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

1.1. Product identifier

Product form : Substance
Name : N-PENTANE
Product code : 100037900
Synonyms : NOVASPRAY n-pentane S / NOVEXPANS n-pentane S / NOVASPRAY n-pentane T / NOVEXPANS n-pentane T

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

1.2.1. Relevant identified uses

Use of the substance/mixture : Blowing agent
Aerosol jet

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 Kft Budepesta sucurcala Bucuresti Romania
Bulevardul Hristo Botev, Nr. 28,
Biroul NR 4, Modulul I
Bucuresti Sectorul 3 - Romania
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
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 nordic service
Östra Hamngatan 50B 3tr
41109 GÖTEBORG - Sweden
T 00 46 44 21 58 80 - F 00 46 44 21 58 80
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
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
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
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
ContactFDS@climalife.dehon.com

Other
IDS Refrigeration Limited
Green Court, Kings Weston Lane
Avonmouth
BS11 8AZ Bristol - United Kingdom
T 00 44 1179 802520 - F 00 44 1179 802521
ContactFDS@climalife.dehon.com

Other
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

1.4. Emergency telephone number

Emergency 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. 1	H224
STOT SE 3	H336
Asp. Tox. 1	H304
Aquatic Chronic 2	H411

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

Adverse physicochemical, human health and environmental effects

Extremely flammable liquid and vapour. May cause drowsiness or dizziness. May be fatal if swallowed and enters airways. Toxic 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 GHS09

Signal word (CLP) : Danger

Hazard statements (CLP) : H224 - Extremely flammable liquid and vapour.
H304 - May be fatal if swallowed and enters airways.
H336 - May cause drowsiness or dizziness.
H411 - Toxic 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.
P243 - Take action to prevent static discharges.
P273 - Avoid release to the environment.
P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P311 - Call a POISON CENTER/doctor.

EUH-statements : EUH066 - Repeated exposure may cause skin dryness or cracking.

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name : N-PENTANE

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
n-pentane	(CAS-No.) 109-66-0 (EC-No.) 203-692-4 (EC Index-No.) 601-006-00-1 (REACH-no) 01-2119459286-30	>= 94	Flam. Liq. 1, H224 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411

Full text of H-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. In the event of coughing and slight breathlessness: Call a doctor.

First-aid measures after skin contact : Wash with plenty of water/…. Take off immediately all contaminated clothing. If skin irritation or rash occurs: Get medical advice/attention.

First-aid measures after eye contact : Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum). Remove contact lenses, if present and easy to do. Continue rinsing. Consult an ophtalmologist if irritation persists.

First-aid measures after ingestion : Do not give the affected person anything to drink, even if he is fully conscious. Do not induce vomiting. Transfer to hospital rapidly.

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 : Dizziness, headaches, nausea. Risk of lung oedema. CNS depression. Suffocation.

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

Risk of aspiration pneumonia. Do not administer medicines from the adrenalin-ephedrine group.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Dry powder. Foam. Carbon dioxide.

Unsuitable extinguishing media : Strong water jet.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Extremely flammable liquid and vapour. The vapours are denser than air and may travel along the ground. Distance ignition possible.

Hazardous decomposition products in case of fire : Toxic fumes may be released.

5.3. Advice for firefighters

Precautionary measures fire : Cool down the containers exposed to heat with a water spray. Contain the extinguishing fluids by bunding.

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Avoid contact with skin and eyes.

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate area.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. Do not breathe vapours.

Emergency procedures : Stop leak if safe to do so. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Remove all sources of ignition.

6.2. Environmental precautions

Contain the spilled material by bunding (product is hazardous for the environment). Do not allow product to spread into the environment.

6.3. Methods and material for containment and cleaning up

For containment : Collect spillage. Take up liquid spill into inert absorbent material.

Methods for cleaning up : Wash with a solution of 60-70 % ethanol. Then wash with water and detergent.

Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For disposal of solid materials or residues refer to section 13 : "Disposal considerations".

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Flammable vapours may accumulate in the container. Use explosion-proof equipment. Wear personal protective equipment. Use only outdoors or in a well-ventilated area. Avoid breathing vapours. Vapour extraction at source.

Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Ground/bond container and receiving equipment.

Storage conditions : Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store : away from any source of ignition.

Incompatible products : Oxidizing materials. Oxidizing materials.

Heat and ignition sources	: Keep away from heat and direct sunlight. Do not expose to temperatures exceeding 50 °C/ 122 °F.
Packaging materials	: Recommended materials Stainless steel, Polyethylene, Polypropylene, Polyester, Teflon. Unsuitable materials: Rubbers.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

n-pentane (109-66-0)	
Austria - Occupational Exposure Limits	
Local name	n-Pentan
MAK (mg/m³)	1800 mg/m³
MAK (ppm)	600 ppm
MAK Short time value (mg/m³)	3600 mg/m³
MAK Short time value (ppm)	1200 ppm
Regulatory reference	BGBl. II Nr. 186/2015
Belgium - Occupational Exposure Limits	
Local name	Pentane, tous isomères # Pentaan, alle isomeren
Limit value (mg/m³)	1800 mg/m³
Limit value (ppm)	600 ppm
Short time value (mg/m³)	2250 mg/m³
Short time value (ppm)	750 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 21/01/2020
Denmark - Occupational Exposure Limits	
Local name	Pentan, alle isomere
Grænseværdie (langvarig) (mg/m³)	1500 mg/m³
Grænseværdie (langvarig) (ppm)	500 ppm
Anmærkninger (DK)	E
Finland - Occupational Exposure Limits	
Local name	n-Pentaani
HTP-arvo (8h) (mg/m³)	1500 mg/m³
HTP-arvo (8h) (ppm)	500 ppm
HTP-arvo (15 min)	1900 mg/m³
HTP-arvo (15 min) (ppm)	630 ppm
Regulatory reference	HTP-ARVOT 2018 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	n-Pentane
VME (mg/m³)	3000 mg/m³
VME (ppm)	1000 ppm
Germany - Occupational Exposure Limits (TRGS 900)	
TRGS 900 Local name	Pentan
Occupational exposure limit value (mg/m³)	3000 mg/m³
Occupational exposure limit value (ppm)	1000 ppm
TRGS 900 Remark	DFG,EU,Y
Greece - Occupational Exposure Limits	
Local name	ν-πεντάνιο
OEL TWA (mg/m³)	2950 mg/m³

OEL TWA (ppm)	1000 ppm
OEL STEL (mg/m³)	2950 mg/m³
OEL STEL (ppm)	1000 ppm
Italy - Occupational Exposure Limits	
Local name	Pentano
OEL TWA (mg/m³)	2000 mg/m³
OEL TWA (ppm)	667 ppm
Regulatory reference	Allegato XXXVIII del D.Lgs. 9 aprile 2008, n. 81 e s.m.i.
Netherlands - Occupational Exposure Limits	
Local name	n-Pentaan
Grenswaarde TGG 8H (mg/m³)	1800 mg/m³
Regulatory reference	Arbeidsomstandighedenregeling 2018
Portugal - Occupational Exposure Limits	
Local name	Pentano , todos os isómeros
OEL TWA (ppm)	1000 ppm
Regulatory reference	Norma Portuguesa NP 1796:2014
Spain - Occupational Exposure Limits	
Local name	n-Pentano
VLA-ED (mg/m³)	3000 mg/m³
VLA-ED (ppm)	1000 ppm
Notes	VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2019. INSHT
Sweden - Occupational Exposure Limits	
Local name	n-Pentan
nivågränsvärde (NVG) (mg/m³)	1800 mg/m³
nivågränsvärde (NVG) (ppm)	600 ppm
kortidsvärde (KTV) (mg/m³)	2000 mg/m³
kortidsvärde (KTV) (ppm)	750 ppm
Anmärkning (SE)	V (Vägledande korttidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	n-pentane
WEL TWA (mg/m³)	1800 mg/m³
WEL TWA (ppm)	600 ppm
Norway - Occupational Exposure Limits	
Local name	Pentan
Grenseverdier (AN) (mg/m³)	750 mg/m³
Grenseverdier (AN) (ppm)	250 ppm
Merknader (NO)	E (EU har en veiledende grenseverdi for stoffet)
Regulatory reference	FOR-2018-08-21-1255
Switzerland - Occupational Exposure Limits	
Local name	n-Pentane
MAK (mg/m³)	1800 mg/m³
MAK (ppm)	600 ppm
KZGW (mg/m³)	3600 mg/m³

KZGW (ppm)	1200 ppm
Remark	4x15
Turkey - Occupational Exposure Limits	
Local name	Pentan
OEL TWA (mg/m³)	3000 mg/m³
OEL TWA (ppm)	1000 ppm
Regulatory reference	12 Ağustos 2013 Tarihli ve 28733 Sayılı Resmî Gazete

n-pentane (109-66-0)	
DNEL/DMEL (Workers)	
Long-term - systemic effects, dermal	432 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	3000 mg/m³
DNEL/DMEL (General population)	
Long-term - systemic effects,oral	214 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	643 mg/m³
Long-term - systemic effects, dermal	214 mg/kg bodyweight/day
PNEC (Water)	
PNEC aqua (freshwater)	0.23 mg/l
PNEC aqua (marine water)	0.23 mg/l
PNEC (Soil)	
PNEC soil	0.55 mg/kg dwt
PNEC (STP)	
PNEC sewage treatment plant	3.6 mg/l

8.2. Exposure controls

Appropriate engineering controls:

Local exhaust is needed at source of vapours. Ensure good ventilation of the work station.

Hand protection:

Nitrile-rubber protective gloves

Type	Material	Permeation	Thickness (mm)	Penetration	Standard
	Nitrile rubber (NBR)	6 (> 480 minutes)	0.35		

Eye protection:

Safety glasses with side shields

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

In the event of insufficient ventilation: Gas mask with filter type AX

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	: weak. Hydrocarbon-like.
Odour threshold	: No data available
pH	: Not applicable
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: -130 °C Not applicable

Freezing point	: No data available
Boiling point	: 35 - 42 °C
Flash point	: -40 °C
Critical temperature	: 196.5 °C
Auto-ignition temperature	: 260 °C
Decomposition temperature	: No data available
Flammability (solid, gas)	: Extremely flammable liquid and vapour.
Vapour pressure	: 56.5 kPa (20°C)
Critical pressure	: 3370 kPa
Relative vapour density at 20 °C	: 2.48
Relative density	: No data available
Density	: 0.626 g/cm³
Solubility	: Water: < 1 g/l practically insoluble Organic solvent:Miscible
Log Pow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: Not explosive material according to EC criteria.
Oxidising properties	: Non oxidizing material according to EC criteria.
Lower explosive limit (LEL)	: 1.4 vol %
Upper explosive limit (UEL)	: 7.8 vol %

9.2. Other information
No additional information available

SECTION 10: Stability and reactivity
10.1. Reactivity
None under normal conditions.
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
Avoid contact with hot surfaces. Heat. No flames, no sparks. Eliminate all sources of ignition.
10.5. Incompatible materials
Strong oxidizing agents. oxidizing materials.
10.6. Hazardous decomposition products
On thermal decomposition (pyrolysis), releases : Carbon oxides (CO, CO2).

SECTION 11: Toxicological information
11.1. Information on toxicological effects
Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified

n-pentane (109-66-0)	
LD50 oral rat	> 2000 mg/kg
LC50 inhalation rat (mg/l)	> 20 mg/l/4h

Skin corrosion/irritation	: Not classified pH: Not applicable
Serious eye damage/irritation	: Not classified pH: Not applicable
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
STOT-single exposure	: May cause drowsiness or dizziness.
STOT-repeated exposure	: Not classified
Aspiration hazard	: May be fatal if swallowed and enters airways.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Toxic to aquatic life with long lasting effects.

Hazardous to the aquatic environment, short-term (acute) : Not classified

Hazardous to the aquatic environment, long-term (chronic) : Toxic to aquatic life with long lasting effects.

n-pentane (109-66-0)	
LC50 fish 1	4.26 mg/l 96 Hours (Oncorhynchus mykiss)
EC50 Daphnia 1	2.7 mg/l 48 Hours (Daphnia magna)
EC50 72h algae (1)	10.7 mg/l 72 Hours (Pseudokirchneriella subcapitata)

12.2. Persistence and degradability

n-pentane (109-66-0)	
Persistence and degradability	87 % biodegradation after 28 days. Half-life in air : 3.95 d.

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

Component	
n-pentane (109-66-0)	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

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

Product/Packaging disposal recommendations : Dispose of this material and its container at hazardous or special waste collection point.

Additional information : Flammable vapours may accumulate in the container.

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA

ADR	IMDG	IATA
14.1. UN number		
UN 1265	UN 1265	UN 1265
14.2. UN proper shipping name		
PENTANES	PENTANES	Pentanes
Transport document description		
UN 1265 PENTANES, 3, I, (D/E), ENVIRONMENTALLY HAZARDOUS	UN 1265 PENTANES, 3, I, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS	UN 1265 Pentanes, 3, I, ENVIRONMENTALLY HAZARDOUS
14.3. Transport hazard class(es)		
3	3	3
		
14.4. Packing group		
I	I	I

14.5. Environmental hazards

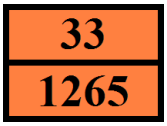
Dangerous for the environment : Yes	Dangerous for the environment : Yes Marine pollutant : Yes	Dangerous for the environment : Yes

No supplementary information available

14.6. Special precautions for user

Overland transport

Classification code (ADR) : F1
Limited quantities (ADR) : 0
Tank code (ADR) : L4BN
Transport category (ADR) : 1
Hazard identification number (Kemler No.) : 33
Orange plates :



Tunnel restriction code (ADR) : D/E
EAC code : 3YE

Transport by sea

Limited quantities (IMDG) : 0
EmS-No. (Fire) : F-E
EmS-No. (Spillage) : S-D
Flash point (IMDG) : - 40°C

Air transport

PCA Limited quantities (IATA) : Forbidden
PCA limited quantity max net quantity (IATA) : Forbidden
PCA packing instructions (IATA) : 351
PCA max net quantity (IATA) : 1L
CAO packing instructions (IATA) : 361
CAO max net quantity (IATA) : 30L

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

No REACH Annex XVII restrictions
N-PENTANE is not on the REACH Candidate List
N-PENTANE is not on the REACH Annex XIV List
N-PENTANE 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.
N-PENTANE 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

France

Occupational diseases : RG 84 - Affections engendrées par les solvants organiques liquides à usage professionnel

Germany

Reference to AwSV : Water hazard class (WGK) 2, Significantly hazardous to water
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

No chemical safety assessment has been carried out

SECTION 16: Other information

Indication of changes:			
Section	**Changed item**	**Change**	**Comments**
1.3	Supplier	Modified	

Full text of H- and EUH-statements:	
Aquatic Chronic 2	Hazardous to the aquatic environment — Chronic Hazard, Category 2
Asp. Tox. 1	Aspiration hazard, Category 1
Flam. Liq. 1	Flammable liquids, Category 1
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Narcosis
H224	Extremely flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H336	May cause drowsiness or dizziness.
H411	Toxic 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.

Annex to the safety data sheet

1. SE1: Distribution of substance

1.1. Title section

Distribution of substance

ES Ref.: SE1 ES Type: Worker Version: 1.0	Date of issue: 21/01/2020

Environment		
	Contributing scenario controlling environmental exposure	ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Worker		
	General exposures (closed systems)	PROC1, PROC2, PROC3
	General exposures (open systems)	PROC4
	sampling	PROC3
	Laboratory activities	PROC15
	Bulk transfers Closed systems	PROC8b
	Bulk transfers , Open systems	PROC8b
	Drum and small package filling	PROC9
	Equipment cleaning and maintenance	PROC8a
	Storage	PROC1, PROC2

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 Industrial use

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)

Product (article) characteristics

Physical form of product	Liquid
Other product characteristics	Readily biodegradable, Predominantly hydrophobic

Amount used, frequency and duration of use (or from service life)

Daily amount per site	360 kg/day
Emission days	20
Continuous release	

Conditions and measures related to sewage treatment plant

Not applicable as there is no release to wastewater	

Conditions and measures related to treatment of waste (including article waste)

Do not apply industrial sludge to natural soils. Incineration, disposal or recycling at specific offsite provider	

Other conditions affecting environmental exposure

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

1.2.2. Control of worker exposure: General exposures (closed systems) (PROC1, PROC2, PROC3)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure

Covers daily exposures up to 8 hours	

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

Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature.	

1.2.3. Control of worker exposure: General exposures (open systems) (PROC4)

PROC4	Chemical production where opportunity for exposure arises

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure

Covers daily exposures up to 8 hours	

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

Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature.	

1.2.4. Control of worker exposure: sampling (PROC3)

PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure

Covers daily exposures up to 8 hours	

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

Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature.	

1.2.5. Control of worker exposure: Laboratory activities (PROC15)

PROC15	Use as laboratory reagent

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure

Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

1.2.6. Control of worker exposure: Bulk transfers Closed systems (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Technical and organisational conditions and measures	
Clear transfer lines prior to de-coupling	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

1.2.7. Control of worker exposure: Bulk transfers , Open systems (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

1.2.8. Control of worker exposure: Drum and small package filling (PROC9)

PROC9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

1.2.9. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

1.2.10. Control of worker exposure: Storage (PROC1, PROC2)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure Contributing scenario controlling environmental exposure (ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1)

Information for contributing exposure scenario					
Hydrocarbon Block Method (Petrorisk)					
Protection target	**Unit**	**Exposure estimation**	**PNEC**	**RCR**	**Assessment method**
Sewage treatment plant				<= 0.00013	

Release estimation	Air	0.0001	
Release estimation	Water	0.00001	
Release estimation	soil	0.00001	

1.3.2. Worker exposure General exposures (closed systems) (PROC1, PROC2, PROC3)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

1.3.3. Worker exposure General exposures (open systems) (PROC4)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

1.3.4. Worker exposure sampling (PROC3)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

1.3.5. Worker exposure Laboratory activities (PROC15)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

1.3.6. Worker exposure Bulk transfers Closed systems (PROC8b)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

1.3.7. Worker exposure Bulk transfers , Open systems (PROC8b)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

1.3.8. Worker exposure Drum and small package filling (PROC9)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

1.3.9. Worker exposure Equipment cleaning and maintenance (PROC8a)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

1.3.10. Worker exposure Storage (PROC1, PROC2)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

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

1.4.1. Environment

Guidance - Environment	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for environment. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e, RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required

1.4.2. Health

Guidance - Health	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e, RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required

2. SE2: Formulation [mixing] of preparations and/or re-packaging

2.1. Title section

Formulation [mixing] of preparations and/or re-packaging

ES Ref.: SE2 ES Type: Worker Version: 1.0	Date of issue: 21/01/2020

Environment		
	Contributing scenario controlling environmental exposure	ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 2.2.v1
Worker		
	General exposures (closed systems)	PROC1, PROC2, PROC3
	General exposures (open systems)	PROC4
	Batch processes at elevated temperatures	PROC3
	Product sampling	PROC3
	Laboratory activities	PROC15
	Bulk transfers	PROC8b
	Mixing operations (open systems)	PROC5
	transfer of material from one container to another	PROC8a
	Drum/batch transfers	PROC8a
	Production of preparations or articles by tabletting, compression, extrusion, pelettisation	PROC14
	Drum and small package filling	PROC9
	Equipment cleaning and maintenance	PROC8a
	Storage	PROC1, PROC2

Processes, tasks, activities covered	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities Industrial use

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)

Product (article) characteristics

Physical form of product	Liquid
Other product characteristics	Readily biodegradable, Predominantly hydrophobic

Amount used, frequency and duration of use (or from service life)

Daily amount per site	11000 kg/day
Emission days	300
Continuous release	

Conditions and measures related to sewage treatment plant

Not applicable as there is no release to wastewater	

Conditions and measures related to treatment of waste (including article waste)

Do not apply industrial sludge to natural soils. Incineration, disposal or recycling at specific offsite provider	

Other conditions affecting environmental exposure	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100

2.2.2. Control of worker exposure: General exposures (closed systems) (PROC1, PROC2, PROC3)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

2.2.3. Control of worker exposure: General exposures (open systems) (PROC4)

PROC4	Chemical production where opportunity for exposure arises

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

2.2.4. Control of worker exposure: Batch processes at elevated temperatures (PROC3)

PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Technical and organisational conditions and measures	
Provide a good standard of controlled ventilation (10 to 15 air changes per hour)	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Operation is carried out at elevated temperature (> 20°C above ambient temperature)	

2.2.5. Control of worker exposure: Product sampling (PROC3)

PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

2.2.6. Control of worker exposure: Laboratory activities (PROC15)

PROC15	Use as laboratory reagent

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

2.2.7. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

2.2.8. Control of worker exposure: Mixing operations (open systems) (PROC5)

PROC5	Mixing or blending in batch processes

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

2.2.9. Control of worker exposure: transfer of material from one container to another (PROC8a)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid

Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

2.2.10. Control of worker exposure: Drum/batch transfers (PROC8a)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

2.2.11. Control of worker exposure: Production of preparations or articles by tabletting, compression, extrusion, pelettisation (PROC14)

PROC14	Tabletting, compression, extrusion, pelettisation, granulation

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

2.2.12. Control of worker exposure: Drum and small package filling (PROC9)

PROC9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

2.2.13. Control of worker exposure: Equipment cleaning and maintenance (PROC8a)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

2.2.14. Control of worker exposure: Storage (PROC1, PROC2)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure Contributing scenario controlling environmental exposure (ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 2.2.v1)

Information for contributing exposure scenario					
Hydrocarbon Block Method (Petrorisk)					
Protection target	**Unit**	**Exposure estimation**	**PNEC**	**RCR**	**Assessment method**
Sewage treatment plant				<= 0.017448	

Release estimation	Air	0.025	
Release estimation	Water	0.0002	
Release estimation	soil	0.0001	

2.3.2. Worker exposure General exposures (closed systems) (PROC1, PROC2, PROC3)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

2.3.3. Worker exposure General exposures (open systems) (PROC4)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

2.3.4. Worker exposure Batch processes at elevated temperatures (PROC3)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

2.3.5. Worker exposure Product sampling (PROC3)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

2.3.6. Worker exposure Laboratory activities (PROC15)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section

2 are implemented

2.3.7. Worker exposure Bulk transfers (PROC8b)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

2.3.8. Worker exposure Mixing operations (open systems) (PROC5)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

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

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

2.3.10. Worker exposure Drum/batch transfers (PROC8a)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

2.3.11. Worker exposure Production of preparations or articles by tabletting, compression, extrusion, pelettisation (PROC14)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

2.3.12. Worker exposure Drum and small package filling (PROC9)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

2.3.13. Worker exposure Equipment cleaning and maintenance (PROC8a)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

2.3.14. Worker exposure Storage (PROC1, PROC2)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

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

2.4.1. Environment

Guidance - Environment	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for environment. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e, RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required

2.4.2. Health

Guidance - Health	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e, RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required

3. SE3: Blowing agent

3.1. Title section

Blowing agent

ES Ref.: SE3 ES Type: Worker Version: 1.0	Date of issue: 21/01/2020

Environment		
	Contributing scenario controlling environmental exposure	ERC4, ESVOC SPERC 4.9.v1
Worker		
	Bulk transfers	PROC8b
	Mixing operations	PROC1, PROC3
	Extrusion and expansion of polymer mass, Sawmilling and planing of wood, Collection and re-processing of shavings, cuttings, etc, Product packaging, Storage	PROC12
	Mixing operations, Intermediate polymer storage, Centrifuging including discharging, Treatment by heating, Casting operations	PROC3, PROC12
	Semi-bulk packaging	PROC8b
	Drying and storage, Cutting by heated wire	PROC12
	Drum and small package filling, Filling of equipment from drums or containers	PROC9
	Foaming, Compression, Cutting by heated wire	PROC12

Processes, tasks, activities covered	Use as a blowing agent for rigid and flexible foams, including material transfers, mixing and injection, curing, cutting, storage and packing Industrial use

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.9.v1)

ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ESVOC SPERC 4.9.v1	Blowing agents: Industrial (SU3)

Product (article) characteristics

Physical form of product	Liquid
Other product characteristics	Readily biodegradable, Predominantly hydrophobic

Amount used, frequency and duration of use (or from service life)

Daily amount per site	15000 kg/day
Emission days	100
Continuous release	

Conditions and measures related to sewage treatment plant

Not applicable as there is no release to wastewater	

Conditions and measures related to treatment of waste (including article waste)

Do not apply industrial sludge to natural soils. Incineration, disposal or recycling at specific offsite provider	

Other conditions affecting environmental exposure

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

3.2.2. Control of worker exposure: Bulk transfers (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure

Covers daily exposures up to 8 hours	

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

Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

3.2.3. Control of worker exposure: Mixing operations (PROC1, PROC3)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

3.2.4. Control of worker exposure: Extrusion and expansion of polymer mass, Sawmilling and planing of wood, Collection and re-processing of shavings, cuttings, etc, Product packaging, Storage (PROC12)

PROC12	Use of blowing agents in manufacture of foam

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

3.2.5. Control of worker exposure: Mixing operations, Intermediate polymer storage, Centrifuging including discharging, Treatment by heating, Casting operations (PROC3, PROC12)

PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC12	Use of blowing agents in manufacture of foam

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Technical and organisational conditions and measures	
Provide a good standard of controlled ventilation (10 to 15 air changes per hour)	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Operation is carried out at elevated temperature (> 20°C above ambient temperature)	

3.2.6. Control of worker exposure: Semi-bulk packaging (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %

Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure
Covers daily exposures up to 8 hours

Conditions and measures related to personal protection, hygiene and health evaluation
Handle in accordance with good industrial hygiene and safety practice

Other conditions affecting workers exposure
Assumes use at not more than 20°C above ambient temperature.

3.2.7. Control of worker exposure: Drying and storage, Cutting by heated wire (PROC12)

PROC12	Use of blowing agents in manufacture of foam

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure
Covers daily exposures up to 8 hours

Conditions and measures related to personal protection, hygiene and health evaluation
Handle in accordance with good industrial hygiene and safety practice

Other conditions affecting workers exposure
Assumes use at not more than 20°C above ambient temperature.

3.2.8. Control of worker exposure: Drum and small package filling, Filling of equipment from drums or containers (PROC9)

PROC9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure
Covers daily exposures up to 8 hours

Conditions and measures related to personal protection, hygiene and health evaluation
Handle in accordance with good industrial hygiene and safety practice

Other conditions affecting workers exposure
Assumes use at not more than 20°C above ambient temperature.

3.2.9. Control of worker exposure: Foaming, Compression, Cutting by heated wire (PROC12)

PROC12	Use of blowing agents in manufacture of foam

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure
Covers daily exposures up to 8 hours

Conditions and measures related to personal protection, hygiene and health evaluation
Handle in accordance with good industrial hygiene and safety practice

Other conditions affecting workers exposure
Assumes use at not more than 20°C above ambient temperature.

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.9.v1)

Information for contributing exposure scenario					
Hydrocarbon Block Method (Petrorisk)					
Protection target	**Unit**	**Exposure estimation**	**PNEC**	**RCR**	**Assessment method**
Sewage treatment plant				<= 0.034	

Release estimation	Air	1	
Release estimation	Water	0.0003	
Release estimation	soil	0	

3.3.2. Worker exposure Bulk transfers (PROC8b)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

3.3.3. Worker exposure Mixing operations (PROC1, PROC3)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

3.3.4. Worker exposure Extrusion and expansion of polymer mass, Sawmilling and planing of wood, Collection and re-processing of shavings, cuttings, etc, Product packaging, Storage (PROC12)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

3.3.5. Worker exposure Mixing operations, Intermediate polymer storage, Centrifuging including discharging, Treatment by heating, Casting operations (PROC3, PROC12)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

3.3.6. Worker exposure Semi-bulk packaging (PROC8b)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

3.3.7. Worker exposure Drying and storage, Cutting by heated wire (PROC12)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

3.3.8. Worker exposure Drum and small package filling, Filling of equipment from drums or containers (PROC9)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

3.3.9. Worker exposure Foaming, Compression, Cutting by heated wire (PROC12)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

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

3.4.1. Environment

Guidance - Environment	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for environment. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e, RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required

3.4.2. Health

Guidance - Health	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e, RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required

4. SE4: Uses in cosmetics/personal care products, perfumes and fragrances

4.1. Title section

Uses in cosmetics/personal care products, perfumes and fragrances

ES Ref.: SE4 ES Type: Consumer Version: 1.0	Date of issue: 21/01/2020

Environment		
	Contributing scenario controlling environmental exposure	ERC8a, ERC8d, ESVOC SPERC 8.16.v1
Consumer		
	Contributing scenario consumer end-use	

Processes, tasks, activities covered	Consumer uses e.g. as a carrier in cosmetics/body care products, perfumes and scented products Consumer use

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.16.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.16.v1	Other Consumer Uses: Consumer (SU21)

Product (article) characteristics

Physical form of product	Liquid
Other product characteristics	Readily biodegradable, Predominantly hydrophobic

Amount used, frequency and duration of use (or from service life)

Regional use tonnage	72
Continuous release	
Emission days	365

Other conditions affecting environmental exposure

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

4.2.2. Control of consumer exposure: Contributing scenario consumer end-use

Product (article) characteristics

Physical form of product	Liquid

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.16.v1)

Information for contributing exposure scenario

Hydrocarbon Block Method (Petrorisk)

Protection target	Unit	Exposure estimation	PNEC	RCR	Assessment method
Sewage treatment plant				<= 0.00012	

Release estimation	Air	0.95	
Release estimation	Water	0.025	
Release estimation	soil	0.025	

4.3.2. Consumer exposure Contributing scenario consumer end-use

No information available

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

4.4.1. Environment

Guidance - Environment	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for environment. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels

4.4.2. 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

5. SE5: Consumer use of washing and cleaning products

5.1. Title section

Consumer use of washing and cleaning products

ES Ref.: SE5 ES Type: Consumer Version: 1.0	Date of issue: 21/01/2020

Environment		
	Contributing scenario controlling environmental exposure	ERC8a, ERC8d, ESVOC SPERC 8.4c.v1
Consumer		
	Air care, instant action (aerosol sprays)	PC3
	Air care, continuous action (solid and liquid)	PC3
	Washing car window	PC4
	Pouring into radiator	PC4
	Lock de-icer	PC4
	Laundry and dish washing products	PC8
	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	PC8
	Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	PC8
	Waterborne latex wall paint	PC9a
	Solvent rich, high solid, water borne paint	PC9a
	Aerosol spray can	PC9a
	Aerosol spray can	PC9a
	Diluent	PC9a
	Fillers and putty	PC9b
	Plastering, Coat	PC9b
	Modelling clay	PC9b
	Finger paints	PC9c
	Liquid	PC24
	adhesives	PC24
	aerosol	PC24
	Laundry and dish washing products	PC35
	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	PC35
	Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	PC35
	Welding and soldering products, flux products	PC38

Processes, tasks, activities covered	Covers general consumer exposures resulting from the use of household products sold as laundry and cleaning products, aerosols, coatings, de-icers, lubricants and air care products. Consumer use

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.4c.v1)

ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ESVOC SPERC 8.4c.v1	Use in Cleaning Agents: Consumer (SU21)

Product (article) characteristics

Physical form of product	Liquid
Other product characteristics	Readily biodegradable, Predominantly hydrophobic

Amount used, frequency and duration of use (or from service life)

Regional use tonnage	42
Continuous release	
Emission days	365

Other conditions affecting environmental exposure	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100

5.2.2. Control of consumer exposure: Air care, instant action (aerosol sprays) (PC3)

PC3	Air care products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 50 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	0.5 g
Covers use up to	4 times per day
Covers use up to	365 days per year
Covers exposure up to	0.25 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	857.5 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.3. Control of consumer exposure: Air care, continuous action (solid and liquid) (PC3)

PC3	Air care products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 50 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	0.48 g
Covers use up to	1 times per day
Covers use up to	365 days per year
Covers exposure up to	8 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	35.7 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.4. Control of consumer exposure: Washing car window (PC4)

PC4	Anti-Freeze and De-icing products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 1 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	0.5 g
Covers use up to	1 times per day
Covers use up to	365 days per year
Covers exposure up to	0.02 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	857.5 cm²
Covers use at ambient temperatures	
Covers use in room size of	34 m³
Covers use under typical household ventilation	

5.2.5. Control of consumer exposure: Pouring into radiator (PC4)

PC4	Anti-Freeze and De-icing products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 10 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	2000 g
Covers use up to	1 times per day
Covers use up to	365 days per year
Covers exposure up to	0.17 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	428 cm²
Covers use at ambient temperatures	
Covers use in room size of	34 m³
Covers use under typical household ventilation	

5.2.6. Control of consumer exposure: Lock de-icer (PC4)

PC4	Anti-Freeze and De-icing products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 50 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	4 g
Covers use up to	1 times per day
Covers use up to	365 days per year
Covers exposure up to	0.25 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	214.4 cm²
Covers use at ambient temperatures	
Covers use in room size of	34 m³
Covers use under typical household ventilation	

5.2.7. Control of consumer exposure: Laundry and dish washing products (PC8)

PC8	Biocidal products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 5 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	15 g
Covers use up to	1 times per day
Covers use up to	365 days per year
Covers exposure up to	0.5 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	857.5 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.8. Control of consumer exposure: Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners) (PC8)

PC8	Biocidal products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 5 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	27 g

Covers use up to	1 times per day
Covers use up to	128 days per year
Covers exposure up to	0.33 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	857.5 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.9. Control of consumer exposure: Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners) (PC8)

PC8	Biocidal products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 15 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	35 g
Covers use up to	1 times per day
Covers use up to	128 days per year
Covers exposure up to	0.17 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	428 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.10. Control of consumer exposure: Waterborne latex wall paint (PC9a)

PC9a	Coatings and paints, thinners, paint removers

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 1.5 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	2760 g
Covers use up to	1 times per day
Covers use up to	4 days per year
Covers exposure up to	2.2 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	428 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.11. Control of consumer exposure: Solvent rich, high solid, water borne paint (PC9a)

PC9a	Coatings and paints, thinners, paint removers

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 27.5 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	744 g
Covers use up to	1 times per day
Covers use up to	6 days per year
Covers exposure up to	2.2 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	428 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.12. Control of consumer exposure: Aerosol spray can (PC9a)

PC9a	Coatings and paints, thinners, paint removers

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 50 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	215 g
Covers use up to	1 times per day
Covers use up to	2 days per year
Covers exposure up to	0.33 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	857.5 cm²
Covers use at ambient temperatures	
Covers use in room size of	34 m³
Covers use under typical household ventilation	

5.2.13. Control of consumer exposure: Aerosol spray can (PC9a)

PC9a	Coatings and paints, thinners, paint removers

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 50 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	215 g
Covers use up to	1 times per day
Covers use up to	2 days per year
Covers exposure up to	0.33 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	857.5 cm²
Covers use at ambient temperatures	
Covers use in room size of	34 m³
Covers use under typical household ventilation	

5.2.14. Control of consumer exposure: Diluent (PC9a)

PC9a	Coatings and paints, thinners, paint removers

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 50 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	491 g
Covers use up to	1 times per day
Covers use up to	3 days per year
Covers exposure up to	2 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	857.5 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.15. Control of consumer exposure: Fillers and putty (PC9b)

PC9b	Fillers, putties, plasters, modelling clay

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	<= 2 %

Amount used (or contained in articles), frequency and duration of use/exposure

For each use event, covers use amounts up to	85 g
Covers use up to	1 times per day
Covers use up to	12 days per year
Covers exposure up to	4 h

Other conditions affecting consumer exposure

Exposed skin surface assumed:	35.73 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.16. Control of consumer exposure: Plastering, Coat (PC9b)

PC9b	Fillers, putties, plasters, modelling clay

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	<= 2 %

Amount used (or contained in articles), frequency and duration of use/exposure

For each use event, covers use amounts up to	13800 g
Covers use up to	1 times per day
Covers use up to	12 days per year
Covers exposure up to	2 h

Other conditions affecting consumer exposure

Exposed skin surface assumed:	857.5 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.17. Control of consumer exposure: Modelling clay (PC9b)

PC9b	Fillers, putties, plasters, modelling clay

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	<= 1 %

Amount used (or contained in articles), frequency and duration of use/exposure

For each use event, covers use amounts up to	13800 g
For each use event, assumes swallowed amount of :	1 g
Covers use up to	1 times per day
Covers use up to	365 days per year
Covers exposure up to	8 h

Other conditions affecting consumer exposure

Exposed skin surface assumed:	254.4 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.18. Control of consumer exposure: Finger paints (PC9c)

PC9c	Finger paints

Product (article) characteristics

Physical form of product	Liquid

Concentration of substance in product	<= 50 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	13800 g
For each use event, assumes swallowed amount of :	1.35 g
Covers use up to	1 times per day
Covers use up to	365 days per year
Covers exposure up to	8 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	254.4 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.19. Control of consumer exposure: Liquid (PC24)

PC24	Lubricants, greases, release products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	2200 g
Covers use up to	1 times per day
Covers use up to	4 days per year
Covers exposure up to	0.17 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	468 cm²
Covers use at ambient temperatures	
Covers use in room size of	34 m³
Covers use under typical household ventilation	

5.2.20. Control of consumer exposure: adhesives (PC24)

PC24	Lubricants, greases, release products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 20 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	34 g
Covers use up to	1 times per day
Covers use up to	10 days per year
Covers exposure up to	4 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	468 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.21. Control of consumer exposure: aerosol (PC24)

PC24	Lubricants, greases, release products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 50 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	73 g
Covers use up to	1 times per day

Covers use up to	6 days per year
Covers exposure up to	0.17 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	428.75 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.22. Control of consumer exposure: Laundry and dish washing products (PC35)

PC35	Washing and cleaning products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 5 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	15 g
Covers use up to	1 times per day
Covers use up to	365 days per year
Covers exposure up to	0.5 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	857.5 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.23. Control of consumer exposure: Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners) (PC35)

PC35	Washing and cleaning products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 5 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	27 g
Covers use up to	1 times per day
Covers use up to	128 days per year
Covers exposure up to	0.33 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	857.5 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.24. Control of consumer exposure: Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners) (PC35)

PC35	Washing and cleaning products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 15 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	35 g
Covers use up to	1 times per day
Covers use up to	128 days per year
Covers exposure up to	0.17 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	428 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.2.25. Control of consumer exposure: Welding and soldering products, flux products (PC38)

PC38	Welding and soldering products, flux products

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 20 %

Amount used (or contained in articles), frequency and duration of use/exposure	
For each use event, covers use amounts up to	12 g
Covers use up to	1 times per day
Covers use up to	365 days per year
Covers exposure up to	1 h

Other conditions affecting consumer exposure	
Exposed skin surface assumed:	857.5 cm²
Covers use at ambient temperatures	
Covers use in room size of	20 m³
Covers use under typical household ventilation	

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure Contributing scenario controlling environmental exposure (ERC8a, ERC8d, ESVOC SPERC 8.4c.v1)

Information for contributing exposure scenario					
Hydrocarbon Block Method (Petrorisk)					
Protection target	**Unit**	**Exposure estimation**	**PNEC**	**RCR**	**Assessment method**
Sewage treatment plant				<= 0.00012	

Release estimation	Air	0.95	
Release estimation	Water	0.025	
Release estimation	soil	0.025	

5.3.2. Consumer exposure Air care, instant action (aerosol sprays) (PC3)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.3. Consumer exposure Air care, continuous action (solid and liquid) (PC3)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.4. Consumer exposure Washing car window (PC4)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.5. Consumer exposure Pouring into radiator (PC4)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.6. Consumer exposure Lock de-icer (PC4)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.7. Consumer exposure Laundry and dish washing products (PC8)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.8. Consumer exposure Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners) (PC8)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.9. Consumer exposure Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners) (PC8)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.10. Consumer exposure Waterborne latex wall paint (PC9a)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.11. Consumer exposure Solvent rich, high solid, water borne paint (PC9a)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.12. Consumer exposure Aerosol spray can (PC9a)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.13. Consumer exposure Aerosol spray can (PC9a)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.14. Consumer exposure Diluent (PC9a)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.15. Consumer exposure Fillers and putty (PC9b)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.16. Consumer exposure Plastering, Coat (PC9b)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.17. Consumer exposure Modelling clay (PC9b)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.18. Consumer exposure Finger paints (PC9c)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.19. Consumer exposure Liquid (PC24)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.20. Consumer exposure adhesives (PC24)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.21. Consumer exposure aerosol (PC24)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.22. Consumer exposure Laundry and dish washing products (PC35)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.23. Consumer exposure Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners) (PC35)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.24. Consumer exposure Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners) (PC35)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

5.3.25. Consumer exposure Welding and soldering products, flux products (PC38)

Information for contributing exposure scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

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

5.4.1. Environment

Guidance - Environment	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for environment. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels

5.4.2. 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

6. SE6: Use in functional fluids

6.1. Title section

Use in functional fluids

ES Ref.: SE6 ES Type: Worker Version: 1.0	Date of issue: 21/01/2020

Environment		
	Contributing scenario controlling environmental exposure	ERC7, ESVOC SPERC 7.13a.v1
Worker		
	Bulk transfers Closed systems	PROC1, PROC2
	Drum/batch transfers	PROC8b
	Filling of articles/equipment Closed systems	PROC9
	Filling of equipment from drums or containers	PROC8a
	General exposures (closed systems)	PROC2
	General exposures (open systems)	PROC4
	Recycling	PROC9
	Equipment maintenance	PROC8a
	Storage	PROC1, PROC2

Processes, tasks, activities covered	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers Industrial use

6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: Contributing scenario controlling environmental exposure (ERC7, ESVOC SPERC 7.13a.v1)

ERC7	Use of functional fluid at industrial site
ESVOC SPERC 7.13a.v1	Functional Fluids: Industrial (SU3)

Product (article) characteristics

Physical form of product	Liquid
Other product characteristics	Readily biodegradable, Predominantly hydrophobic

Amount used, frequency and duration of use (or from service life)

Daily amount per site	500 kg/day
Emission days	20
Continuous release	

Conditions and measures related to sewage treatment plant

Not applicable as there is no release to wastewater	

Conditions and measures related to treatment of waste (including article waste)

Do not apply industrial sludge to natural soils. Incineration, disposal or recycling at specific offsite provider	

Other conditions affecting environmental exposure

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

6.2.2. Control of worker exposure: Bulk transfers Closed systems (PROC1, PROC2)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure

Covers daily exposures up to 8 hours	

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

Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

6.2.3. Control of worker exposure: Drum/batch transfers (PROC8b)

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

6.2.4. Control of worker exposure: Filling of articles/equipment Closed systems (PROC9)

PROC9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

6.2.5. Control of worker exposure: Filling of equipment from drums or containers (PROC8a)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

6.2.6. Control of worker exposure: General exposures (closed systems) (PROC2)

PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

6.2.7. Control of worker exposure: General exposures (open systems) (PROC4)

PROC4	Chemical production where opportunity for exposure arises

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Technical and organisational conditions and measures	
Provide a good standard of controlled ventilation (10 to 15 air changes per hour)	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Operation is carried out at elevated temperature (> 20°C above ambient temperature)	

6.2.8. Control of worker exposure: Recycling (PROC9)

PROC9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

6.2.9. Control of worker exposure: Equipment maintenance (PROC8a)

PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

6.2.10. Control of worker exposure: Storage (PROC1, PROC2)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	<= 100 %
Vapour pressure	> 10 kPa

Amount used (or contained in articles), frequency and duration of use/exposure	
Covers daily exposures up to 8 hours	

Conditions and measures related to personal protection, hygiene and health evaluation	
Handle in accordance with good industrial hygiene and safety practice	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	

6.3. Exposure estimation and reference to its source

6.3.1. Environmental release and exposure Contributing scenario controlling environmental exposure (ERC7, ESVOC SPERC 7.13a.v1)

Information for contributing exposure scenario					
Hydrocarbon Block Method (Petrorisk)					
Protection target	**Unit**	**Exposure estimation**	**PNEC**	**RCR**	**Assessment method**
Sewage treatment plant				<= 0.0012	

Release estimation	Air	0.01	
Release estimation	Water	0.0003	
Release estimation	soil	0.001	

6.3.2. Worker exposure Bulk transfers Closed systems (PROC1, PROC2)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

6.3.3. Worker exposure Drum/batch transfers (PROC8b)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

6.3.4. Worker exposure Filling of articles/equipment Closed systems (PROC9)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

6.3.5. Worker exposure Filling of equipment from drums or containers (PROC8a)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

6.3.6. Worker exposure General exposures (closed systems) (PROC2)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

6.3.7. Worker exposure General exposures (open systems) (PROC4)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

6.3.8. Worker exposure Recycling (PROC9)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

6.3.9. Worker exposure Equipment maintenance (PROC8a)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

6.3.10. Worker exposure Storage (PROC1, PROC2)

Information for contributing exposure scenario
Used ECETOC TRA model ,Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

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

6.4.1. Environment

Guidance - Environment	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for environment. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e, RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required

6.4.2. Health

Guidance - Health	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use (i.e, RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required