

## ZapSibNeftekhim LLC

### SAFETY DATA SHEET

According to Regulations (EC) 1907/2006 (REACH), (EC) 1272/2008 (CLP) & (EU) 2015/830

## NORMAL PENTANE FRACTION

Version: 3.1  
Date created: 22/12/2020

### SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

#### 1.1. Product identifier

Product form: Substance  
Substance name: Pentane  
Chemical name: Pentane  
EC index No.: 601-006-00-1  
EC No.: 203-692-4  
CAS-No.: 109-66-0  
REACH registration No: 01-2119459286-30-0003  
Formula: C<sub>5</sub>H<sub>12</sub>  
Synonyms: n-pentane, normal pentane  
Trade names: Pentane, normal pentane fraction

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

##### 1.2.1. Relevant identified uses

Use of the substance/mixture: Industrial uses  
Manufacture of Substance  
Distribution of Substance  
Formulation & (Re)packing of Substances and Mixtures  
Uses in Coatings  
Use in Cleaning Agents  
Use as Blowing Agents  
Use in Fuel  
Use as Functional Fluids  
Use in Laboratories  
Professional uses  
Use in Cleaning Agents  
Use in Agrochemicals  
Use in Fuel  
Use in Functional Fluids  
Use in Laboratories  
Consumer uses  
Uses in Coatings  
Use in Cleaning Agents  
Use in Fuel  
Use in Other Consumer Uses  
*See Section 16 for a complete list of uses for which an ES is provided as an Annex.*

Most common technical function of substance: Solvents

### 1.2.2. Uses advised against

Restrictions on use: Uses other than those given in section 1.2.1 are not recommended unless an assessment is completed, prior to commencement of that use, which demonstrates that the use will be controlled

### 1.3. Details of the supplier of the safety data sheet

#### Only representative

Company name: Gazprom Marketing and Trading France  
Address: 68 avenue des Champs-Élysées, 75008, Paris, France  
Contact Telephone: +33 1 42 99 73 50  
Fax: +33 1 42 99 73 99  
Email Address: didier.lebout@gazprom-mt.com

#### Manufacturer

Company name: ZapSibNeftekhim LLC  
Address: Promzona, 626150, Tobolsk, Tumen region, Russian Federation  
Contact phone: +7 (3456) 398-000  
Fax: +7 (3456) 266-449  
Email Address: ZapSib@sibur.ru  
Emergency Telephone: +7 (3456) 398-755; +7 (3456) 398-000, ext. 8899 (office hours only, GMT+5)

### 1.4. Emergency telephone number

**Emergency phone in the country of delivery** 112 (*Please note that emergency numbers may vary depending upon the country of delivery though 112 remains valid as universal number*)

## SECTION 2. HAZARDS IDENTIFICATION

### 2.1. Classification of the substance or mixture

#### Classification according to Regulation (EC) No. 1272/2008 [CLP]

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

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

### 2.2. Label elements

#### Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP):



GHS02



GHS07



GHS08



GHS09

Signal word (CLP):

**Danger**

Hazard statements (CLP):

H224: Extremely flammable liquid and vapour.  
H304: May be fatal if swallowed and enters airways.  
H336: May cause drowsiness or dizziness.  
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements (CLP):

P210: Keep away from heat/sparks/open flames/hot surfaces – No smoking  
P261: Avoid breathing dust/fume/gas/mist/vapours/spray.  
P273: Avoid release to the environment.  
P280: Wear protective gloves/protective clothing/eye protection/face

protection.

P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

P331: Do NOT induce vomiting.

EUH-statements:

EUH066: Repeated exposure may cause skin dryness or cracking.

### 2.3. Other hazards

Other hazards not contributing to the classification: No other hazards identified.

Assessment PBT / vPvB: According to Annex XIII of Regulation (EC) No.1907/2006 (REACH):  
- not fulfilling PBT (persistent/bioaccumulative/toxic) criteria;  
- not fulfilling vPvB (very persistent/very bioaccumulative) criteria.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substances

Name	Product identifier	%	Classification [CLP]
Pentane	(CAS-No.) 109-66-0 (EC No.) 203-692-4 (EC index No.) 601-006-00-1 (REACH-no) 01-2119459286-30-0003	96.5- 99.8	H224, H304, H336, H411, EUH066

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

The product does not contain impurities or additives that could affect product's labelling and classification according to Regulation (EC) No 1272/2008 (CLP).

### 3.2. Mixtures

Not applicable

## SECTION 4. FIRST-AID MEASURES

### 4.1. Description of first aid measures

#### First-aid measures general

If high-pressure injuries or ingestion occur, obtain immediate medical attention.

Warning before intervention: Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply. Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces. Drench contaminated clothing with water before removing to avoid risk of sparks from static electricity

#### First-aid measures after inhalation

If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

If the casualty is unconscious and not breathing – ensure that there is no obstruction to breathing and give artificial respiration by trained personnel. If necessary, give external cardiac massage and obtain medical assistance.

If the casualty is unconscious and breathing - place in the recovery position and keep the head below the level of the torso. Administer oxygen if necessary;

Obtain medical attention if casualty has an altered state of consciousness or if symptoms do not resolve.

#### First-aid measures after skin contact

Remove contaminated clothing and footwear and dispose of safely. Wash affected area thoroughly with soap and water.

Seek medical attention if skin irritation, swelling or redness develops and persists.

When using high-pressure equipment, injection of product can occur. If high-pressure injuries occur, immediately seek professional medical attention. Do not wait for symptoms to develop. For minor thermal burns: Cool the burn. Hold the burned area under cold running water for at least five minutes, or until the pain subsides. However, body hypothermia must be avoided.

#### **First-aid measures after eye contact**

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing. If irritation, blurred vision or swelling occurs and persists, obtain medical advice from a specialist.

#### **First-aid measures after ingestion**

Ingestion (swallowing) of this material may result in an altered state of consciousness and loss of coordination.

In case of ingestion, always assume that aspiration has occurred. The casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.

Do not induce vomiting as there is high risk of aspiration.

Do not give anything by mouth to an unconscious person.

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

Symptoms/effects after inhalation:	Inhalation of vapours may cause headache, nausea, vomiting and an altered state of consciousness
Symptoms/effects after skin contact:	Reddening, irritation
Symptoms/effects after eye contact:	Slight irritation (unspecific).
Symptoms/effects after ingestion:	Few or no symptoms expected. If any, nausea and diarrhoea might occur. Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

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

<b>Advice to physician</b>	If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately. This light hydrocarbon material, or a component, may be associated with cardiac sensitisation following very high exposures (well above occupational exposure limits) or with concurrent exposure to high stress levels or heart-stimulating substances like epinephrine. Administration of such substances should be avoided.
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### **SECTION 5. FIRE-FIGHTING MEASURES**

#### **5.1. Extinguishing media**

Suitable extinguishing media	LARGE FIRE: Use water spray or fog, alcohol-resistant foam SMALL FIRE: Dry chemical powder, carbon dioxide (CO <sub>2</sub> ), sand or earth
Unsuitable extinguishing media	This material is lighter than water and insoluble in water. Do not use direct water jets on the burning product; they could cause splattering and spread the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

#### **5.2. Special hazards arising from the substance or mixture**

Fire hazard:	Extremely flammable liquid and vapour. This substance will float and can be reignited on surface water. The vapour is heavier than air, spreads along the ground and distant ignition is possible.
Explosion hazard:	Vapours may form explosive mixtures with air. Heating will cause pressure rise with risk of bursting and subsequent explosion.

Hazardous decomposition products in case of fire: Smoke, Fume, Incomplete combustion products, Carbon dioxide, Carbon monoxide

### 5.3. Advice for fire-fighters

Firefighting instructions: Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapours and to protect personnel attempting to stop a leak. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Use water spray to cool fire exposed surfaces and to protect personnel.

Protection during firefighting: Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA).

## SECTION 6. ACCIDENTAL RELEASE MEASURE

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

#### 6.1.1. For non-emergency personnel

Emergency procedures: Persons not engaged in emergency response should be taken away. Avoid walking through spilled product and do not touch spilt material. Use suitable protective equipment, refer to Section 8.

#### 6.1.2. For emergency responders

Emergency procedures: Stop or contain leak at the source if safe to do so. All equipment used when handling the product must be grounded. Avoid direct contact with released material. Stay upwind. In case of large spillages, alert occupants in downwind areas. The vapour is heavier than air; beware of pits and confined spaces.

Wear suitable protective equipment (See Section 8).

Keep non-involved personnel away from the area of spillage. Alert emergency personnel. Except in case of small spillages, the feasibility of any actions should always be assessed and advised, if possible, by a trained, competent person in charge of managing the emergency.

Eliminate all ignition sources if safe to do so (e.g. electricity, sparks, fires, flares). If required, notify relevant authorities according to all applicable regulations.

### 6.2. Environmental precautions

Prevent product from entering sewers, rivers, waterways or other bodies of water. Protect ecologically sensitive areas and water supply systems from contact with spilled product. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body.

Land spillage: Prevent product from entering sewers, rivers, waterways or other bodies of water. If necessary dike the product with dry earth, sand or similar non-combustible materials.

Large spillages may be cautiously covered with foam, if available, to limit vapour cloud formation. Water spray may reduce vapour, but may not prevent ignition in enclosed spaces. Do not use direct jets.

When inside buildings or confined spaces, ensure adequate ventilation.

Absorb spilled product with suitable non-combustible materials.

Collect free product with suitable means. Transfer collected product and other contaminated materials to suitable containers for recovery or safe disposal.

In case of soil contamination, remove contaminated soil and treat in accordance with local regulations.

Water spillage: Allow liquid to evaporate from the surface. Seek the advice of a specialist before using dispersants.

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

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according 'Disposal considerations'. Dispose of the material collected according to regulations. Ensure adequate ventilation.

Small spills: transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

Large spills: transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

### 6.4. Reference to other sections

SECTION 8: Exposure controls/personal protection. SECTION 13: Disposal considerations.

### 6.5 Additional information:

Note: recommended measures are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Local regulations may prescribe or limit action to be taken.

## SECTION 7. HANDLING AND STORAGE

### 7.1. Precautions for safe handling

Precautions for safe handling Risk of explosive mixtures of vapour and air. Ensure that all relevant regulations regarding explosive atmospheres, and handling and storage facilities of flammable products, are followed.

Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Use and store only outdoors or in a well-ventilated area. Prevent small spills and leakage to avoid slip hazard. Avoid contact with the product. Avoid release to the environment.

Take precautionary measures against static electricity. Handle with care. Avoid jolting, friction and impact. Ground/bond containers, tanks and transfer/receiving equipment. Use only non-sparking tools. The vapour is heavier than air. Beware of accumulation in pits and confined spaces. Do not use compressed air for filling, discharging, or handling operations.

Avoid contact with skin and eyes. Do not ingest. Avoid breathing vapours. Use personal protective equipment as required (see Section 8). For more information regarding protective equipment and operational conditions see Exposure scenarios.

Hygiene measures

Ensure that proper housekeeping measures are in place. Contaminated materials should not be allowed to accumulate in the workplace and should never be kept inside the pockets. Keep away from food and beverages. Do not eat, drink or smoke when using this product. Wash the hands thoroughly after handling. Change contaminated clothes at the end of working shift.

### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions Storage installations should be designed with adequate bunds so as to

prevent ground and water pollution in case of leaks or spills.  
 Cleaning, inspection and maintenance of internal structure of storage tanks must be done only by properly equipped and qualified personnel as defined by national, local or company regulations.

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended.

Before entering storage tanks and commencing any operation in a confined area check the atmosphere for oxygen content and flammability.

If the product is supplied in containers: Keep only in the original container or in a suitable container for this kind of product. Keep containers tightly closed and properly labelled. Protect from the sunlight. Store in a cool, well-ventilated area. Fixed storage containers, transfer containers and associated equipment should be earthed and bonded to prevent accumulation of static charge. Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability / explosion hazards. Empty containers may contain flammable product residues. Do not weld, solder, drill, cut or incinerate empty containers, unless they have been properly cleaned.

Incompatible materials

Store separately from strong oxidising agents, rubber, various plastics.

Storage area

Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation.

Packaging materials

Recommended containers/packing: tank trucks; bulk liquid container (BLC); barges; drums.

Recommended materials and coatings: carbon steel; stainless steel; polyethylene; polypropylene; polyester; teflon.

Unsuitable materials and coatings: natural rubber; butyl rubber; ethylene-propylene-diene monomer (EPDM); polystyrene.

### 7.3. Specific end use(s)

Please check the identified uses given in Section 1.2 of this safety data sheet. For more information please see the relevant exposure scenarios, available in the annex of this safety data sheet.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control parameters

#### 8.1.1 Occupational Exposure Limits

<i>Pentane (CAS 109-66-0)</i>	LTEL TWA		STEL		Note
	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>	
<b>European Union</b>	<b>1000</b>	<b>3000</b>			
Austria	600	1800	1200	3600	
Belgium	600	1800	750	2250	
Denmark	500	1500	1000	3000	
Finland	500	1500	630 (1)	1900 (1)	(1) 15 minutes average value
France	1000*	3000*			*Restrictive statutory limit values
Germany (AGS)	1000	3000	2000 (1)	6000 (1)	(1) 15 minutes average value
Germany (DFG)	1000	3000	2000	6000	STV 15 minutes average value
Hungary		2950			
Ireland	1000	3000			

Italy	667	2000			
Latvia	1000	3000			
Poland		3000			
Romania	1000	3000			
Spain	1000	3000			
Sweden	600	1800	750 (1)	2000 (1)	(1) 15 minutes average value
Switzerland	600	1800	1200	3600	
The Netherlands		1800			
Turkey	1000	3000			
United Kingdom	600	1800			

### 8.1.2 DNEL/ PNEC values

<i>Pentane (CAS 109-66-0)</i>	
<b>DNEL/DMEL (Workers)</b>	
Acute - systemic effects, dermal	No hazard identified
Acute - systemic effects, inhalation	No hazard identified
Acute - local effects, dermal	No hazard identified
Acute - local effects, inhalation	No hazard identified
Long-term - systemic effects, dermal	(DNEL) 432 mg/kg bw/day (Most sensitive endpoint: repeated dose toxicity)
Long-term - systemic effects, inhalation	(DNEL) 3000 mg/m <sup>3</sup> (Most sensitive endpoint: repeated dose toxicity)
Long-term - local effects, dermal	No hazard identified
Long-term - local effects, inhalation	No hazard identified
Eyes, local effects	No hazard identified
<b>DNEL/DMEL (General population)</b>	
Acute - systemic effects, dermal	No hazard identified
Acute - systemic effects, inhalation	No hazard identified
Acute - systemic effects, oral	No hazard identified
Acute - local effects, dermal	No hazard identified
Acute - local effects, inhalation	No hazard identified
Long-term - systemic effects, dermal	(DNEL) 214 mg/kg bw/day (Most sensitive endpoint: repeated dose toxicity)
Long-term - systemic effects, inhalation	(DNEL) 643 mg/m <sup>3</sup> (Most sensitive endpoint: repeated dose toxicity)
Long-term - systemic effects, oral	(DNEL) 214 mg/kg bw/day (Most sensitive endpoint: repeated dose toxicity)
Long-term - local effects, dermal	No hazard identified
Long-term - local effects, inhalation	No hazard identified
Eyes, local effects	No hazard identified
<b>PNEC (water)</b>	
PNEC aqua (freshwater)	0.23 mg/L
PNEC aqua (marine water)	0.23 mg/L
PNEC aqua (intermittent, freshwater)	0.88 mg/L
<b>PNEC (Sediment)</b>	
PNEC sediment (freshwater)	1.2 mg/kg sediment dw
PNEC sediment (marine water)	1.2 mg/kg sediment dw
<b>PNEC (Soil)</b>	



PNEC soil	0.55 mg/kg soil dw
<b>PNEC (Oral)</b>	
PNEC oral (secondary poisoning)	No potential for bioaccumulation
<b>PNEC (STP)</b>	
PNEC sewage treatment plant	3.6 mg/L

## 8.2. Exposure controls

### Appropriate engineering controls:

Read in conjunction with Exposure scenarios for the identified uses contained in the annex. Select controls based on a risk assessment of local circumstances.

Appropriate measures include: closed system, adequate exhaust ventilation system, explosion-proof electrical/ventilating/lighting equipment, only non-sparking tools, regular cleaning of equipment and work area, etc.

### Personal protection equipment:

Personal protection equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Follow the principles of good occupational and personal hygiene to control personal exposures.

### Hand protection:

Wear gloves (tested to EN 374) if hand contamination likely.

Work gloves providing adequate chemical resistance, specifically to aromatic hydrocarbons.

Note: gloves made of PVA are not water-resistant, and are not suitable for emergency use.

### Eye protection:

Goggles or face shield, if splashes or contact with eyes is possible or anticipated (BS EN 166)

### Skin and body protection:

Work helmet. Antistatic non-skid safety shoes or boots. Normal antistatic working clothes are usually adequate.

If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

### Respiratory protection:

Wear suitable respiratory protective equipment if exposure to levels above the occupational exposure limit is likely. (BS EN 14387:2004 or EN 140)

A half or full-face respirator with filter(s) for organic vapours or a Self Contained Breathing Apparatus (SCBA) can be used according to the extent of spill and predictable amount of exposure. If the situation cannot be completely assessed, or if an oxygen deficiency is possible, only SCBA's should be used.

### Environmental exposure controls:

Avoid release to the environment.

### Other information:

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Discard contaminated clothing and footwear that cannot be cleaned. Ensure that eyewash stations and safety showers are close to the workstation location.

Assumes a good basic standard of occupational hygiene is implemented. Provide basic employee training to prevent/ minimize exposures and to report any skin effects that may develop.

For more information please see the relevant exposure scenario in Annex of this SDS.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

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

Physical state at 20 °C and 101.3 kPa	Liquid Form: clear
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Colour	Colourless
Odour	Faint
Melting / freezing point	<-20 °C (ASTM D 5950) -129.67 °C (literature data)
Boiling point	28 to 70 °C (ASTM D 1078)
Relative density	0.63 g/cm <sup>3</sup> at 20 °C 0.60 to 0.65 g/cm <sup>3</sup> (ISO 12185)
Vapour pressure	59.04 kPa at 21.111 °C 45 to 79 kPa at 20 °C (calculated)
Surface tension	13 to 17 mN/m at 25 °C
Water solubility	38.5 mg/L at 20 °C (slightly soluble)
Partition coefficient n-octanol/water (log value)	log Kow = 3.45 at 25 °C log Kow = 3 at 20 °C
Flash point	<-20 °C (DIN 51755) -40°C (literature data)
Flammability	Extremely flammable The explosion limits of n-pentane are 1.3-7.8%. This data would result in a classification of category 1 flammable liquid and the hazard statement 'extremely flammable liquid '.
Explosive properties	Non-explosive
Self-ignition temperature	>200 °C (ASTM E 659) 260 °C
Oxidising properties	Not applicable
Viscosity	0.2 to 0.52 mm <sup>2</sup> /s at 20°C (ASTM D 7042) 0.224 mPa s at 25 °C
Granulometry	Not applicable
Stability in organic solvents and identity of relevant degradation products	Not applicable
Dissociation constant	Not applicable

## 9.2. Other information

Not available.

## SECTION 10. STABILITY AND REACTIVITY

### 10.1. Reactivity

Material is stable under normal conditions.

Volatile liquid. Extremely flammable. Stable at room temperature in closed containers under normal storage and handling conditions.

### 10.2. Chemical stability

Stable under normal pressures and temperatures.

### 10.3. Possibility of hazardous reactions

Risk of explosive mixtures of vapour and air. Heating will cause pressure rise with risk of bursting and subsequent explosion. Ensure that all relevant regulations regarding explosive atmospheres, and handling and storage facilities of flammable products, are followed.

Violent reactions possible with: Nitric acid, Strong oxidizing agents, halogens.

### 10.4. Conditions to avoid

Keep away from heat, sparks, open flames and other ignition sources. No smoking

### 10.5. Incompatible materials

Strong oxidising agents, rubber, various plastics.

### 10.6. Hazardous decomposition products

Not expected to form during normal storage.

Incomplete combustion products: a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide and/or carbon dioxide, and unidentified organic and inorganic compounds.

## SECTION 11. TOXICOLOGICAL INFORMATION

### 11.1. Information on toxicological effects

#### Acute toxicity

<i>Pentane (CAS 109-66-0)</i>	
LD50, oral, rats	> 2000 mg/kg bw Test material: n-pentane Test method: equivalent or similar to OECD 401/EU Method B.1
	> 5000 mg/kg bw (read-across) Test material: Cyclopentane Test method: equivalent or similar to OECD 423
LC50, inhalation, rats	> 25.3 mg/L – 4h (read-across) Test material: Cyclopentane Test method: equivalent or similar to OECD 403

#### Skin corrosion/irritation

##### Additional information

Mild irritating. Not classified.

Samples were tested in rabbit skin irritation studies (24 hour semioccluded) (equivalent or similar to OECD 404 / EU Method B.4).

Primary dermal irritation index: 0.67 (mean) (Time point: 24 and 72 hours).

Erythema score: 0.5 (mean) (Time point: 24 and 72 hours). Edema score: 0.06 (mean) (Time point: 24 and 72 hour).

Based on a lack of significant skin irritation, n-pentane is not classified as skin irritant.

No specific studies have been reported on corrosivity. No corrosion action of the substance is expected.

Mild irritating. Not classified.

#### Serious eye

#### damage/irritation

##### Additional information

Test animals: rabbits.

Test method: equivalent or similar to OECD 405.

Redness: 2.33 of max. 110 (mean) (Time point: 1 hour) (fully reversible within: 72 hours).

Redness: 1.33 of max. 110 (mean) (Time point: 24 hours) (fully reversible within: 72 hours).

Redness: 0.33 of max. 110 (mean) (Time point: 48 hours) (fully reversible within: 72 hours).

Chemosis score: 0.33 of max. 110 (mean) (Time point: 1 hour) (fully reversible within: 72 hours).

Based on a lack of significant eye irritation, n-pentane is not classified as eye irritant.

#### Respiratory or skin

#### sensitisation

Not sensitizing (equivalent or similar to OECD 406 / EU Method B.6), guinea pig

#### Germ cell mutagenicity

CLP classification (Regulation (EC) No 1272/2008): no

**Additional information** classification required.  
 In-vitro studies (bacterial reverse mutation assay, e.g. Ames test, gene mutation (*S. typhimurium* TA)): negative (equivalent or similar to OECD 471).  
 In-vitro studies (mammalian cell chromosome aberration test, cytogenicity (Chinese hamster Ovary)): negative (EU Method B.10).  
 In vivo studies (micronucleus assay, chromosome aberration (inhalation, rat)): negative (EU Method B.12).

**Carcinogenicity** CLP classification (Regulation (EC) No 1272/2008): no classification required.

**Toxicity for reproduction** CLP classification (Regulation (EC) No 1272/2008): no classification required.

<i>Pentane (CAS 109-66-0)</i>	
NOAEC (effects on fertility), inhalation, rat	2000 ppm (6880 mg/m <sup>3</sup> ) (read-across) Test material: Cyclohexane Test method: equivalent or similar to OECD 416
NOAEL (developmental toxicity), oral, rat	1000 mg/kg/day (maternal toxicity) (read-across) Test material: n-pentane Test method: equivalent or similar to OECD 414/EU Method B.31.

**STOT-single exposure** n-pentane is classified as STOT Single Exp. 3 (H336: May cause drowsiness or dizziness) in accordance with CLP EU Regulation 1272/2008. Affected organs: Central Nervous System. Route of exposure: Inhalation.  
 [Based on the information on anaesthetic activity of n-pentane].

**Repeated dose toxicity** CLP classification (Regulation (EC) No 1272/2008): Specific Target Organ Toxicity: Repeated Exposure: no classification required.

<i>Pentane (CAS 109-66-0)</i>	
NOAEC, short-term repeated dose toxicity, inhalation, rat, male	1000 ppm (2951 mg/m <sup>3</sup> ) (equivalent or similar to OECD 412)
NOAEC, subchronic toxicity, inhalation, rats	20 - 30 mg/L air (equivalent or similar to OECD 413)
NOEC, subchronic toxicity, inhalation, rats	> 2220 ppm (organ weights) (equivalent or similar to OECD 413)
NOEC, neurotoxicity, inhalation, rats	>= 6646 ppm (overall effects) (equivalent or similar to OECD 413)

**Aspiration hazard** Asp. Tox. 1. May be fatal if swallowed and enters airways.  
**Additional information** Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

## SECTION 12. ECOLOGICAL INFORMATION

### 12.1. Toxicity

CLP classification (Regulation (EC) No 1272/2008): Aquatic Chronic 2 (Toxic to aquatic life with long lasting effects)

<i>Pentane (CAS 109-66-0)</i>	
<b>Fish (Short-term toxicity)</b>	
LL50 (96h)	27.55 mg/L - <i>Oncorhynchus mykiss</i> (freshwater) (QSAR)

	(PETROTOX) modelled data)
LC50 (96h)	4.26 mg/L - <i>Oncorhynchus mykiss</i> (freshwater) (OECD 203)
<b>Fish (Long-term toxicity)</b>	
NOELR (28 days)	6.165 mg/L <i>Oncorhynchus mykiss</i> (freshwater) (QSAR (PETROTOX) modelled data)
<b>Aquatic invertebrates (Short-term toxicity)</b>	
EL50 (48 h)	48.11 mg/L <i>Daphnia magna</i> (freshwater) (QSAR (PETROTOX) modelled data)
EC50 (48 h)	2.7 mg/L <i>Daphnia magna</i> (freshwater) (OECD 202)
<b>Aquatic invertebrates (Long-term toxicity)</b>	
NOELR (21 days)	10.76 mg/L <i>Daphnia magna</i> (freshwater) (QSAR (PETROTOX) modelled data)
<b>Algae and aquatic plants</b>	
EL50 (72 h)	20.33 mg/L <i>Pseudokirchnerella subcapitata</i> (freshwater) (QSAR (PETROTOX) modelled data)
NOEC (72 h)	4.549 mg/L <i>Pseudokirchnerella subcapitata</i> (freshwater) (QSAR (PETROTOX) modelled data)
EC50 (72 h)	10.7 mg/L <i>Scenedesmus capricornutum</i> (freshwater) (OECD 201)
NOEC (72 h)	2.04 mg/L <i>Scenedesmus capricornutum</i> (freshwater) (OECD 201)
<b>Toxicity to aquatic micro-organisms</b>	
EL50 (48 h)	105.9 mg/L <i>Tetrahymena pyriformis</i> (freshwater) (QSAR (PETROTOX) modelled data)
NOEL (48 h)	23.7 mg/L <i>Tetrahymena pyriformis</i> (freshwater) (QSAR (PETROTOX) modelled data)
<b>12.2. Persistence and degradability</b>	
Abiotic degradation:	<u>Hydrolysis</u> This chemical substance consists entirely of carbon and hydrogen and does not contain hydrolyzable groups. As such, it has a very low potential to hydrolyze. Therefore, this degradative process will not contribute to its removal from the environment. <u>Phototransformation in air</u> Half-life (DT50): 94.8 h (3.95 d) (calculation data accordance with the TGD)
Biodegradation	Readily biodegradable % Degradation of test substance: 87 after 28 d (equivalent or similar to OECD Guideline 301F).
Persistence and degradability	Based on the available measured data, n-pentane is biodegradable. Therefore, based on initial persistence screening the substance is not expected to meet the Persistent (P) or very Persistent (vP) criteria.
<b>12.3. Environmental distribution</b>	
Adsorption / desorption	Log Kow: 3.45; Koc at 20 °C: 794.3; Log Koc: 2.9 (QSAR data) The adsorptivity of n-pentane is moderate, but it still has good mobility in the environment.
Environmental distribution:	Percent distribution in media (PETRORISK Model, version 5.2): Air (%): 97.7                      Sediment (%): 0.5 Water (%): 1.8                      Susp. sediment (%): 0 Soil (%): 0                              Biota (%): 0

NORMAL PENTANE FRACTION  
VERSION:3.1  
DATE CREATED: 22/12/2020  
LANGUAGE: ENGLISH



#### 12.4. Bioaccumulative potential

Aquatic bioaccumulation:	Bioaccumulation factor: BCF: 171 (log Kow of 3.45) (QSAR) The BCF indicates that n-pentane has a low potential to bioaccumulate in the lipids of ecological receptors.
Secondary poisoning:	Based on the available information, there is no indication of a bioaccumulation potential and, hence, secondary poisoning is not considered relevant.

#### 12.5. Mobility in soil

Biodegradation in soil:	In accordance with column 2 of REACH Annex IX, no simulation tests in soil are required, since n-pentane is readily biodegradable according to OECD criteria.
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#### 12.6. Results of PBT and vPvB assessment

Regarding all available data on biotic and abiotic degradation, bioaccumulation and toxicity it can be stated that the substance does not fulfill the PBT criteria (not PBT) and not the vPvB criteria (not vPvB).

#### 12.7. Other adverse effects

Not available.

### SECTION 13. DISPOSAL CONSIDERATIONS

#### 13.1. Waste treatment methods

Waste disposal recommendations	<p><u>Disposal methods:</u> Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.</p> <p><u>Product disposal:</u> Recover and recycle product if possible. If recovery and recycling are not possible, isopentane may be disposed of by incineration. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.</p> <p><u>Packaging disposal:</u> Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND</p>
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CAUSE INJURY OR DEATH.

European List of Waste (LoW)  
code

08 XX XX

These codes are assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste producers need to assess the actual process used when generating the waste and its contaminants in order to assign the proper waste disposal code(s).

## SECTION 14. TRANSPORT INFORMATION

### 14.1. Land transport (ADR/ RID)

UN-No. 1265  
Proper Shipping Name: PENTANES  
Hazard class: 3  
Packing group: I  
Hazard label: 3



Classification Code: F1  
Hazard identification number (HIN): 33  
EAC code 3YE  
Transport category (Tunnel restriction code) 1 (D/E)  
Environmental hazard: Yes

### 14.2. Inland waterway transport (ADN)

UN-No. 1265  
Proper Shipping Name: PENTANES  
Hazard class: 3  
Packing group: I  
Hazard label: 3 (N2)



Classification Code: 1F  
Hazard identification number (HIN): 33  
Environmental hazard: Yes

### 14.3. Sea transport (IMDG)

UN-No. 1265  
Proper Shipping Name: PENTANES  
Hazard class: 3  
Packing group: I  
Hazard label: 3



EmS-No. (Fire) F-E



EmS-No. (Spillage) S-D  
Properties and Observations: Colourless liquids with a paraffin-like odour.  
Explosive limits: 1.4% to 8%.  
Boiling point 36°C.  
Immiscible with water.  
Slightly irritating to skin, eyes and mucous membranes.  
Narcotic in high concentrations.  
Marine pollutant: Yes

#### 14.4. Air transport (IATA/ICAO)

UN-No. 1265  
Proper Shipping Name: PENTANES  
Hazard class: 3  
Packing group: I  
Hazard label: 3



Environmental hazard: Yes

#### 14.5. Special precautions for user

Always transport in closed containers. Ensure that persons transporting the product know what to do in the event of an accident or spillage. For information regarding Exposure Controls/Personal Protection see Section 8 of the SDS

#### 14.6. Transport in bulk according to Annex II of Marpol and the IBC Code

##### Pentane (all isomers):

Ship type required: 3  
Inland Barge: Double Hull  
Pollution category: Y  
IBC 16.2.6: No  
IBC 16.2.9: No  
Pre-Wash Required: No  
Tank type: 2G

### SECTION 15. REGULATORY INFORMATION

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

##### 15.1.1. EU-Regulations

##### Authorisations and/or restrictions on use (Annex XVII)

##### (H304, Aspiration hazard)

1. Shall not be used in:

- ornamental articles intended to produce light or colour effects by means of different phases, for example in ornamental lamps and ashtrays,
- tricks and jokes,
- games for one or more participants, or any article intended to be used as such, even with ornamental aspects,

2. Articles not complying with paragraph 1 shall not be placed on the market.

3. Shall not be placed on the market if they contain a colouring agent, unless required for fiscal reasons, or perfume, or both, if they:

- can be used as fuel in decorative oil lamps for supply to the general public, and,
- present an aspiration hazard and are labelled with R65 or H304,

4. Decorative oil lamps for supply to the general public shall not be placed on the market unless they conform to the European Standard on Decorative oil lamps (EN 14059) adopted by the European Committee for Standardisation (CEN).

5. Without prejudice to the implementation of other Community provisions relating to the classification, packaging and labelling of dangerous substances and mixtures, suppliers shall ensure, before the placing on the market, that the following requirements are met:

(a) lamp oils, labelled with R65 or H304, intended for supply to the general public are visibly, legibly and indelibly marked as follows: 'Keep lamps filled with this liquid out of the reach of children'; and, by 1 December 2010, 'Just a sip of lamp oil — or even sucking the wick of lamps — may lead to lifethreatening lung damage';

(b) grill lighter fluids, labelled with R65 or H304, intended for supply to the general public are legibly and indelibly marked by 1 December 2010 as follows: 'Just a sip of grill lighter may lead to life threatening lung damage';

(c) lamp oils and grill lighters, labelled with R65 or H304, intended for supply to the general public are packaged in black opaque containers not exceeding 1 litre by 1 December 2010.

6. No later than 1 June 2014, the Commission shall request the European Chemicals Agency to prepare a dossier, in accordance with Article 69 of the present Regulation with a view to ban, if appropriate, grill lighter fluids and fuel for decorative lamps, labelled R65 or H304, intended for supply to the general public.

7. Natural or legal persons placing on the market for the first time lamp oils and grill lighter fluids, labelled with R65 or H304, shall by 1 December 2011, and annually thereafter, provide data on alternatives to lamp oils and grill lighter fluids labelled R65 or H304 to the competent authority in the Member State concerned. Member States shall make those data available to the Commission.

Pentane (CAS 109-66-0) is not on the REACH **Candidate List**.

Pentane (CAS 109-66-0) is not on the REACH **Annex XIV List**.

**Other information, restriction and prohibition regulations** Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer. Annex II - Not listed.

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances- (SEVESO III):  
Physical Hazard – P5a, P5b, P5c - Flammable liquids.  
Environmental Hazard – E2 – Hazardous to the Aquatic Environment

Directive 2013/39/EU priority substances in the field of water policy (amending Directive 2006/60/EC – Water Framework Directive and Directive 2008/105/EC on environmental quality standards in the field of water policy): Not listed.

Regulation (EC) No 850/2004 on persistent organic pollutants:  
Annex III – Not listed.

Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals: Not listed.

### 15.1.2. National regulations

Germany Ordinance on facilities for handling substances that are hazardous to water (Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (AwSV)) of 18 April 2017 (BGBl 2017, Teil I, Nr. 22, Seite 905).  
 Kennnummer: 452  
 WGK: 2 - distinct hazard to waters.

### 15.2. Chemical safety assessment

Chemical Safety Report has been performed for Pentane (CAS 109-66-0).

## SECTION 16. OTHER INFORMATION

### 16.1 Indication of changes

Version	Date of change	Section	Description of changes
Version: 1	16/01/2010		Version created according to Regulations (EC) No 1907/2006 (Article 31.1)
Version: 2.1	08/02/2011		Version created according to Regulation (EC) No 1272/2008 (Regulation CLP) & 453/2010
Version: 2.2	17/10/2011	2-8; 10-16	Sections 2-8; 10-16 were fully updated according to recommendations of 'Guidance on the compilation of safety data sheets (version 1.0 – September 2011)'
Version: 2.3	29/09/2014	8.1.1; 16.1	Sections 8.1.1 and 16.1 were corrected.
Version: 2.4	17/05/2016	Title, 1.3	Company name of the Supplier was changed from «Tobolsk-Neftekhim» on «SIBUR Tobolsk».
Version: 3.0	12/03/2020	1-16, Annex	SDS have been corrected in according to new data of Registration dossier, Chemical Safety Report and new Transport information
Version: 3.1	22/12/2020	1.3, 1.4	Company name of the Supplier was changed

### 16.2 Abbreviations and acronyms

ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
AGS	German Committee on Hazardous Substances (Ausschuss für Gefahrstoffe – AGS)
BCF	Bioconcentration factor
DFG	Germany Research Foundation
DMEL	Derived Minimum Effect Level
DNEL	Derived No Effect Level
DT50	Disappearance Time for 50%
EAC	Emergency Action Code
EmS	Emergency Procedures for Ships Carrying Dangerous Goods
ERG	Emergency Response Guidance
EC50	Effect Concentration to 50%
EL50	Effect Load for 50%
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
ICAO-TI	Technical Instructions for the Safe Transport of Dangerous Goods by Air

Koc	Adsorption coefficient
Kow	Octanol-water partition coefficient
LC50	Lethal Concentration to 50 % of a test population
LD50	Lethal Dose to 50% of a test population (Median Lethal Dose)
LL50	Lethal Load for 50%
LOAEC	Lowest Observable Adverse Effect Concentration
LTEL	Long Term Exposure Limit
NOEC	No Observed Effect Concentration
NOAEL	No Observed Adverse Effect Level
NOAEC	No Observable Adverse Effect Concentration
NOEL	No Observed Effect Loading
NOELR	No Observed Effect Loading Rate
OECD	Organization for Economic Co-operation and Development
PNEC	Predicted No Effect Concentration
PBT	Persistent, bioaccumulative, toxic chemical
vPvB	Very Persistent, Very Bioaccumulative
QSAR	Quantitative structure activity relationship
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
STEL	Short Term Exposure Limit
STP	sewage treatment plant
STOT	Specific Target Organ Toxicity
(STOT) RE	Repeated Exposure
(STOT) SE	Single Exposure
TGD	Technical Guidance Documents
TWA	Time Weighted Average
UN	United Nations

### 16.3. Full text of H- and EUH-statements:

H224	Flam. Liquid 1	Extremely flammable liquid and vapour.
H304	Asp. Tox. 1	May be fatal if swallowed and enters airways.
H336	STOT Single Exp. 3	May cause drowsiness or dizziness.
H411	Aquatic Chronic 2	Toxic to aquatic life with long lasting effects.
EUH066	Repeated exposure may cause skin dryness or cracking.	

### 16.4 List of ES (exposure scenario) given in Annex to the extended SDS

ES1	Manufacture of Substance - Industrial
ES2	Distribution of Substance – Industrial
ES3	Formulation & (Re)packing of Substances and Mixtures – Industrial
ES4	Uses in Coatings – Industrial
ES5	Uses in Coatings – Consumer
ES6	Use in Cleaning Agents – Industrial
ES7	Use in Cleaning Agents – Professional
ES8	Use in Cleaning Agents – Consumer
ES9	Use as a Blowing Agent – Industrial
ES10	Use in Agrochemicals – Professional
ES11	Use as a Fuel – Industrial
ES12	Use as a Fuel – Professional
ES13	Use as a Fuel - Consumer
ES14	Use as Functional Fluids – Industrial

ES15	Use as Functional Fluids – Professional
ES16	Other Consumer Uses – Consumer
ES17	Use in Laboratories – Industrial
ES18	Use in Laboratories – Professional

### 16.5. Key literature references and sources

#### **DOCUMENTS, PROVIDED BY FERC CONSORTIUM:**

CHEMICAL SAFETY REPORT to Pentane (CAS 109-66-0)

#### **EU DIRECTIVES**

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

Regulation (EC) No 1272/2008 REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Regulations. Commission regulation (EU) no 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

#### **Training advice**

Product handling instruction shall be included into the educational system about the safety work (initial training, training at the workplace, repeated training) according to specific conditions at the workplace.

#### *DISCLAIMER*

*This information is based on our current level of knowledge. This information may be subject to revision as new knowledge and experience becomes available, and SIBUR makes no warranties and assumes no liability in connection with any use of this information. Since SIBUR cannot be aware of all aspects of your business and the impact the REACH Regulation has for your company, SIBUR strongly encourages you to get familiar with the REACH Regulation in order to comply with its requirements and timelines.*

## ANNEX. EXPOSURE SCENARIOS

### Exposure Scenario 1 (ES1): Manufacture of Substance – Industrial

<b>Section 1 Exposure Scenario Title</b>	
Title	
Manufacture of Substance – Industrial GES1.1	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 4, 8a, 8b, 15
Environmental Release Categories	1, 4
Specific Environmental Release Category	ESVOC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions</b> <i>(only required controls to demonstrate safe use listed)</i>
General exposures (closed systems) [CS15] PROC1	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC2	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC3	No specific measures identified[EI18]
General exposures (open systems) [CS16] PROC4	No specific measures identified[EI18]
Process sampling [CS2] PROC8b	No specific measures identified[EI18]
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]
Bulk transfers [CS14](open systems) [CS108] PROC8b	No specific measures identified[EI18]
Bulk transfers [CS14](closed systems) [CS107] PROC8b	No specific measures identified[EI18]
Equipment cleaning and maintenance [CS39] PROC8a	No specific measures identified[EI18]

Material storage [CS67] PROC1	No specific measures identified[EI18]
Material storage [CS67] PROC2	No specific measures identified[EI18]
<b>Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3</b>	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	22000
Fraction of Regional tonnage used locally [A3]	1
Annual site tonnage (tonnes/year) [A5]	22000
Maximum daily site tonnage (kg/day) [A4]	72000
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.005
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.0003
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR9].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	7.5
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{Safe}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	2200000
Assumed domestic sewage treatment plant flow ( $m^3/d$ ) [STP5]	10000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated [ETW4].	

Conditions and measures related to external recovery of waste
During manufacturing no waste of the substance is generated [ERW2].
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet
<b>Section 3 Exposure Estimation</b>
<b>3.1. Health</b>
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]
<b>3.2. Environment</b>
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
<b>4.2. Environment</b>
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].

**Exposure Scenario 2 (ES2) Distribution of Substance – Industrial**

<b>Section 1 Exposure Scenario Title</b>	
Title	
Distribution of Substance – Industrial GES1A.1	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 4, 8a, 8b, 9, 15
Environmental Release Categories	1, 2, 3, 4, 5, 6, 7
Specific Environmental Release Category	ESVOC 1.1b.v1
Processes, tasks, activities covered	
Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, maintenance and associated laboratory activities.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been



	implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)</b>
General exposures (closed systems) [CS15] PROC1	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC2	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC3	No specific measures identified[EI18]
General exposures (open systems) [CS16] PROC4	No specific measures identified[EI18]
Process sampling [CS2] PROC3	No specific measures identified[EI18]
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]
Bulk transfers [CS14](closed systems) [CS107] PROC8b	No specific measures identified[EI18]
Bulk transfers [CS14](open systems) [CS108] PROC8b	No specific measures identified[EI18]
Drum and small package filling [CS6] PROC9	No specific measures identified[EI18]
Equipment cleaning and maintenance [CS39] PROC8a	No specific measures identified[EI18]
Material storage [CS67] PROC1	No specific measures identified[EI18]
Material storage [CS67] PROC2	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	3600
Fraction of Regional tonnage used locally [A3]	0.002
Annual site tonnage (tonnes/year) [A5]	7.2
Maximum daily site tonnage (kg/day) [A4]	360
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.0001
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.00001
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	

Risk from environmental exposure is driven by freshwater sediment [TCR1b]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{\text{Safe}}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	13000000
Assumed domestic sewage treatment plant flow ( $\text{m}^3/\text{d}$ ) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
<b>4.2. Environment</b>	
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].	

**Exposure Scenario 3 (ES3) Formulation & (Re)packing of Substances and Mixtures – Industrial**

<b>Section 1 Exposure Scenario Title</b>
Title
Formulation & (Re)packing of Substances and Mixtures – Industrial GES2.1

Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15
Environmental Release Categories	2
Specific Environmental Release Category	ESVOC 2.2.v1
Processes, tasks, activities covered	
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletization, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product characteristics</b>	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions</b> <i>(only required controls to demonstrate safe use listed)</i>
General exposures (closed systems) [CS15] PROC1	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC2	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC3	No specific measures identified[EI18]
General exposures (open systems) [CS16] PROC4	No specific measures identified[EI18]
Batch processes at elevated temperatures [CS136] Operation is carried out at elevated temperature (> then 20°C above ambient temperature) [OC7 ] PROC3	Provide enhanced mechanical ventilation by mechanical means [E48]
Process sampling [CS2] PROC3	No specific measures identified[EI18]
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]
Bulk transfers [CS14] PROC8b	No specific measures identified[EI18]
Mixing operations (open systems) [CS30] PROC5	No specific measures identified[EI18]
Manual [CS34] Transfer from/pouring from containers [CS22] PROC8a	No specific measures identified[EI18]
Drum/batch transfers [CS8] PROC8b	No specific measures identified[EI18]
Production or preparation of articles by tableting, compression, extrusion or pelletisation [CS100] PROC14	No specific measures identified[EI18]
Drum and small package filling [CS6]	No specific measures identified[EI18]

PROC9	
Equipment cleaning and maintenance [CS39] PROC8a	No specific measures identified[EI18]
Material storage [CS67] PROC1	No specific measures identified[EI18]
Material storage [CS67] PROC2	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	3400
Fraction of Regional tonnage used locally [A3]	1
Annual site tonnage (tonnes/year) [A5]	3400
Maximum daily site tonnage (kg/day) [A4]	11000
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (after typical onsite RMMs, consistent with EU Solvent Emissions Directive requirements) [OOC11]	0.025
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.0002
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{\text{Safe}}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	650000

Assumed domestic sewage treatment plant flow (m <sup>3</sup> /d) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
<b>4.2. Environment</b>	
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].	

#### Exposure Scenario 4 (ES4) Uses in Coatings – Industrial

<b>Section 1 Exposure Scenario Title</b>	
Title	
Uses in Coatings – Industrial GES3.1	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 4, 5, 7, 8a, 8b, 10, 13, 15.
Environmental Release Categories	4
Specific Environmental Release Category	ESVOC 4.3a.v1
Processes, tasks, activities covered	
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.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated

	differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions</b> <i>(only required controls to demonstrate safe use listed)</i>
General exposures (closed systems) [CS15] PROC1	No specific measures identified[EI18]
General exposures (closed systems) [CS15]with sample collection [CS56]Use in contained systems [CS38] PROC2	No specific measures identified[EI18]
Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing [CS94]Operation is carried out at elevated temperature (> then 20°C above ambient temperature) [OC7 ] PROC2	Provide enhanced mechanical ventilation by mechanical means [E48]
Mixing operations (closed systems) [CS29]General exposures (closed systems) [CS15] PROC3	No specific measures identified[EI18]
Film formation - air drying [CS95] PROC4	No specific measures identified[EI18]
Preparation of material for application [CS96]Mixing operations (open systems) [CS30] PROC5	No specific measures identified[EI18]
Spraying (automatic/robotic) [CS97] PROC7	No specific measures identified[EI18]
Manual [CS34]Spraying [CS10] PROC7	No specific measures identified[EI18]
Material transfers [CS3] PROC8a	No specific measures identified[EI18]
Material transfers [CS3] PROC8b	No specific measures identified[EI18]
Roller, spreader, flow application [CS98] PROC10	No specific measures identified[EI18]
Dipping, immersion and pouring [CS4] PROC13	No specific measures identified[EI18]
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]
Material transfers [CS3]Drum/batch transfers [CS8]Transfer from/pouring from containers [CS22] PROC9	No specific measures identified[EI18]
Production or preparation of articles by tableting, compression, extrusion or pelletisation [CS100] PROC14	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
<i>Product characteristics</i>	

Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	2.1
Fraction of Regional tonnage used locally [A3]	1
Annual site tonnage (tonnes/year) [A5]	2.1
Maximum daily site tonnage (kg/day) [A4]	110
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.098
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.0007
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{\text{Safe}}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	190000
Assumed domestic sewage treatment plant flow ( $\text{m}^3/\text{d}$ ) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	

<b>3.1. Health</b>
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]
<b>3.2. Environment</b>
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
<b>4.2. Environment</b>
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].

**Exposure Scenario 5 (ES5) Uses in Coatings – Consumer**

<b>Section 1 Exposure Scenario Title</b>	
Title	
Uses in Coatings – Consumer GES3.3	
Use Descriptor	
Sector(s) of Use	21
Product Categories	1, 4, 8 (excipient only), 9, 15, 18, 23, 24, 31, 34
Environmental Release Categories	8a, 8d
Specific Environmental Release Category	ESVOC 8.3c.v1
Processes, tasks, activities covered	
Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of consumer exposure</b>	
Product characteristics	
Physical form of product	liquid
Vapour pressure	56.3 kPa
Concentration of substance in product	Unless otherwise stated, cover concentrations up to 100% [ConsOC1]
Amounts used	Unless otherwise stated, covers use amounts up to 13800g [ConsOC2]; covers skin contact area up to 857.5cm <sup>2</sup> [ConsOC5]
Frequency and duration of use/exposure	Unless otherwise stated, covers use frequency up to 1 times per day [ConsOC4]; covers exposure up to 6 hours per event [ConsOC14]
Other Operational Conditions affecting exposure	Unless otherwise stated assumes use at ambient temperatures [ConsOC15]; assumes use in a 20 m <sup>3</sup> room [ConsOC11]; assumes use with typical ventilation [ConsOC8].
<b>Product Category</b>	<b>Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)</b>
PC1:Adhesives, sealants--	Unless otherwise stated, covers concentrations up to 30% [ConsOC1]; covers



Glues, hobby use	use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 35.73 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 9g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC1:Adhesives, sealants-- Glues DIY-use (carpet glue, tile glue, wood parquet glue)	Unless otherwise stated, covers concentrations up to 30% [ConsOC1]; covers use up to 1 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 110.00 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 6390g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 6.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC1:Adhesives, sealants-- Glue from spray	Unless otherwise stated, covers concentrations up to 30% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 35.73 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 85.05g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC1:Adhesives, sealants-- Sealants	Unless otherwise stated, covers concentrations up to 30% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 35.73 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 75g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 1.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products--Washing car window	Unless otherwise stated, covers concentrations up to 1% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 0.5g [ConsOC2]; Covers use in a one car garage (34m <sup>3</sup> ) under typical ventilation [ConsOC10]; covers use in room size of 34m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.02hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products--Pouring into radiator	Unless otherwise stated, covers concentrations up to 10% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.00 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 2000g [ConsOC2]; Covers use in a one car garage (34m <sup>3</sup> ) under typical ventilation [ConsOC10]; covers use in room size of 34m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products--Lock de-icer	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 214.40 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 4g [ConsOC2]; Covers use in a one

	car garage (34m <sup>3</sup> ) under typical ventilation [ConsOC10]; covers use in room size of 34m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.25hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC8_n: Biocidal products (excipient use only for solvent products)--Laundry and dish washing products	Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 15g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.50hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC8_n: Biocidal products (excipient use only for solvent products)-- Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners )	Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 27g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC8_n: Biocidal products (excipient use only for solvent products)-- Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Unless otherwise stated, covers concentrations up to 15% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.00 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 35g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners-- Waterborne latex wall paint	Unless otherwise stated, covers concentrations up to 1.5% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 2760g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners-- Solvent rich, high solid, water borne paint	Unless otherwise stated, covers concentrations up to 27.5% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 744g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners-- Aerosol spray can	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 2 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 215g [ConsOC2]; Covers use in a one car garage (34m <sup>3</sup> ) under typical ventilation [ConsOC10]; covers use in room size of 34m <sup>3</sup> [ConsOC11]; for each use

	event, covers exposure up to 0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9a:Coatings and paints, fillers putties, thinners-- Removers (paint-, glue-, wall paper-, sealant-remover)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 3 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 491g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay-- Fillers and putty	Unless otherwise stated, covers concentrations up to 2% [ConsOC1]; covers use up to 12 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 85g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay-- Plasters and floor equalizers	Unless otherwise stated, covers concentrations up to 2% [ConsOC1]; covers use up to 12 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 13800g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay-- Modelling clay	Unless otherwise stated, covers concentrations up to 1% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 254.40 cm2 [ConsOC5]; for each use event, assumes swallowed amount of 1g [ConsOC13];
	No specific RMMs identified beyond those OCs stated
PC9c:Finger paints --Finger paints	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 254.40 cm2 [ConsOC5]; for each use event, assumes swallowed amount of 1.35g [ConsOC13];
	No specific RMMs identified beyond those OCs stated
PC15_n: Non-metal surface treatment products-- Waterborne latex wall paint	Unless otherwise stated, covers concentrations up to 1.5% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 2760g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC15_n: Non-metal surface treatment products--Solvent	Unless otherwise stated, covers concentrations up to 27.5% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of

rich, high solid, water borne paint	use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 744g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC15_n: Non-metal surface treatment products-- Aerosol spray can	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 2 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 215g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC15_n: Non-metal surface treatment products-- Removers (paint-, glue-, wall paper-, sealant-remover)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 3 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 491g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC18_n: Ink and toners-- Inks and toners.	Unless otherwise stated, covers concentrations up to 10% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 71.40 cm2 [ConsOC5]; for each use event, covers use amounts up to 40g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC23_n: Leather tanning, dye, finishing, impregnation and care products--Polishes, wax / cream (floor, furniture, shoes)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 29 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 430.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 56g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 1.23hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC23_n: Leather tanning, dye, finishing, impregnation and care products--Polishes, spray (furniture, shoes)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 8 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 430.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 56g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products-- Liquids	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 468.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 2200g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in

	room size of 34m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products-- Pastes	Unless otherwise stated, covers concentrations up to 20% [ConsOC1]; covers use up to 10 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 468.00 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 34g [ConsOC2];
	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products-- Sprays	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 73g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC31:Polishes and wax blends--Polishes, wax / cream (floor, furniture, shoes)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 29 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 430.00 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 142g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 1.23hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC31:Polishes and wax blends--Polishes, spray (furniture, shoes)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 8 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 430.00 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 35g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC34_n: Textile dyes, finishing and impregnating products--	Unless otherwise stated, covers concentrations up to 10% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 115g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 1.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	1
Fraction of Regional tonnage used locally [A3]	0.0005

Annual site tonnage (tonnes/year) [A5]	0.0005
Maximum daily site tonnage (kg/day) [A4]	0.0014
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.99
Release fraction to wastewater from wide dispersive use [OOC8]	0.01
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.005
Conditions and measures related to municipal sewage treatment plant	
Risk from environmental exposure is driven by freshwater [STP7a].	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Maximum allowable site tonnage ( $M_{Safe}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	60
Assumed domestic sewage treatment plant flow (m <sup>3</sup> /d) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated consumer exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[ConsG1]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
<b>4.2. Environment</b>	
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 [DSU1]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].	

### Exposure Scenario 6 (ES6) Use in Cleaning Agents – Industrial

<b>Section 1 Exposure Scenario Title</b>	
Title	
Use in Cleaning Agents – Industrial GES 4.1	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 4, 7, 8a, 8b, 10, 13
Environmental Release Categories	4
Specific Environmental Release Category	ESVOC 4.4a.v1
Processes, tasks, activities covered	
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.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
Contributing Scenarios	<b>Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)</b>
Bulk transfers [CS14] PROC8a	No specific measures identified[EI18]
Automated process with (semi) closed systems. [CS93]Use in contained systems [CS38] PROC2	No specific measures identified[EI18]
Automated process with (semi) closed systems. [CS93]Drum/batch transfers [CS8] PROC3	No specific measures identified[EI18]
Application of cleaning products in closed systems [CS101] PROC2	No specific measures identified[EI18]
Filling / preparation of equipment from drums or containers. [CS45] PROC8b	No specific measures identified[EI18]
Use in contained batch processes [CS37] PROC4	No specific measures identified[EI18]
Degreasing small objects in cleaning station [CS41] PROC13	No specific measures identified[EI18]
Cleaning with low-pressure washers [CS42] PROC10	No specific measures identified[EI18]
Cleaning with high pressure washers	No specific measures identified[EI18]

[CS44] PROC7	
Manual [CS34]Surfaces [CS48]Cleaning [CS47] PROC10	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	7.5
Fraction of Regional tonnage used locally [A3]	1
Annual site tonnage (tonnes/year) [A5]	7.5
Maximum daily site tonnage (kg/day) [A4]	380
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.03
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.000003
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater [TCR1a]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	70
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{Safe}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	12000000
Assumed domestic sewage treatment plant flow (m <sup>3</sup> /d) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	



External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].
Conditions and measures related to external recovery of waste
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet
<b>Section 3 Exposure Estimation</b>
<b>3.1. Health</b>
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]
<b>3.2. Environment</b>
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
<b>4.2. Environment</b>
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].

**Exposure Scenario 7 (ES7) Use in Cleaning Agents – Professional**

<b>Section 1 Exposure Scenario Title</b>	
Title	
Use in Cleaning Agents – Professional GES4.2	
Use Descriptor	
Sector(s) of Use	22
Process Categories	1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19
Environmental Release Categories	8a, 8d
Specific Environmental Release Category	ESVOC 8.4b.v1
Processes, tasks, activities covered	
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).	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]

Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions</b> <i>(only required controls to demonstrate safe use listed)</i>
Filling / preparation of equipment from drums or containers. [CS45] PROC8b	No specific measures identified[EI18]
Automated process with (semi) closed systems. [CS93]Use in contained systems [CS38] PROC2	No specific measures identified[EI18]
Automated process with (semi) closed systems. [CS93]Drum/batch transfers [CS8]Use in contained systems [CS38] PROC3	No specific measures identified[EI18]
Semi Automated process. (e.g.: Semi automatic application of floor care and maintenance products) [CS76] PROC4	No specific measures identified[EI18]
Filling / preparation of equipment from drums or containers. [CS45] PROC8a	No specific measures identified[EI18]
Manual [CS34]Surfaces [CS48]Cleaning [CS47]Dipping, immersion and pouring [CS4] PROC13	No specific measures identified[EI18]
Cleaning with low-pressure washers [CS42]Rolling, Brushing [CS51]no spraying [CS60] PROC10	No specific measures identified[EI18]
Cleaning with high pressure washers [CS44]Spraying [CS10]Indoor [OC8] PROC11	Avoid carrying out operation for more than 4 hours [OC12 ]
Cleaning with high pressure washers [CS44]Spraying [CS10]Outdoor [OC9] PROC11	Avoid carrying out operation for more than 4 hours [OC12 ]
Manual [CS34]Surfaces [CS48]Cleaning [CS47]Spraying [CS10] PROC10	No specific measures identified[EI18]
Ad hoc manual application via trigger sprays, dipping, etc. [CS27]Rolling, Brushing [CS51] PROC10	No specific measures identified[EI18]
Ad hoc manual application via trigger sprays, dipping, etc. [CS27]Rolling, Brushing [CS51] PROC10	No specific measures identified[EI18]
Application of cleaning products in closed systems [CS101]Outdoor [OC9] PROC4	No specific measures identified[EI18]
Cleaning of medical devices [CS74] PROC4	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	

Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	7.5
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.0038
Maximum daily site tonnage (kg/day) [A4]	0.01
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.02
Release fraction to wastewater from wide dispersive use [OOC8]	0.000001
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater [TCR1a]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{Safe}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	450
Assumed domestic sewage treatment plant flow ( $m^3/d$ ) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW3].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management	

measures are adopted.[G8]
<b>3.2. Environment</b>
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
<b>4.2. Environment</b>
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].

**Exposure Scenario 8 (ES8) Use in Cleaning Agents – Consumer**

<b>Section 1 Exposure Scenario Title</b>	
Title	
Use in Cleaning Agents – Consumer GES4.3	
Use Descriptor	
Sector(s) of Use	21
Product Categories	3, 4, 8 (excipient only), 9, 24, 35, 38
Environmental Release Categories	8a, 8d
Specific Environmental Release Category	ESVOC 8.4c.v1
Processes, tasks, activities covered	
Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of consumer exposure</b>	
Product characteristics	
Physical form of product	liquid
Vapour pressure	56.300 kPa
Concentration of substance in product	Unless otherwise stated, cover concentrations up to 100% [ConsOC1]
Amounts used	Unless otherwise stated, covers use amounts up to 13800g [ConsOC2]; covers skin contact area up to 857.5cm <sup>2</sup> [ConsOC5]
Frequency and duration of use/exposure	Unless otherwise stated, covers use frequency up to 4 times per day [ConsOC4]; covers exposure up to 8 hours per event [ConsOC14]
Other Operational Conditions affecting exposure	Unless otherwise stated assumes use at ambient temperatures [ConsOC15]; assumes use in a 20 m <sup>3</sup> room [ConsOC11]; assumes use with typical ventilation [ConsOC8].
<b>Product Category</b>	<b>Specific Risk Management Measures and Operating Conditions (<i>only required controls to demonstrate safe use listed</i>)</b>
PC3:Air care products-- Air care, instant action (aerosol sprays)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 4 times/day of use[ConsOC4]; for each use event, covers use amounts up to 0.1g [ConsOC2];

	covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.25hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC3:Air care products-- Air care, instant action (aerosol sprays)- pesticidal- excipient only	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 4 times/day of use[ConsOC4]; for each use event, covers use amounts up to 5g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.25hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC3:Air care products-- Air care, continuous action (solid and liquid)	Unless otherwise stated, covers concentrations up to 10% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 35.70 cm2 [ConsOC5]; for each use event, covers use amounts up to 0.48g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 8.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC3:Air care products-- Air care, continuous action (solid and liquid)- pesticidal- excipient only	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 35.70 cm2 [ConsOC5]; for each use event, covers use amounts up to 0.48g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 8.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products-- Washing car window	Unless otherwise stated, covers concentrations up to 1% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 0.5g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.02hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products-- Pouring into radiator	Unless otherwise stated, covers concentrations up to 10% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 2000g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC4_n:Anti-freeze and de-icing products--Lock de-icer	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 214.40 cm2 [ConsOC5]; for each use event, covers use amounts up to 4g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.25hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated

<p>PC8_n: Biocidal products (excipient use only for solvent products)-- Laundry and dish washing products</p>	<p>Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 15g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.50hr/event[ConsOC14];</p>
	<p>No specific RMMs identified beyond those OCs stated</p>
<p>PC8_n: Biocidal products (excipient use only for solvent products)-- Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners )</p>	<p>Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 27g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];</p>
	<p>No specific RMMs identified beyond those OCs stated</p>
<p>PC8_n: Biocidal products (excipient use only for solvent products)-- Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)</p>	<p>Unless otherwise stated, covers concentrations up to 15% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 35g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];</p>
	<p>No specific RMMs identified beyond those OCs stated</p>
<p>PC9a:Coatings and paints, fillers putties, thinners--Waterborne latex wall paint</p>	<p>Unless otherwise stated, covers concentrations up to 1.5% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 2760g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];</p>
	<p>No specific RMMs identified beyond those OCs stated</p>
<p>PC9a:Coatings and paints, fillers putties, thinners--Solvent rich, high solid, water borne paint</p>	<p>Unless otherwise stated, covers concentrations up to 27.5% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each use event, covers use amounts up to 744g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.20hr/event[ConsOC14];</p>
	<p>No specific RMMs identified beyond those OCs stated</p>
<p>PC9a:Coatings and paints, fillers putties, thinners--Aerosol spray can</p>	<p>Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 2 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 215g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];</p>
	<p>No specific RMMs identified beyond those OCs stated</p>

PC9a:Coatings and paints, fillers putties, thinners--Removers (paint-, glue-, wall paper-, sealant-remover)	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 3 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 491 g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay-- Fillers and putty	Unless otherwise stated, covers concentrations up to 2% [ConsOC1]; covers use up to 12 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 35.73 cm2 [ConsOC5]; for each use event, covers use amounts up to 85g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 4.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay-- Plasters and floor equalizers	Unless otherwise stated, covers concentrations up to 2% [ConsOC1]; covers use up to 12 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 13800g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC9b:Fillers, putties, plasters, modeling clay-- Modelling clay	Unless otherwise stated, covers concentrations up to 1% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 254.40 cm2 [ConsOC5]; for each use event, assumes swallowed amount of 1g [ConsOC13];
	No specific RMMs identified beyond those OCs stated
PC9c:Finger paints -- Finger paints	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 254.40 cm2 [ConsOC5]; for each use event, assumes swallowed amount of 1.35g [ConsOC13];
	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Liquids	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 4 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 468.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 2200g [ConsOC2]; Covers use in a one car garage (34m3) under typical ventilation [ConsOC10]; covers use in room size of 34m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Pastes	Unless otherwise stated, covers concentrations up to 20% [ConsOC1]; covers use up to 10 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 468.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 34g [ConsOC2];
	No specific RMMs identified beyond those OCs stated
PC24: Lubricants, greases, and release products--Sprays	Unless otherwise stated, covers concentrations up to 50% [ConsOC1]; covers use up to 6 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.75 cm2 [ConsOC5]; for each

	use event, covers use amounts up to 73g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC35:Washing and cleaning products (including solvent based products)--Laundry and dish washing products	Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 15g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.50hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC35:Washing and cleaning products (including solvent based products)--Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	Unless otherwise stated, covers concentrations up to 5% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 857.50 cm2 [ConsOC5]; for each use event, covers use amounts up to 27g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.33hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC35:Washing and cleaning products (including solvent based products)--Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	Unless otherwise stated, covers concentrations up to 15% [ConsOC1]; covers use up to 128 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 428.00 cm2 [ConsOC5]; for each use event, covers use amounts up to 35g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 0.17hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
PC38_n: Welding and soldering products, flux products--NOTE, n_assessment not in TRA	Unless otherwise stated, covers concentrations up to 20% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 12g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m3[ConsOC11]; for each use event, covers exposure up to 1.00hr/event[ConsOC14];
	No specific RMMs identified beyond those OCs stated
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	42
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.021
Maximum daily site tonnage (kg/day) [A4]	0.057
Frequency and duration of use	



Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.95
Release fraction to wastewater from wide dispersive use [OOC8]	0.025
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.025
Conditions and measures related to municipal sewage treatment plant	
Risk from environmental exposure is driven by freshwater [STP7a].	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Maximum allowable site tonnage (M <sub>Safe</sub> ) based on release following total wastewater treatment removal (kg/d) [STP6]	1800
Assumed domestic sewage treatment plant flow (m <sup>3</sup> /d) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated consumer exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[ConsG1]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
<b>4.2. Environment</b>	
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 [DSU1]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].	

**Exposure Scenario 9 (ES9) Use as a Blowing Agent – Industrial**

<b>Section 1 Exposure Scenario Title</b>	
<b>Title</b>	
Use as a Blowing Agent – Industrial GES9.1	
<b>Use Descriptor</b>	
Sector(s) of Use	3
Process Categories	1, 2, 3, 8b, 9, 12
Environmental Release Categories	4

Specific Environmental Release Category	ESVOC 4.9.v1
Processes, tasks, activities covered	
Use as a blowing agent for rigid and flexible foams, including material transfers, mixing and injection, curing, cutting, storage and packing.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions</b> <i>(only required controls to demonstrate safe use listed)</i>
Bulk transfers [CS14] PROC8b	No specific measures identified[EI18]
Mixing operations (closed systems) [CS29] PROC1	No specific measures identified [EI18]
Extrusion and expansion of polymer mass [CS122] PROC12	No specific measures identified[EI18]
Cutting and shaving [CS134] PROC12	No specific measures identified[EI18]
Collection and re-processing of shavings, cuttings, etc [CS123] PROC12	No specific measures identified[EI18]
Product packaging [CS124] PROC12	No specific measures identified[EI18]
Material storage [CS67] PROC12	No specific measures identified[EI18]
Mixing operations (closed systems) [CS29]Operation is carried out at elevated temperature (> then 20°C above ambient temperature) [OC7 ] PROC3	Provide enhanced mechanical ventilation by mechanical means [E48]
Intermediate polymer storage [CS66]Operation is carried out at elevated temperature (> then 20°C above ambient temperature) [OC7 ] PROC3	Provide enhanced mechanical ventilation by mechanical means [E48]
Centrifuging including discharging [CS127]Operation is carried out at elevated temperature (> then 20°C above ambient temperature) [OC7 ] PROC3	Provide enhanced mechanical ventilation by mechanical means [E48]
Drying and storage [CS12] PROC12	No specific measures identified[EI18]
Semi-bulk packaging [CS128] PROC8b	No specific measures identified[EI18]
Treatment by heating	Provide enhanced mechanical ventilation by mechanical means [E48]

[CS129]Operation is carried out at elevated temperature (> then 20°C above ambient temperature) [OC7 ] PROC12	
Drying and storage [CS12] PROC12	No specific measures identified[EI18]
Article formation in mould [CS130]Operation is carried out at elevated temperature (> then 20°C above ambient temperature) [OC7 ] PROC12	Provide enhanced mechanical ventilation by mechanical means [E48]
Cutting by heated wire [CS131]Manual [CS34] PROC12	No specific measures identified[EI18]
Mixing operations (closed systems) [CS29] PROC3	No specific measures identified[EI18]
Drum and small package filling [CS6]Filling / preparation of equipment from drums or containers. [CS45] PROC9	No specific measures identified[EI18]
Foaming [CS132] PROC12	No specific measures identified[EI18]
Compression [CS133] PROC12	No specific measures identified[EI18]
Cutting by heated wire [CS131] PROC12	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	1500
Fraction of Regional tonnage used locally [A3]	1
Annual site tonnage (tonnes/year) [A5]	1500
Maximum daily site tonnage (kg/day) [A4]	15000
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	100
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	1.0
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.00003
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by agricultural soil [TCR1f].	

Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{\text{Safe}}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	2500000
Assumed domestic sewage treatment plant flow ( $\text{m}^3/\text{d}$ ) [STP4]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
<b>4.2. Environment</b>	
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].	

**Exposure Scenario 10 (ES10) Use in Agrochemicals – Professional**

<b>Section 1 Exposure Scenario Title</b>
Title
Use in Agrochemicals – Professional GES11.2

Use Descriptor	
Sector(s) of Use	22
Process Categories	1, 2, 4, 8a, 8b, 11, 13
Environmental Release Categories	8a, 8d
Specific Environmental Release Category	ESVOC 8.11a.v1
Processes, tasks, activities covered	
Use as an agrochemical excipient for application by manual or machine spraying, smokes and fogging; including equipment clean-downs and disposal.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions</b> <i>(only required controls to demonstrate safe use listed)</i>
Transfer from/pouring from containers [CS22] PROC8b	No specific measures identified[EI18]
Mixing and blending [CS23] PROC4	No specific measures identified[EI18]
Spraying/fogging by manual application [CS24] PROC11	Avoid carrying out operation for more than 4 hours [OC12 ]
Spraying/fogging by machine application [CS25] PROC11	Avoid carrying out operation for more than 4 hours [OC12 ]
Ad hoc manual application via trigger sprays, dipping, etc. [CS27] PROC13	No specific measures identified[EI18]
Clean-down and maintenance of equipment [CS26] PROC8a	No specific measures identified[EI18]
Disposal of wastes [CS28] PROC8a	No specific measures identified[EI18]
Material storage [CS67] PROC1	No specific measures identified[EI18]
Material storage [CS67] PROC2	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	10
Fraction of Regional tonnage used locally [A3]	0.002
Annual site tonnage (tonnes/year) [A5]	0.02
Maximum daily site tonnage (kg/day) [A4]	0.055

Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.9
Release fraction to wastewater from wide dispersive use [OOC8]	0.01
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.09
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater [TCR1a]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{Safe}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	2100
Assumed domestic sewage treatment plant flow ( $m^3/d$ ) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that	

risks are managed to at least equivalent levels. [G23]
<b>4.2. Environment</b>
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].

**Exposure Scenario 11 (ES11) Use as a Fuel – Industrial**

<b>Section 1 Exposure Scenario Title</b>	
Title	
Use as a Fuel – Industrial GES12.1	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 8a, 8b, 16.
Environmental Release Categories	7
Specific Environmental Release Category	ESVOC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product characteristics</b>	
Physical form of product	Liquid, vapour pressure < 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)</b>
Bulk transfers [CS14] PROC8b	No specific measures identified[EI18]
Drum/batch transfers [CS8] PROC8b	No specific measures identified[EI18]
General exposures (closed systems) [CS15]Use in contained batch processes [CS37] PROC1	No specific measures identified[EI18]
General exposures (closed systems) [CS15]Use in contained batch processes [CS37] PROC2	No specific measures identified[EI18]
General exposures (closed systems) [CS15]Use in contained batch processes [CS37] PROC3	No specific measures identified[EI18]
General exposures (closed systems)	No specific measures identified[EI18]

[CS15] PROC1	
General exposures (closed systems) [CS15] PROC2	No specific measures identified[EI18]
General exposures (closed systems) [CS15](closed systems) [CS107] PROC16	No specific measures identified[EI18]
General exposures (closed systems) [CS15](closed systems) [CS107] PROC3	No specific measures identified[EI18]
Equipment cleaning and maintenance [CS39] PROC8a	No specific measures identified[EI18]
Vessel and container cleaning [CS103] PROC8a	No specific measures identified[EI18]
Material storage [CS67] PROC1	No specific measures identified[EI18]
Material storage [CS67] PROC2	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	4
Fraction of Regional tonnage used locally [A3]	1
Annual site tonnage (tonnes/year) [A5]	4
Maximum daily site tonnage (kg/day) [A4]	200
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.0025
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.00001
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater [TCR1a].	
No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed	



[OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{Safe}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	5500000
Assumed domestic sewage treatment plant flow ( $m^3/d$ ) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2].	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated [ERW3].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
<b>4.2. Environment</b>	
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].	

**Exposure Scenario 12 (ES12) Use as a Fuel – Professional**

<b>Section 1 Exposure Scenario Title</b>	
Title	
Use as a Fuel – Professional GES12.2	
Use Descriptor	
Sector(s) of Use	22
Process Categories	1, 2, 3, 8a, 8b, 16.
Environmental Release Categories	9a, 9b
Specific Environmental Release Category	ESVOC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Assessment Method	
See Section 3 [AM1].	

<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product characteristics</b>	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions (only required controls to demonstrate safe use listed)</b>
Bulk transfers [CS14] PROC8b	No specific measures identified[EI18]
Drum/batch transfers [CS8] PROC8b	No specific measures identified[EI18]
General exposures [CS1] PROC8b	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC1	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC2	No specific measures identified[EI18]
General exposures (closed systems) [CS15](closed systems) [CS107] PROC3	No specific measures identified[EI18]
General exposures (closed systems) [CS15](closed systems) [CS107] PROC16	No specific measures identified[EI18]
Equipment cleaning and maintenance [CS39] PROC8a	No specific measures identified[EI18]
Vessel and container cleaning [CS103] PROC8a	No specific measures identified[EI18]
Material storage [CS67] PROC1	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
<b>Product characteristics</b>	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
<b>Amounts used</b>	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	10
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.005
Maximum daily site tonnage (kg/day) [A4]	0.014
<b>Frequency and duration of use</b>	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
<b>Environmental factors not influenced by risk management</b>	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100

Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.01
Release fraction to wastewater from wide dispersive use [OOC8]	0.00001
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater [TCR1a]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{Safe}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	600
Assumed domestic sewage treatment plant flow ( $m^3/d$ ) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2].	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated [ERW3].	
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
<b>4.2. Environment</b>	
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet	

(<http://cefic.org/en/reach-for-industries-libraries.html>) [DSU4].

### Exposure Scenario 13 (ES13) Use as a Fuel - Consumer

<b>Section 1 Exposure Scenario Title</b>	
Title	
Use as a Fuel – Consumer GES12.3	
Use Descriptor	
Sector(s) of Use	21
Product Categories	13
Environmental Release Categories	9a, 9b
Specific Environmental Release Category	ESVOC 9.12c.v1
Processes, tasks, activities covered	
Covers consumer uses in liquid fuels.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of consumer exposure</b>	
Product characteristics	
Physical form of product	liquid
Vapour pressure	56.3 kPa
Concentration of substance in product	Unless otherwise stated, cover concentrations up to 100% [ConsOC1]
Amounts used	Unless otherwise stated, covers use amounts up to 37500g [ConsOC2]; covers skin contact area up to 420cm <sup>2</sup> [ConsOC5]
Frequency and duration of use/exposure	Unless otherwise stated, covers use frequency up to 1 times per day [ConsOC4]; covers exposure up to 2 hours per event [ConsOC14]
Other Operational Conditions affecting exposure	Unless otherwise stated assumes use at ambient temperatures [ConsOC15]; assumes use in a 20 m <sup>3</sup> room [ConsOC11]; assumes use with typical ventilation [ConsOC8].
<b>Product Category</b>	<b>Specific Risk Management Measures and Operating Conditions (<i>only required controls to demonstrate safe use listed</i>)</b>
PC13:Fuels--Liquid - subcategories added: Automotive Refuelling	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 52 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 37500g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.05hr/event[ConsOC14];
	No specific RMMs developed beyond those OCs stated
PC13:Fuels--Liquid - subcategories added: Scooter Refuelling	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 52 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 3750g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.03hr/event[ConsOC14];
	No specific RMMs developed beyond those OCs stated
PC13:Fuels--Liquid - subcategories added: Garden Equipment - Use	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 26 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; for each use event, covers use amounts up to 750g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m <sup>3</sup> [ConsOC11];

	for each use event, covers exposure up to 2.00hr/event[ConsOC14];
	No specific RMMs developed beyond those OCs stated
PC13:Fuels--Liquid (subcategories added): Garden Equipment - Refueling	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 26 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 420.00 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 750g [ConsOC2]; Covers use in a one car garage (34m <sup>3</sup> ) under typical ventilation [ConsOC10]; covers use in room size of 34m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.03hr/event[ConsOC14];
	No specific RMMs developed beyond those OCs stated
PC13:Fuels--Liquid - subcategories added: Lamp oil	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 52 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 100g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.01hr/event[ConsOC14];
	No specific RMMs developed beyond those OCs stated
PC13:Fuels--Liquid (subcategories added): Home space heater fuel	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 365 days/year[ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm <sup>2</sup> [ConsOC5]; for each use event, covers use amounts up to 3000g [ConsOC2]; covers use under typical household ventilation [ConsOC8]; covers use in room size of 20m <sup>3</sup> [ConsOC11]; for each use event, covers exposure up to 0.03hr/event[ConsOC14];
	No specific RMMs developed beyond those OCs stated
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	720
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.36
Maximum daily site tonnage (kg/day) [A4]	0.99
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.01
Release fraction to wastewater from wide dispersive use [OOC8]	0.00001
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.00001
Conditions and measures related to municipal sewage treatment plant	
Risk from environmental exposure is driven by freshwater [STP7a].	
Estimated substance removal from wastewater via domestic sewage treatment	96.9

(%) [STP3]	
Maximum allowable site tonnage (M <sub>Safe</sub> ) based on release following total wastewater treatment removal (kg/d) [STP6]	43000
Assumed domestic sewage treatment plant flow (m <sup>3</sup> /d) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2].	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated [ERW3].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated consumer exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[ConsG1]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
<b>4.2. Environment</b>	
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 [DSU1]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].	

#### Exposure Scenario 14 (ES14) Use as Functional Fluids – Industrial

<b>Section 1 Exposure Scenario Title</b>	
Title	
Use as Functional Fluids – Industrial GES13.1	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 4, 8a, 8b, 9
Environmental Release Categories	7
Specific Environmental Release Category	ESVOC 7.13a.v1
Processes, tasks, activities covered	
Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product characteristics</b>	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]

Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions</b> <i>(only required controls to demonstrate safe use listed)</i>
Bulk transfers [CS14](closed systems) [CS107] PROC1	No specific measures identified[EI18]
Bulk transfers [CS14](closed systems) [CS107] PROC2	No specific measures identified[EI18]
Drum/batch transfers [CS8] PROC8b	No specific measures identified[EI18]
Filling of articles/equipment [CS84](closed systems) [CS107] PROC9	No specific measures identified[EI18]
Filling / preparation of equipment from drums or containers. [CS45] PROC8a	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC2	No specific measures identified[EI18]
General exposures (open systems) [CS16] PROC4	Provide enhanced mechanical ventilation by mechanical means [E48]
Remanufacture of reject articles [CS19] PROC9	No specific measures identified[EI18]
Equipment maintenance [CS5] PROC8a	No specific measures identified[EI18]
Material storage [CS67] PROC1	No specific measures identified[EI18]
Material storage [CS67] PROC2	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	9200
Fraction of Regional tonnage used locally [A3]	0.0011
Annual site tonnage (tonnes/year) [A5]	10
Maximum daily site tonnage (kg/day) [A4]	500
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.0003

[OOC5]	
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0.001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{Safe}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	4300000
Assumed domestic sewage treatment plant flow ( $m^3/d$ ) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
<b>4.2. Environment</b>	
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in	



combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>) [DSU4].

### Exposure Scenario 15 (ES15) Use as Functional Fluids – Professional

<b>Section 1 Exposure Scenario Title</b>	
Title	
Use as Functional Fluids – Professional GES13.2	
Use Descriptor	
Sector(s) of Use	22
Process Categories	1, 2, 3, 8a, 9, 20
Environmental Release Categories	9a, 9b
Specific Environmental Release Category	ESVOC 9.13b.v1
Processes, tasks, activities covered	
Use as functional fluids e.g. cable oils, transfer oils, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions</b> <i>(only required controls to demonstrate safe use listed)</i>
Drum/batch transfers [CS8] PROC8a	No specific measures identified[EI18]
Transfer from/pouring from containers [CS22] PROC9	No specific measures identified[EI18]
Filling / preparation of equipment from drums or containers. [CS45] PROC9	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC1	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC2	No specific measures identified[EI18]
General exposures (closed systems) [CS15] PROC3	No specific measures identified[EI18]
General exposures (open systems) [CS16] PROC20	No specific measures identified[EI18]
Remanufacture of reject articles [CS19] PROC9	Provide enhanced mechanical ventilation by mechanical means [E48]
Remanufacture of reject articles [CS19] PROC9	No specific measures identified[EI18]
Equipment maintenance [CS5]	No specific measures identified[EI18]

PROC8a	
Material storage [CS67] PROC1	No specific measures identified[EI18]
Material storage [CS67] PROC2	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	50
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.025
Maximum daily site tonnage (kg/day) [A4]	0.068
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.05
Release fraction to wastewater from wide dispersive use [OOC8]	0.025
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.025
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater [TCR1a]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{Safe}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	2000
Assumed domestic sewage treatment plant flow ( $m^3/d$ ) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	

Conditions and measures related to external recovery of waste
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].
Additional information on the basis for the allocation of the indentified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet
<b>Section 3 Exposure Estimation</b>
<b>3.1. Health</b>
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]
<b>3.2. Environment</b>
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>
<b>4.1. Health</b>
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]
<b>4.2. Environment</b>
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].

**Exposure Scenario 16 (ES16) Other Consumer Uses – Consumer**

<b>Section 1 Exposure Scenario Title</b>	
Title	
Other Consumer Uses – Consumer GES16.3	
Use Descriptor	
Sector(s) of Use	21
Product Categories	28, 39
Environmental Release Categories	8a, 8d
Specific Environmental Release Category	ESVOC 8.16.v1
Processes, tasks, activities covered	
Consumer uses not covered in consumer examples listed above e.g. use as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	160
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.081
Maximum daily site tonnage (kg/day) [A4]	0.022

Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.95
Release fraction to wastewater from wide dispersive use [OOC8]	0.025
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0.025
Conditions and measures related to municipal sewage treatment plant	
Risk from environmental exposure is driven by freshwater sediment [STP7b].	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Maximum allowable site tonnage ( $M_{Safe}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	5200
Assumed domestic sewage treatment plant flow ( $m^3/d$ ) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated consumer exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[ConsG1]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
<b>4.2. Environment</b>	
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 [DSU1]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].	

### Exposure Scenario 17 (ES17) Use in Laboratories – Industrial

<b>Section 1 Exposure Scenario Title</b>	
Title	
Use in Laboratories – Industrial GES17.1	
Use Descriptor	
Sector(s) of Use	3
Process Categories	10, 15

Environmental Release Categories	2, 4
Specific Environmental Release Category	<i>Not Applicable</i>
Processes, tasks, activities covered	
Use of the substance within laboratory settings, including material transfers and equipment cleaning.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
<b>Product characteristics</b>	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions</b> <i>(only required controls to demonstrate safe use listed)</i>
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]
Cleaning [CS47] PROC10	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	5
Fraction of Regional tonnage used locally [A3]	0.4
Annual site tonnage (tonnes/year) [A5]	2
Maximum daily site tonnage (kg/day) [A4]	100
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM) [OOC4]	0.025
Release fraction to wastewater from process (initial release prior to RMM) [OOC5]	0.02
Release fraction to soil from process (initial release prior to RMM) [OOC6]	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	

No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{Safe}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	6500
Assumed domestic sewage treatment plant flow (m <sup>3</sup> /d) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
<b>4.2. Environment</b>	
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3].	

**Exposure Scenario 18 (ES18) Use in Laboratories – Professional**

<b>Section 1 Exposure Scenario Title</b>	
Title	
Use in Laboratories – Professional GES17.2	
Use Descriptor	
Sector(s) of Use	22

Process Categories	10, 15
Environmental Release Categories	8a
Specific Environmental Release Category	ESVOC 8.17.v1
Processes, tasks, activities covered	
Use of small quantities within laboratory settings, including material transfers and equipment cleaning.	
Assessment Method	
See Section 3 [AM1].	
<b>Section 2 Operational conditions and risk management measures</b>	
<b>Section 2.1 Control of worker exposure</b>	
Product characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP [OC5]
Concentration of substance in product	Covers percentage substance in the product up to 100% (unless stated differently) [G13]
Amounts used	No Limit
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20oC above ambient [G15]
	Assumes a good basic standard of occupational hygiene has been implemented [G1]
<b>Contributing Scenarios</b>	<b>Specific Risk Management Measures and Operating Conditions</b> <i>(only required controls to demonstrate safe use listed)</i>
Laboratory activities [CS36] PROC15	No specific measures identified[EI18]
Cleaning [CS47] PROC10	No specific measures identified[EI18]
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 1 to 3	
<b>Section 2.2 Control of environmental exposure</b>	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region [A1]	0.1
Regional use tonnage (tonnes/year) [A2]	5
Fraction of Regional tonnage used locally [A3]	0.0005
Annual site tonnage (tonnes/year) [A5]	0.0025
Maximum daily site tonnage (kg/day) [A4]	0.0069
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only) [OOC7]	0.5
Release fraction to wastewater from wide dispersive use [OOC8]	0.5
Release fraction to soil from wide dispersive use (regional only) [OOC9]	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	

No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%) [TCR7]	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%) [TCR8]	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%) [TCR10]	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) [STP3]	96.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%) [STP4]	96.9
Maximum allowable site tonnage ( $M_{Safe}$ ) based on release following total wastewater treatment removal (kg/d) [STP6]	260
Assumed domestic sewage treatment plant flow (m <sup>3</sup> /d) [STP5]	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Petrorisk file in IUCLID Section 13 - "LocalCSR" worksheet	
<b>Section 3 Exposure Estimation</b>	
<b>3.1. Health</b>	
Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.[G8]	
<b>3.2. Environment</b>	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
<b>Section 4 Guidance to check compliance with the Exposure Scenario</b>	
<b>4.1. Health</b>	
Where other Risk management Measures/Operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
<b>4.2. Environment</b>	
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 [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet ( <a href="http://cefic.org/en/reach-for-industries-libraries.html">http://cefic.org/en/reach-for-industries-libraries.html</a> ) [DSU4].	

**END OF SAFETY DATA SHEET**