee training.
Effectiveness (of a measure)	: 90 %
Additional good practice advice bey	
Additional good practice advice	of worker exposure: Industrial use (Treatment of
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring)	Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13)
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article	 Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13) : <= 100 %
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use)	 Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article	 Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13) : <= 100 %
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use	 Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid 0,123 hPa
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration	 Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid 0,123 hPa <= 480 min
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use	 Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid 0,123 hPa
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use	 Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration	 Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year sk management Assumes that potential dermal contact is limited to inside
Additional good practice advice 24.2.10 ES 24 - CS 10: Control of articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure	 Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year sk management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris	 Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year sk management Assumes that potential dermal contact is limited to inside
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure Covers skin contact area up to	 Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid 0,123 hPa <= 240 days per year sk management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm²
Additional good practice advice 24.2.10 ES 24 - CS 10: Control of articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure Covers skin contact area up to Other operational conditions affecti Outdoor / Indoor	 Wear solely goggles. of worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year sk management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² ng workers exposure
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure Covers skin contact area up to Other operational conditions affecti Outdoor / Indoor Risk Management Measures	 Wear solely goggles. by worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year sk management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² mg workers exposure Indoor use
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure Covers skin contact area up to Other operational conditions affecti Outdoor / Indoor Risk Management Measures Exposure routes	 Wear solely goggles. by worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid 0,123 hPa <= 240 min <= 240 days per year sk management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² Indoor use Dermal
Additional good practice advice 24.2.10 ES 24 - CS 10: Control c articles by dipping and pouring) Product characteristics Concentration of the Substance in Mixture/Article Physical Form (at time of use) Vapour pressure Frequency and duration of use Exposure duration Frequency of use Human factors not influenced by ris Dermal exposure Covers skin contact area up to Other operational conditions affecti Outdoor / Indoor Risk Management Measures	 Wear solely goggles. by worker exposure: Industrial use (Treatment of (PROC13)) <= 100 % Low volatile liquid 0,123 hPa <= 480 min <= 240 days per year sk management Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands. 480 cm² ng workers exposure Indoor use

Covers skin contact area up to : 240 cm²



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Additional good practice advice bey Additional good practice advice 24.2.11 ES 24 - CS 11: Control c	: Wear solely goggles.	
compression, extrusion, pelettis		
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Frequency and duration of use		
Exposure duration Frequency of use	: <= 480 min : <= 240 days per yea	r
Human factors not influenced by ris Dermal exposure	k management : Assumes that potenti hands / one hand / pa	al dermal contact is limited to inside alm of hands.
Covers skin contact area up to	•	
Other operational conditions affecti Outdoor / Indoor	ng workers exposure : Indoor use	
Risk Management Measures Note	: No specific measures	identified.
Additional good practice advice bey Additional good practice advice		cal Safety Assessment
24.2.12 ES 24 - CS 12: Control c reagent) (PROC15)	of worker exposure: Ir	ndustrial use (Use as laboratory
Product characteristics Concentration of the Substance in Mixture/Article	: <= 100 %	
Physical Form (at time of use) Vapour pressure	: Low volatile liquid : 0,123 hPa	
Amount used Storage	: <1 kg, < 1 l	
Frequency and duration of use Exposure duration Frequency of use	: <= 480 min : <= 240 days per yea	r
Human factors not influenced by ris Dermal exposure		al dermal contact is limited to inside
Covers skin contact area up to	· 240 cm ²	



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Other operational conditions affect Outdoor / Indoor	ting workers exposure : Indoor use	
Risk Management Measures Note	: Use as laboratory reagent No specific measures iden	tified.
Additional good practice advice be	yond the REACH Chemical Sa	afety Assessment

Additional good practice advice beyond the REACT chemical safety A

24.3. ES 24 Exposure estimation and reference to its source

24.3.2 ES 24 - CS 2: Worker exposure: Industrial use (Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions) (PROC1)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	0,03 mg/m ³ (ECETOC TRA worker v2.0)	0,0007
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,004

24.3.3 ES 24 - CS 3: Worker exposure: Industrial use (Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions) (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,08

24.3.4 ES 24 - CS 4: Worker exposure: Industrial use (Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition, Chemical production where opportunity for exposure arises) (PROC3, PROC4)

Route of exposure and type of effects	Exposure estimate	RCR



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Worker - inhalative, long-term - local and systemic	7,76 mg/m ³ (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,22
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition)	0,003
combined routes	ECETOC TRA worker v2.0, Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	0,23
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises)	0,06
combined routes	ECETOC TRA worker v2.0, Chemical production where opportunity for exposure arises	0,43

24.3.5 ES 24 - CS 5: Worker exposure: Industrial use (Mixing or blending in batch processes) (PROC5)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,38

24.3.6 ES 24 - CS 6: Worker exposure: Industrial use (Industrial spraying) (PROC7)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	9,79 mg/m ³ (Stoffenmanager v4.0)	0,28
Worker - dermal, long-term - systemic	54,6 mg/kg bw/day (RISKOFDERM v2.1)	0,52
combined routes	Not applicable	0,80

24.3.7 ES 24 - CS 7: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at non dedicated-facilities) (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term	2,59 mg/m ³ (ECETOC TRA worker v2.0)	0,07



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- local and systemic		1
Worker - dermal, long-term -	13,71 mg/kg bw/day (ECETOC TRA worker v2.0)	0,13
systemic		
combined routes	ECETOC TRA worker v2.0	0,20

24.3.8 ES 24 - CS 8: Worker exposure: Industrial use (Transfer of substance or mixture (charging/discharging) at dedicated facilities, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)) (PROC8b, PROC9)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities)	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture (charging/discharging) at dedicated facilities	0,43
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,37
Worker - dermal, long-term - systemic	6,86 mg/kg bw/day (ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing))	0,06
combined routes	ECETOC TRA worker v2.0, Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	0,43

24.3.9 ES 24 - CS 9: Worker exposure: Industrial use (Roller application or brushing) (PROC10)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	25,87 mg/m ³ (ECETOC TRA worker v2.0)	0,74
Worker - dermal, long-term - systemic	2,74 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03
combined routes	ECETOC TRA worker v2.0	0,77

24.3.10 ES 24 - CS 10: Worker exposure: Industrial use (Treatment of articles by dipping and pouring) (PROC13)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term	25,87 mg/m ³ (ECETOC TRA worker v2.0)	0,74

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- local and systemic Worker - dermal, long-term - systemic	1,37 mg/kg bw/day (ECETOC TRA worker v2.0)	0,01
combined routes	ECETOC TRA worker v2.0	0,75

24.3.11 ES 24 - CS 11: Worker exposure: Industrial use (Tabletting, compression, extrusion, pelettisation, granulation) (PROC14)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	3,43 mg/kg bw/day (ECETOC TRA worker v2.0)	0,03
combined routes	ECETOC TRA worker v2.0	0,40

24.3.12 ES 24 - CS 12: Worker exposure: Industrial use (Use as laboratory reagent) (PROC15)

Route of exposure and type of effects	Exposure estimate	RCR
Worker - inhalative, long-term - local and systemic	12,94 mg/m ³ (ECETOC TRA worker v2.0)	0,37
Worker - dermal, long-term - systemic	0,34 mg/kg bw/day (ECETOC TRA worker v2.0)	0,003
combined routes	ECETOC TRA worker v2.0	0,37

24.4. ES 24 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2

25. ES 25: Consumer use; Insulation foams

25.1. Title section

Polym	Polymer preparations and compounds (PC32)		
Enviro	nment		
CS1:	Consumer use (Widespread use leading to inclusion into/onto article (indoor), Widespread use leading to inclusion into/onto article (outdoor))	ERC8c, ERC8f	
Consu	Consumer		
CS2:	Consumer use (Polymer preparations and compounds)	PC32	



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25.2. ES 25 Conditions of use affecting exposure

25.2.1 ES 25 - CS 1: Control of environmental exposure: Consumer use (Widespread use leading to inclusion into/onto article (indoor), Widespread use leading to inclusion into/onto article (outdoor)) (ERC8c, ERC8f)

Remarks

: As no environmental hazard was identified no environmentalrelated exposure assessment and risk characterization was performed.

25.2.2 ES 25 - CS 2: Control of consumer exposure: Consumer use (Polymer preparations and compounds) (PC32)

Product characteristics Concentration of the Substance in Mixture/Article	: <= 5 %
Physical Form (at time of use) Vapour pressure	: Liquid : 0,123 hPa
Amount used	
Amount per use	: 0,825 kg
Frequency and duration of use Exposure duration Frequency of use	: 30 min : 0,2 days per year
Human factors not influenced by risl	<pre>c management</pre>
Covers skin contact area up to	: 1900 cm ²
Breathing volume	: 1,5 m3/day
Other given operational conditions a	Iffecting consumers exposure
Outdoor / Indoor	: Indoor use
Room size	: 57,5 m3
Temperature	: 25 °C
Conditions and measures related to	protection of consumer (e.g. b

Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)

Consumer Measures	
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: No specific measures identified.

25.3. ES 25 Exposure estimation and reference to its source



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25.3.2 ES 25 - CS 2: Consumer exposure: Consumer use (Polymer preparations and compounds) (PC32)

Route of exposure and type of effects	Exposure estimate	RCR
Consumer- inhalative, long-	0,06 mg/m ³ (Consexpo V4.1)	0,009
term - local and systemic		
Chronic dermal systemic exposure	0,007 mg/kg bw/day (Consexpo V4.1)	0,0008
Consumer - oral, long-term - systemic	Not applicable	
combined routes	Consexpo V4.1	0,01

25.4. ES 25 Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

ECHA guidance for downstream users Section 2