

## Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 SDS Ref.: 100037700 Revision date: 2/20/2020 Supersedes: 1/2/2020 Version: 12.0

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

1.1. Product identifier	
Product form	: Substance
Name	: CYCLOPENTANE
Chemical name	: CYCLOPENTANE
EC Index-No.	: 601-030-00-2
EC-No.	: 206-016-6
CAS-No.	: 287-92-3
REACH registration No	: 01-2119463053-47
Product code	: 100037700
Synonyms	: NOVEXPANS cyclopentane
1.2. Relevant identified uses of the substanc	e or mixture and uses advised against

## 1.2.1. Relevant identified uses

Use of the substance/mixture

: Solvent Blowing agent

## 1.2.2. Uses advised against

No additional information available 1.3. Details of the supplier of the safety data sheet

## Supplier

Dehon Service SAS 26 Avenue du Petit Parc 94683 VINCENNES Cedex - France T 01 43 98 75 00 - F 01 43 98 21 51 ContactFDS@climalife.dehon.com

## Other

Climalife Hongrie Kft Villányi út 47 1118 Budaörs - Hungary T (36) 23 431 660 - F (36) 23 431 661 ContactFDS@climalife.dehon.com

## Other

Climalife Supplied by Inventec Performance Chemicals Italia SRL Via del Lavoro, 10/G 20874 Busnago MB - Italia T +39 39-5973480 - F +39 39-5973490 <u>ContactFDS@climalife.dehon.com</u>

## Other

Dehon nordic service Östra Hamngatan 50B 3tr 41109 GÖTEBORG - Sweden T 00 46 44 21 58 80 - F 00 46 44 21 58 80 <u>ContactFDS@climalife.dehon.com</u>

## Other

Dehon Service Nerderland B.V. Van Konijnenburgweg 84 NL-4612 PL Bergen Op Zoom - Netherlands T 00 31 164 212 830 - F 00 31 164 212 831 <u>ContactFDS@climalife.dehon.com</u>

## Other

IDS Refrigeration Limited 22 Apex Court, Woodlands, Bradley Stoke BS32 4JT Bristol - United Kingdom T 00 44 1179 802520 - F 00 44 1179 802521 ContactFDS@climalife.dehon.com

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## Other

Galco s.a/n.v. Avenue Carton de Wiart, 79 1090 BRUSSELS - Belgium T 00 32 2 421 01 84 - F 00 32 2 421 01 84 / 00 32 2 425 38 12 <u>ContactFDS@climalife.dehon.com</u>

## Other

Climalife Kft Budepesta sucurcala Bucuresti Romania Bulevardul Hristo Botev, Nr. 28, Biroul NR 4, Modulul I Bucuresti Sectorul 3 - Romania ContactFDS@climalife.dehon.com

## Other

Dehon Kälte-Fachvertriebs GmbH Robert-Bosch-Strasse 14 40668 MEERBUSCH - Germany T 00 49 2150 7073 0 - F 00 49 2150 7073 17 ContactFDS@climalife.dehon.com

## Other

Dehon Service Belgium s.a/n.v. Avenue Carton de Wiart, 79 1090 Bruxelles - Belgium T 00 32 2 421 01 70 - F 00 32 2 426 96 62 ContactFDS@climalife.dehon.com

## Other

Friogas sa Poligono Industrial SEPES Parcela 10 46500 SAGUNTO (Valencia) - Spain T 00 34 9 6 266 36 32 - F 00 34 9 6 266 50 25 ContactFDS@climalife.dehon.com

## Other

EN (English)

Prochimac SA Rue du Château 10 CH-2000 NEUCHATEL - Switzerland T 00 41 32 727 36 00 - F 00 41 32 727 36 19 ContactFDS@climalife.dehon.com

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<b>1.4. Emergency</b> f Emergency number	telephone number	+33 (0) 1 72 11 00 03		
Country	Organisation/Company	Address	Emergency number	Comment
United Kingdom	National Poisons Information Service (Birmingham Centre) City Hospital	Dudley Road B18 7QH Birmingham	0344 892 0111	

## SECTION 2: Hazards identification 2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]	
Flam. Liq. 2	H225
STOT SE 3	H336
Asp. Tox. 1	H304
Aquatic Chronic 3	H412

Full text of hazard classes and H-statements : see section 16

## Adverse physicochemical, human health and environmental effects

Highly flammable liquid and vapour. May be fatal if swallowed and enters airways. May cause drowsiness or dizziness. Harmful to aquatic life with long lasting effects. **2.2. Label elements** 

### Labelling according to Regulation (EC) No. 1272/2008 [CLP] Hazard pictograms (CLP) GHS02 GHS07 GHS08 Signal word (CLP) : Danger Hazard statements (CLP) : H225 - Highly flammable liquid and vapour. H304 - May be fatal if swallowed and enters airways. H336 - May cause drowsiness or dizziness. H412 - Harmful to aquatic life with long lasting effects. Precautionary statements (CLP) : P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P261 - Avoid breathing vapours. P273 - Avoid release to the environment. P301+P310+P331 - IF SWALLOWED: Immediately call a POISON CENTER, a doctor. Do NOT induce vomiting. P312 - Call a doctor, a POISON CENTER if you feel unwell. P403+P233 - Store in a well-ventilated place. Keep container tightly closed. P501 - Dispose of contents and container to hazardous or special waste collection point in accordance with national regulation.. **EUH-statements** : EUH066 - Repeated exposure may cause skin dryness or cracking. 2.3. Other hazards Other hazards not contributing to the classification : Flammable or explosive vapour/air mixtures may be formed.

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

## SECTION 3: Composition/information on ingredients 3.1. Substances

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
CYCLOPENTANE	(CAS-No.) 287-92-3 (EC-No.) 206-016-6 (EC Index-No.) 601-030-00-2 (REACH-no) 01-2119463053-47	> 95	Flam. Liq. 2, H225 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 3, H412

Full text of H-statements: see section 16

## 3.2. Mixtures

Not applicable

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SECTION 4: First aid measures			
4.1. Description of first aid measures			
First-aid measures after inhalation	: Move the affected person away from the contaminated area and into the fresh air. Make the person rest. If you feel unwell, seek medical advice.		
First-aid measures after skin contact	: Wash immediately with plenty of soap and water. Remove all contaminated clothing and footwear. If skin irritation occurs: Get medical advice/attention.		
First-aid measures after eye contact	: Rinse eyes with water as a precaution. If irritation persists, consult an eye specialist.		
First-aid measures after ingestion	: Do not give anything to drink. Do not induce vomiting. Call a physician immediately.		
4.2. Most important symptoms and effects,	both acute and delayed		
Symptoms/effects	: May cause drowsiness or dizziness.		
Symptoms/effects after skin contact	: Repeated exposure may cause skin dryness or cracking.		
Symptoms/effects after ingestion	: May be fatal if swallowed and enters airways.		

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

SECTION 5: Firefighting measures		
5.1. Extinguishing media		
Suitable extinguishing media	: Foam. Powders. Carbon dioxide.	
Unsuitable extinguishing media	: Strong water jet.	
5.2. Special hazards arising from the substa	ance or mixture	
Fire hazard	: Highly flammable liquid and vapour. The vapours are denser than air and may travel along the ground. Distance ignition possible.	
Explosion hazard	: Vapour/air mixtures are explosive.	
Hazardous decomposition products in case of fire	: Toxic vapours may be released. Carbon oxides (CO, CO2). Hydrocarbons.	
5.3. Advice for firefighters		
Firefighting instructions	: Cool down the containers exposed to heat with a water spray. Contain the extinguishing fluids by bunding (the product is hazardous for the environment).	
Protection during firefighting	: Do not attempt to take action without suitable protective equipment. Self-contained	

SECTION 6: Accidental release measures 6.1. Personal precautions, protective equipment and emergency procedures			
General measures	: Avoid contact with skin and eyes. Remove all sources of ignition. Only qualified personnel equipped with suitable protective equipment may intervene.		
6.1.1. For non-emergency personnel No additional information available			
6.1.2. For emergency responders			
Protective equipment	: For further information refer to section 8: "Exposure controls/personal protection".		
Emergency procedures	: Evacuate the danger area.		
6.2. Environmental precautions			
Contain the spilled material by bunding (proc	duct is hazardous for the environment). Do not discharge into drains or rivers.		
6.3. Methods and material for containment and cleaning up			
For containment	: Recover the product with absorbent material. Absorb with : sand or inert absorbent.		
Other information	: Dispose of contaminated materials in accordance with current regulations.		
6.4 Reference to other sections			

**6.4. Reference to other sections** Concerning disposal elimination after cleaning, see section 13.

SECTION 7: Handling and storage		
7.1. Precautions for safe handling		
Precautions for safe handling	: Smoking is forbidden. Avoid the build-up of electrostatic charge. Vapour extraction at source. Use non-sparking tools.	
Hygiene measures	: Always wash hands after handling the product. Separate working clothes from town clothes.	
7.2. Conditions for safe storage, including a	ny incompatibilities	
Technical measures	: The floor of the depot must be impermeable, non-combustible and designed to form a basin, in order that stored flammable liquids should not, under any circumstances, be released outside. Take all necessary measures to avoid accidental discharge of produinto drains and waterways due to the rupture of containers or transfer systems.	
Storage conditions	: Store in a well-ventilated place. Keep cool. Keep away from ignition sources. Keep av from naked flames/heat.	vay
Incompatible materials	: Strong bases. Strong oxidizing agents.	
Packaging materials	: Stainless steel. Carbon steel. Polypropylene. Polyethylene.	
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## 7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection		
8.1. Control parameters		
CYCLOPENTANE (287-92-3)		
Belgium - Occupational Exposure Limits		
	Cyclopentane # Cyclopentaan	
Limit value (mg/m <sup>3</sup> )	1800 mg/m <sup>3</sup>	
Limit value (ppm)	600 ppm	
Regulatory reference	Koninklijk besluit/Arrêté royal 02/09/2018	
Denmark - Occupational Exposure Limits		
Local name	Cyclopentan	
Grænseværdie (langvarig) (mg/m³)	850 mg/m³	
Grænseværdie (langvarig) (ppm)	300 ppm	
Regulatory reference	BEK nr 655 af 31/05/2018	
France - Occupational Exposure Limits		
Local name	Cyclopentane	
VME (mg/m³)	1720 mg/m³	
VME (ppm)	600 ppm	
Note (FR)	Valeurs recommandées/admises	
Regulatory reference	Circulaire du Ministère du travail (réf.: INRS ED 984, 2016)	
Greece - Occupational Exposure Limits		
Local name	Κυκλοπεντάνιο	
OEL TWA (mg/m³)	1720 mg/m <sup>3</sup>	
OEL TWA (ppm)	600 ppm	
Regulatory reference	П.Д. 90/1999	
Portugal - Occupational Exposure Limits		
Local name	Ciclopentano	
OEL TWA (ppm)	600 ppm	
Regulatory reference	Norma Portuguesa NP 1796:2014	
Spain - Occupational Exposure Limits		
Local name	Ciclopentano	
VLA-ED (mg/m <sup>3</sup> )	1745 mg/m³	
VLA-ED (ppm)	600 ppm	
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2019. INSHT	
United Kingdom - Occupational Exposure Limits		
Local name	Cyclopentane	
WEL TWA (mg/m <sup>3</sup> )	1800	
WEL TWA (ppm)	619	
Switzerland - Occupational Exposure Limits		
Local name	Cyclopentane / Cyclopentan	
MAK (mg/m³)	1720 mg/m³	
MAK (ppm)	600 ppm	
Critical toxicity	VRS, Peau, SNC, Yeux / OAW, Haut, ZNS, Auge	
Regulatory reference	www.suva.ch, 01.11.2018	

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CYCLOPENTANE (287-92-3)		
DNEL/DMEL (Workers)		
Long-term - systemic effects, dermal	432 mg/kg bw/day	
Long-term - systemic effects, inhalation	3000 mg/m <sup>3</sup>	
DNEL/DMEL (General population)		
Long-term - systemic effects,oral	214 mg/kg bw/day	
Long-term - systemic effects, inhalation	643 mg/m³	
Long-term - systemic effects, dermal	214 mg/kg bw/day	
8.2. Exposure controls		
Appropriate engineering controls:		
Ensure that there is a suitable ventilation system.		
Hand protection:		
Nitrile-rubber protective gloves		
Eye protection:		
Safety glasses	Safety glasses	
Skin and body protection:		
None under normal conditions		
Respiratory protection:		
Self-contained breathing apparatus. Filter type AX - A/P2		

## Environmental exposure controls:

Avoid release to the environment.

SECTION 9: Physical and chemical properties		
9.1. Information on basic physical and chemical properties		
Physical state	: Liquid	
Colour	: Colourless.	
Odour	: Hydrocarbon-like.	
Odour threshold	: No data available	
рН	: Not applicable	
Relative evaporation rate (butylacetate=1)	: No data available	
Melting point	: -94 °C	
Freezing point	: No data available	
Boiling point	: 49 °C	
Flash point	: -35 °C	
Auto-ignition temperature	: No data available	
Decomposition temperature	: No data available	
Flammability (solid, gas)	: Not applicable	
Vapour pressure	: 36 kPa (20 °C); 68 kPa (38 °C)	
Vapour pressure at 50 °C	: 1060 hPa	
Relative vapour density at 20 °C	: 2.4	
Relative density	: 0.745	
Solubility	: Insoluble in water.	
Log Pow	: 3 Potentially bioaccumulable	
Viscosity, kinematic	: No data available	
Viscosity, dynamic	: No data available	
Explosive properties	: Vapours may form explosive mixture with air.	
Oxidising properties	: Non oxidizing material according to EC criteria.	
Lower explosive limit (LEL)	: 1.1 vol %	
Upper explosive limit (UEL)	: 8.7 vol %	
9.2. Other information		
No additional information available		

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SECTION 10: Stability and reactivity
10.1. Reactivity
Highly flammable liquid and vapour.
10.2. Chemical stability
Stable at ambient temperature and under normal conditions of use.
10.3. Possibility of hazardous reactions
No dangerous reactions known under normal conditions of use.
10.4. Conditions to avoid
Heat and ignition sources. Open flame.
10.5. Incompatible materials
Strong bases. Strong oxidizing agents.
10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

<b>SECTION 11: Toxicological information</b>	
11.1. Information on toxicological effects	
Acute toxicity (oral)	: Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (dermal)	: Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (inhalation)	: Not classified (Based on available data, the classification criteria are not met)
CYCLOPENTANE (287-92-3)	
LD50 oral rat	> 5000 mg/kg bodyweight (OECD 423 method)
LC50 inhalation rat (mg/l)	> 25.3 mg/l/4h (OECD 403 method)
Skin corrosion/irritation	: Not classified (Based on available data, the classification criteria are not met)
	pH: Not applicable
Additional information	: Repeated exposure may cause skin dryness or cracking.
Serious eye damage/irritation	: Not classified (Based on available data, the classification criteria are not met)
	pH: Not applicable
Respiratory or skin sensitisation	: Not classified (Based on available data, the classification criteria are not met)
Germ cell mutagenicity	: Not classified (Based on available data, the classification criteria are not met)
Carcinogenicity	: Not classified (Based on available data, the classification criteria are not met)
Reproductive toxicity	: Not classified (Based on available data, the classification criteria are not met)
STOT-single exposure	: May cause drowsiness or dizziness.
STOT-repeated exposure	: Not classified (Based on available data, the classification criteria are not met)
Aspiration hazard	: May be fatal if swallowed and enters airways.

SECTION 12: Ecological information			
12.1. Toxicity	Not classified (Based on available data, the classification criteria are not met)		
Hazardous to the aquatic environment, long-term : (chronic)	Harmful to aquatic life with long lasting effects.		
CYCLOPENTANE (287-92-3)			
LC50 fish 1	29.3 mg/l (96 Hours) (Oncorhynchus mykiss)		
EC50 Daphnia 1	51.1 mg/l (48 Hours) (Daphnia magma)		
ErC50 (algae)	21.6 mg/l (72 Hours) (Pseudokirchneriella subcapitata)		
12.2. Persistence and degradability No additional information available			
12.3. Bioaccumulative potential			
CYCLOPENTANE (287-92-3)			
Log Pow	3 Potentially bioaccumulable		
12.4. Mobility in soil			
No additional information available			
12.5. Results of PBT and vPvB assessment			
CYCLOPENTANE (287-92-3)			
This substance/mixture does not meet the PBT criteria	of REACH regulation, annex XIII		
This substance/mixture does not meet the vPvB criteria	of REACH regulation, annex XIII		
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## 12.6. Other adverse effects

No additional information available

<b>SECTION 13: Disposal considerations</b>	
13.1. Waste treatment methods	
Waste treatment methods	: Dispose of in accordance with relevant local regulations.
Product/Packaging disposal recommendations	: Destroy at an authorised site.
Additional information	: The user's attention is drawn to the possible existence of specific european, national or local regulations regarding disposal.

SECTION 14: Transport information					
In accordance with ADR / RI					
ADR	IMDG	ΙΑΤΑ	RID		
14.1. UN number					
UN 1146	UN 1146	UN 1146	UN 1146		
14.2. UN proper shippin	ig name		` `		
CYCLOPENTANE	CYCLOPENTANE	Cyclopentane	CYCLOPENTANE		
Transport document desc	ription				
UN 1146 CYCLOPENTANE, 3, II, (D/E)	UN 1146 CYCLOPENTANE, 3, II (< - 18°C c.c.)	UN 1146 Cyclopentane, 3, II	UN 1146 CYCLOPENTANE, 3, II		
14.3. Transport hazard	class(es)				
3	3	3	3		
14.4. Packing group					
II	I	II	II		
14.5. Environmental has	zards				
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No		
No supplementary information	on available				
14.6. Special precaution	s for user				
Overland transport					
Classification code (ADR)	: F1				
Limited quantities (ADR)	: 11				
Tank code (ADR)	: LG	BF			
Transport category (ADR)	: 2				
Hazard identification number	(Kemler No.) : 33				
Orange plates		33 1146			
Tunnel restriction code (ADR					
EAC code	: 3Y	E			
Transport by sea					
Limited quantities (IMDG)	: 1 L				
EmS-No. (Fire)	: F-E	Ξ			
EmS-No. (Spillage) : S-D					
Flash point (IMDG)	: bel	low -18°C c.c.			

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## Air transport

PCA Limited quantities (IATA)	: Y341
PCA limited quantity max net quantity (IATA)	: 1L
PCA packing instructions (IATA)	: 353
PCA max net quantity (IATA)	: 5L
CAO packing instructions (IATA)	: 364
CAO max net quantity (IATA)	: 60L
Rail transport	
Classification code (RID)	: F1
Limited quantities (RID)	: 1L
Tank codes for RID tanks (RID)	: LGBF
Transport category (RID)	: 2
Colis express (express parcels) (RID)	: CE7
Hazard identification number (RID)	: 33

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code Not applicable

## SECTION 15: Regulatory information

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

## 15.1.1. EU-Regulations

The following restrictions are applicable according to Annex XVII of the REACH Regulation (EC) No 1907/2006:		
Reference code	Applicable on	
3.	CYCLOPENTANE	
3(a)	CYCLOPENTANE	
3(b)	CYCLOPENTANE	
3(c)	CYCLOPENTANE	
40.	CYCLOPENTANE	
CVCLOPENTANE is not on the REACH Condidate List		

CYCLOPENTANE is not on the REACH Candidate List

CYCLOPENTANE is not on the REACH Annex XIV List

CYCLOPENTANE is not subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 july 2012 concerning the export and import of hazardous chemicals.

CYCLOPENTANE is not subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

## 15.1.2. National regulations

### Germany

Connary	
Reference to AwSV	: Water hazard class (WGK) 1, Slightly hazardous to water (Classification according to AwSV; ID No. 478)
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV	: Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)
Netherlands	
SZW-lijst van kankerverwekkende stoffen	: The substance is not listed
SZW-lijst van mutagene stoffen	: The substance is not listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding	: The substance is not listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid	: The substance is not listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling	: The substance is not listed
Denmark	
Classification remarks	: Emergency management guidelines for the storage of flammable liquids must be followed
Danish National Regulations	: Young people below the age of 18 years are not allowed to use the product
15.2. Chemical safety assessment	

A chemical safety assessment has been carried out for the substance or the mixture by the supplier

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SECTION 16: Other information					
Indication of changes:					
Section	Changed item Change Comments				
2.2	Hazard pictograms (CLP)	Added			
Data sources     : ECHA (European Chemicals Agency).					

Full text of H- and EUH-statements:		
Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3	
Asp. Tox. 1	Aspiration hazard, Category 1	
Flam. Liq. 2	Flammable liquids, Category 2	
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Narcosis	
H225	Highly flammable liquid and vapour.	
H304	May be fatal if swallowed and enters airways.	
H336	May cause drowsiness or dizziness.	
H412	Harmful to aquatic life with long lasting effects.	
EUH066	Repeated exposure may cause skin dryness or cracking.	

SDS EU (REACH Annex II)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

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## Annex to the safety data sheet

Identified Uses	Es N°	Short title	Page
Distribution of substance	1		11
Formulation & (re)packing of substances and mixtures	2		18
Use in blowing agents <traduction manquante=""> - Industrial</traduction>	3		26
Uses in cosmetics/personal care products, perfumes and fragrances	4		34
Use as a fuel - Industrial	5		35

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## 1. SE 1: Distribution of substance

1.1. Title section		
Distribution of substance	ES Ref.: SE 1	Association ref code: ES 1
	ES Type: Worker	Date of issue: 30/09/2019
	Version: 1.0	

Environment			
	Contributing scenario controlling environmental exposure		ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Worker			
	Generic exposure scenario		
	General expo	osures (closed systems) - no sampling	PROC1
	Storage		PROC1
		osures (closed systems) with sample /ith occasional controlled exposure	PROC2
	Storage with exposure	sample collection - With occasional controlled	PROC2
	General expo	osures (closed systems) - Batch process	PROC3
	Process sam	pling	PROC3
	General expo	osures (open systems) - Batch process	PROC4
	Equipment cleaning and maintenance		PROC8a
	Bulk transfers (Open systems) - bulk open loading and unloading with local exhaust ventilation		PROC8b
		s (Open systems) - bulk open loading and hout local exhaust ventilation	PROC8b
	Drum and sm	nall package filling	PROC9
	Laboratory activities		PROC15
Processes, tasks, activities covered		Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities	
Assessment method		Used ECETOC TRA model Hydrocarbon Block Method (Petrorisk)	

## 1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Contributing scenario controlling environmental exposure (ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1)

ERC1	Manufacture of the substance			
ERC2	Formulation into mixture			
ERC3	Formulation into solid matrix			
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)			
ERC5	Use at industrial site leading to inclusion into/onto article			
ERC6a	Use of intermediate			
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)			
ERC6c	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)			
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)			
ERC7	Use of functional fluid at industrial site			
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)			
Assessment method	Hydrocarbon Block Method (Petrorisk)			
Product (article) character	Product (article) characteristics			

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic, Moderately soluble in water (100 - 1000 mg/L), Inherently biodegradable, Low bioaccumulation potential		
Amount used, frequency and duration of use (or from service life)			
Daily amount per site	9500000 kg/day		
Continuous roloaso			

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	Technical and organisational conditions and measures				
ſ	Bund storage facilities to prevent soil and water pollution in the event of spillage				
ŀ	Prevent environmental discharge consistent with regulatory requirements				
ŀ	Do not apply industrial sludge to natural soils				
ŀ	Sewage sludge should be incinerated, contained or reclaimed.				
ŀ	Risk from environmental exposure is driven by freshwater				
ŀ	Treat air emission to provide a typical removal efficiency		90		
ŀ	Provide onsite wastewater treatment.		>= 0		
	If discharging to municipal sewage treatment plant, provid removal efficiency of	de the required onsite wastewater	>= 0		
	Conditions and measures related to sewage treatment	nt plant			
ſ	Not applicable as there is no release to wastewater				
F	Assumed domestic sewage treatment plant flow	2000			
	Estimated substance removal from wastewater via municipal sewage treatment	96			
	Maximum allowable site tonnage (MSafe) based on	9500000			
┝	release following total wastewater treatment removal Total efficiency of removal from wastewater after	96			
	onsite and offsite municipal treatment plant) RMMs				
Ī	Conditions and measures related to treatment of was	te (including article waste)			
ſ	External treatment and disposal of waste should				
	comply with applicable local and/or national regulations				
	External recovery and recycling of waste should comply with applicable local and/or national regulations				
-	Other conditions affecting environmental exposure	10			
-	Local freshwater dilution factor:	10			
	Local marine water dilution factor:	100			
1.	2.2. Control of worker exposure: Generic exposure sc	enario			
	Product (article) characteristics				
	Physical form of product	Liquid	Physical form of product Liquid		
	Concentration of substance in product Covers percentage substance in the product up to 100 % (unless stated differently)				
	Concentration of substance in product	Covers percentage substance in the p	roduct up to 100 % (unless stated differently)		
-	Concentration of substance in product Vapour pressure	Normal use conditions, (Temperature,			
	•				
	•	Normal use conditions, (Temperature, > 10 kPa			
	Vapour pressure	Normal use conditions, (Temperature, > 10 kPa			
	Vapour pressure Amount used (or contained in articles), frequency and	Normal use conditions, (Temperature, > 10 kPa			
	Vapour pressure Amount used (or contained in articles), frequency an Not applicable.	Normal use conditions, (Temperature, > 10 kPa			
	Vapour pressure Amount used (or contained in articles), frequency an Not applicable. Covers daily exposures up to 8 hours Continuous process	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure			
	Vapour pressure Amount used (or contained in articles), frequency an Not applicable. Covers daily exposures up to 8 hours Continuous process Conditions and measures related to personal protect	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation			
	Vapour pressure Amount used (or contained in articles), frequency an Not applicable. Covers daily exposures up to 8 hours Continuous process Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to E	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation			
	Vapour pressure Amount used (or contained in articles), frequency an Not applicable. Covers daily exposures up to 8 hours Continuous process Conditions and measures related to personal protect	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation			
	Vapour pressure Amount used (or contained in articles), frequency an Not applicable. Covers daily exposures up to 8 hours Continuous process Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to E employee training	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation			
	Vapour pressure Amount used (or contained in articles), frequency an Not applicable. Covers daily exposures up to 8 hours Continuous process Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to E employee training Do not ingest.	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation			
	Vapour pressure Amount used (or contained in articles), frequency an Not applicable. Covers daily exposures up to 8 hours Continuous process Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to E employee training Do not ingest. Avoid splashing	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation			
	Vapour pressure Amount used (or contained in articles), frequency an Not applicable. Covers daily exposures up to 8 hours Continuous process Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to E employee training Do not ingest. Avoid splashing Avoid contact with contaminated tools and objects	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation EN374) in combination with 'basic'			
	Vapour pressure Amount used (or contained in articles), frequency an Not applicable. Covers daily exposures up to 8 hours Continuous process Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to E employee training Do not ingest. Avoid splashing Avoid contact with contaminated tools and objects Clean equipment and the work area every day Management/supervision in place to check that RMMs or OCs followed	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation EN374) in combination with 'basic'			
	Vapour pressure         Amount used (or contained in articles), frequency an         Not applicable.         Covers daily exposures up to 8 hours         Continuous process         Conditions and measures related to personal protect         IF exposed: Wear chemically resistant gloves (tested to B employee training         Do not ingest.         Avoid splashing         Avoid contact with contaminated tools and objects         Clean equipment and the work area every day         Management/supervision in place to check that RMMs or OCs followed         Other conditions affecting workers exposure	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation EN374) in combination with 'basic'			
	Vapour pressure Amount used (or contained in articles), frequency an Not applicable. Covers daily exposures up to 8 hours Continuous process Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to E employee training Do not ingest. Avoid splashing Avoid contact with contaminated tools and objects Clean equipment and the work area every day Management/supervision in place to check that RMMs or OCs followed	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation EN374) in combination with 'basic'			
	Vapour pressure         Amount used (or contained in articles), frequency an         Not applicable.         Covers daily exposures up to 8 hours         Continuous process         Conditions and measures related to personal protect         IF exposed: Wear chemically resistant gloves (tested to E employee training         Do not ingest.         Avoid splashing         Avoid contact with contaminated tools and objects         Clean equipment and the work area every day         Management/supervision in place to check that RMMs or OCs followed         Other conditions affecting workers exposure         Keep good industrial hygiene         Assumes use at not more than 20°C above ambient temp	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation EN374) in combination with 'basic' n place are being used correctly and perature.	Pressure)		
	Vapour pressure         Amount used (or contained in articles), frequency an         Not applicable.         Covers daily exposures up to 8 hours         Continuous process         Conditions and measures related to personal protect         IF exposed: Wear chemically resistant gloves (tested to E employee training         Do not ingest.         Avoid splashing         Avoid contact with contaminated tools and objects         Clean equipment and the work area every day         Management/supervision in place to check that RMMs or OCs followed         Other conditions affecting workers exposure         Keep good industrial hygiene         Assumes use at not more than 20°C above ambient temp         2.3. Control of worker exposure: General exposures (context)	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation EN374) in combination with 'basic' n place are being used correctly and berature. closed systems) - no sampling (PROC	Pressure)		
	Vapour pressure         Amount used (or contained in articles), frequency an         Not applicable.         Covers daily exposures up to 8 hours         Continuous process         Conditions and measures related to personal protect         IF exposed: Wear chemically resistant gloves (tested to E employee training         Do not ingest.         Avoid splashing         Avoid contact with contaminated tools and objects         Clean equipment and the work area every day         Management/supervision in place to check that RMMs or OCs followed         Other conditions affecting workers exposure         Keep good industrial hygiene         Assumes use at not more than 20°C above ambient temp         2.3. Control of worker exposure: General exposures (context)	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation EN374) in combination with 'basic' n place are being used correctly and berature. closed systems) - no sampling (PROC	Pressure)		
	Vapour pressure         Amount used (or contained in articles), frequency an         Not applicable.         Covers daily exposures up to 8 hours         Continuous process         Conditions and measures related to personal protect         IF exposed: Wear chemically resistant gloves (tested to E employee training         Do not ingest.         Avoid splashing         Avoid contact with contaminated tools and objects         Clean equipment and the work area every day         Management/supervision in place to check that RMMs or OCs followed         Other conditions affecting workers exposure         Keep good industrial hygiene         Assumes use at not more than 20°C above ambient temp         2.3. Control of worker exposure: General exposures (C         PROC1       Chemical production or ref	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation EN374) in combination with 'basic' n place are being used correctly and perature. closed systems) - no sampling (PROC inery in closed process without likelihoo	Pressure)		
	Vapour pressure         Amount used (or contained in articles), frequency an         Not applicable.         Covers daily exposures up to 8 hours         Continuous process         Conditions and measures related to personal protect         IF exposed: Wear chemically resistant gloves (tested to E employee training         Do not ingest.         Avoid splashing         Avoid contact with contaminated tools and objects         Clean equipment and the work area every day         Management/supervision in place to check that RMMs or OCs followed         Other conditions affecting workers exposure         Keep good industrial hygiene         Assumes use at not more than 20°C above ambient temp         2.3. Control of worker exposure: General exposures (or PROC1	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation EN374) in combination with 'basic' n place are being used correctly and perature. closed systems) - no sampling (PROC inery in closed process without likelihoo	Pressure)		
	Vapour pressure         Amount used (or contained in articles), frequency an         Not applicable.         Covers daily exposures up to 8 hours         Continuous process         Conditions and measures related to personal protect         IF exposed: Wear chemically resistant gloves (tested to E employee training         Do not ingest.         Avoid splashing         Avoid contact with contaminated tools and objects         Clean equipment and the work area every day         Management/supervision in place to check that RMMs or OCs followed         Other conditions affecting workers exposure         Keep good industrial hygiene         Assumes use at not more than 20°C above ambient temp         2.3. Control of worker exposure: General exposures (c         PROC1       Chemical production or ref containment conditions         Technical and organisational conditions and measure         Handle substance within a closed system	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation EN374) in combination with 'basic' an place are being used correctly and berature. closed systems) - no sampling (PROC inery in closed process without likelihoo es	Pressure)		
	Vapour pressure         Amount used (or contained in articles), frequency an         Not applicable.         Covers daily exposures up to 8 hours         Continuous process         Conditions and measures related to personal protect         IF exposed: Wear chemically resistant gloves (tested to E employee training         Do not ingest.         Avoid splashing         Avoid contact with contaminated tools and objects         Clean equipment and the work area every day         Management/supervision in place to check that RMMs or OCs followed         Other conditions affecting workers exposure         Keep good industrial hygiene         Assumes use at not more than 20°C above ambient temp         2.3. Control of worker exposure: General exposures (containment conditions affections or reficients)         PROC1       Chemical production or reficients)	Normal use conditions, (Temperature, > 10 kPa d duration of use/exposure ion, hygiene and health evaluation EN374) in combination with 'basic' an place are being used correctly and berature. closed systems) - no sampling (PROC inery in closed process without likelihoo es	Pressure)		

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1.2.4. Control of worker expos	sure: Storage (PROC1)						
PROC1	Chemical production or refinery in closed process without likelihood containment conditions	d of exposure or processes with equivalent					
Technical and organisation	Technical and organisational conditions and measures						
Store substance within a closed system							
Transfer via enclosed lines	Transfer via enclosed lines						
Conditions and measures related to personal protection, hygiene and health evaluation							
	Store substance within a closed system						
Transfer via enclosed lines							
(PROC2)	sure: General exposures (closed systems) with sample collectio						
PROC2	Chemical production or refinery in closed continuous process with with equivalent containment conditions	occasional controlled exposure or processes					
Technical and organisation	al conditions and measures						
Handle substance within a cl	osed system						
Use a sampling system desig	gned to control exposure						
Conditions and measures	related to personal protection, hygiene and health evaluation						
Handle substance within a cl							
Use a sampling system desig							
	sure: Storage with sample collection - With occasional controlle	d exposure (BPOC2)					
PROC2	Chemical production or refinery in closed continuous process with						
PROCZ	with equivalent containment conditions	occasional controlled exposure of processes					
Technical and organisation	nal conditions and measures						
Ensure dedicated sample points are provided							
Store substance within a closed system							
Transfer via enclosed lines							
Conditions and measures	related to personal protection, hygiene and health evaluation						
Store substance within a close	sed system						
Transfer via enclosed lines							
1 2 7 Control of worker expo	sure: General exposures (closed systems) - Batch process (PRC	0C3)					
PROC3	Manufacture or formulation in the chemical industry in closed batch or processes with equivalent containment condition						
Technical and organisation	nal conditions and measures						
Handle substance within a cl							
	d under containment or extract ventilation						
	related to personal protection, hygiene and health evaluation						
Handle substance within a cl	-						
Ensure samples are obtained	d under containment or extract ventilation						
1.2.8. Control of worker exposed	sure: Process sampling (PROC3)						
PROC3	Manufacture or formulation in the chemical industry in closed batch or processes with equivalent containment condition	processes with occasional controlled exposure					
Technical and organisation	nal conditions and measures						
-	d under containment or extract ventilation						
Conditions and measures	related to personal protection, hygiene and health evaluation						
Ensure samples are obtained	d under containment or extract ventilation						
1.2.9. Control of worker expo	sure: General exposures (open systems) - Batch process (PROC	(4)					
PROC4	Chemical production where opportunity for exposure arises						
-	nal conditions and measures						
Local exhaust is needed at s	•						
Clear transfer lines prior to d	e-coupiniy						
Transfer via enclosed lines							

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Conditions and measures	related to personal protection, hygiene and health evaluation	
Local exhaust is needed at	source of vapours	
Clear transfer lines prior to	de-coupling	
Transfer via enclosed lines		
1.2.10. Control of worker exp	oosure: Equipment cleaning and maintenance (PROC8a)	
PROC8a	Transfer of substance or mixture (charging and discharging) at not	n-dedicated facilities
Technical and organisation	onal conditions and measures	
	ed storage pending disposal or for subsequent recycle	1
Transfer via enclosed lines		
	related to personal protection, hygiene and health evaluation	1
	ed storage pending disposal or for subsequent recycle	
Transfer via enclosed lines		
(PROC8b)	oosure: Bulk transfers (Open systems) - bulk open loading and u	
PROC8b	Transfer of substance or mixture (charging and discharging) at de	dicated facilities
Technical and organisation	onal conditions and measures	
Provide extract ventilation t	o material transfer points and other openings	
Clear transfer lines prior to		
	ed storage pending disposal or for subsequent recycle	
Transfer via enclosed lines		
Conditions and measures	related to personal protection, hygiene and health evaluation	
Provide extract ventilation t	o material transfer points and other openings	
Clear transfer lines prior to	de-coupling	
Retain drain downs in seale	ed storage pending disposal or for subsequent recycle	
Transfer via enclosed lines		
1.2.12. Control of worker exp (PROC8b)	posure: Bulk transfers (Open systems) - bulk open loading and u	nloading without local exhaust ventilation
PROC8b	Transfer of substance or mixture (charging and discharging) at de	dicated facilities
Technical and organisation	onal conditions and measures	
Transfer via enclosed lines		1
Clear transfer lines prior to	de-coupling	
	ed storage pending disposal or for subsequent recycle	
	related to personal protection, hygiene and health evaluation	
Avoid splashing	related to personal protection, nygiene and nearth evaluation	1
	oosure: Drum and small package filling (PROC9)	
PROC9	Transfer of substance or mixture into small containers (dedicated	filling line, including weighing)
	onal conditions and measures	
Fill containers/cans at dedic	cated fill points supplied with local extract ventilation	
Conditions and measures	related to personal protection, hygiene and health evaluation	
Fill containers/cans at dedic	cated fill points supplied with local extract ventilation	
1.2.14. Control of worker exp	oosure: Laboratory activities (PROC15)	
PROC15	Use as laboratory reagent	
	onal conditions and measures	
-	pard or implement suitable equivalent methods to minimise	
Conditions and measures	s related to personal protection, hygiene and health evaluation	
Use suitable eye protection	and gloves	
1.3. Exposure estimation	on and reference to its source	
ERC6a, ERC6b, ERC6c, ERC	and exposure Contributing scenario controlling environmental 6d, ERC7, ESVOC SPERC 1.1b.v1)	exposure (ERC1, ERC2, ERC3, ERC4, ERC5,
Information for contributi Required removal efficience	ng exposure scenario y for wastewater can be achieved using onsite/offsite technologies, ei	ther alone or in combination.Required removal
		· · · · · · · · · · · · · · · · · · ·

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efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html)

Release route			Release rate Release Re		Release e	Release estimation method	
Release fraction to air from process (initial release prior to RMM):		0.001					
Release fraction to soil from process (initial release prior to RMM):		0.00001					
Release fraction to wastewater from process (initial release prior to RMM):		0.0000001					
Protection target	Unit	Exposu estimat		PNEC	RCF	R	Assessment method
Freshwater	mg/l	0.00003	38		0.00	0257	
Marine water	mg/l	0.00000	0038 0.000	000995			
Freshwater sediment	mg/kg dwt	0.00007	74		0.00	00514	
Marine water sediment	mg/kg dwt	0.00000	)31		0.00	000215	
Soil	mg/kg dwt	0.00000	043		0.00	000093	

## 1.3.2. Worker exposure Generic exposure scenario

## No information available

## 1.3.3. Worker exposure General exposures (closed systems) - no sampling (PROC1)

## Information for contributing exposure scenario

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

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	0.02867 mg/m <sup>3</sup>	0	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.001	

1.3.4. Worker exposure Storage (PROC1)

## Information for contributing exposure scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels				
Route of exposure and type of effects	Exposure estimate	RCR	Method	
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model	
Inhalation - Long-term -	0.02867 mg/m <sup>3</sup>	0	Used ECETOC TRA model	

0.001

## Sum RCR - Long-term systemic effects

systemic effects

1.3.5. Worker exposure General exposures (closed systems) with sample collection - With occasional controlled exposure (PROC2)

## Information for contributing exposure scenario

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

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	1.37 mg/kg bw/day	0.003	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	143.35 mg/m³	0.048	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.051	

1.3.6. Worker exposure Storage with sample collection - With occasional controlled exposure (PROC2)

## Information for contributing exposure scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels				
Route of exposure and type of effects         Exposure estimate         RCR         Method				
Dermal - Long-term - systemic effects	1.37 mg/kg bw/day	0.003	Used ECETOC TRA model	
Inhalation - Long-term - systemic effects	143.35 mg/m³	0.048	Used ECETOC TRA model	
Systemic circula     0.051				

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ording to Regulation (EC) No. 1907/2		· · ·		
7. Worker exposure General e	xposures (closed systems) - I	Batch process (PROC3)	1	
nformation for contributing ex	posure scenario			
Risk Management Measures are based on qualitative risk characterisation, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels				
Route of exposure and type of effects	Exposure estimate	RCR	Method	
Dermal - Long-term - systemic	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model	
nhalation - Long-term - systemic effects	286.71 mg/m³	0.096	Used ECETOC TRA model	
Sum RCR - Long-term - systemic effects		0.097		
8. Worker exposure Process s				
nformation for contributing ex Where other Risk Management M equivalent levels		is are adopted, then users shou	Id ensure that risks are managed to at least	
Route of exposure and type of effects	Exposure estimate	RCR	Method	
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model	
nhalation - Long-term - systemic effects	286.71 mg/m³	0.096	Used ECETOC TRA model	
Sum RCR - Long-term - systemic effects		0.097		
9. Worker exposure General e		atch process (PROC4)		
nformation for contributing ex Where other Risk Management N equivalent levels		is are adopted, then users shou	Id ensure that risks are managed to at least	
Route of exposure and type of effects	Exposure estimate	RCR	Method	
Dermal - Long-term - systemic	6.86 mg/kg bw/day	0.016	Used ECETOC TRA model	
nhalation - Long-term - systemic effects	286.71 mg/m³	0.096	Used ECETOC TRA model	
Sum RCR - Long-term - systemic effects		0.112		
10. Worker exposure Equipme	ent cleaning and maintenance	(PROC8a)		
nformation for contributing ex	•			
Where other Risk Management N equivalent levels	Measures/Operational Condition	is are adopted, then users shou	Id ensure that risks are managed to at least	
Route of exposure and type	Exposure estimate	RCR	Method	
Dermal - Long-term - systemic effects	13.71 mg/kg bw/day	0.032	Used ECETOC TRA model	
nhalation - Long-term - systemic effects	716.77 mg/m³	0.239	Used ECETOC TRA model	
Sum RCR - Long-term -		0.271		
-	nsfers (Open systems) - bulk (	open loading and unloading v	vith local exhaust ventilation (PROC8b)	
nformation for contributing ex	posure scenario			
Where other Risk Management N equivalent levels	leasures/Operational Condition	is are adopted, then users shou	Id ensure that risks are managed to at least	
Route of exposure and type	Exposure estimate	RCR	Method	
of effects		0.010	Used ECETOC TRA model	
of effects Dermal - Long-term - systemic	6.86 mg/kg bw/day	0.016		
of effects Dermal - Long-term - systemic effects nhalation - Long-term -	6.86 mg/kg bw/day 12.9 mg/m³	0.016	Used ECETOC TRA model	
of effects				
of effects Dermal - Long-term - systemic effects nhalation - Long-term - systemic effects Sum RCR - Long-term - systemic effects	12.9 mg/m³	0.004		

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Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	6.86 mg/kg bw/day	0.016	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	430.06 mg/m <sup>3</sup>	0.143	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.159	

## 1.3.13. Worker exposure Drum and small package filling (PROC9)

## Information for contributing exposure scenario

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

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	6.86 mg/kg bw/day	0.016	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	573.42 mg/m³	0.191	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.207	

## 1.3.14. Worker exposure Laboratory activities (PROC15)

## Information for contributing exposure scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels						
Route of exposure and type of effects         Exposure estimate         RCR         Method						
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model			
Inhalation - Long-term - systemic effects	143.35 mg/m³	0.048	Used ECETOC TRA model			
Sum RCR - Long-term - systemic effects		0.049				

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

### 1.4.1. Environment

uidance - Environment
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### 1.4.2. Health

Guidance - Health	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e, RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required
Health Scaling Method	Used ECETOC TRA model

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2. SE 2: Formulation & (re)packing of substances and mixtures

### 2.1. Title section ES Ref.: SE 2 Association ref code: ES 1 Formulation & (re)packing of substances and ES Type: Worker Date of issue: 30/09/2019 mixtures Version: 1.0 Environment ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, Contributing scenario controlling environmental exposure ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 2.2.v1 Worker Generic exposure scenario PROC1 Expositions générales (systèmes clos) - <Traduction manquante> - no sampling Storage PROC1 General exposures (closed systems) with sample PROC2 collection - Continuous process Storage with sample collection PROC2 General exposures (open systems) - Batch process -PROC3 <Traduction manquante> Batch processes at elevated temperatures Closed systems PROC3 Process sampling PROC3 General exposures (open systems) - Batch process PROC4 Mixing operations (open systems) PROC5 transfer of material from one container to another PROC8a Equipment cleaning and maintenance PROC8a Bulk transfers PROC8b Drum/batch transfers PROC8b Drum and small package filling PROC9 Mixing operations (open systems) PROC14 Laboratory activities PROC15 Processes, tasks, activities covered Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities Assessment method Used ECETOC TRA model Hydrocarbon Block Method (Petrorisk)

## 2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Contributing scenario controlling environmental exposure (ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 2.2.v1)

ERC1	Manufacture of the substance
ERC2	Formulation into mixture
ERC3	Formulation into solid matrix
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5	Use at industrial site leading to inclusion into/onto article
ERC6a	Use of intermediate
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC6c	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC7	Use of functional fluid at industrial site
ESVOC SPERC 2.2.v1	Formulation & packing of preparations and mixtures: Industrial (SU10)
Assessment method	Hydrocarbon Block Method (Petrorisk)

## Product (article) characteristics

Substance is complex UVCB, Predominantly hydrophobic, Moderately soluble in water (100 - 1000 mg/L), Inherently biodegradable, Low bioaccumulation potential

# Amount used, frequency and duration of use (or from service life) Daily amount per site 120000 kg/day

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Continuous release					
Emission days	nission days 100				
Technical and organisational conditions and measures					
Bund storage facilities to prevent soil and water pollution in the event of spillage					
Prevent environmental discharge consistent with regulatory requirements					
Do not apply industrial sludge to natural soils					
Sewage sludge should be incinerated, contained or recla	Sewage sludge should be incinerated, contained or reclaimed.				
Common practices vary across sites thus conservative p	rocess release estimates used				
Prevent discharge of undissolved substance to or recover	r from onsite wastewater				
Treat air emission to provide a typical removal efficiency	of	0			
Provide onsite wastewater treatment.		>= 59.1			
Conditions and measures related to sewage treatment	nt plant				
Not applicable as there is no release to wastewater					
Assumed domestic sewage treatment plant flow Estimated substance removal from wastewater via	2000 96				
municipal sewage treatment	90				
Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	96				
Conditions and measures related to treatment of was	ste (including article waste)				
External treatment and disposal of waste should					
comply with applicable local and/or national regulations					
External recovery and recycling of waste should comply with applicable local and/or national regulations					
Other conditions affecting environmental exposure	· · · · · · · · · · · · · · · · · · ·				
Local freshwater dilution factor:	10				
Local marine water dilution factor:	100				
2.2.2. Control of worker exposure: Generic exposure sc	opario				
Product (article) characteristics	enano				
Physical form of product	Liquid				
Concentration of substance in product	•	roduct up to 100 % (unless stated differently)			
Vapour pressure	Normal use conditions, (Temperature,				
	> 10 kPa				
Amount used (or contained in articles), frequency an					
Not applicable.					
Covers daily exposures up to 8 hours					
Continuous process					
Conditions and measures related to personal protect	tion, hygiene and health evaluation				
Do not ingest.					
Avoid splashing					
Avoid contact with contaminated tools and objects					
Clean equipment and the work area every day Management/supervision in place to check that RMMs or	a place are being used correctly and				
OCs followed	r place are being used correctly and				
Other conditions affecting workers exposure					
Keep good industrial hygiene					
Assumes use at not more than 20°C above ambient tem	perature.				
2.2.3. Control of worker exposure: Expositions générale	es (systèmes clos) - <traduction man<="" td=""><td>quante&gt; - no sampling (PROC1)</td></traduction>	quante> - no sampling (PROC1)			
PROC1 Chemical production or ref containment conditions	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent				
Technical and organisational conditions and measur	es				
Handle substance within a closed system					
2.2.4. Control of worker exposure: Storage (PROC1)					
	inery in closed process without likelihood	d of exposure or processes with equivalent			
Technical and organisational conditions and measur	es				
Store substance within a closed system					
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2.5. Control of worker expo	osure: General exposures (closed systems) with sample	e collection - Continuous process (PROC2)
PROC2	Chemical production or refinery in closed continuous pro with equivalent containment conditions	ocess with occasional controlled exposure or processes
Technical and organisation	onal conditions and measures	
Handle substance within a d	closed system	
Use a sampling system des	igned to control exposure	
2.6. Control of worker expo	osure: Storage with sample collection (PROC2)	
PROC2	Chemical production or refinery in closed continuous pro with equivalent containment conditions	ocess with occasional controlled exposure or processes
Technical and organisation	onal conditions and measures	
Ensure dedicated sample p	oints are provided	
Store substance within a clo	osed system	
2.7. Control of worker expo	osure: General exposures (open systems) - Batch proc	ess - <traduction manguante=""> (PROC3)</traduction>
PROC3		losed batch processes with occasional controlled exposure
Technical and organisatic	onal conditions and measures	
	ed under containment or extract ventilation	
·	osure: Batch processes at elevated temperatures Close	ed systems (PROC3)
PROC3		losed batch processes with occasional controlled exposure
Technical and organisatio	onal conditions and measures	
Provide a good standard of	controlled ventilation (10 to 15 air changes per hour)	
Formulate in enclosed or ve	entilated mixing vessels	
Ensure samples are obtained	ed under containment or extract ventilation	
2.9. Control of worker expo	osure: Process sampling (PROC3)	
PROC3	Manufacture or formulation in the chemical industry in cl or processes with equivalent containment condition	losed batch processes with occasional controlled exposure
Technical and organisation	onal conditions and measures	
Ensure samples are obtaine	ed under containment or extract ventilation	
2.10. Control of worker exr	oosure: General exposures (open systems) - Batch pro	cess (PROC4)
PROC4	Chemical production where opportunity for exposure aris	
Technical and organisation	onal conditions and measures	
reennieur und ergumsude		
Local exhaust is needed at	source of vapours	
Local exhaust is needed at	•	
Clear transfer lines prior to	•	
Clear transfer lines prior to Transfer via enclosed lines	de-coupling	
Clear transfer lines prior to Transfer via enclosed lines 2.11. Control of worker exp	de-coupling posure: Mixing operations (open systems) (PROC5)	
Clear transfer lines prior to Transfer via enclosed lines 2.11. Control of worker exp PROC5	de-coupling oosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes	
Clear transfer lines prior to Transfer via enclosed lines 2.11. Control of worker exp PROC5 Technical and organisation	de-coupling bosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes bonal conditions and measures	
Clear transfer lines prior to Transfer via enclosed lines 2.11. Control of worker exp PROC5 Technical and organisation	de-coupling oosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes	
Clear transfer lines prior to Transfer via enclosed lines 2.11. Control of worker exp PROC5 Technical and organisation Provide extract ventilation to Conditions and measures	de-coupling bosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes bonal conditions and measures o material transfer points and other openings s related to personal protection, hygiene and health eva	aluation
Clear transfer lines prior to Transfer via enclosed lines 2.11. Control of worker exp PROC5 Technical and organisation Provide extract ventilation to Conditions and measures Use suitable eye protection	de-coupling boosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes bonal conditions and measures o material transfer points and other openings s related to personal protection, hygiene and health eva and gloves	
Clear transfer lines prior to Transfer via enclosed lines 2.11. Control of worker exp PROC5 Technical and organisation Provide extract ventilation to Conditions and measures Use suitable eye protection 2.12. Control of worker exp	de-coupling bosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes bonal conditions and measures o material transfer points and other openings s related to personal protection, hygiene and health eva and gloves bosure: transfer of material from one container to another	her (PROC8a)
Clear transfer lines prior to Transfer via enclosed lines 2.11. Control of worker exp PROC5 Technical and organisation Provide extract ventilation to Conditions and measures Use suitable eye protection 2.12. Control of worker exp PROC8a	de-coupling bosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes bonal conditions and measures o material transfer points and other openings s related to personal protection, hygiene and health eva and gloves bosure: transfer of material from one container to anoth Transfer of substance or mixture (charging and discharge	her (PROC8a)
Clear transfer lines prior to Transfer via enclosed lines 2.11. Control of worker exp PROC5 Technical and organisation Provide extract ventilation to Conditions and measures Use suitable eye protection 2.12. Control of worker exp PROC8a Technical and organisation	de-coupling bosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes bonal conditions and measures o material transfer points and other openings a related to personal protection, hygiene and health eva and gloves bosure: transfer of material from one container to anoth Transfer of substance or mixture (charging and discharg bonal conditions and measures	her (PROC8a)
Clear transfer lines prior to Transfer via enclosed lines 2.11. Control of worker exp PROC5 Technical and organisation Provide extract ventilation to Conditions and measures Use suitable eye protection 2.12. Control of worker exp PROC8a Technical and organisation	de-coupling bosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes bonal conditions and measures o material transfer points and other openings s related to personal protection, hygiene and health eva and gloves bosure: transfer of material from one container to anoth Transfer of substance or mixture (charging and discharge	her (PROC8a)
Clear transfer lines prior to Transfer via enclosed lines 2.11. Control of worker exp PROC5 Technical and organisation Provide extract ventilation to Conditions and measures Use suitable eye protection 2.12. Control of worker exp PROC8a Technical and organisation Provide extract ventilation to	de-coupling bosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes bonal conditions and measures o material transfer points and other openings a related to personal protection, hygiene and health eva and gloves bosure: transfer of material from one container to anoth Transfer of substance or mixture (charging and discharg bonal conditions and measures	her (PROC8a) ging) at non-dedicated facilities
Clear transfer lines prior to a Transfer via enclosed lines 2.11. Control of worker exp PROC5 Technical and organisation Provide extract ventilation to Conditions and measures Use suitable eye protection 2.12. Control of worker exp PROC8a Technical and organisation Provide extract ventilation to Conditions and measures	de-coupling oosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes onal conditions and measures o material transfer points and other openings s related to personal protection, hygiene and health eva and gloves oosure: transfer of material from one container to anoth Transfer of substance or mixture (charging and discharg o material transfer points and other openings o material transfer points and other openings	her (PROC8a) ging) at non-dedicated facilities
Clear transfer lines prior to a Transfer via enclosed lines 2.11. Control of worker exp PROC5 Technical and organisation Provide extract ventilation to Conditions and measures Use suitable eye protection 2.12. Control of worker exp PROC8a Technical and organisation Provide extract ventilation to Conditions and measures	de-coupling bosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes onal conditions and measures o material transfer points and other openings a related to personal protection, hygiene and health eval and gloves bosure: transfer of material from one container to anoth Transfer of substance or mixture (charging and discharg bonal conditions and measures o material transfer points and other openings a related to personal protection, hygiene and health eval bonal conditions and measures o material transfer points and other openings a related to personal protection, hygiene and health eval mg to EN140 with Type A filter or better	her (PROC8a) ging) at non-dedicated facilities
Clear transfer lines prior to Transfer via enclosed lines 2.11. Control of worker exp PROC5 Technical and organisation Provide extract ventilation to Conditions and measures Use suitable eye protection 2.12. Control of worker exp PROC8a Technical and organisation Provide extract ventilation to Conditions and measures Wear a respirator conformin Use suitable eye protection	de-coupling bosure: Mixing operations (open systems) (PROC5) Mixing or blending in batch processes onal conditions and measures o material transfer points and other openings a related to personal protection, hygiene and health eval and gloves bosure: transfer of material from one container to anoth Transfer of substance or mixture (charging and discharg bonal conditions and measures o material transfer points and other openings a related to personal protection, hygiene and health eval bonal conditions and measures o material transfer points and other openings a related to personal protection, hygiene and health eval mg to EN140 with Type A filter or better	her (PROC8a) ging) at non-dedicated facilities

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	onal conditions and measures	
Retain drain downs in seal	ed storage pending disposal or for subsequent recycle	
Transfer via enclosed lines	3	
Conditions and measure	s related to personal protection, hygiene and health evaluation	
Use suitable eye protection	n and gloves	
2.14. Control of worker ex	posure: Bulk transfers (PROC8b)	
PROC8b	Transfer of substance or mixture (charging and discharging) at o	dedicated facilities
Technical and organisati	onal conditions and measures	
Provide extract ventilation	to material transfer points and other openings	
Clear transfer lines prior to	de-coupling	
Transfer via enclosed lines	3	
2.15. Control of worker ex	posure: Drum/batch transfers (PROC8b)	
PROC8b	Transfer of substance or mixture (charging and discharging) at o	dedicated facilities
Technical and organisati	onal conditions and measures	
Ensure material transfers a	are under containment or extract ventilation	
Use drum pumps		
2.16. Control of worker ex	posure: Drum and small package filling (PROC9)	
PROC9	Transfer of substance or mixture into small containers (dedicate	d filling line, including weighing)
Technical and organisati	onal conditions and measures	
Ensure material transfers a	are under containment or extract ventilation	
Transfer via enclosed lines	3	
2.17. Control of worker ex	posure: Mixing operations (open systems) (PROC14)	
PROC14	Tabletting, compression, extrusion, pelettisation, granulation	
Technical and organisati	onal conditions and measures	
	to material transfer points and other openings	
Conditions and measure	s related to personal protection, hygiene and health evaluation	
Use suitable eye protection		
2 18 Control of worker ex	posure: Laboratory activities (PROC15)	
PROC15	Use as laboratory reagent	
	onal conditions and measures	
	oard or implement suitable equivalent methods to minimise	
exposure		
Conditions and measure	s related to personal protection, hygiene and health evaluation	
Use suitable eye protection	n and gloves	
3. Exposure estimati	ion and reference to its source	
	e and exposure Contributing scenario controlling environment	al exposure (ERC1, ERC2, ERC3, ERC4, ERC5,
RC6a, ERC6b, ERC6c, ERC	500, ERC7, ESVOC SPERC 2.2.V1)	

 reflected in our control of the value of the additional of the data of

Release fraction to soil from prior to RMM): Release fraction to wastew release prior to RMM):	• •		0.0001				
Protection target	Unit	Exposu estimat		PNEC	RCF	2	Assessment method
Freshwater	mg/l	0.058			0.08	53	
Marine water	mg/l	0.0058			0.00	853	
Freshwater sediment	mg/kg dwt	0.47			0.09	63	
Marine water sediment	mg/kg dwt	0.047			0.00	963	

Soil mg/	kg dwt 0.00045	0.	000231	
2. Worker exposure Generic e	exposure scenario			
No information available				
3. Worker exposure Exposition	ons générales (systèmes clos)	- <traduction manquante=""> ·</traduction>	no sampling (PRC	DC1)
nformation for contributing e	•			
Where other Risk Management equivalent levels	Measures/Operational Condition	s are adopted, then users sho	uld ensure that risk	s are managed to at least
Route of exposure and type	Exposure estimate	RCR	Me	thod
Dermal - Long-term - systemic	0.34 mg/kg bw/day	0.001	Use	ed ECETOC TRA model
effects Inhalation - Long-term -	0.02867 mg/m <sup>3</sup>	0	Use	ed ECETOC TRA model
systemic effects Sum RCR - Long-term - systemic effects		0.001		
4. Worker exposure Storage (	PROC1)			
Information for contributing e				
Where other Risk Management equivalent levels	Measures/Operational Condition	s are adopted, then users sho	uld ensure that risk	s are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Me	thod
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Use	ed ECETOC TRA model
nhalation - Long-term - systemic effects	0.02867 mg/m³	0	Use	ed ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.001		
	exposures (closed systems) w	ith sample collection - Conti	nuous process (Pl	ROC2)
Information for contributing e	•	<u> </u>		
equivalent levels	Measures/Operational Condition	· · · · · · · · · · · · · · · · · · ·		-
Route of exposure and type of effects	Exposure estimate	RCR	Me	thod
Dermal - Long-term - systemic effects	1.37 mg/kg bw/day	0.003		ed ECETOC TRA model
nhalation - Long-term - systemic effects	143.35 mg/m <sup>3</sup>	0.048	Use	ed ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.051		
	with sample collection (PROC2	2)		
Information for contributing e Where other Risk Management	xposure scenario Measures/Operational Condition	s are adopted, then users sho	uld ensure that risk	s are managed to at least
equivalent levels Route of exposure and type of effects	Exposure estimate	RCR	Me	thod
Dermal - Long-term - systemic	1.37 mg/kg bw/day	0.003	0.003 Use	
effects Inhalation - Long-term - systemic effects	143.35 mg/m <sup>3</sup>	0.048	048 Used ECET	
Sum RCR - Long-term - systemic effects		0.051		
-	exposures (open systems) - Ba	atch process - <traduction r<="" td=""><td>nanquante&gt; (PROC</td><td>23)</td></traduction>	nanquante> (PROC	23)
Information for contributing e	xposure scenario			
Where other Risk Management equivalent levels	Measures/Operational Condition	s are adopted, then users sho	uld ensure that risk	s are managed to at least
Route of exposure and type	Exposure estimate	RCR	Me	

equivalent levels					
Route of exposure and type of effects	Exposure estimate	RCR	Method		
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model		
Inhalation - Long-term - systemic effects	286.71 mg/m³	0.096	Used ECETOC TRA model		
Sum RCR - Long-term - systemic effects		0.097			

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systemic effects Sum RCR - Long-term -

according to Regulation (EC) No. 1907/2	006 (REACH) with its amendment F	egulation (EU) 2015/830	
2.3.8. Worker exposure Batch pro	cesses at elevated temperatu	ires Closed systems (PRC	DC3)
Information for contributing ex	cposure scenario		
Where other Risk Management I equivalent levels	Measures/Operational Conditior	is are adopted, then users s	should ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	12.9 mg/m³	0.004	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.005	
.3.9. Worker exposure Process s	ampling (PROC3)		
Information for contributing ex	cposure scenario		
Where other Risk Management I equivalent levels	Measures/Operational Condition	is are adopted, then users s	should ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term -	286.71 mg/m <sup>3</sup>	0.096	Used ECETOC TRA model

### systemic effects 2.3.10. Worker exposure General exposures (open systems) - Batch process (PROC4)

### Information for contributing exposure scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels RCR Method Route of exposure and type Exposure estimate

0.097

of effects			
Dermal - Long-term - systemic	6.86 mg/kg bw/day	0.016	Used ECETOC TRA model
effects			
Inhalation - Long-term -	286.71 mg/m <sup>3</sup>	0.096	Used ECETOC TRA model
systemic effects			
Sum RCR - Long-term -		0.112	
systemic effects			

### 2.3.11. Worker exposure Mixing operations (open systems) (PROC5)

### Information for contributing exposure scenario

-			
Where other Risk Management N equivalent levels	Measures/Operational Conditions are	e adopted, then users should ensure that	at risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	13.71 mg/kg bw/day	0.032	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	716.77 mg/m³	0.239	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.271	

2.3.12. Worker exposure transfer of material from one container to another (PROC8a)

## Information for contributing exposure scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels Route of exposure and type Exposure estimate RCR Method

of effects			mourou
Dermal - Long-term - systemic effects	13.71 mg/kg bw/day	0.032	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	716.77 mg/m³	0.239	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.271	

2.3.13. Worker exposure Equipment cleaning and maintenance (PROC8a)

Information for contributing exposure scenario

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

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Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	13.71 mg/kg bw/day	0.032	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	716.77 mg/m³	0.239	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.271	

## 2.3.14. Worker exposure Bulk transfers (PROC8b) Information for contributing exposure scenario

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

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	6.86 mg/kg bw/day	0.016	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	430.06 mg/m <sup>3</sup>	0.143	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.159	

## 2.3.15. Worker exposure Drum/batch transfers (PROC8b)

## Information for contributing exposure scenario

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

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	6.86 mg/kg bw/day	0.016	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	430.06 mg/m³	0.143	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.159	

## 2.3.16. Worker exposure Drum and small package filling (PROC9)

## Information for contributing exposure scenario

Where other Risk Management Mequivalent levels	Measures/Operational Conditio	ns are adopted, then users sho	ould ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	6.86 mg/kg bw/day	0.016	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	573.42 mg/m³	0.191	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.207	
3.17. Worker exposure Mixing o	perations (open systems) (P	ROC14)	

## Information for contributing exposure scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels Route of exposure and type Exposure estimate RCR Method of effects Dermal - Long-term - systemic 3.43 mg/kg bw/day 0.008 Used ECETOC TRA model effects Inhalation - Long-term -716.77 mg/m<sup>3</sup> 0.239 Used ECETOC TRA model systemic effects 0.247 Sum RCR - Long-term systemic effects

2.3.18. Worker exposure Laboratory activities (PROC15)

## Information for contributing exposure scenario

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	143.35 mg/m³	0.048	Used ECETOC TRA model
Sum RCR - Long-term -		0.049	

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svstemic effects	ects	effe	mic	syste
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Systemic chects	
2.4. Guidance to Downstrea	am User to evaluate whether he works inside the boundaries set by the ES
2.4.1. Environment	
Guidance - Environment	Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html)
2.4.2. Health	
Guidance - Health	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e, RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required
Health Scaling Method	Used ECETOC TRA model

1

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3. SE 3: Use in blowing agents <Traduction manquante> - Industrial

Use in blowing agents <traduction< th=""><th colspan="2">ES Ref.: SE 3</th><th>Association ref code: ES</th></traduction<>		ES Ref.: SE 3		Association ref code: ES
manquante> - Industrial		ES Type: 1	Worker	Date of issue: 30/09/207
		Versi	ion: 1.0	
Environment				
	Contributing scenario controlling	g environmental exposure		ERC3, ERC4, ERC5, ERC6a, ic, ERC6d, ERC7, ESVOC
Worker				
	Generic exposure scenario			
	Mixing operations	5 1		
	Mixing operations - High temper	Mixing operations - High temperature.		
	Intermediate polymer storage - H	Intermediate polymer storage - High temperature. PR		
	Centrifuging including dischargir	Centrifuging including discharging - High temperature. PR		
	Mixing operations			
	Semi-bulk packaging			
	Bulk transfers		PROC8b	
	Drum and small package filling - drums or containers			
	Extrusion and expansion of poly	mer mass	PROC12	
	Cutting and shaving	5 5		
	Collection and re-processing of	Collection and re-processing of shavings, cuttings, etc		
	Product packaging			
	Storage			
	Drying and storage		PROC12	
	Treatment by heating - High tem	nperature.	PROC12	
	Article formation in mould - High	temperature.	PROC12	
	Cutting by heated wire - High ter	mperature.	PROC12	
	<traduction manquante=""></traduction>		PROC12	
	Compression		PROC12	
	Cutting by heated wire - Machine	es	PROC12	

	operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities	
Assessment method	Used ECETOC TRA model	1

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Contributing scenario controlling environmental exposure (ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 4.9.v1)

Hydrocarbon Block Method (Petrorisk)

ERC1	Manufacture of the substance			
ERC2	Formulation into mixture			
ERC3	Formulation into solid matrix			
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)			
ERC5	Use at industrial site leading to inclusion into/onto article			
ERC6a	Use of intermediate			
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)			
ERC6c	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)			
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)			
ERC7	Use of functional fluid at industrial site			
ESVOC SPERC 4.9.v1	Blowing agents: Industrial (SU3)			
Assessment method	Hydrocarbon Block Method (Petrorisk)			
Product (article) characte	ristics			
Other product characteristic	cs Substance is complex UVCB, Predominantly hydrophobic, Moderately soluble in water			

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	(100 - 1000 mg/L), Inherently biodegra	dable, Low bioaccumulation potential		
Amount used, frequency and duration of use (or fror	n service life)			
Daily amount per site	820000 kg/day			
Continuous release				
Emission days	100			
Technical and organisational conditions and measur	'es			
Bund storage facilities to prevent soil and water pollution	in the event of spillage			
Prevent environmental discharge consistent with regulat	ory requirements			
Do not apply industrial sludge to natural soils				
Sewage sludge should be incinerated, contained or recla	aimed.			
Common practices vary across sites thus conservative p	rocess release estimates used			
Risk from environmental exposure is driven by freshwate	er			
Treat air emission to provide a typical removal efficiency	of	0		
Provide onsite wastewater treatment. If discharging to municipal sewage treatment plant, provi removal efficiency of	de the required onsite wastewater	>= 96 >= 0		
Conditions and measures related to sewage treatme	nt plant			
Not applicable as there is no release to wastewater	•			
Assumed domestic sewage treatment plant flow	2000			
Estimated substance removal from wastewater via municipal sewage treatment	96			
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	820000			
Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	96			
Conditions and measures related to treatment of was	ste (including article waste)			
External treatment and disposal of waste should				
comply with applicable local and/or national regulations External recovery and recycling of waste should				
comply with applicable local and/or national regulations				
Other conditions affecting environmental exposure				
Local freshwater dilution factor:	10			
Local marine water dilution factor:	100			
3.2.2. Control of worker exposure: Generic exposure so	enario			
Product (article) characteristics				
Physical form of product	Liquid			
Concentration of substance in product		roduct up to 100 % (unless stated differently)		
Vapour pressure	Normal use conditions, (Temperature,	Pressure)		
	> 10 kPa			
Amount used (or contained in articles), frequency an	d duration of use/exposure			
Not applicable.				
Covers daily exposures up to 8 hours				
Continuous process				
Continuous process Conditions and measures related to personal protect	tion, hygiene and health evaluation			
Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to employee training				
Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to employee training Do not ingest.				
Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to employee training Do not ingest. Avoid splashing				
Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to employee training Do not ingest. Avoid splashing Avoid contact with contaminated tools and objects				
Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to employee training Do not ingest. Avoid splashing Avoid contact with contaminated tools and objects Clean equipment and the work area every day	EN374) in combination with 'basic'			
Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to employee training Do not ingest. Avoid splashing Avoid contact with contaminated tools and objects Clean equipment and the work area every day Management/supervision in place to check that RMMs o OCs followed	EN374) in combination with 'basic'			
Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to employee training Do not ingest. Avoid splashing Avoid contact with contaminated tools and objects Clean equipment and the work area every day Management/supervision in place to check that RMMs o OCs followed Other conditions affecting workers exposure	EN374) in combination with 'basic'			
Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to employee training Do not ingest. Avoid splashing Avoid contact with contaminated tools and objects Clean equipment and the work area every day Management/supervision in place to check that RMMs o OCs followed Other conditions affecting workers exposure Keep good industrial hygiene	EN374) in combination with 'basic'			
Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to employee training Do not ingest. Avoid splashing Avoid contact with contaminated tools and objects Clean equipment and the work area every day Management/supervision in place to check that RMMs o OCs followed Other conditions affecting workers exposure Keep good industrial hygiene Assumes use at not more than 20°C above ambient tem	EN374) in combination with 'basic'			
Conditions and measures related to personal protect IF exposed: Wear chemically resistant gloves (tested to employee training Do not ingest. Avoid splashing Avoid contact with contaminated tools and objects Clean equipment and the work area every day Management/supervision in place to check that RMMs o OCs followed Other conditions affecting workers exposure Keep good industrial hygiene Assumes use at not more than 20°C above ambient tem 3.2.3. Control of worker exposure: Mixing operations (P	EN374) in combination with 'basic' n place are being used correctly and perature. ROC1)	d of exposure or processes with equivalent		

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	5. 1907/2000 (REACH) with its amenument Regulation (EO) 2015/630	
.2.4. Control of worker ex	posure: Mixing operations - High temperature. (PROC3)	
PROC3	Manufacture or formulation in the chemical industry in closed	batch processes with occasional controlled exposure
	or processes with equivalent containment condition	· ·
Technical and organisa	tional conditions and measures	
Provide a good standard	of controlled ventilation (10 to 15 air changes per hour)	
Minimise exposure by ext	tracted full enclosure for the operation or equipment	
2.5. Control of worker ex	posure: Intermediate polymer storage - High temperature. (PI	ROC3)
PROC3	Manufacture or formulation in the chemical industry in closed or processes with equivalent containment condition	I batch processes with occasional controlled exposure
Technical and organisa	tional conditions and measures	
Provide a good standard	of controlled ventilation (10 to 15 air changes per hour)	
Handle substance within	a closed system	
2.6. Control of worker ex	posure: Centrifuging including discharging - High temperatu	re. (PROC3)
PROC3	Manufacture or formulation in the chemical industry in closed or processes with equivalent containment condition	
Technical and organisa	tional conditions and measures	
Provide a good standard	of controlled ventilation (10 to 15 air changes per hour)	
Handle substance within	a closed system	
2.7. Control of worker ex	posure: Mixing operations (PROC3)	•
PROC3	Manufacture or formulation in the chemical industry in closed or processes with equivalent containment condition	batch processes with occasional controlled exposure
Technical and organisa	tional conditions and measures	
Local exhaust is needed	at source of vapours	
2.8. Control of worker ex	posure: Semi-bulk packaging (PROC8b)	1
PROC8b	Transfer of substance or mixture (charging and discharging)	at dedicated facilities
<b>T</b>	0	
	tional conditions and measures	
Provide a good standard	of general ventilation (not less than 3 to 5 air changes per hour)	
2.9. Control of worker ex	posure: Bulk transfers (PROC8b)	
PROC8b	Transfer of substance or mixture (charging and discharging)	at dedicated facilities
Technical and organisa	tional conditions and measures	
Clear transfer lines prior t	o de-coupling	
Transfer via enclosed line	25	
Use dedicated equipment	t	
2.10 Control of worker a	xposure: Drum and small package filling - Filling of equipmer	at from drums or containers (PROC9)
PROC9	Transfer of substance or mixture into small containers (dedic	
	,	
	tional conditions and measures	
Fill containers/cans at de	dicated fill points supplied with local extract ventilation	
2.11. Control of worker e	xposure: Extrusion and expansion of polymer mass (PROC12	2)
PROC12	Use of blowing agents in manufacture of foam	
Technical and organisa	tional conditions and measures	
•	rtial enclosure of the operation or equipment and provide extract	
2.12. Control of worker e	xposure: Cutting and shaving (PROC12)	
PROC12	Use of blowing agents in manufacture of foam	
Technical and organisa	tional conditions and measures	
Minimise exposure by pa ventilation at openings	rtial enclosure of the operation or equipment and provide extract	
· -	xposure: Collection and re-processing of shavings, cuttings,	etc (PROC12)
PROC12	Use of blowing agents in manufacture of foam	
Technical and organica	tional conditions and measures	
	rtial enclosure of the operation or equipment and provide extract	
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. ,	( <b>3</b> )	

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3.2.14. Control of worker exp	posure: Product pa	ckaging	(PROC12)				
PROC12	Use of blowing ag	gents in m	nanufacture of fo	bam			
Technical and organisation	onal conditions and	measur	es				
Provide a good standard of	general ventilation (	not less tl	han 3 to 5 air ch	anges per hour)			
3.2.15. Control of worker exp	posure: Storage (PF	ROC12)					
PROC12	Use of blowing ag	gents in m	nanufacture of fo	am			
Technical and organisation	onal conditions and	measur	es				
Provide a good standard of	general ventilation (	not less tl	han 3 to 5 air ch	anges per hour)			
3.2.16. Control of worker exp	posure: Drying and	storage	(PROC12)				
PROC12	Use of blowing ag	gents in m	nanufacture of fo	am			
3.2.17. Control of worker ex	posure: Treatment b	oy heatin	g - High tempe	rature. (PROC12)			
PROC12	Use of blowing ag	gents in m	anufacture of fo	am			
Technical and organisation	onal conditions and	measur	es				
Provide a good standard of	controlled ventilatior	ר (10 to 1	5 air changes pe	er hour)			
3.2.18. Control of worker ex	posure: Article form	nation in	mould - High te	emperature. (PRO	C12)		
PROC12	Use of blowing ag						
Technical and organisation	onal conditions and	measur	es				
Provide a good standard of				er hour)			
Local exhaust is needed at	source of vapours						
3.2.19. Control of worker ex	posure: Cutting by I	heated w	ire - High temp	erature. (PROC12	2)		
PROC12	Use of blowing ag	gents in m	nanufacture of fo	am			
Technical and organisation	onal conditions and	measur	es				
Local exhaust is needed at	source of vapours						
3.2.20. Control of worker ex	posure: <traduction< td=""><td>n manqua</td><td>ante&gt; (PROC12</td><td>)</td><td></td><td></td><td></td></traduction<>	n manqua	ante> (PROC12	)			
PROC12	Use of blowing ag	gents in m	nanufacture of fo	am			
Technical and organisation	onal conditions and	measur	es				
Local exhaust is needed at	source of vapours						
3.2.21. Control of worker exp	posure: Compressio	on (PRO	C12)				
PROC12	Use of blowing ag	gents in m	nanufacture of fo	am			
Technical and organisation	onal conditions and	measur	es				
Local exhaust is needed at	source of vapours						
3.2.22. Control of worker exp	posure: Cutting by I	heated w	ire - Machines	(PROC12)			
PROC12	Use of blowing ag	gents in m	nanufacture of fo	bam			
Technical and organisation	onal conditions and	measur	es				
Local exhaust is needed at	source of vapours						
3.3. Exposure estimati	on and referenc	e to its	source				
3.3.1. Environmental release ERC6a. ERC6b. ERC6c. ERC				rolling environme	ental o	exposure (E	RC1, ERC2, ERC3, ERC4, ERC5,
Information for contributi		-					
Required removal efficienc	y for wastewater can nieved using on-site t	be achie echnolog	ies, either alone	or in combination			in combination,Required removal scaling and control technologies
Release route			Release rate	/		Release es	stimation method
Release fraction to air from prior to RMM):	process (initial relea	ise	1				
Release fraction to soil from prior to RMM):			0				
Release fraction to wastew release prior to RMM):	ater from process (in	itial	0.0003				
Protection target	Unit	Exposu estimat		PNEC	RCF	र	Assessment method

Marine water 2/20/2020 (Version: 12.0)

Freshwater

0.0221

0.00221

0.015

0.0015

mg/l

mg/l

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	Freshwater sediment	mg/kg dwt	0.13		0.0266	
	Marine water sediment	mg/kg dwt	0.013		0.00266	
	Soil	mg/kg dwt	0.029		0.0149	
3.	3.3.2. Worker exposure Generic exposure scenario					

## No information available

3.3.3. Worker exposure Mixing operations (PROC1)

## Information for contributing exposure scenario

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

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	6.86 mg/kg bw/day	0.016	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	0.02867 mg/m³	0	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.016	

## 3.3.4. Worker exposure Mixing operations - High temperature. (PROC3)

## Information for contributing exposure scenario

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

 Route of exposure and type of effects
 Exposure estimate
 RCR
 Method

of effects			mounou
Dermal - Long-term - systemic	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
effects			
Inhalation - Long-term -	12.9 mg/m <sup>3</sup>	0.004	Used ECETOC TRA model
systemic effects			
Sum RCR - Long-term -		0.005	
systemic effects			

## 3.3.5. Worker exposure Intermediate polymer storage - High temperature. (PROC3)

## Information for contributing exposure scenario

•	•		
Where other Risk Management I equivalent levels	Measures/Operational Conditio	ns are adopted, then users sho	ould ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	12.9 mg/m³	0.004	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.005	
3.3.6. Worker exposure Centrifug	ing including discharging - H	ligh temperature. (PROC3)	

## Information for contributing exposure scenario

Where other Risk Management Mequivalent levels	•	ns are adopted, then users sh	ould ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	12.9 mg/m³	0.004	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.005	
systemic effects .3.7. Worker exposure Mixing op	erations (PROC3)		

## Information for contributing exposure scenario

	·		
Where other Risk Management N equivalent levels	Measures/Operational Conditions a	are adopted, then users sho	uld ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	286.71 mg/m³	0.096	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.097	

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nformation for contributing ex	posure scenario		
¥	•	ns are adopted, then users shou	Id ensure that risks are managed to at least
Route of exposure and type	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	6.86 mg/kg bw/day	0.016	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	430.06 mg/m <sup>3</sup>	0.143	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.159	
9. Worker exposure Bulk trans	sfers (PROC8b)		
Information for contributing ex	posure scenario		
Where other Risk Management N equivalent levels	Measures/Operational Conditior	ns are adopted, then users shou	ld ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	6.86 mg/kg bw/day	0.016	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	430.06 mg/kg bw/day	143.353	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		143.369	
.10. Worker exposure Drum an	d small package filling - Fillin	ig of equipment from drums o	r containers (PROC9)
Information for contributing ex	posure scenario		
Where other Risk Management N equivalent levels	Measures/Operational Conditior	ns are adopted, then users shou	ld ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	6.86 mg/kg bw/day	0.016	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	573.42 mg/m³	0.191	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.207	
.11. Worker exposure Extrusio	n and expansion of polymer r	mass (PROC12)	
Information for contributing ex	•		
Where other Risk Management N equivalent levels	Measures/Operational Conditior	ns are adopted, then users shou	ld ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	286.71 mg/m <sup>3</sup>	0.096	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.097	
12. Worker exposure Cutting a	and shaving (PROC12)		
Information for contributing ex	posure scenario		
Where other Risk Management N equivalent levels	Measures/Operational Condition	ns are adopted, then users shou	ld ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	286.71 mg/m³	0.096	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.097	
	on and re-processing of shavi	ngs, cuttings, etc (PROC12)	·

equivalent levels

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Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	286.71 mg/m <sup>3</sup>	0.096	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.097	

## 3.3.14. Worker exposure Product packaging (PROC12)

## Information for contributing exposure scenario

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

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	286.71 mg/m <sup>3</sup>	0.096	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.097	

3.3.15. Worker exposure Storage (PROC12)

## Information for contributing exposure scenario

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

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	286.71 mg/m³	0.096	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.097	

## 3.3.16. Worker exposure Drying and storage (PROC12)

Where other Risk Management Nequivalent levels	Measures/Operational Conditio	ns are adopted, then users sho	ould ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
nhalation - Long-term - systemic effects	286.71 mg/m³	0.096	Used ECETOC TRA model
Sum RCR - Long-term -		0.097	

## Information for contributing exposure scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels Route of exposure and type Exposure estimate RCR Method of effects Dermal - Long-term - systemic 0.34 mg/kg bw/day 0.001 Used ECETOC TRA model effects Inhalation - Long-term -8.6 mg/m<sup>3</sup> 0.003 Used ECETOC TRA model systemic effects 0.004 Sum RCR - Long-term systemic effects

3.3.18. Worker exposure Article formation in mould - High temperature. (PROC12)

## Information for contributing exposure scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels RCR Method Route of exposure and type Exposure estimate of effects Used ECETOC TRA model 0.34 mg/kg bw/day 0.001 Dermal - Long-term - systemic effects Inhalation - Long-term -0.003 Used ECETOC TRA model 8.6 mg/m<sup>3</sup> systemic effects 0.004 Sum RCR - Long-term -

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systemic effects			
.19. Worker exposure Cutting I	by heated wire - High temper	ature. (PROC12)	
Information for contributing ex	posure scenario		
Where other Risk Management I equivalent levels	Measures/Operational Conditio	ns are adopted, then users sho	uld ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	286.71 mg/m <sup>3</sup>	0.096	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.097	
.20. Worker exposure <traduc< td=""><td></td><td></td><td></td></traduc<>			
Information for contributing ex	•		
Where other Risk Management I equivalent levels	Measures/Operational Conditio	ns are adopted, then users sho	uld ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	286.71 mg/m³	0.096	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.097	
21. Worker exposure Compres			
Information for contributing ex			
Where other Risk Management I equivalent levels		ns are adopted, then users sho	uld ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	286.71 mg/m <sup>3</sup>	0.096	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.097	
22. Worker exposure Cutting I		ROC12)	
Information for contributing ex			
equivalent levels		ns are adopted, then users sho	uld ensure that risks are managed to at least
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	286.71 mg/m³	0.096	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.097	
. Guidance to Downstre	am User to evaluate wh	ether he works inside t	he boundaries set by the ES
.1. Environment			
Guidance - Environment	alone or in combination either alone or in comb	<ol> <li>Required removal efficiency for the second se</li></ol>	nieved using onsite/offsite technologies, either or air can be achieved using on-site technologies ng and control technologies are provided in SpE es.html)
.2. Health			
Guidance - Health	that risks are managed	to at least equivalent levels. If	Conditions are adopted, then users should ensu scaling reveals a condition of unsafe use (i.e, al safety assessment is required

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4. SE 4: Uses in cosmetics/personal care products, perfumes and fragrances

4.1. Title section					
Uses in cosmetics/p		products,	ES Ref.: SE 4	Association ref code: ES 1	
perfumes and fragrances			ES Type: Consumer Version: 1.0	Date of issue: 30/09/2019	
			Version: 1.0		
Consumer					
	Contributing	scenario consumer	end-use PC28,	PC39	
Processes, tasks, activities co	overed	fragrances. Note:	umer uses e.g. as a carrier in cosmetics/personal care products, perfumes and nces. Note: For cosmetic and personal care products, risk assessment only required for nvironment under REACH as human health is covered by alternative legislation		
Assessment method		Hydrocarbon Blo	ck Method (Petrorisk)		
4.2. Conditions of use af	fecting exposu	ire			
4.2 (ERC8a, ERC8d, ESVOC					
ERC8a	Widespread use of	non-reactive proce	ssing aid (no inclusion into or onto a	rticle, indoor)	
ERC8d	Widespread use of	non-reactive proce	ssing aid (no inclusion into or onto a	rticle, outdoor)	
ESVOC SPERC 8.16.v1	Other Consumer U	ses: Consumer (SL	J21)		
Assessment method	Hydrocarbon Block	Method (Petrorisk)	1		
Product (article) characteris	stics				
Other product characteristics			nce is complex UVCB, Water miscible, Inherently biodegradable, Low unulation potential		
		L			
Daily amount per site		630 kg/da	у		
Emission days 36		365			
4.2.1. Control of consumer exp	oosure: Contributir	ng scenario consu	mer end-use (PC28, PC39)		
PC28	Perfumes, fragrand	ces			
PC39	Cosmetics, person	al care products			
Product (article) characteris	stics				
Vapour pressure		Very volat	Very volatile		
		> 10000 P	> 10000 Pa		
4.3. Exposure estimation	n and reference	e to its source			
4.3.1. Consumer exposure Cor			se (PC28, PC39)		
Information for contributing	g exposure scenari	io			
No exposure assessment presented for human health					
4.4. Guidance to Downst	tream User to e	valuate wheth	er he works inside the bour	ndaries set by the ES	
4.4.1. Environment					
scaling may be necessary to		ned operating conditions which may o define appropriate site-specific risk ologies are provided in SpERC facts	management measures. Further details		
4.4.2. Health					
Guidance - Health	No expos	sure assessment pr	esented for human health		

Health Scaling Method

Used ECETOC TRA model

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## 5. SE 5: Use as a fuel - Industrial

## 5.1. Title section

Use as a fuel - Industrial

ES Ref.: SE 5

Association ref code: ES 1

Use as a fuer - industrial		ES Type: Vers	Worker sion: 1.0	Date of issue: 30/09/2019
Environment				
Contributing s	cenario controlling	environmental exposure		RC2, ERC3, ERC4, ERC5, ERC6a, ERC6c, ERC6d, ERC7, ESVOC .12a.v1
Worker				
Generic expo	sure scenario			
Expositions gr manquante>	······································		PROC1	
Expositions g	Expositions générales (systèmes clos) - Use as a fuel		PROC1	
	General exposures (closed systems) - Continuous process - <traduction manguante=""></traduction>		PROC2	
Expositions g	Expositions générales (systèmes clos) - Use as a fuel		PROC2	
Use as a fuel			PROC16	
Processes, tasks, activities covered	Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste		activities associated with its	
Assessment method Used EC		DC TRA model		
Hydrocarbon Bloc		ck Method (Petrorisk)		

## 5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Contributing scenario controlling environmental exposure (ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 7.12a.v1)

ERC1	Manufacture of the substance
ERC2	Formulation into mixture
ERC3	Formulation into solid matrix
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5	Use at industrial site leading to inclusion into/onto article
ERC6a	Use of intermediate
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC6c	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC7	Use of functional fluid at industrial site
ESVOC SPERC 7.12a.v1	Use as a fuel: Industrial (SU3)
Assessment method	Hydrocarbon Block Method (Petrorisk)

## Product (article) characteristics

	ostance is complex UVCB, Predominantly hydrophobic, Moderately soluble in water 0 - 1000 mg/L), Inherently biodegradable, Low bioaccumulation potential
--	--

Amount used, frequency and duration of use (or from service life)			
Daily amount per site	250 kg/day		
Annual site tonnage	5		
Continuous release			
Emission days	20		
Technical and organisational conditions and measur	es		
Bund storage facilities to prevent soil and water pollution in the event of spillage			
Prevent environmental discharge consistent with regulatory requirements			
Do not apply industrial sludge to natural soils			
Sewage sludge should be incinerated, contained or reclaimed.			
Risk from environmental exposure is driven by freshwater			
Treat air emission to provide a typical removal efficiency of		95	
Provide onsite wastewater treatment.		>= 0	
If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of		>= 0	

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ccording to Regulation (EC) No. 1907/2006 (REACH) with its amen	ndment Regulation (EU) 2015/830			
Conditions and measures related to sewage treatment plant				
Not applicable as there is no release to wastewater				
Assumed domestic sewage treatment plant flow Estimated substance removal from wastewater via municipal sewage treatment	2000 96			
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	1200000			
Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	96			
Conditions and measures related to treatment of was	ste (including article waste)			
External treatment and disposal of waste should comply with applicable local and/or national regulations				
External recovery and recycling of waste should comply with applicable local and/or national regulations				
Other conditions affecting environmental exposure				
Local freshwater dilution factor:	10			
Local marine water dilution factor:	100			
5.2.2. Control of worker exposure: Generic exposure sc	cenario			
Product (article) characteristics	1			
Physical form of product	Liquid			
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)			
Vapour pressure	Normal use conditions, (Temperature, Pressure) > 10 kPa			
Amount used (or contained in articles) frames are				
Amount used (or contained in articles), frequency an Not applicable.	a duration of use/exposure			
Covers daily exposures up to 8 hours				
Continuous process				
Conditions and measures related to personal protect	tion byging and health system			
IF exposed: Wear chemically resistant gloves (tested to E employee training Do not ingest.	EN374) in combination with 'basic'			
Avoid splashing	Avoid splashing			
Avoid contact with contaminated tools and objects				
Clean equipment and the work area every day				
Management/supervision in place to check that RMMs or OCs followed	on place are being used correctly and			
Other conditions affecting workers exposure				
Keep good industrial hygiene				
Assumes use at not more than 20°C above ambient temp	nperature.			
.2.3. Control of worker exposure: Expositions générale	es (systèmes clos) - <traduction manquante=""> (PROC1)</traduction>			
PROC1 Chemical production or ref containment conditions	finery in closed process without likelihood of exposure or processes with equivalent			
Technical and organisational conditions and measure	res			
Handle substance within a closed system				
Conditions and measures related to personal protect	tion, hygiene and health evaluation			
Use suitable eye protection and gloves				
5.2.4. Control of worker exposure: Expositions générales (systèmes clos) - Use as a fuel (PROC1)				
PROC1         Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions				
Technical and organisational conditions and measure	res			
Store substance within a closed system				
	(closed systems) - Continuous process - <traduction manquante=""> (PROC2)</traduction>			
PROC2 Chemical production or ref with equivalent containment	efinery in closed continuous process with occasional controlled exposure or processes ent conditions			
Technical and organisational conditions and measure	res			
Handle substance within a closed system				

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Conditions and measures related to personal protection, hygiene and health evaluation					
Use suitable eye protection a	Use suitable eye protection and gloves				
5.2.6. Control of worker expos	sure: Expositions générales (systèmes clos) - Use as a fuel (PR	OC2)			
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions					
Technical and organisation	nal conditions and measures				
Store substance within a close	sed system				
5.2.7. Control of worker expos	sure: Use as a fuel (PROC16)				
PROC16 Use of fuels					
Technical and organisational conditions and measures					
Store substance within a closed system					

## 5.3. Exposure estimation and reference to its source

# 5.3.1. Environmental release and exposure Contributing scenario controlling environmental exposure (ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 7.12a.v1)

## Information for contributing exposure scenario

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html)

Release route			Release rate		Release estimation method		
Release fraction to air from process (initial release prior to RMM):		0.05					
Release fraction to soil from process (initial release prior to RMM):		0					
Release fraction to wastewater from process (initial release prior to RMM):		nitial	0.00001				
Protection target	Unit	Exposi estima		PNEC RCR		र	Assessment method
Freshwater	mg/l	0.0000061			0.00	000897	
Marine water	mg/l	0.0000061			0.00	000089	
Freshwater sediment	mg/kg dwt	0.000049			0.00	001	
Marine water sediment	mg/kg dwt	0.0000049			0.00	0001	
Soil	mg/kg dwt	0.0000006		1	0.00	00003	

### 5.3.2. Worker exposure Generic exposure scenario

No information available

5.3.3. Worker exposure Expositions générales (systèmes clos) - <Traduction manquante> (PROC1)

### Information for contributing exposure scenario

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

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	0.02867 mg/m <sup>3</sup>	0	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.001	

## 5.3.4. Worker exposure Expositions générales (systèmes clos) - Use as a fuel (PROC1)

## Information for contributing exposure scenario

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

Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	0.02867 mg/m³	0	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.001	

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5.3.5. Worker exposure General exposures (closed systems) - Continuous process - <Traduction manguante> (PROC2)

3.5. Worker exposure General e Information for contributing ex			()
Risk Management Measures are adopted, then users should ensu			anagement Measures/Operational Conditions are
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	1.37 mg/kg bw/day	0.003	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	143.35 mg/m³	0.048	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.051	
.3.6. Worker exposure Expositio		- Use as a fuel (PROC2)	
Information for contributing ex	•		
Risk Management Measures are adopted, then users should ensu			anagement Measures/Operational Conditions are
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	1.37 mg/kg bw/day	0.003	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	143.35 mg/m³	0.048	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.051	
3.7. Worker exposure Use as a f	fuel (PROC16)		
Information for contributing ex	cposure scenario		
Risk Management Measures are adopted, then users should ensu	based on qualitative risk chara ire that risks are managed to at	cterisation,Where other Risk M least equivalent levels	anagement Measures/Operational Conditions are
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.34 mg/kg bw/day	0.001	Used ECETOC TRA model
Inhalation - Long-term - systemic effects	71.68 mg/m³	0.024	Used ECETOC TRA model
Sum RCR - Long-term - systemic effects		0.025	
.4. Guidance to Downstre	am User to evaluate wh	ether he works inside t	he boundaries set by the ES
4.1. Environment			
Guidance - Environment	uidance - Environment Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologie either alone or in combination. Further details on scaling and control technologies are provided in Spl factsheet (http://cefic.org/en/reach-for-industries-libraries.html)		
.4.2. Health			
Guidance - Health Where other Risk Management Measures/Operational Conditions are adopted, then users should er that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e, RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required			scaling reveals a condition of unsafe use (i.e,

Health Scaling Method

Used ECETOC TRA model