2. útgáfa 28.10.2026

Öryggisblað (SDS)

Samkvæmt reglugerð Nr. 888/2015 (EB reglugerð 1907/2006 REACH)

1. Auðkenning efnisins eða blöndunnar og félagsins eða fyrirtækisins

1.1 Vörukenni: **Hexan**

1.2 Viðeigandi og tilgreind notkun efnis eða blöndu og notkun sem ráðið er frá:

Viðeigandi notkun Leysiefni.

Notkun sem ráðið er frá Engar upplýsingar fyrirliggjandi.

1.3 Söluaðili:

N1
Dalvegur 10-14
201 Kópavogur
Sími: 440 1000
Netfang: n1@n1.is
Veffang: www.n1.is

Framleiðandi:

Brenntag N.V.
Nijverheidslaan 38
BE-8540 Deerlijk, Belgía
32-56-776944
info@brenntag.be
www.brenntag.be

1.4 Neyðarsímanúmer: Eitrunarmiðstöð LSH veitir upplýsingar allan sólarhringinn um viðbrögð við slysum með hættuleg efni. Sími 543 2222. Neyðarlínan, lögregla, slökkvilið, sjúkraflutningar; sími 112.

2. Hættugreining

2.1 Flokkun efnisins eða blöndunnar:

Flokkun skv. reglugerð EB 1272/2008 (CLP):

H225	Mjög eldfimur vökvi og gufa	Eldf.vökvi 2
H304	Getur verið banvænt við inntöku ef það kemst í öndunarveg.	Eit.v.ásvelg.1
H315	Veldur húðertingu	Húðert. 2
H336	Getur valdið sljóleika eða svima	SEM-VES 3
H361f	Grunað um að hafa skaðleg áhrif á frjósemi.	Eit.á æxl.2
H372	Skaðar líffæri við langvinn eða endurtekin váhrif	SEM-EV 3
H411	Eitrað lífi í vatni, hefur langvinn áhrif.	Langv.eit.á vatn 2

2.2 Merkingaratriði:

Merking skv. reglugerð EB 1272/2008 (CLP):

Hættumerki



Viðvörunarorð **HÆTTA**

Hættusetningar

H225	Mjög eldfimur vökvi og gufa
H304	Getur verið banvænt við inntöku ef það kemst í öndunarveg.
H315	Veldur húðertingu
H336	Getur valdið sljóleika eða svima
H361f	Grunað um að hafa skaðleg áhrif á frjósemi.
H372	Skaðar líffæri við langvinn eða endurtekin váhrif
H411	Eitrað lífi í vatni, hefur langvinn áhrif.

Varnaðarsetningar

P102	Geymist þar sem börn ná ekki til.
P210	Haldið frá hitagjöfum, heitum flötum, neistagjöfum, opnum eldi og öðrum íkveikivöldum. Reykingar bannaðar.
P240	Jarðtengið og spennujafnið ílát og viðtökubúnað
P243	Gerið varúðarráðstafanir gegn stöðurafmagni.
P260	Andið ekki að ykkur ryki/reyk/lofttegund/úða/gufu/ýringi.
P273	Forðist losun út í umhverfi.
P280	Notið hlífðarhanska/hlífðarfatnað/augnhlífar/andlitshlífar.
P301+P310	EFTIR INNTÖKU: Hringið umsvifalaust í EITRUNARMIÐSTÖÐ/lækni.

P303+P361+P353	BERIST EFNIÐ Á HÚÐ (eða í hár): Farið strax úr fötum sem óhreinkast af efninu. Skolið húðina með vatni [eða farið í sturtu].
P304+P340	EFTIR INNÖNDUN: Flytjið viðkomandi í ferskt loft og látið hann hvílast í stellingu sem léttir öndun.
P403+P235	Geymist á vel loftræstum stað. Geymist á köldum stað.
P501	Fargið innihaldi/íláti hjá viðurkenndri spilliefnamóttöku.

Inniheldur: Vetniskolefni - C6, n-alkana, ísóalkana, hringsambönd, hátt hlutfall n-hexans.

2.3 Aðrar hættur:
Sjá einnig 11. og 15. lið.

Varan inniheldur engin efni sem flokkast sem PBT eða vPvB (>0,1%).
(**PBT**: Þrávirkt, safnast upp í lífverum, eitrað. **vPvB**: Afar þrávirkt, safnast mjög fyrir í lífverum).

Eiturfræðilegar og Umhverfislegar hættur

Varan inniheldur engin efni sem talin eru hafa áhrif á starfsemi innkirtla samkvæmt REACH grein 59(1) eða reglugerð ESB 2017/2100 eða (EU) 2018/605 (>0,1%).

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

HEXANE ISOMERS

Version 2.0 Print Date 02.05.2026

Revision date / valid from 30.04.2026

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

1.1. Product identifier

Trade name	:	HEXANE ISOMERS
Substance name	:	Hydrocarbons, C6, n-alkanes, isoalkanes, cyclics, n-hexane rich
CAS-No.	:	64742-49-0
EC-No.	:	925-292-5

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

Use of the Substance/Mixture	:	At this time we do not yet have information on identified uses. They will be included in this safety data sheet when available.
Uses advised against	:	At this moment we have not identified any uses advised against

1.3. Details of the supplier of the safety data sheet

Company	:	Brenntag N.V. Nijverheidslaan 38 BE 8540 Deerlijk
Telephone	:	+32 (0)56 77 6944
Telefax	:	+32 (0)56 77 5711
E-mail address	:	info@brenntag.be
Responsible/issuing person	:	Master Data Administration
Company	:	Brenntag Nederland B.V. Donker Duyvisweg 44 NL 3316 BM Dordrecht
Telephone	:	+31 (0)78 65 44 944
Telefax	:	+31 (0)78 65 44 919
E-mail address	:	info@brenntag.nl
Responsible/issuing person	:	Master Data Administration

1.4. Emergency telephone number

Emergency telephone number	:	Belgium: Antipoison Center - Brussels TEL: +32(0)70 245 245 Netherland: National Poisoning Information Center - Bilthoven TEL: +31(0) 88 755 8000 (Only for the purpose of informing

medical personnel in cases of acute intoxications)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

REGULATION (EC) No 1272/2008			
Hazard class	**Hazard category**	**Target Organs**	**Hazard statements**
Flammable liquids	Category 2	---	H225
Reproductive toxicity	Category 2	---	H361f
Aspiration hazard	Category 1	---	H304
Specific target organ toxicity - repeated exposure (Inhalation)	Category 1	Central nervous system, Peripheral nervous system	H372
Specific target organ toxicity - single exposure	Category 3	---	H336
Skin irritation	Category 2	---	H315
Long-term (chronic) aquatic hazard	Category 2	---	H411

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

Most important adverse effects

Human Health : See section 11 for toxicological information.

Physical and chemical hazards : See section 9/10 for physicochemical information.

Potential environmental effects : See section 12 for environmental information.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008

Hazard symbols :



Signal word : Danger

Hazard statements : H225 Highly flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.

		H315	Causes skin irritation.
		H336	May cause drowsiness or dizziness.
		H361f	Suspected of damaging fertility.
		H372	Causes damage to organs (Central nervous system, Peripheral nervous system) through prolonged or repeated exposure.
		H411	Toxic to aquatic life with long lasting effects.
Precautionary statements			
Prevention	:	P233	Keep container tightly closed.
		P240	Ground and bond container and receiving equipment.
		P243	Take action to prevent static discharges.
		P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
		P273	Avoid release to the environment.
		P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
		P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Response	:	P308 + P313	IF exposed or concerned: Get medical advice/ attention.
		P331	Do NOT induce vomiting.
		P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
		P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
		P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
Storage	:	P403 + P235	Store in a well-ventilated place. Keep cool.

Hazardous components which must be listed on the label:

- Hydrocarbons, C6, n-alkanes, isoalkanes, cyclics, n-hexane rich

2.3. Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1. Substances

Hazardous components	Amount [%]	Classification (REGULATION (EC) No 1272/2008)	
		Hazard class / Hazard category	Hazard statements
Hydrocarbons, C6, n-alkanes, isoalkanes, cyclics, n-hexane rich			
EC-No. : 925-292-5	<= 100	Flam. Liq.2 Skin Irrit.2 Repr.2 STOT SE3 STOT RE1 Asp. Tox.1 Aquatic Chronic2	H225 H315 H361f H336 H372 H304 H411
n-hexane			
Index-No. : 601-037-00-0 CAS-No. : 110-54-3 EC-No. : 203-777-6 EU REACH-Reg. No. : 01-2119480412-44-xxxx	>= 45 - <= 60	Flam. Liq.2 Skin Irrit.2 Repr.2 STOT SE3 STOT RE1 Asp. Tox.1 Aquatic Chronic2	H225 H315 H361f H336 H372 H304 H411

Remarks : n-Hexane is a part of the hydrocarbon mixture.
Benzene content < 0.1%
This product contains a substance included on the candidate list according to article 59 (1, 10) of regulation EC No. 1907/2006 ('REACH') in a concentration >= 0.1% w/w.

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

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice	: Move out of dangerous area. Take off all contaminated clothing immediately. First aider needs to protect himself.
If inhaled	: Remove to fresh air. If breathing is difficult, give oxygen. If unconscious, place in recovery position and seek medical advice.
In case of skin contact	: Wash off immediately with soap and plenty of water. If skin irritation persists, call a physician.
In case of eye contact	: Rinse thoroughly with plenty of water, also under the eyelids. Consult a physician.
If swallowed	: Rinse mouth. Do NOT induce vomiting. Risk of aspiration! If a person vomits when lying on his back, place him in the recovery position. Call a physician immediately.
Protection of First Aid Responders	: First Aid responders should pay attention to self-protection and use the recommended protective clothing. If potential for exposure exists refer to Section 8 for specific personal protective equipment.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms	: Dries out the skin.; Disorder of the central nervous system.; Inhalation of high vapour concentrations can cause CNS-depression and narcosis.;
Effects	: Aspiration hazard if swallowed - can enter lungs and cause damage. May cause eye and skin irritation. Suspected of damaging fertility.

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

Treatment	: Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable extinguishing media	: Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards during firefighting	: Combustible liquid. Vapours may form explosive mixtures with air. Vapours are heavier than air and may spread along floors. Flash back possible over considerable distance. The product is insoluble and floats on water. In case of fire hazardous

decomposition products may be produced such as: Carbon oxides

5.3. Advice for firefighters

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

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Use personal protective equipment. Keep people away from and upwind of spill/leak. Provide adequate ventilation. Remove or make safe all sources of ignition Avoid contact with skin and eyes. Do not breathe gas/fumes/vapor/spray. For personal protection see section 8.

6.2. Environmental precautions

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

6.3. Methods and materials for containment and cleaning up

Methods and materials for containment and cleaning up	:	Ensure adequate ventilation. Do not empty into drains. Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders). Treat recovered material as described in the section "Disposal considerations".

6.4. Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling	:	Keep container tightly closed. Provide sufficient air exchange and/or exhaust in work rooms. Do not breathe vapours or spray mist. Avoid contact with the skin and the eyes.
Hygiene measures	:	Take off all contaminated clothing immediately. Avoid contact with the skin and the eyes. Do not breathe gas/fumes/vapor/spray. Keep away from food, drink and animal feeding stuffs. Smoking, eating and drinking should be prohibited in the application area. Wash hands before breaks

and at the end of workday.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Keep in an area equipped with solvent resistant flooring. Keep in a dry, cool and well-ventilated place.
Advice on protection against fire and explosion	:	Combustible liquid. Keep away from sources of ignition - No smoking. Vapours may form explosive mixtures with air. Use only in an area containing explosion proof equipment. Take measures to prevent the build up of electrostatic charge.
Further information on storage conditions	:	Keep away from heat. Keep away from direct sunlight.
Advice on common storage	:	Strong oxidizing agents Do not store together with oxidizing and self-igniting products.

7.3. Specific end use(s)

Specific use(s)	:	Identified use: See table in front of appendix for a complete overview of identified uses.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)

DNEL Workers, Long-term - systemic effects, Skin contact	:	13 mg/kg bw/day
DNEL Workers, Long-term - systemic effects, Inhalation	:	93 mg/m3
DNEL Consumers, Long-term - systemic effects, Skin contact	:	7 mg/kg bw/day
DNEL Consumers, Long-term - systemic effects, Inhalation	:	20 mg/m3
DNEL Consumers, Long-term - systemic effects, Ingestion	:	6 mg/kg bw/day

Predicted No Effect Concentration (PNEC)

Substance is a hydrocarbon with a complex, unknown or variable composition. Conventional methods of deriving PNECs are not appropriate and it is not possible to identify a single representative PNEC for such substances.	:	

Component:	n-hexane	CAS-No. 110-54-3

Other Occupational Exposure Limit Values

Belgium. OELs. Exposure Limit Values to Chemical Substances at Work, Code of Well-being at work, Book VI, Title 1, as amended, Time Weighted Average (TWA):
20 ppm, 72 mg/m3

EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended, Time Weighted Average (TWA):
20 ppm, 72 mg/m3
Indicative

Netherlands. OELs (binding) per Annex XIII of Working Conditions Regulation, as amended, Time Weighted Average (TWA):
20 ppm, 72 mg/m3

Netherlands. OELs (binding) per Annex XIII of Working Conditions Regulation, as amended, Short Term Exposure Limit (STEL):
40 ppm, 144 mg/m3, (15 minutes)

EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended, Time Weighted Average (TWA):
20 ppm, 72 mg/m3
Indicative

8.2. Exposure controls

Personal protective equipment

Respiratory protection

Advice : In case of intensive or longer exposure use self-contained breathing apparatus.
In case of brief exposure or low pollution use breathing filter apparatus.
Recommended Filter type:
Filter type A for organic gases and vapors.

Hand protection

Advice : Protective gloves
Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
Protective gloves should be replaced at first signs of wear.
The following materials are suitable:

Material : Nitrile rubber
Break through time : > 480 min
Glove thickness : 0,4 mm

Material	:	Fluorinated rubber
Break through time	:	> 480 min
Glove thickness	:	0,4 mm

Eye protection

Advice	:	Tightly fitting safety goggles

Skin and body protection

Protecting Clothes	:	Flame retardant antistatic protective clothing.

Environmental exposure controls

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

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	:	liquid
Physical state	:	liquid
Colour	:	colourless
Odour	:	hydrocarbon-like
Odour Threshold	:	No data available
Melting point/ range	:	< -20 °C
Boiling point/boiling range	:	65 - 70 °C
Flammability (solid, gas)	:	Highly flammable.
Upper explosion limit / Upper flammability limit	:	8,0 %(V)
Lower explosion limit / Lower flammability limit	:	1,1 %(V)
Flash point	:	<= -20 °C Method: DIN 51755
Auto-ignition temperature	:	> 200 °C
Decomposition temperature	:	No data available
Self-Accelerating decomposition temperature (SADT)	:	No data available

pH	:	No data available
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	0,4 - 0,7 mm2/s (20 °C)
Flow time	:	No data available
Solubility(ies)		
Water solubility	:	(20 °C) negligible
Solubility in other solvents	:	No data available
Dissolution Rate	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Dispersion Stability	:	No data available
Vapour pressure	:	19 - 50 kPa (25 °C)
Relative density	:	No data available
Density	:	0,65 - 0,7 g/cm3 (15 °C) Method: DIN 51757
Bulk density	:	No data available
Relative vapour density	:	2,8 - 3
Particle characteristics		
Assessment	:	This substance/ mixture does not contain nanoforms (according to REACH Regulation)

9.2 Other information

Explosives	:	Formation of explosive air/vapour mixtures is possible.
Oxidizing properties	:	Not applicable
Evaporation rate	:	No data available
Conductivity	:	< 100 pS/m

SECTION 10: Stability and reactivity

10.1. Reactivity

Advice : Stable under recommended storage conditions.

10.2. Chemical stability

Advice : No decomposition if stored and applied as directed.

10.3. Possibility of hazardous reactions

Hazardous reactions : Formation of explosive air/vapour mixtures is possible.

10.4. Conditions to avoid

Conditions to avoid : Heat, flames and sparks.Keep away from direct sunlight.
Thermal decomposition : No data available

10.5. Incompatible materials

Materials to avoid : Strong oxidizing agents

10.6. Hazardous decomposition products

Hazardous decomposition products : Fire may cause evolution of: Carbon oxides

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Data for the product		
Acute toxicity		
Oral		
LD50	:	> 5000 mg/kg (Rat) (OECD Test Guideline 401)
Inhalation		
LC50	:	> 20 mg/l (Rat) (OECD Test Guideline 403)
Dermal		
LD50	:	> 3350 mg/kg (Rabbit) (OECD Test Guideline 402)
Irritation		
Skin		
Result	:	Causes skin irritation.
Eyes		
Result	:	Slight irritation is possible.
Sensitisation		
Result	:	No sensitizing effect known.
CMR effects		
CMR Properties		

Carcinogenicity	:	It is not considered carcinogenic.
Mutagenicity	:	It is not considered mutagenic.
Reproductive toxicity	:	Suspected of damaging fertility.

Specific Target Organ Toxicity

Single exposure

Remarks	:	May cause drowsiness or dizziness.

Repeated exposure

Inhalation	:	Target Organs: Central nervous system, Peripheral nervous systemCauses damage to organs through prolonged or repeated exposure.

Other toxic properties

Aspiration hazard

May be fatal if swallowed and enters airways.,

Further information

Other relevant toxicity information	:	Inhalation of high vapour concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting. Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.
Experience with human exposure	:	Harmful: danger of serious damage to health by prolonged exposure through inhalation. Chronic exposure may cause permanent damage of health.,

11.2. Information on other hazards

Data for the product

Endocrine disrupting properties

Assessment Endocrine Disrupting Properties	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 12: Ecological information

12.1. Toxicity

Component:	Hydrocarbons, C6, n-alkanes, isoalkanes, cyclics, n-hexane rich

Acute toxicity

Fish

LC50	:	> 1.000 mg/l (Oryzias latipes (Orange-red killifish); 48 h) Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates

LC50	:	3,9 mg/l (Daphnia magna (Water flea); 48 h) Based on data from similar materials

algae

NOEL	:	30 mg/l (Pseudokirchneriella subcapitata (green algae); 72 h) Based on data from similar materials
EbL50		55 mg/l (Pseudokirchneriella subcapitata (green algae); 72 h) Based on data from similar materials

12.2. Persistence and degradability

Component:	Hydrocarbons, C6, n-alkanes, isoalkanes, cyclics, n-hexane rich

Persistence and degradability

Persistence

Result	:	The substance is rapidly degraded photochemically in the air.

Biodegradability

Result	:	98 % (Exposure Time: 28 d)Readily biodegradable.

12.3. Bioaccumulative potential

Component:	Hydrocarbons, C6, n-alkanes, isoalkanes, cyclics, n-hexane rich

Bioaccumulation

Result	:	log Kow > 4
	:	No data available

12.4. Mobility in soil

Component:	Hydrocarbons, C6, n-alkanes, isoalkanes, cyclics, n-hexane rich

Mobility

Water	:	Floats on water.
Air	:	The product evaporates readily.
Soil	:	Adsorbs on soil.

12.5. Results of PBT and vPvB assessment

Data for the product

Results of PBT and vPvB assessment

Result	:	This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6. Endocrine disrupting properties

Data for the product

Assessment Endocrine Disrupting Properties	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7. Other adverse effects

Data for the product

Additional ecological information

Result	:	Toxic to aquatic life with long lasting effects. Do not flush into surface water or sanitary sewer system.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product	:	Disposal together with normal waste is not allowed. Do not let product enter drains. Can be incinerated, when in compliance with local regulations.
Contaminated packaging	:	Empty remaining contents. Do not burn, or use a cutting torch on, the empty drum. Risk of explosion. Empty containers

should be taken to an approved waste handling site for recycling or disposal.

European Waste Catalogue Number	:	No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

SECTION 14: Transport information

14.1. UN number or ID number

1208

14.2. UN proper shipping name

ADR : HEXANES
RID : HEXANES
IMDG : HEXANES

14.3. Transport hazard class(es)

ADR-Class (Labels; Classification Code; Hazard Identification Number; Tunnel restriction code)	:	3 3; F1; 33; (D/E)
RID-Class (Labels; Classification Code; Hazard Identification Number)	:	3 3; F1; 33
IMDG-Class (Labels; EmS)	:	3 3; F-E, S-D

14.4. Packaging group

ADR : II
RID : II
IMDG : II

14.5. Environmental hazards

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

14.6. Special precautions for user

Not applicable.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

Data for the product

EU. REACH, Annex XVII, Restrictions on manufacture, placing on the market and use of certain dangerous substances, 1907/2006/EC, as amended	:	Point Nos.: 3 Point Nos.: 40

Component: Hydrocarbons, C6, n-alkanes, isoalkanes, cyclics, n-hexane rich

EU. Chemicals Subject to Export Notification: Annex 1, Part 1, Regulation 649/2012/EU on export and import of dangerous chemicals, as amended	:	; The substance/mixture does not fall under this legislation.
EU. REACH, Annex XVII, Restrictions on manufacture, placing on the market and use of certain dangerous substances, 1907/2006/EC, as amended	:	Point Nos.: , 3; Listed Point Nos.: , 40; Listed
EU. Directive 2012/18/EU on major accident hazards involving dangerous substances, Annex I, as amended	:	Qualifying quantity for the application of Lower-tier requirements: 5.000 tonnes; Part 1: Categories of dangerous substances; Flammable liquids, Categories 2 or 3 not covered by P5a and P5b, The information given is valid if the product is stored below the boiling point and at a pressure of 1013 hPa. Qualifying quantity for the application of Upper-tier requirements: 50.000 tonnes; Part 1: Categories of dangerous substances; Flammable liquids, Categories 2 or 3 not covered

by P5a and P5b, The information given is valid if the product is stored below the boiling point and at a pressure of 1013 hPa.
Qualifying quantity for the application of Lower-tier requirements: 200 tonnes; Part 1: Categories of dangerous substances; Hazardous to the Aquatic Environment in Category Chronic 2
Qualifying quantity for the application of Upper-tier requirements: 500 tonnes; Part 1: Categories of dangerous substances; Hazardous to the Aquatic Environment in Category Chronic 2

Component:	**n-hexane**	**CAS-No. 110-54-3**

EU. REACH Candidate List of Substances of Very High Concern for Authorization (SVHC)	:	EC Number/Date of inclusion: , 04/02/2026; Specific target organ toxicity after repeated exposure (Article 57(f) - human health)

15.2. Chemical safety assessment

No data available

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361f	Suspected of damaging fertility.
H372	Causes damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.

Full text of the Notes referred to under section 3.

Abbreviations and Acronyms

AU AIICL	Australia. Industrial Chemicals Act (AIIC) List
BCF	bioconcentration factor
BOD	biochemical oxygen demand
CAS	Chemical Abstracts Service
CLP	Classification, Labelling and Packaging
CMR	carcinogenic, mutagenic or toxic to reproduction
COD	chemical oxygen demand
DNEL	derived no-effect level
DSL	Canada. Environmental Protection Act, Domestic Substances List

EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
ENCS (JP)	Japan. Kashin-Hou Law List
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
IECSC	China. Inventory of Existing Chemical Substances
INSQ	Mexico. National Inventory of Chemical Substances
ISHL (JP)	Japan. Inventory of Industrial Safety & Health
KECI (KR)	Korea. Existing Chemicals Inventory
LC50	median lethal concentration
LOAEC	lowest observed adverse effect concentration
LOAEL	lowest observed adverse effect level
LOEL	lowest observed effect level
NDSL	Canada. Environmental Protection Act. Non-Domestic Substances List
NLP	no-longer polymer
NOAEC	no observed adverse effect concentration
NOAEL	no observed adverse effect level
NOEC	no observed effect concentration
NOEL	no observed effect level
NZIOC	New Zealand. Inventory of Chemicals
OECD	Organisation for Economic Cooperation and Development
OEL	occupational exposure limit
ONT INV	Canada. Ontario Inventory List
PBT	persistent, bioaccumulative and toxic
PHARM (JP)	Japan. Pharmacopoeia Listing
PICCS (PH)	Philippines. Inventory of Chemicals and Chemical Substances
PNEC	predicted no-effect concentration
REACH Auth. No.:	REACH Authorisation Number
REACH AuthAppC. No.	REACH Authorisation Application Consultation Number
UK REACH Auth. No.:	UK REACH Authorisation Number
UK REACH AuthAppC. No.	UK REACH Authorisation Application Consultation Number
UK REACH-Reg.No	UK REACH Registration Number
STOT	specific target organ toxicity
SPM	Synthetic Polymer Microparticles
SVHC	substance of very high concern
TCSI	Taiwan. Existing Chemicals Inventory
TH INV	Thailand. Existing Chemicals Inventory from FDA
TSCA	US. Toxic Substances Control Act
UVCB	substance of unknown or variable composition, complex reaction products or biological materials

VN INVL	Vietnam. National Chemical Inventory
vPvB	very persistent and very bioaccumulative

Further information

Key literature references and sources for data	:	Supplier information and data from the "Database of registered substances" of the European Chemicals Agency (ECHA) were used to create this safety data sheet.
Methods used for product classification	:	The classification for human health, physical and chemical hazards and environmental hazards were derived from a combination of calculation methods and if available test data.
Hints for trainings	:	The workers have to be trained regularly on the safe handling of the products based on the information provided in the Safety Data Sheet and the local conditions of the workplace. National regulations for the training of workers in the handling of hazardous materials must be adhered to.
Other information	:	The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and does not constitute a legal relationship. The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

|| Indicates updated section.

No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	1, 4	NA	ES2865
2	Distribution of substance	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 9, 15	1, 2	NA	ES3122
3	Formulation & (re)packing of substances and mixtures	3	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	2	NA	ES3166
4	Polymer processing	3	10	NA	1, 2, 3, 4, 5, 6, 8a, 8b, 9, 13, 14, 21	4, 7	NA	ES3311
5	Uses in coatings	3	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15	4	NA	ES3192
6	Uses in coatings	22	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19	8a, 8d	NA	ES3319
7	Use in Cleaning Agents	3	NA	NA	1, 2, 3, 4, 7, 8a, 8b, 10, 13	4	NA	ES3194
8	Use in Cleaning Agents	22	NA	NA	2, 3, 4, 8a, 8b, 10, 11, 13	8a, 8d	NA	ES3349
9	Use in agrochemicals	22	NA	NA	1, 2, 4, 8a, 8b, 11, 13	8a, 8d	NA	ES3351
10	Use as lubricants	3	NA	NA	1, 2, 3, 4, 7, 8a, 8b, 9, 10, 13, 17, 18	4, 7	NA	ES3293
11	Use as Functional Fluids	3	NA	NA	1, 2, 4, 8a, 8b, 9	7	NA	ES3309
12	Use as Functional Fluids	22	NA	NA	1, 2, 3, 8a, 9, 20	9a, 9b	NA	ES3353
13	Use in laboratories	3	NA	NA	10, 15	2, 4	NA	ES3284
14	Use in laboratories	22	NA	NA	10, 15	8a	NA	ES3291
15	Use as blowing agents	3	NA	NA	1, 3, 8b, 9, 12	4	NA	ES3305
16	Use as mining chemicals	3	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 9	4, 7	NA	ES3315

1. Short title of Exposure Scenario 1: Manufacture of substance	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15: Use as laboratory reagent
Environmental Release Categories	ERC1: Manufacture of substances ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Manufacture of substance or use as an intermediate, process chemical or extracting agent. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC4,		
Substance is isomeric mixture, Predominantly hydrophobic, Readily biodegradable., Substance is complex UVCB		
Amount used	Annual site tonnage (tons/year):	15000 ton(s)/year
	Maximum daily site tonnage (kg/day):	51000 kg/day
	Regional use tonnage (tons/year):	15000 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	1
Frequency and duration of use	Continuous exposure	300 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300

	Emission or Release Factor: Air	5 %
	initial release prior to RMM	
	Emission or Release Factor: Soil	0,01 %
	initial release prior to RMM	
	Emission or Release Factor: Water	0,03 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 90 %)
	Water	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., No secondary wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater.
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 45,8 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	10.000 m3/d
	Degradation efficiency	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	During manufacturing no waste of the substance is generated.
Conditions and measures related to external recovery of waste	Recovery Methods	During manufacturing no waste of the substance is generated.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	General exposures (closed systems)	Handle substance within a closed system. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC2)
	Storage	Provide extract ventilation to material transfer points and other openings. Store substance within a closed system.(PROC2)
	General exposures (closed systems)	Ensure material transfers are under containment or extract ventilation. Handle substance within a closed system.(PROC3)
	General exposures (open systems)	Ensure material transfers are under containment or extract ventilation.(PROC4)
	Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance. Provide enhanced general ventilation by mechanical means.(PROC8a)
	Bulk transfers (open systems)	Provide extract ventilation to points where emissions occur.(PROC8b)
	Bulk transfers (closed systems)	Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Process sampling	Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Laboratory activities	Handle in a fume cupboard or under extract ventilation.(PROC15)
	Storage	Store substance within a closed system.(PROC1)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.
Risk Management Measures are based on qualitative risk characterisation.		

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	720000 kg/day	---
---	---	Air	---	---	0,00078
---	---	Water	---	---	0,07

ESVOC spERC 1.1v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 2: Distribution of substance		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC1: Manufacture of substances ERC2: Formulation of preparations	
Activity	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.	
2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC2,		
Substance is isomeric mixture, Predominantly hydrophobic, Readily biodegradable., Substance is complex UVCB		
Amount used	Annual site tonnage (tons/year):	1,2 ton(s)/year
	Maximum daily site tonnage (kg/day):	60 kg/day
	Regional use tonnage (tons/year):	600 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	0,002
Frequency and duration of use	Continuous exposure	20 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	20

	Emission or Release Factor: Air	0,1 %
	initial release prior to RMM	
	Emission or Release Factor: Soil	0,001 %
	initial release prior to RMM	
	Emission or Release Factor: Water	0,001 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 90 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement)., Prevent discharge of undissolved substance to or recover from onsite wastewater., Risk from environmental exposure is driven by freshwater., No wastewater treatment required., If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. (Degradation effectiveness: 0 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Percentage removed from waste water	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.(PROC1)
	General exposures (closed systems)	Ensure operation is undertaken outdoors. Handle substance within a closed system.(PROC2)
	Storage	Store substance within a closed system. Ensure operation is undertaken outdoors.(PROC2)
	Process sampling	Ensure operation is undertaken outdoors.(PROC3)
	General exposures (open systems)	Ensure operation is undertaken outdoors.(PROC4)
	Equipment cleaning and maintenance	Provide enhanced general ventilation by mechanical means. Transfer via enclosed lines. Drain down and flush system prior to equipment opening or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Bulk transfers (open systems)	Ensure operation is undertaken outdoors. Clear transfer lines prior to de-coupling.(PROC8b)
	Bulk transfers (closed systems)	Ensure material transfers are under containment or extract ventilation. or Ensure operation is undertaken outdoors. Avoid carrying out operation for more than 1 hour.(PROC8b)
	Drum and small package filling	Fill containers/cans at dedicated filling points supplied with local extract ventilation. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC9)
	Laboratory activities	Handle in a fume cupboard or under extract ventilation.(PROC15)
	General exposures (closed systems)	Handle substance within a closed system.(PROC3)
	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
	Storage	Store substance within a closed system.(PROC1)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.(PROC1)

Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.(PROC1)
	General exposures (closed systems)	Avoid carrying out operation for more than 4 hours.(PROC2)
	Storage	Avoid carrying out operation for more than 4 hours.(PROC2)
	Process sampling	Avoid carrying out operation for more than 1 hour.(PROC3)
	General exposures (open systems)	Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC4)
	Bulk transfers (open systems)	Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC8b)
	General exposures (closed systems)	Avoid carrying out operation for more than 1 hour.(PROC3)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	210000 kg/day	---
---	---	Air	---	---	0
---	---	Water	---	---	0,00013

ESVOC spERC 1.1b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 3: Formulation & (re)packing of substances and mixtures	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelettisation PROC15: Use as laboratory reagent
Environmental Release Categories	ERC2: Formulation of preparations
Activity	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.

2.1 Contributing scenario controlling environmental exposure for: ERC2		
Substance is isomeric mixture, Predominantly hydrophobic, Readily biodegradable., Substance is complex UVCB		
Amount used	Annual site tonnage (tons/year):	310 ton(s)/year
	Maximum daily site tonnage (kg/day):	3100 kg/day
	Regional use tonnage (tons/year):	310 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	1
Frequency and duration of use	Continuous exposure	100 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10

	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	100
	Emission or Release Factor: Air	2,5 %
	After typical onsite RMMs consistent with EU Solvent Emissions Directive requirements	
	Emission or Release Factor: Water	0,02 %
	initial release prior to RMM	
	Emission or Release Factor: Soil	0,01 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 0 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement)., Prevent discharge of undissolved substance to or recover from onsite wastewater. (Degradation effectiveness: 0 %)
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Water	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):, No secondary wastewater treatment required. (Degradation effectiveness: 0 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Percentage removed from waste water	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.(PROC1)
	General exposures (closed systems)	Ensure material transfers are under containment or extract ventilation. Handle substance within a closed system.(PROC2, PROC3)
	Storage	Ensure operation is undertaken outdoors.(PROC2)
	Process sampling	Ensure material transfers are under containment or extract ventilation. or Avoid carrying out operation for more than 1 hour.(PROC3)
	General exposures (open systems)	Provide extract ventilation to points where emissions occur.(PROC4)
	Equipment cleaning and maintenance	Provide enhanced general ventilation by mechanical means. Drain down and flush system prior to equipment opening or maintenance.(PROC8a)
	Drum/batch transfers Dedicated facility	Provide extract ventilation to points where emissions occur.(PROC8b)
	Bulk transfers	Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Mixing operations (open systems)	Provide extract ventilation to points where emissions occur. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC5)
	Drum and small package filling	Fill containers/cans at dedicated filling points supplied with local extract ventilation. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC9)

	Manual Transfer from/pouring from containers Non-dedicated facility	Provide extract ventilation to points where emissions occur. Avoid carrying out operation for more than 4 hours.(PROC8a)
	Laboratory activities	Handle in a fume cupboard or under extract ventilation.(PROC15)
	Batch processes at elevated temperatures	Ensure material transfers are under containment or extract ventilation.(PROC3)
	Production of preparations or articles by tabletting, compression, extrusion, pelettisation	Handle substance within a predominantly closed system provided with extract ventilation. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC14)
	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
	Storage	Store substance within a closed system.(PROC1)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.(PROC1)
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.(PROC1)
	Storage	Avoid carrying out operation for more than 4 hours.(PROC2)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	220000 kg/day	---
---	---	Air	---	---	0,000079
---	---	Water	---	---	0,014

ESVOC spERC 2.2.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Exposure Scenario

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 4: Polymer processing	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC6: Calendering operations PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelettisation PROC21: Low energy manipulation of substances bound in materials and/or articles
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC7: Industrial use of substances in closed systems
Activity	Processing of formulated polymers including material transfers, additives handling (e.g. pigments, stabilisers, fillers, plasticisers, etc.), moulding, curing and forming activities, material re-works, storage and associated maintenance.

2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC7		
Predominantly hydrophobic, Substance is complex UVCB		
Amount used	Annual site tonnage (tons/year):	6,6 ton(s)/year
	Maximum daily site tonnage (kg/day):	330 kg/day
	Regional use tonnage (tons/year):	6,6 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	1
Frequency and duration of use	Continuous exposure	20 days/year, Continuous release

Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	20
	Emission or Release Factor: Air	75 %
	initial release prior to RMM	
	Emission or Release Factor: Water	0 %
	initial release prior to RMM	
	Emission or Release Factor: Soil	0,001 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 80 %)
	Water	Risk from environmental exposure is driven by freshwater., If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., No wastewater treatment required.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC21

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

	Physical Form (at time of use)	liquid
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Bulk transfers (closed systems)	Provide enhanced general ventilation by mechanical means.(PROC2)
	Bulk transfers	Provide extract ventilation to material transfer points and other openings. Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Bulk weighing	Provide enhanced general ventilation by mechanical means.(PROC2)
	Small scale weighing	Ensure material transfers are under containment or extract ventilation. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC9)
	Additive premixing	Ensure material transfers are under containment or extract ventilation.(PROC3, PROC4, PROC5)
	Additive premixing	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC5)
	Bulk transfers	Ensure material transfers are under containment or extract ventilation. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC9)
	Calendering (including Banburys) Elevated temperature	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC6)
	Production of articles by dipping and pouring	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC13)
	Extrusion and masterbatching	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC14)
	Injection moulding of articles	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of controlled ventilation

		(10 to 15 air changes per hour)(PROC14)
	Equipment maintenance	Provide enhanced general ventilation by mechanical means. Drain down and flush system prior to equipment opening or maintenance.(PROC8a)
	Storage	Provide enhanced general ventilation by mechanical means.(PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.
	Additive premixing	Avoid carrying out operation for more than 4 hours.(PROC5)
	Equipment maintenance	Wear suitable gloves tested to EN374.(PROC8a)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	4100000 kg/day	---

ESVOC spERC 4.21a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

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

Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 5: Uses in coatings	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelettisation PROC15: Use as laboratory reagent
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC4		
Substance is isomeric mixture, Predominantly hydrophobic, Readily biodegradable., Substance is complex UVCB		
Amount used	Annual site tonnage (tons/year):	830 ton(s)/year
	Maximum daily site tonnage (kg/day):	41500 kg/day
	Regional use tonnage (tons/year):	830 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	1
Frequency and duration of use	Continuous exposure	20 days/year, Continuous release
Environment factors not	Other data. Other	Local freshwater dilution factor:: 10

influenced by risk management	information	
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	20
	Emission or Release Factor: Air	98 %
	initial release prior to RMM	
	Emission or Release Factor: Water	0,07 %
	initial release prior to RMM	
	Emission or Release Factor: Soil	0 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 90 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 94,3 %)
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Water	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Percentage removed from waste water	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related	Recovery Methods	External recovery and recycling of waste should

to external recovery of waste		comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	General exposures (closed systems) with sample collection Use in contained systems	Ensure material transfers are under containment or extract ventilation. Handle substance within a closed system.(PROC2)
	Laboratory activities	Provide extract ventilation to points where emissions occur. Fill containers/cans at dedicated filling points supplied with local extract ventilation.(PROC15)
	Film formation - force drying (50-100℃). stoving (>100℃). UV/EB radiation curing Elevated temperature	Ensure material transfers are under containment or extract ventilation. Handle substance within a closed system.(PROC2)
	Mixing operations (closed systems) General exposures (closed systems)	Ensure material transfers are under containment or extract ventilation. Handle substance within a closed system.(PROC3)
	Film formation - air drying	Provide extract ventilation to points where emissions occur.(PROC4)
	Preparation of material for application Mixing operations (open systems)	Provide extract ventilation to points where emissions occur.(PROC5)
	Spraying (automatic/robotic)	Carry out in a vented booth provided with laminar airflow. Provide enhanced general ventilation by mechanical means.(PROC7)
	Manual Spraying	Provide enhanced general ventilation by mechanical means. Provide a good standard of controlled ventilation

		(10 to 15 air changes per hour)(PROC7)
	Material transfers	Provide extract ventilation to points where emissions occur. Clear transfer lines prior to de-coupling.(PROC8a)
	Material transfers	Provide extract ventilation to points where emissions occur. Clear transfer lines prior to de-coupling.(PROC8b)
	Roller, spreader, flow application	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC10)
	Dipping, immersion and pouring	Provide extract ventilation to points where emissions occur. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC13)
	Production of preparations or articles by tabletting, compression, extrusion, pelettisation	Provide extract ventilation to points where emissions occur. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC14)
	Storage	Store substance within a closed system.
	General exposures (closed systems)	Handle substance within a closed system.(PROC1)
	Material transfers Drum/batch transfers Transfer from/pouring from containers	Provide extract ventilation to material transfer points and other openings.(PROC9)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.
	Preparation of material for application Mixing operations (open systems)	Avoid carrying out operation for more than 4 hours.(PROC5)
	Manual Spraying	Wear a respirator conforming to EN140 with Type A filter or better.(PROC7)
	Material transfers	Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC8a)

Production of preparations or articles by tabletting, compression, extrusion, pelettisation	Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC14)
Material transfers Drum/batch transfers Transfer from/pouring from containers	Avoid direct eye contact with product, also via contamination on hands. Wear a respirator conforming to EN140 with Type A filter or better.(PROC9)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	42000 kg/day	---
---	---	Air	---	---	0,00083
---	---	Water	---	---	0,67

ESVOC spERC 4.3a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 6: Uses in coatings		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC15: Use as laboratory reagent PROC19: Hand-mixing with intimate contact and only PPE available	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems	
Activity	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, brush, spreader by hand or similar methods, and film formation) and equipment cleaning, maintenance and associated laboratory activities.	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Predominantly hydrophobic, Substance is complex UVCB		
Amount used	Annual site tonnage (tons/year):	0,2 ton(s)/year
	Maximum daily site tonnage (kg/day):	0,55 kg/day
	Regional use tonnage (tons/year):	400 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	0,0005
Frequency and duration of use	Continuous exposure	365 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other	Local marine water dilution factor:: 100

	information	
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	98 %
	initial release prior to RMM	
	Emission or Release Factor: Water	1 %
	initial release prior to RMM	
	Emission or Release Factor: Soil	100 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	No secondary wastewater treatment required., Risk from environmental exposure is driven by freshwater., If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of	liquid

	use)	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Filling / preparation of equipment from drums or containers	Ensure material transfers are under containment or extract ventilation.(PROC2)
	General exposures (closed systems) Use in contained systems	Ensure material transfers are under containment or extract ventilation.(PROC2)
	Preparation of material for application	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC3)
	Film formation - air drying Outdoor.	Ensure operation is undertaken outdoors.(PROC4)
	Film formation - air drying Indoor	Provide extract ventilation to points where emissions occur. Provide enhanced general ventilation by mechanical means.(PROC4)
	Preparation of material for application Outdoor.	Ensure operation is undertaken outdoors.(PROC5)
	Roller, spreader, flow application Outdoor.	Ensure operation is undertaken outdoors.(PROC10)
	Dipping, immersion and pouring Indoor	Provide extract ventilation to points where emissions occur.(PROC13)
	Dipping, immersion and pouring Outdoor.	Ensure operation is undertaken outdoors.(PROC13)
	Laboratory activities	Provide extract ventilation to points where emissions occur. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC15)
	Hand application - finger paints, pastels, Adhesives Indoor	Ensure doors and windows are opened. Limit the substance content in the mixture to 25 %.(PROC19)
	Hand application - finger paints, pastels, Adhesives	Ensure operation is undertaken outdoors. Limit the substance content in the mixture to 5 %.(PROC19)

	Outdoor.	
	Material transfers Drum/batch transfers	Provide extract ventilation to material transfer points and other openings. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8b)
	Manual Spraying Indoor	Carry out in a vented booth or extracted enclosure.(PROC11)
	Material transfers Drum/batch transfers	Handle substance within a closed system. Provide enhanced general ventilation by mechanical means.(PROC8a)
	Roller, spreader, flow application Indoor	Provide enhanced general ventilation by mechanical means.(PROC10)
	Manual Spraying Outdoor.	Ensure operation is undertaken outdoors.(PROC11)
	Preparation of material for application Indoor	Provide enhanced general ventilation by mechanical means.(PROC5)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
	Preparation of material for application	Avoid carrying out operation for more than 4 hours. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC3)
	Film formation - air drying Outdoor.	Avoid carrying out operation for more than 1 hour. Limit the substance content in the mixture to 5 %. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC4)
	Film formation - air drying Indoor	If no adequate ventilation is available: Wear a respirator conforming to EN140 with Type A filter or better.(PROC4)
	Preparation of material for application	Wear a respirator conforming to EN140 with Type A filter or better.

Outdoor.	Avoid carrying out operation for more than 4 hours.(PROC5)
Roller, spreader, flow application Outdoor.	Wear a full face respirator conforming to EN140 with Type A filter or better. Limit the substance content in the product to 50 %.(PROC10)
Dipping, immersion and pouring Indoor	Avoid carrying out operation for more than 15 minutes. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC13)
Dipping, immersion and pouring Outdoor.	Wear a full face respirator conforming to EN140 with Type A filter or better.(PROC13)
Hand application - finger paints, pastels, Adhesives Indoor	Avoid carrying out operation for more than 15 minutes. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. or Avoid carrying out operation for more than 4 hours. Wear a respirator conforming to EN140 with Type A filter or better.(PROC19)
Hand application - finger paints, pastels, Adhesives Outdoor.	Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Avoid carrying out operation for more than 15 minutes. or Wear a respirator conforming to EN140 with Type A filter or better. Avoid carrying out operation for more than 1 hour.(PROC19)
Material transfers Drum/batch transfers	Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC8b)
Manual Spraying Indoor	Limit the substance content in the mixture to 5 %. Avoid carrying out operation for more than 15 minutes. or Limit the substance content in the mixture to 25 %. Wear a full face respirator conforming to EN140 with Type A filter or better. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.(PROC11)

Material transfers Drum/batch transfers	Avoid carrying out operation for more than 4 hours. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC8a)
Roller, spreader, flow application Indoor	Avoid carrying out operation for more than 1 hour. Limit the substance content in the mixture to 25 %. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
Manual Spraying Outdoor.	Avoid carrying out operation for more than 15 minutes. Limit the substance content in the mixture to 1 %. Wear suitable gloves tested to EN374.(PROC11)
Preparation of material for application Indoor	Limit the substance content in the mixture to 5 %. Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC5)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	1400 kg/day	---
---	---	Air	---	---	< 0,00012
---	---	Water	---	---	0,00023

ESVOC spERC 4.3a.v1 has been used to evaluate the exposure for the environment ESVOC spERC 8.3b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

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

industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 7: Use in Cleaning Agents	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.

2.1 Contributing scenario controlling environmental exposure for: ERC4		
Substance is isomeric mixture, Predominantly hydrophobic, Readily biodegradable., Substance is complex UVCB		
Amount used	Annual amount per site	100 ton(s)/year
	Maximum daily site tonnage (kg/day):	5000 kg/day
	Regional use tonnage (tons/year):	340 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	0,3
Frequency and duration of use	Continuous exposure	20 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	20
	Emission or Release Factor: Air	100 %

	initial release prior to RMM	
	Emission or Release Factor: Water	0,0003 %
	initial release prior to RMM	
	Emission or Release Factor: Soil	0 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 70 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):, Prevent discharge of undissolved substance to or recover from onsite wastewater., Risk from environmental exposure is driven by freshwater., If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. (Degradation effectiveness: 0 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	

Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Storage	Store substance within a closed system.
	Bulk transfers	Ensure material transfers are under containment or extract ventilation.(PROC8a)
	Automated process with (semi) closed systems Use in contained systems	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC2)
	Automated process with (semi) closed systems Drum/batch transfers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC3)
	Application of cleaning products in closed systems	Provide enhanced general ventilation by mechanical means.(PROC2)
	Filling / preparation of equipment from drums or containers	Provide enhanced general ventilation by mechanical means.(PROC8b)
	Use in contained batch processes	Provide extract ventilation to points where emissions occur.(PROC4)
	Degreasing small objects in cleaning station	Provide extract ventilation to points where emissions occur.(PROC13)
	Cleaning with low-pressure washers	Provide enhanced general ventilation by mechanical means. Limit the substance content in the mixture to 25 %.(PROC10)
	Cleaning with high pressure washers	Provide enhanced general ventilation by mechanical means. Limit the substance content in the mixture to 5 %.(PROC7)
	Manual Surfaces cleaning	Provide enhanced general ventilation by mechanical means. Limit the substance content in the mixture to 25 %.(PROC10)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to

	substantial aerosol release, e.g. spraying.
Bulk transfers	Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC8a)
Automated process with (semi) closed systems Use in contained systems	Avoid carrying out operation for more than 4 hours. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC2)
Automated process with (semi) closed systems Drum/batch transfers	Wear a respirator conforming to EN140 with Type A filter or better. or Avoid carrying out operation for more than 1 hour.(PROC3)
Application of cleaning products in closed systems	Avoid carrying out operation for more than 4 hours. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC2)
Filling / preparation of equipment from drums or containers	Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC8b)
Use in contained batch processes	If no adequate extract ventilation is available: Wear a respirator conforming to EN140 with Type A filter or better.(PROC4)
Degreasing small objects in cleaning station	If no adequate extract ventilation is available: Wear a respirator conforming to EN140 with Type A filter or better.(PROC13)
Cleaning with low-pressure washers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
Cleaning with high pressure washers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC7)
Manual Surfaces cleaning	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	4400000 kg/day	---
---	---	Air	---	---	< 0,0003
---	---	Water	---	---	< 0,00035

ESVOC spERC 4.4a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 8: Use in Cleaning Agents	
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand).

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Predominantly hydrophobic, Substance is complex UVCB		
Amount used	Annual site tonnage (tons/year):	0,11 ton(s)/year
	Maximum daily site tonnage (kg/day):	0,31 kg/day
	Regional use tonnage (tons/year):	220 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	0,0005
Frequency and duration of use	Continuous exposure	365 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	2 %

	initial release prior to RMM	
	Emission or Release Factor: Water	0,00001 %
	initial release prior to RMM	
	Emission or Release Factor: Soil	0 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Risk from environmental exposure is driven by freshwater., If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater., No secondary wastewater treatment required.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	

Technical conditions and measures to control dispersion from source towards the worker	Clean up contamination/spills as soon as they occur.	
	Automated process with (semi) closed systems Use in contained systems	Provide enhanced general ventilation by mechanical means.(PROC2)
	Automated process with (semi) closed systems Drum/batch transfers Use in contained systems	Provide enhanced general ventilation by mechanical means.(PROC3)
	Manual Surfaces cleaning Dipping, immersion and pouring	Provide enhanced general ventilation by mechanical means.(PROC13)
	Manual Surfaces cleaning	Provide enhanced general ventilation by mechanical means.(PROC13)
	Cleaning with high pressure washers Spraying Indoor	Provide enhanced general ventilation by mechanical means. Limit the substance content in the mixture to 5 %.(PROC11)
	Cleaning with high pressure washers Spraying Outdoor.	Ensure operation is undertaken outdoors. Avoid carrying out operation for more than 1 hour.(PROC11)
	Manual Surfaces cleaning Spraying	Ensure doors and windows are opened.(PROC10)
	Manual Surfaces cleaning	Ensure doors and windows are opened.(PROC10)
	Application of cleaning products in closed systems Outdoor.	Ensure operation is undertaken outdoors. Avoid carrying out operation for more than 1 hour.(PROC4)
	Cleaning with low-pressure washers Rolling, Brushing No spraying	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Provide enhanced general ventilation by mechanical means.(PROC10)
	Cleaning of medical devices	Provide extract ventilation to points where emissions occur. Provide enhanced general ventilation by mechanical means.(PROC4)
	Filling / preparation of equipment from drums or containers	Provide enhanced general ventilation by mechanical means.(PROC8b)

	Semi-automated process (e.g.: Semi-automatic application of floor care and maintenance products)	Provide enhanced general ventilation by mechanical means.(PROC4)
	Filling / preparation of equipment from drums or containers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Provide enhanced general ventilation by mechanical means.(PROC8a)
	Ad hoc manual application via trigger sprays, dipping, etc Rolling, Brushing	Provide extract ventilation to points where emissions occur. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
	Automated process with (semi) closed systems Use in contained systems	Avoid carrying out operation for more than 4 hours. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC2)
	Automated process with (semi) closed systems Drum/batch transfers Use in contained systems	Avoid carrying out operation for more than 4 hours. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC3)
	Manual Surfaces cleaning Dipping, immersion and pouring	Avoid carrying out operation for more than 1 hour. Wear suitable gloves tested to EN374.(PROC13)
	Manual Surfaces cleaning	Wear a respirator conforming to EN140 with Type A filter or better. Wear suitable gloves tested to EN374.(PROC13)
	Cleaning with high pressure washers Spraying Indoor	Wear suitable gloves tested to EN374. Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)
	Cleaning with high	Wear suitable gloves tested to EN374.

pressure washers Spraying Outdoor.	Limit the substance content in the mixture to 1 %. or Limit the substance content in the mixture to 5 %. Wear a full face respirator conforming to EN140 with Type A filter or better.(PROC11)
Manual Surfaces cleaning Spraying	Avoid carrying out operation for more than 4 hours. Limit the substance content in the mixture to 5 %. Wear suitable gloves tested to EN374.(PROC10)
Manual Surfaces cleaning	Wear a respirator conforming to EN140 with Type A filter or better. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.(PROC10)
Application of cleaning products in closed systems Outdoor.	Limit the substance content in the mixture to 5 %. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC4)
Wear suitable gloves tested to EN374. Limit the substance content in the mixture to 5 %. Avoid carrying out operation for more than 1 hour. or Avoid carrying out operation for more than 4 hours. Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)	
Cleaning of medical devices	Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC4)
Filling / preparation of equipment from drums or containers	Limit the substance content in the mixture to 25 %. Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC8b)
Semi-automated process (e.g.: Semi-automatic application of floor care and maintenance products)	Limit the substance content in the mixture to 25 %. Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC4)
Filling / preparation of equipment from drums or containers	Limit the substance content in the mixture to 5 %. Avoid carrying out operation for more than 1 hour. or Wear a respirator conforming to EN140 with Type A filter or better. Avoid carrying out operation for more than 4 hours.(PROC8a)
Ad hoc manual application via trigger	Avoid carrying out operation for more than 1 hour. or

	sprays, dipping, etc Rolling, Brushing	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	1100 kg/day	---
---	---	Air	---	---	0
---	---	Water	---	---	< 0,00012

ESVOC spERC 8.4b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 9: Use in agrochemicals		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring	
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems	
Activity	Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal.	
2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d		
Substance is complex UVCB, Predominantly hydrophobic		
Amount used	Annual site tonnage (tons/year):	0,657 ton(s)/year
	Maximum daily site tonnage (kg/day):	1,8 kg/day
	Regional use tonnage (tons/year):	330 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	0,002
Frequency and duration of use	Continuous exposure	365 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	90 %
	initial release prior to RMM	
	Emission or Release Factor: Water	1 %

	initial release prior to RMM	
	Emission or Release Factor: Soil	9 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., No secondary wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater.
	Soil	Risk from environmental exposure is driven by soil.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC11, PROC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	Transfer from/pouring from containers	Provide enhanced general ventilation by mechanical means.(PROC8b)
	Mixing operations (open	Ensure operation is undertaken outdoors.(PROC4)

	systems)	
	Spraying/fogging by manual application	Ensure operation is undertaken outdoors.(PROC11)
	Spraying/ fogging by machine application	Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20.(PROC11)
	Ad hoc manual application via trigger sprays, dipping, etc	Ensure operation is undertaken outdoors.(PROC13)
	Equipment cleaning and maintenance	Provide enhanced general ventilation by mechanical means. Drain down system prior to equipment break-in or maintenance.(PROC8a)
	Disposal of wastes	Limit the substance content in the mixture to 5 %. Ensure operation is undertaken outdoors.(PROC8a)
	Storage	Ensure material transfers are under containment or extract ventilation.(PROC2)
	Storage	Store substance within a closed system.(PROC1, PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Avoid direct contact with the chemical/the product/the preparation by establishing organisational measures.
Conditions and measures related to personal protection, hygiene and health evaluation	Transfer from/pouring from containers	Limit the substance content in the mixture to 25 %. Avoid carrying out operation for more than 1 hour.(PROC8b)
	Mixing operations (open systems)	Limit the substance content in the mixture to 25 %. Avoid carrying out operation for more than 1 hour.(PROC4)
	Spraying/fogging by manual application	Avoid carrying out operation for more than 4 hours. Wear a full face respirator conforming to EN140 with Type A filter or better. Wear suitable coveralls to prevent exposure to the skin. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.(PROC11)
	Spraying/ fogging by machine application	Limit the substance content in the mixture to 5 %. Avoid carrying out operation for more than 1 hour.(PROC11)
	Ad hoc manual application via trigger sprays, dipping, etc	Avoid carrying out operation for more than 1 hour. Limit the substance content in the mixture to 25 %.(PROC13)
	Equipment cleaning and maintenance	Limit the substance content in the mixture to 25 %. Avoid carrying out operation for more than 1 hour.(PROC8a)

	Disposal of wastes	Avoid carrying out operation for more than 1 hour.(PROC8a)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	12000 kg/day	---
---	---	Air	---	---	< 0,0004
---	---	Water	---	---	< 0,00042

ESVOC spERC 8.11a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 10: Use as lubricants	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC17: Lubrication at high energy conditions and in partly open process PROC18: Greasing at high energy conditions
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC7: Industrial use of substances in closed systems
Activity	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of machinery/engines and similar articles, reworking on reject articles, equipment maintenance and disposal of wastes.

2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC7		
Predominantly hydrophobic, Substance is complex UVCB		
Amount used	Annual amount per site	12 ton(s)/year
	Maximum daily site tonnage (kg/day):	600 kg/day
	Regional use tonnage (tons/year):	12 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	1
Frequency and duration of use	Continuous exposure	20 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational	Number of emission days	20

conditions affecting environmental exposure	per year	
	Emission or Release Factor: Air	1 %
	initial release prior to RMM	
	Emission or Release Factor: Water	0,003 %
	initial release prior to RMM	
	Emission or Release Factor: Soil	0,1 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 70 %)
	Water	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater.
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 0 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

	Physical Form (at time of use)	liquid
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	General exposures (closed systems)	Handle substance within a closed system. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
	General exposures (open systems)	Ensure material transfers are under containment or extract ventilation.(PROC4)
	Storage	Store substance within a closed system.(PROC1)
	Bulk transfers	Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Filling / preparation of equipment from drums or containers	Use drum pumps or carefully pour from container.(PROC8a, PROC8b)
	Initial factory fill of equipment	Ensure material transfers are under containment or extract ventilation. Provide enhanced general ventilation by mechanical means.(PROC9)
	Operation and lubrication of high energy open equipment	Provide extract ventilation to points where emissions occur. Restrict area of openings to equipment.(PROC17)
	Rolling, Brushing	Ensure material transfers are under containment or extract ventilation. Provide enhanced general ventilation by mechanical means.(PROC10)
	Treatment by dipping and pouring	Provide extract ventilation to points where emissions occur. Provide enhanced general ventilation by mechanical means.(PROC13)
	Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide enhanced general ventilation by mechanical means.(PROC7)
	Maintenance (of larger plant items) and machine set up Elevated temperature	Drain down and flush system prior to equipment opening or maintenance. Ensure material transfers are under containment or extract ventilation. Provide enhanced general ventilation by mechanical means. Provide extract ventilation to emission points when contact with warm (>50oC) product is likely.(PROC8b)
	Maintenance of small	Provide extract ventilation to points where

	items	emissions occur. Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.(PROC8a)
	Remanufacture of reject articles	Provide enhanced general ventilation by mechanical means.(PROC9)
	General exposures (closed systems)	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.(PROC3)
	Storage	Transfer via enclosed lines. Store substance within a closed system.(PROC2)
	Storage	Provide extract ventilation to points where emissions occur.(PROC3)
	Operation and lubrication of high energy open equipment	Provide extract ventilation to points where emissions occur. Provide enhanced general ventilation by mechanical means.(PROC18)
	Maintenance (of larger plant items) and machine set up	Drain down and flush system prior to equipment opening or maintenance. Ensure material transfers are under containment or extract ventilation.(PROC8b)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Avoid direct contact with the chemical/the product/the preparation by establishing organisational measures.
Conditions and measures related to personal protection, hygiene and health evaluation	Remanufacture of reject articles	Limit the substance content in the mixture to 5 %. or Avoid carrying out operation for more than 1 hour.(PROC9)
	Storage	Wear a respirator conforming to EN140 with Type A filter or better.(PROC2)
	Filling / preparation of equipment from drums or containers	Wear suitable gloves tested to EN374.(PROC8a)
	Filling / preparation of equipment from drums or containers	Avoid carrying out operation for more than 1 hour.(PROC8b)
Risk Management Measures are based on qualitative risk characterisation.		

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	4200000 kg/day	---

ESVOC spERC 4.6a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 11: Use as Functional Fluids		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	
Environmental Release Categories	ERC7: Industrial use of substances in closed systems	
Activity	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.	
2.1 Contributing scenario controlling environmental exposure for: ERC7		
Predominantly hydrophobic, Substance is complex UVCB		
Amount used	Annual site tonnage (tons/year):	10 ton(s)/year
	Maximum daily site tonnage (kg/day):	500 kg/day
	Regional use tonnage (tons/year):	610 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	1
Frequency and duration of use	Continuous exposure	20 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	20
	Emission or Release Factor: Air	1 %
	initial release prior to RMM	
	Emission or Release	0,003 %

	Factor: Water	
	initial release prior to RMM	
	Emission or Release Factor: Soil	0,1 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., No secondary wastewater treatment required.
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC4, PROC8a, PROC8b, PROC9		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	Storage	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)

		Store substance within a closed system.(PROC2)
	Bulk transfers (closed systems)	Transfer via enclosed lines. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC2)
	Drum/batch transfers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8b)
	Filling of articles/equipment (closed systems)	Provide extract ventilation to points where emissions occur.(PROC9)
	Filling / preparation of equipment from drums or containers	Provide extract ventilation to material transfer points and other openings.(PROC8a)
	General exposures (closed systems)	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC2)
	General exposures (open systems)	Provide extract ventilation to points where emissions occur.(PROC4)
	Remanufacture of reject articles	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC9)
	Equipment maintenance	Drain down and flush system prior to equipment opening or maintenance.(PROC8a)
	Bulk transfers (closed systems)	Transfer via enclosed lines.(PROC1)
	Storage	Store substance within a closed system.(PROC1)
Conditions and measures related to personal protection, hygiene and health evaluation	Drum/batch transfers	Avoid carrying out operation for more than 1 hour.(PROC8b)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	1400000 kg/day	---
---	---	Air	---	---	< 0,000001
---	---	Water	---	---	< 0,00035

ESVOC spERC 7.13a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 12: Use as Functional Fluids		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems	
Environmental Release Categories	ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems	
Activity	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.	
2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b		
Predominantly hydrophobic, Substance is complex UVCB		
Amount used	Annual site tonnage (tons/year):	0,052 ton(s)/year
	Maximum daily site tonnage (kg/day):	0,14 kg/day
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	1
Frequency and duration of use	Continuous exposure	365 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	5 %
	initial release prior to RMM	
	Emission or Release Factor: Water	2,5 %

	initial release prior to RMM	
	Emission or Release Factor: Soil	2,5 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Risk from environmental exposure is driven by freshwater., If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., No secondary wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC9, PROC20		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	Drum/batch transfers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Use drum pumps or carefully pour from container. Avoid carrying out operation for more than 4 hours.(PROC8a)

Transfer from/pouring from containers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Use drum pumps or carefully pour from container.(PROC9)
Filling / preparation of equipment from drums or containers	Avoid carrying out operation for more than 1 hour. Use drum pumps or carefully pour from container.(PROC9)
General exposures (closed systems)	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC2)
General exposures (closed systems)	Ensure material transfers are under containment or extract ventilation.(PROC3)
General exposures (closed systems)	Handle substance within a closed system.(PROC1)
Operation of equipment containing engine oils and similar Elevated temperature	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC20)
Remanufacture of reject articles	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Limit the substance content in the mixture to 25 %. Avoid carrying out operation for more than 4 hours.(PROC9)
Equipment maintenance	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Avoid carrying out operation for more than 4 hours. Drain down system prior to equipment break-in or maintenance.(PROC8a)
Storage	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC2)
Storage	Store substance within a closed system.(PROC1, PROC2)
Operation of equipment containing engine oils and similar	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC20)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	410 kg/day	---

---	---	Air	---	---	< 0,000078
---	---	Water	---	---	< 0,00019

ESVOC spERC 9.13b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 13: Use in laboratories		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC10: Roller application or brushing PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC2: Formulation of preparations ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
Activity	Use of the substance within laboratory settings, including material transfers and equipment cleaning..	
2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC4		
Substance is isomeric mixture, Predominantly hydrophobic, Readily biodegradable., Substance is complex UVCB		
Amount used	Annual site tonnage (tons/year):	0,1 ton(s)/year
	Maximum daily site tonnage (kg/day):	5 kg/day
	Regional use tonnage (tons/year):	0,1 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	1
Frequency and duration of use	Continuous exposure	20 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	20
	Emission or Release Factor: Air	2,5 %
	initial release prior to RMM	
	Emission or Release Factor: Water	2 %
	initial release prior to RMM	
	Emission or Release Factor: Soil	0,01 %
	initial release prior to RMM	
Technical conditions and measures at process level	Air	No air emission controls required; required removal efficiency is 0%.

(source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., No secondary wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater.
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC10, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	cleaning	Handle in a fume cupboard or under extract ventilation.(PROC10)
	Laboratory activities	Provide enhanced general ventilation by mechanical means. Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Carefully pour from containers. Put lids on containers immediately after

		use.(PROC15)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.
	cleaning	Wear suitable gloves tested to EN374. Avoid carrying out operation for more than 4 hours.(PROC10)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	2200 kg/day	---
---	---	Air	---	---	0
---	---	Water	---	---	< 0,0023

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 14: Use in laboratories	
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC10: Roller application or brushing PROC15: Use as laboratory reagent
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems
Activity	Use of small quantities within laboratory settings, including material transfers and equipment cleaning.

2.1 Contributing scenario controlling environmental exposure for: ERC8a

Substance is isomeric mixture, Predominantly hydrophobic, Readily biodegradable., Substance is complex UVCB

Amount used	Annual site tonnage (tons/year):	0,00005 ton(s)/year
	Maximum daily site tonnage (kg/day):	0,00014 kg/day
	Regional use tonnage (tons/year):	0,1 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	0,0005
Frequency and duration of use	Continuous exposure	365 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	50 %
	initial release prior to RMM	
	Emission or Release Factor: Water	50 %
	initial release prior to RMM	
	Emission or Release Factor: Soil	0 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release	Air	No air emission controls required; required removal efficiency is 0%.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Risk from environmental exposure is driven by freshwater., If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., No secondary wastewater treatment required.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC10, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	cleaning	Handle in a fume cupboard or under extract ventilation. Ensure doors and windows are opened. Avoid carrying out operation for more than 1 hour.(PROC10)
	Laboratory activities	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Ensure doors and windows are opened.(PROC15)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin

		problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	0,49 kg/day	---
---	---	Air	---	---	< 0,000002
---	---	Water	---	---	< 0,00012

ESVOC spERC 8.17.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 15: Use as blowing agents		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC3: Use in closed batch process (synthesis or formulation) PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC12: use of blowing agents in manufacture of foam	
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles	
Activity	Use as a blowing agent for rigid and flexible foams, including material transfers, mixing and injection, curing, cutting, storage and packing.	
2.1 Contributing scenario controlling environmental exposure for: ERC4		
Predominantly hydrophobic, Substance is complex UVCB		
Amount used	Annual site tonnage (tons/year):	47 ton(s)/year
	Maximum daily site tonnage (kg/day):	2300 kg/day
	Regional use tonnage (tons/year):	47 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	1
Frequency and duration of use	Continuous exposure	20 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	20
	Emission or Release Factor: Air	100 %
	initial release prior to RMM	
	Emission or Release Factor: Water	0,003 %
	initial release prior to RMM	
	Emission or Release	0 %

	Factor: Soil	
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	No air emission controls required; required removal efficiency is 0%.
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., No secondary wastewater treatment required.
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC3, PROC8b, PROC9, PROC12		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Storage	Provide extract ventilation to points where emissions occur.(PROC12)

Bulk transfers	Ensure operation is undertaken outdoors. Use dry break couplings for material transfer. Clear transfer lines prior to de-coupling.(PROC8b)
Extrusion and expansion of polymer mass	Provide extract ventilation to points where emissions occur. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC12)
Cutting and shaving	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC12)
Collection and re-processing of shavings, cuttings, etc	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC12)
Product packaging	Provide extract ventilation to points where emissions occur.(PROC12)
Mixing operations (closed systems) Elevated temperature	Provide extract ventilation to points where emissions occur.(PROC3)
Intermediate polymer storage Elevated temperature	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC3)
Centrifuging including discharging Elevated temperature	Provide extract ventilation to points where emissions occur.(PROC3)
Drying and storage	Provide extract ventilation to points where emissions occur.(PROC12)
Semi-bulk packaging	Provide extract ventilation to points where emissions occur.(PROC8b)
Treatment by heating Elevated temperature	Provide extract ventilation to points where emissions occur.(PROC12)
Article formation in mould Elevated temperature	Provide extract ventilation to points where emissions occur.(PROC12)
Mixing operations (closed systems)	Provide extract ventilation to points where emissions occur.(PROC3)
Cutting by heated wire	Provide extract ventilation to points where emissions occur.(PROC12)
Drum and small package filling Filling / preparation of equipment from drums or containers	Provide extract ventilation to points where emissions occur. provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC9)
Foaming	Provide extract ventilation to points where emissions occur.(PROC12)
Compression	Provide extract ventilation to points where emissions occur.(PROC12)

Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.
	Storage	Avoid carrying out operation for more than 4 hours.(PROC12)
	Bulk transfers	Avoid carrying out operation for more than 1 hour. Limit the substance content in the mixture to 25 %.(PROC8b)
	Product packaging	Avoid carrying out operation for more than 4 hours.(PROC12)
	Intermediate polymer storage Elevated temperature	Avoid carrying out operation for more than 4 hours.(PROC3)
	Centrifuging including discharging Elevated temperature	Avoid carrying out operation for more than 1 hour.(PROC3)
	Drying and storage	Avoid carrying out operation for more than 4 hours.(PROC12)
	Treatment by heating Elevated temperature	Avoid carrying out operation for more than 4 hours.(PROC12)
	Article formation in mould Elevated temperature	Avoid carrying out operation for more than 4 hours.(PROC12)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	1300000 kg/day	---
---	---	Air	---	---	< 0,00047
---	---	Water	---	---	< 0,0016

ESVOC spERC 4.9.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

1. Short title of Exposure Scenario 16: Use as mining chemicals	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC7: Industrial use of substances in closed systems
Activity	Covers the use of the substance in extraction processes at mining operations, including material transfers, winning and separation activities, and substance recovery and disposal.

2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC7		
Predominantly hydrophobic, Substance is complex UVCB		
Amount used	Annual site tonnage (tons/year):	46 ton(s)/year
	Maximum daily site tonnage (kg/day):	2300 kg/day
	Regional use tonnage (tons/year):	47 ton(s)/year
	Fraction of EU tonnage used in region:	0,1
	Fraction of Regional tonnage used locally:	1
Frequency and duration of use	Continuous exposure	20 days/year, Continuous release
Environment factors not influenced by risk management	Other data. Other information	Local freshwater dilution factor:: 10
	Other data. Other information	Local marine water dilution factor:: 100
Other given operational conditions affecting environmental exposure	Number of emission days per year	20
	Emission or Release	25 %

	Factor: Air	
	initial release prior to RMM	
	Emission or Release Factor: Water	50 %
	initial release prior to RMM	
	Emission or Release Factor: Soil	5 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 80 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 99,9 %)
	Sediment	Risk from environmental exposure is driven by freshwater sediment.
	Water	If discharging to domestic sewage treatment plant, no onsite wastewater treatment required., Prevent discharge of undissolved substance to or recover from onsite wastewater. (Degradation effectiveness: 96,3 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	96, %
	Percentage removed from waste water	99,9 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations., This substance is consumed during use and no waste of the substance is generated.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20℃ above ambient temp erature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Bulk transfers	Provide enhanced general ventilation by mechanical means. Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Transfer via enclosed lines.(PROC2)
	Drum/batch transfers	Provide enhanced general ventilation by mechanical means. Use drum pumps.(PROC8b)
	Pouring from small containers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Provide extract ventilation to points where emissions occur.(PROC9)
	General exposures (closed systems)	Ensure samples are obtained under containment or extract ventilation.(PROC3)
	General exposures (open systems)	Provide extract ventilation to points where emissions occur. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC5)
	phase separation (closed systems)	Provide extract ventilation to points where emissions occur.(PROC4)
	ion exchange processes (closed systems)	Provide enhanced general ventilation by mechanical means. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC2)
	Process sampling	Ensure material transfers are under containment or extract ventilation. Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC3)
	Equipment cleaning and maintenance	Provide enhanced general ventilation by mechanical means. Drain down and flush system prior to equipment opening or maintenance.(PROC8a)
	Storage	Store substance within a closed system.(PROC1)
Organisational measures to	General measures (skin	Provide basic employee training to prevent

prevent /limit releases, dispersion and exposure	irritants)	/minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.
	Drum/batch transfers	Avoid carrying out operation for more than 4 hours.(PROC8b)
	Drum/batch transfers	Avoid carrying out operation for more than 1 hour.(PROC9)
	Process sampling	Avoid carrying out operation for more than 4 hours.(PROC3)
	Equipment cleaning and maintenance	Wear suitable gloves tested to EN374.(PROC8a)

Risk Management Measures are based on qualitative risk characterisation.

3. Exposure estimation and reference to its source

Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	---	Msafe	2300 kg/day	---

ESVOC spERC 4.23.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

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

Environment
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.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that

risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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