SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of:
Regulation (EC) No. 1907/2006 as amended by Commission Regulation (EU) 2020/878
and Regulation (EC) No. 1272/2008

Supercedes date 28-Feb-2024 **Issuing Date** 05-Nov-2020 **Revision Date** 09-Feb-2026 **Revision Number** 6.1

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

1.1. Product identifier

Product Code(s) P520FP

Product Name Braskem Sensitis® Hiflash

REACH registration number 01-2119456810-40-0016

EC No (EU Index No) 920-901-0

CAS No 246538-78-3

Synonyms Hydrocarbons, C11-C13, isoalkanes

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

Recommended use Manufacture of substances
Formulation & (re)packing of substances and mixtures
Industrial use: Cleaning agent, Lubricants, Metalworking fluids / rolling oils, Polymer production
Professional use: Coatings

Uses advised against No information available

1.3. Details of the supplier of the safety data sheet

Supplier
Braskem Netherlands BV
Weena 238-240, 9th Floor Tower C
NL - 3012NJ- Rotterdam, Netherlands
Telephone: +31 10 798 5002

For further information, please contact
E-mail address productsafety@braskem.com

1.4. Emergency telephone number

Emergency telephone CHEMTREC: +1 703-741-5970 (24h)

Emergency telephone - §45 - (EC)1272/2008	
Europe	**112**

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Aspiration hazard	Category 1 - (H304)

2.2. Label elements

Signal word
Danger

Hazard statements
H304 - May be fatal if swallowed and enters airways.
EUH066 - Repeated exposure may cause skin dryness or cracking

Precautionary Statements - EU (§28, 1272/2008)
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor.
P331 - Do NOT induce vomiting.
P405 - Store locked up.
P501 - Dispose of contents/ container to an approved waste disposal plant.

Additional information
This product requires tactile warnings if supplied to the general public. This product requires child resistant fastenings if supplied to the general public.

2.3. Other hazards
Combustible liquid.
This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

Endocrine Disruptor Information This product does not contain any known or suspected endocrine disruptors.

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Weight-%	REACH registration number	EC No (EU Index No)	Classification according to Regulation (EC) No. 1272/2008 [CLP]	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)
(UVCB) Hydrocarbons, C11-C13, isoalkanes 246538-78-3	90 - 100	01-2119456810-40-0016	920-901-0	Asp. Tox. 1 (H304) EUH066	-	-	-

Additional information
*Substance is a complex UVCB. Primary substance and constituents listed above

Full text of H- and EUH-phrases: see section 16

Acute Toxicity Estimate
If LD50/LC50 data is not available or does not correspond to the classification category, then the appropriate conversion value from CLP Annex I, Table 3.1.2, is used to calculate the acute toxicity estimate (ATEmix) for classifying a mixture based on its components

Chemical name	Oral LD50 mg/kg	Dermal LD50 mg/kg	Inhalation LC50 - 4 hour - dust/mist - mg/L	Inhalation LC50 - 4 hour - vapour - mg/L	Inhalation LC50 - 4 hour - gas - ppm
(UVCB) Hydrocarbons, C11-C13, isoalkanes 246538-78-3	> 15 000 mg/kg	> 5 000 mg/kg	-	>4.951 mg/L*	-

This product does not contain candidate substances of very high concern at a concentration >=0.1% (Regulation (EC) No. 1907/2006 (REACH), Article 59)

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Inhalation Aspiration into lungs can produce severe lung damage. If breathing has stopped, give artificial respiration. Get medical attention immediately. Remove to fresh air. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. If breathing is difficult, (trained personnel should) give oxygen. Get immediate medical attention. Delayed pulmonary edema may occur.

Eye contact Rinse thoroughly with plenty of water, also under the eyelids.

Skin contact Wash skin with soap and water.

Ingestion ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE. Do NOT induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Rinse mouth. Never give anything by mouth to an unconscious person. Get immediate medical attention.

Self-protection of the first aider Remove all sources of ignition. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Use personal protective equipment as required.

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

Symptoms Difficulty in breathing. Coughing and/ or wheezing. Dizziness.

Effects of Exposure No information available.

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

Note to doctors Because of the danger of aspiration, emesis or gastric lavage should not be used unless the risk is justified by the presence of additional toxic substances.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media Dry chemical. Carbon dioxide (CO2). Water spray. Alcohol resistant foam.

Unsuitable extinguishing media No information available.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical	Keep product and empty container away from heat and sources of ignition. In the event of fire, cool tanks with water spray.

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	Evacuate personnel to safe areas. Use personal protective equipment as required. See section 8 for more information. Take precautionary measures against static discharges. Do not touch or walk through spilled material. Ensure adequate ventilation.
Other information	Refer to protective measures listed in Sections 7 and 8.
For emergency responders	Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions	Refer to protective measures listed in Sections 7 and 8. Prevent further leakage or spillage if safe to do so.

6.3. Methods and material for containment and cleaning up

Methods for containment	Stop leak if you can do it without risk. Do not touch or walk through spilled material. Dyke far ahead of liquid spill for later disposal.
Methods for cleaning up	Take precautionary measures against static discharges. Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labelled containers.
Prevention of secondary hazards	Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections	See section 8 for more information See section 13 for more information

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharges. Ensure adequate ventilation.
General hygiene considerations	Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions	Keep/store only in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Store locked up. Store in accordance with the particular national regulations.

7.3. Specific end use(s)

Specific use(s) Manufacture: Manufacture of substance; Formulation or re-packing: Formulation & (re)packing of substances and mixtures; Use at industrial sites: Use in cleaning agents, Use in lubricants, Use in metal working fluids/rolling oils, Polymer production; Widespread use by professional workers: Use in coatings.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Biological occupational exposure limits
This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

Derived No Effect Level (DNEL) - Workers Not applicable

Derived No Effect Level (DNEL) - General Public Not applicable.

Predicted No Effect Concentration (PNEC) Substance is a hydrocarbon UVCB. Hydrocarbons, C11-C13, isoalkanes, <2% aromatics, does not demonstrate acute fish and invertebrate toxicity, and alga toxicity at loadings up to 1000 mg/L. Log Kow value is >4. Substance is not readily biodegradable.

8.2. Exposure controls

Engineering controls Showers
Eyewash stations
Ventilation systems.

Personal protective equipment

Eye/face protection Tight sealing safety goggles. Eye protection must conform to standard EN 166.

Hand protection Gloves must conform to standard EN 374. Suitable material is Nitril or Viton. Thickness: 0.4/0.7. Usage possible for max. 480 min. E.g. KCL type: 730 or 890 or equivalent. Don't reuse again, next shift. Be aware that the choice of suitable gloves has to be made after a full chemical risk assessment. E.g. temperatures higher than ambient temperature or mixed exposure needs consultation with the manufacturer. For short time exposure risk (e.g. single splash) other material may be usable, also Contact your local PPE supplier.

Skin and body protection Impervious clothing (EN ISO 6529).

Respiratory protection In case the concentration in workplace atmosphere is higher than max. allowed concentration, use full face mask with filter cartridge systems type A, according to EN 14387. Use self-contained breathing apparatus, if concentration is unknown or higher then max. allowed for used filter type. Take care of wear time limits, especially if worn together with protection coveralls and physically hard work. Stop work and leave area, immediately, if "chemical" smell of substance occurs in the filter mask.

General hygiene considerations Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls No information available.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance		
Physical state	Liquid	
Colour	Colourless	
Odour	Characteristic	
Odour threshold	No information available	

Property	Values	Remarks • Method
Melting point / freezing point	< -20 °C	ASTM D 5950
Initial boiling point and boiling range	170 - 250 °C	ASTM D86
Flammability		No data available
Flammability Limit in Air		
Upper flammability or explosive limits	7.0	No data available
Lower flammability or explosive limits	0.6	No data available
Flash point	64 °C	CC (closed cup) ASTM D93
Autoignition temperature	336 °C	No data available
Decomposition temperature		No data available
pH		No data available
pH (as aqueous solution)		No data available
Kinematic viscosity	1.30 cSt	No data available
Dynamic viscosity		No data available
Water solubility	Insoluble in water	No data available
Solubility(ies)	Ethanol, Organic solvents	No data available
Partition coefficient		No data available
Vapour pressure	0.04 kPa	@ 20 °C
Relative density	0.73 a 0.85 g/cm³	ISO 12185, @ 15 ° C
Bulk density		No data available
Liquid Density		No data available
Relative vapour density		No data available
Particle characteristics		
Particle Size		No data available
Particle Size Distribution		No data available

9.2. Other information

Surface tension 23 - 26 mN/m @ 20 ° C, Wilhelmy plate testing

9.2.1. Information with regards to physical hazard classes

Not applicable

9.2.2. Other safety characteristics

Evaporation rate 0.08

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity None under normal use conditions.

10.2. Chemical stability

Stability Stable under normal conditions.

Explosion data
Sensitivity to mechanical impact None.
Sensitivity to static discharge Yes.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions None under normal processing.

10.4. Conditions to avoid

Conditions to avoid Heat, flames and sparks. Incompatible materials.

10.5. Incompatible materials

Incompatible materials Strong acids. Strong bases.

10.6. Hazardous decomposition products

Hazardous decomposition products Carbon oxides. Ketones.

SECTION 11: Toxicological information

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

Information on likely routes of exposure

Product Information .

Inhalation Specific test data for the substance or mixture is not available. Aspiration into lungs can produce severe lung damage. May cause pulmonary edema. Pulmonary edema can be fatal. May cause irritation of respiratory tract.

Eye contact Specific test data for the substance or mixture is not available. May cause irritation.

Skin contact Repeated exposure may cause skin dryness or cracking.

Ingestion Specific test data for the substance or mixture is not available. Potential for aspiration if swallowed. May cause lung damage if swallowed. Aspiration may cause pulmonary edema and pneumonitis. May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Difficulty in breathing. Coughing and/ or wheezing. Dizziness.

Acute toxicity
Numerical measures of toxicity
Based on available data, the classification criteria are not met.

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
(UVCB) Hydrocarbons, C11-C13, isoalkanes	> 15 000 mg/kg	> 5 000 mg/kg	-

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation Based on available data, the classification criteria are not met.

Germ cell mutagenicity Based on available data, the classification criteria are not met.

Carcinogenicity Based on available data, the classification criteria are not met.

Reproductive toxicity Based on available data, the classification criteria are not met.

STOT - single exposure Based on available data, the classification criteria are not met.

STOT - repeated exposure Based on available data, the classification criteria are not met.

Aspiration hazard May be fatal if swallowed and enters airways.

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Endocrine disrupting properties This product does not contain any known or suspected endocrine disruptors.

11.2.2. Other information

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity Based on available data, the classification criteria are not met.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
(UVCB) Hydrocarbons, C11-C13, isoalkanes 246538-78-3	-	>1000 mg/L	-	-

12.2. Persistence and degradability

Persistence and degradability No information available.

12.3. Bioaccumulative potential

Bioaccumulation Not expected to bioaccumulate.

12.4. Mobility in soil

Mobility in soil No information available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment

Chemical name	PBT and vPvB assessment
(UVCB) Hydrocarbons, C11-C13, isoalkanes 246538-78-3	The substance is not PBT / vPvB

12.6. Endocrine disrupting properties

Endocrine disrupting properties This product does not contain any known or suspected endocrine disruptors.

12.7. Other adverse effects

Other adverse effects No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused products Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

Waste codes / waste designations according to EWC / AVV According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport information

IMDG Not regulated
14.1 UN number or ID number Not regulated
14.2 UN proper shipping name Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not applicable
14.5 Environmental hazards Not applicable
14.6 Special Precautions for Users
Special Provisions None
14.7 Maritime transport in bulk according to IMO instruments No information available

RID Not regulated
14.1 UN number or ID number Not regulated
14.2 UN proper shipping name Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not applicable
14.5 Environmental hazards Not applicable
14.6 Special Precautions for Users
Special Provisions None

ADR Not regulated
14.1 UN number or ID number Not regulated
14.2 UN proper shipping name Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not applicable
14.5 Environmental hazards Not applicable
14.6 Special Precautions for Users

Special Provisions None

IATA Not regulated
14.1 UN number or ID number Not regulated
14.2 UN proper shipping name Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not applicable
14.5 Environmental hazards Not applicable
14.6 Special Precautions for Users
Special Provisions None
Note: None

SECTION 15: Regulatory information

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

France
Occupational Illnesses (R-463-3, France)

Chemical name	French RG number
(UVCB) Hydrocarbons, C11-C13, isoalkanes 246538-78-3	-

Germany
Water hazard class (WGK) slightly hazardous to water (WGK 1)

European Union
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.

Authorisations and/or restrictions on use:
This product does not contain substances subject to authorisation (Regulation (EC) No. 1907/2006 (REACH), Annex XIV) This product does not contain substances subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII)

Persistent Organic Pollutants
Not applicable

Ozone-depleting substances (ODS) regulation (EC) 1005/2009
Not applicable

International Inventories
Contact supplier for inventory compliance status

15.2. Chemical safety assessment

Chemical Safety Report A Chemical Safety Assessment has been carried out for this substance Date of most recent Chemical Safety Report: 2022-03-03

SECTION 16: Other information

Key or legend to abbreviations and acronyms used in the safety data sheet

Full text of H-Statements referred to under section 3
H304 - May be fatal if swallowed and enters airways
EUH066 - Repeated exposure may cause skin dryness or cracking

Legend
SVHC: Substances of Very High Concern for Authorisation:
PBT: Persistent, Bioaccumulative, and Toxic (PBT) Substances
vPvB: Very Persistent and very Bioaccumulative (vPvB) Substances
STOT: Specific Target Organ Toxicity
ATE: Acute Toxicity Estimate
LC50: 50% Lethal Concentration
LD50: 50% Lethal Dose

Legend Section 8: Exposure controls/personal protection

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	Sk*	Skin designation
SCBA	Self-contained breathing apparatus		

Classification procedure	
Classification according to Regulation (EC) No. 1272/2008 [CLP]	Method Used
Acute oral toxicity	Calculation method
Acute dermal toxicity	Calculation method
Acute inhalation toxicity - gas	Calculation method
Acute inhalation toxicity - vapour	Calculation method
Acute inhalation toxicity - dust/mist	Calculation method
Skin corrosion/irritation	Calculation method
Serious eye damage/eye irritation	Calculation method
Respiratory sensitisation	Calculation method
Skin sensitisation	Calculation method
Mutagenicity	Calculation method
Carcinogenicity	Calculation method
Reproductive toxicity	Calculation method
STOT - single exposure	Calculation method
STOT - repeated exposure	Calculation method
Acute aquatic toxicity	Calculation method
Chronic aquatic toxicity	Calculation method
Aspiration hazard	Calculation method
Ozone	Calculation method

Key literature references and sources for data used to compile the SDS
Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
European Chemicals Agency (ECHA) Committee for Risk Assessment (ECHA_RAC)
European Chemicals Agency (ECHA) (ECHA_API)
Environmental Protection Agency
Acute Exposure Guideline Level(s) (AEGL(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
Japan GHS Classification

Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine’s PubMed database (NLM PUBMED)
U.S. National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organisation for Economic Co-operation and Development Environment, Health, and Safety Publications
Organisation for Economic Co-operation and Development High Production Volume Chemicals Programme
Organisation for Economic Co-operation and Development Screening Information Data Set
World Health Organization

Issuing Date	05-Nov-2020
Supercedes date	28-Feb-2024
Revision Date	09-Feb-2026
Revision Note	Update: Product Name

This safety data sheet complies with the requirements of Commission Regulation (EU) 2020/878 of 18 June 2020 amending Regulation (EC) No. 1907/2006

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name Braskem Sensitis® Hiflash
REACH registration number 01-2119456810-40-0016
EC No (EU Index No) 920-901-0
CAS No 246538-78-3

Chemical name Hydrocarbons, C11-C13, isoalkanes (UVCB)

Identified uses

Exposure scenario	Product categories [PC]	Sector of uses [SU]	Process categories [PROC]	Article categories [AC]	Environmental release categories [ERC]
ES01: Manufacture; Manufacture of substance	-	-	PROC1 PROC2 PROC3 PROC4 PROC8a PROC8b PROC9 PROC15 PROC28	-	ERC1
ES02: Formulation or re-packing; Formulation & (re)packing of substances and mixtures	-	-	PROC1 PROC2 PROC3 PROC4 PROC5 PROC8a PROC8b PROC9 PROC14 PROC15 PROC28	-	ERC2
ES03: Use at industrial sites; Use in cleaning agents	-	-	PROC1 PROC2 PROC3 PROC4 PROC7 PROC8a PROC8b PROC10 PROC13 PROC28	-	ERC4
ES04: Use at industrial sites; Use in lubricants	-	-	PROC1 PROC2 PROC3 PROC4 PROC7 PROC8a PROC8b PROC9 PROC10 PROC13 PROC17 PROC18 PROC28	-	ERC4
ES05: Use at industrial sites; Use in metal working fluids/rolling oils	-	-	PROC1 PROC2 PROC3 PROC4	-	ERC4

			PROC5 PROC7 PROC8a PROC8b PROC9 PROC10 PROC13 PROC17 PROC28		
ES06: Use at industrial sites; Polymer production	-	-	PROC1 PROC2 PROC3 PROC4 PROC5 PROC6 PROC8a PROC8b PROC14 PROC28	-	ERC4
ES07: Widespread use by professional workers; Use in coatings	-	-	PROC1 PROC2 PROC3 PROC4 PROC5 PROC8a PROC8b PROC10 PROC11 PROC13 PROC15 PROC19 PROC28	-	ERC8a ERC8d

Exposure scenario

ES01: Manufacture - Manufacture of substance

Section 1 - Title

Title	ES01: Manufacture - Manufacture of substance
Environmental release category(ies)	- ERC1 - Manufacture of substances
Specific Environmental Release Category	- ESVOC SPERC 1.1.v2
Process category(ies)	- PROC1 - Use in closed process, no likelihood of exposure - PROC2 - Use in closed, continuous process with occasional controlled exposure - PROC3 - Use in closed batch process (synthesis or formulation) - PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises - PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities - PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - PROC15 - Use as laboratory reagent - PROC28 - Manual maintenance (cleaning and repair) of machinery

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC1 - Manufacture of substances
Specific Environmental Release Category - ESVOC SPERC 1.1.v2

Amounts used	
Value	2,000,000
Units	kg/d
Remarks	Daily use amount at site

Value	10 %
Remarks	Percentage of EU tonnage used at regional scale

Value	100 %
Remarks	Percentage of Regional tonnage used at local scale

Value	≤3.9E3
Units	t(ons)/year
Remarks	Annual use amount at site

Product characteristics	
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High

Other operational conditions of use affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	1 %, 2E4 kg/d
Release fraction to wastewater from process (initial release prior to RMM)	3E-3 %, 60 kg/d
Release fraction to soil from process (initial release prior to RMM)	0.01 %, - kg/d
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Assumed domestic sewage treatment plant flow	STP: ≥2E3 m^3/d
Assumed on-site sewage treatment plant flow	STP: ≥2000 m^3/d
Sludge treatment	No application of sewage sludge to soil
Remarks	Biological STP: Site specific. The biological STP is site specific and the releases to the various compartments have been set by the assessor. Default EUSES settings.

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM); Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor; RMM limiting release to water: The release to water is modified after biological treatment at a standard municipal sewage treatment plant (STP) with an effluent flow rate of 2,000 m3/day

Waste management	
Soil	not applicable - no direct release to soil
Remarks	Release factor to external waste: 0.2 %. The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste.

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors All unrecovered waste is handled as an industrial waste that can be incinerated

Control of worker exposure	
Process category(ies)	**PROC1 - Use in closed process, no likelihood of exposure** **PROC2 - Use in closed, continuous process with occasional controlled exposure** **PROC3 - Use in closed batch process (synthesis or formulation)** **PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises** **PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities**

	PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities **PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)** **PROC15 - Use as laboratory reagent** **PROC28 - Manual maintenance (cleaning and repair) of machinery**
Covers concentrations up to	100 %
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High
Remarks	Exposure assessment and risk characterization are not required for man via the environment as no hazard has been identified for long term systemic effects Exposure assessment and risk characterization are not required for workers as no hazard has been identified for human health
Conditions and measures related to personal protection, hygiene and health evaluation	PPE20: If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to EN 374 and provide employee skin care programs
Organisational measures to prevent /limit releases, dispersion and exposure	E14: Aspiration hazard. Do not ingest. If swallowed then seek immediate medical assistance. Keep good industrial hygiene
Additional good practice advice beyond the REACH Chemical Safety Report	Assumes a good basic standard of occupational hygiene is implemented. Avoid splashing. Decontaminate tools, equipment and personal protective equipment in a segregated area. Clear up spills immediately and dispose of waste safely. Ensure operatives are trained to minimise exposures.
Operational conditions	Industrial

Section 3 - Exposure estimation

Environmental release category(ies) - ERC1 - Manufacture of substances

Specific Environmental Release Category - ESVOC SPERC 1.1.v2

Predicted No Effect Concentration (PNEC) Substance is a hydrocarbon UVCB. Hydrocarbons, C11-C13, isoalkanes, <2% aromatics, does not demonstrate acute fish and invertebrate toxicity, and alga toxicity at loadings up to 1000 mg/L. Substance is not readily biodegradable.

Calculation method The hydrocarbon block method was used for environmental risk assessment.

Remarks As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater fish (short-term). Danio rerio OECD Guideline 203.	LL50: > 100 mg/L (96h)	-
Freshwater fish (long-term). Oncorhynchus mykiss QSAR modeled data.	PETROTOX (v4.0): EL10: 27 mg/L (60d)	-
Freshwater invertebrates (short-term). Daphnia magna. OECD Guideline 202.	EL50: > 100 mg/L (24h)	-
Freshwater invertebrates (long-term). Daphnia magna. OECD Guideline 211.	NOELR: >10.2 mg/L (21d)	-
Algae and aquatic plants. Pseudokirchnerella subcapitata. OECD Guideline 201.	EL50: > 100 mg/L (72h) NOELR: ≥100 mg/L (72h)	-

Derived No Effect Level (DNEL) There is no basis for setting a DNEL for certain human health endpoints when the available data for this effect does not provide quantitative dose-response information, but there exist toxicity data of a qualitative nature. The endpoints for which the available data may trigger a qualitative risk characterisation includes aspiration and defatting of the skin. An aspiration hazard is a non-quantifiable hazard determined by physical properties that can only occur following accidental oral exposure or non-intended uses. Repeated exposure may cause skin dryness and cracking, is generally applied to petroleum substances and solvents that have the capacity to extract lipids from the skin and that are not classified as irritant. There is no test method and the effect cannot be quantified. A DNEL cannot be derived.

Section 4 - Guidance to check compliance with the exposure scenario

Available hazard data does not support the need for a DNEL to be established for other health effects. Substance is a hydrocarbon UVCB. The hydrocarbon block method was used for environmental risk assessment. Used Petrorisk model
Additional information can be found in REACH guidance (Report published on the methodologies employed in the environmental risk assessment of petroleum substances).

Exposure scenario

ES02: Formulation or re-packing - Formulation & (re)packing of substances and mixtures

Section 1 - Title

Title	ES02: Formulation or re-packing - Formulation & (re)packing of substances and mixtures
Environmental release category(ies)	- ERC2 - Formulation of preparations (mixtures)
Specific Environmental Release Category	- ESVOC SPERC 2.2.v2
Process category(ies)	- PROC1 - Use in closed process, no likelihood of exposure - PROC2 - Use in closed, continuous process with occasional controlled exposure - PROC3 - Use in closed batch process (synthesis or formulation) - PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises - PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) - PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities - PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising - PROC15 - Use as laboratory reagent - PROC28 - Manual maintenance (cleaning and repair) of machinery

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)
Specific Environmental Release Category - ESVOC SPERC 2.2.v2

Amounts used	
Value	100,000
Units	kg/d

Value	10 %
Remarks	Percentage of EU tonnage used at regional scale

Value	100 %
Remarks	Percentage of Regional tonnage used at local scale

Value	<= 136
Units	t(ons)/year

Product characteristics	
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High

Volatility	High

Other operational conditions of use affecting environmental exposure	
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Assumed domestic sewage treatment plant flow	STP: >=2E3 m^3/d
Sludge treatment	No application of sewage sludge to soil
Remarks	The biological STP is site specific and the releases to the various compartments have been set by the assessor. Default EUSES settings.

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM). Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor. RMM limiting release to water: Oil-water separation (e.g. via oil water separators, oil skimmers, or dissolved air flotation) is required.

Waste management	
Soil	not applicable - no direct release to soil
Remarks	Release factor to external waste: 4 %. The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting.

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors All unrecovered waste is handled as an industrial waste that can be incinerated

Control of worker exposure	
Process category(ies)	**PROC1 - Use in closed process, no likelihood of exposure** **PROC2 - Use in closed, continuous process with occasional controlled exposure** **PROC3 - Use in closed batch process (synthesis or formulation)** **PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises** **PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)** **PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities** **PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities** **PROC9 - Transfer of substance or preparation into small**

	containers (dedicated filling line, including weighing) PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising PROC15 - Use as laboratory reagent PROC28 - Manual maintenance (cleaning and repair) of machinery
Covers concentrations up to	100 %
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High
Conditions and measures related to personal protection, hygiene and health evaluation	PPE20: If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to EN 374 and provide employee skin care programs.
Organisational measures to prevent /limit releases, dispersion and exposure	E14: Aspiration hazard. Do not ingest. If swallowed then seek immediate medical assistance. Keep good industrial hygiene.
Additional good practice advice beyond the REACH Chemical Safety Report	Assumes a good basic standard of occupational hygiene is implemented. Avoid splashing. Decontaminate tools, equipment and personal protective equipment in a segregated area. Clear up spills immediately and dispose of waste safely. Ensure operatives are trained to minimise exposures.
Operational conditions	Industrial

Section 3 - Exposure estimation

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)
Specific Environmental Release Category - ESVOC SPERC 2.2.v2

Predicted No Effect Concentration (PNEC) Substance is a hydrocarbon UVCB. Hydrocarbons, C11-C13, isoalkanes, <2% aromatics, does not demonstrate acute fish and invertebrate toxicity, and alga toxicity at loadings up to 1000 mg/L. Log Kow value is >4. Substance is not readily biodegradable.

Calculation method The hydrocarbon block method was used for environmental risk assessment.
Remarks As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater fish (short-term). Oncorhynchus mykiss. OECD Guideline 203.	LL50: > 1000 mg/L (96h)	-
Freshwater fish (long-term). Oncorhynchus mykiss. QSAR modeled data.	NOELR: 1 mg/L (28d)	-
Freshwater invertebrates (short-term). Daphnia magna. OECD Guideline 202.	EL50: > 1000 mg/L (24h)	-
Freshwater invertebrates (long-term). Daphnia magna. OECD Guideline 211.	NOELR: 1 mg/L (21d)	-
Algae and aquatic plants. Pseudokirchnerella subcapitata. OECD Guideline 201.	EL50: > 1000 mg/L (72h)	-

Derived No Effect Level (DNEL) There is no basis for setting a DNEL for certain human health endpoints when the available data for this effect does not provide quantitative dose-response information, but there exist toxicity data of a qualitative nature. The endpoints for which the available data may trigger a qualitative risk characterisation includes aspiration and defatting of the skin. An aspiration hazard is a non-quantifiable hazard determined by physical properties that can only occur following accidental oral

exposure or non-intended uses. Repeated exposure may cause skin dryness and cracking, is generally applied to petroleum substances and solvents that have the capacity to extract lipids from the skin and that are not classified as irritant. There is no test method and the effect cannot be quantified. A DNEL cannot be derived.

Section 4 - Guidance to check compliance with the exposure scenario

Available hazard data does not support the need for a DNEL to be established for other health effects. Substance is a hydrocarbon UVCB. The hydrocarbon block method was used for environmental risk assessment. Additional information can be found in REACH guidance (Report published on the methodologies employed in the environmental risk assessment of petroleum substances).

Exposure scenario

ES03: Use at industrial sites - Use in cleaning agents

Section 1 - Title

Title	ES03: Use at industrial sites - Use in cleaning agents
Environmental release category(ies)	- ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Specific Environmental Release Category	- ESVOC SPERC 4.4a.v3
Process category(ies)	- PROC1 - Use in closed process, no likelihood of exposure - PROC2 - Use in closed, continuous process with occasional controlled exposure - PROC3 - Use in closed batch process (synthesis or formulation) - PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises - PROC7 - Industrial spraying - PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities - PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC10 - Roller application or brushing - PROC13 - Treatment of articles by dipping and pouring - PROC28 - Manual maintenance (cleaning and repair) of machinery

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SPERC 4.4a.v3

Amounts used	
Value	<=5
Units	t(ons)/day
Remarks	Daily use amount at site

Value	10 %
Remarks	Percentage of EU tonnage used at regional scale

Value	100 %
Remarks	Percentage of Regional tonnage used at local scale

Value	<=100
Units	t(ons)/year
Remarks	Annual use amount at site

Product characteristics	
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	98 %, 4.9E3 kg/d
Release fraction to wastewater from process (initial release prior to RMM)	3E-5 %, 1.5E-3 kg/d
Release fraction to soil from process (initial release prior to RMM)	0 %, - kg/d
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Assumed domestic sewage treatment plant flow	STP: >=2E3 m^3/d
Sludge treatment	No application of sewage sludge to soil
Remarks	Biological STP: Site specific. Biological wastewater treatment (WWT) may involve the use of both industrial and municipal WWT facilities. The prevalence of each type of facility was assessed in a survey of WWT technologies at 81 European chemical facilities that included both large integrated facilities and smaller dedicated stand-alone sites. The operations at these facilities included the production and formulation of a wide range of chemicals and solvents for use in a wide range of downstream applications. The survey results indicated that a majority (i.e. 89%) of the chemical facilities used a dedicated industrial wastewater treatment facility; a much smaller percentage utilized a municipal treatment plant capable of handling both industrial and domestic wastewater. Despite the limited reliance on municipal treatment facilities, their usage is conservatively assumed to exist as a normal operating condition during the production, formulation, and downstream use of solvents. The biological STP is site specific and the releases to the various compartments have been set by the assessor. Default EUSES settings.

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM). Emissions to air are minimized when the product is used in accordance with the manufacturers' instructions and/or the established practices. RMM limiting release to water: Oil-water separation (e.g. via oil water separators, oil skimmers, or dissolved air flotation) is required. The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance.

Waste management	
Soil	not applicable - no direct release to soil
Remarks	Release factor to external waste: 4 %. A VOC waste factor has been reported in a life cycle assessment of cleaner and degreaser use in the metal industry. The reported solid waste factor of 0.4% was judged to be representative of other industrial cleaning agents. An uncertainty factor of 10 has been applied to this value based on published estimates of the expected variability in the waste factor.

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors. Solvent-containing liquid cleaning wastes are handled as hazardous waste and disposed of via thermal or catalytic incineration capable of efficiently converting volatile organic compounds to carbon dioxide and water. Hazardous waste handling conforms with the requirements of the Waste Framework Directive and includes procedures that minimize release during production, collection, storage, transportation, and treatment. These measures include a ban on the mixing of waste types, suitable packaging and labelling, and detailed documentation on the sources, quantities, and characteristics of the waste.

Control of worker exposure	
Process category(ies)	**PROC1 - Use in closed process, no likelihood of exposure** **PROC2 - Use in closed, continuous process with occasional controlled exposure** **PROC3 - Use in closed batch process (synthesis or formulation)** **PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises** **PROC7 - Industrial spraying** **PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities** **PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities** **PROC10 - Roller application or brushing** **PROC13 - Treatment of articles by dipping and pouring** **PROC28 - Manual maintenance (cleaning and repair) of machinery**
Covers concentrations up to	100 %
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High
Remarks	Exposure assessment and risk characterization are not required for man via the environment as no hazard has been identified for long term systemic effects Exposure assessment and risk characterization are not required for workers as no hazard has been identified for human health
Conditions and measures related to personal protection, hygiene and health evaluation	PPE20: If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to EN 374 and provide employee skin care programs
Organisational measures to prevent /limit releases, dispersion and exposure	E14: Aspiration hazard. Do not ingest. If swallowed then seek immediate medical assistance. Keep good industrial hygiene
Additional good practice advice beyond the REACH Chemical Safety Report	Assumes a good basic standard of occupational hygiene is implemented. Avoid splashing. Decontaminate tools, equipment and personal protective equipment in a segregated area. Clear up spills immediately and dispose of waste safely. Ensure operatives are trained to minimise exposures.
Operational conditions	Industrial

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SPERC 4.4a.v3

Predicted No Effect Concentration (PNEC) Substance is a hydrocarbon UVCB. Hydrocarbons, C11-C13, isoalkanes, <2% aromatics, does not demonstrate acute fish and invertebrate toxicity, and alga toxicity at loadings up to

1000 mg/L. Substance is not readily biodegradable.

Calculation method The hydrocarbon block method was used for environmental risk assessment.
Remarks As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater fish (short-term). Danio rerio OECD Guideline 203.	LL50: > 100 mg/L (96h)	-
Freshwater fish (long-term). Oncorhynchus mykiss QSAR modeled data.	PETROTOX (v4.0): EL10: 27 mg/L (60d)	-
Freshwater invertebrates (short-term). Daphnia magna. OECD Guideline 202.	EL50: > 100 mg/L (24h)	-
Freshwater invertebrates (long-term). Daphnia magna. OECD Guideline 211.	NOELR: >10.2 mg/L (21d)	-
Algae and aquatic plants. Pseudokirchnerella subcapitata. OECD Guideline 201.	EL50: > 100 mg/L (72h) NOELR: =100 mg/L (72h)	-

Derived No Effect Level (DNEL) There is no basis for setting a DNEL for certain human health endpoints when the available data for this effect does not provide quantitative dose-response information, but there exist toxicity data of a qualitative nature. The endpoints for which the available data may trigger a qualitative risk characterisation includes aspiration and defatting of the skin. An aspiration hazard is a non-quantifiable hazard determined by physical properties that can only occur following accidental oral exposure or non-intended uses. Repeated exposure may cause skin dryness and cracking, is generally applied to petroleum substances and solvents that have the capacity to extract lipids from the skin and that are not classified as irritant. There is no test method and the effect cannot be quantified. A DNEL cannot be derived.

Section 4 - Guidance to check compliance with the exposure scenario

Available hazard data does not support the need for a DNEL to be established for other health effects. Substance is a hydrocarbon UVCB. The hydrocarbon block method was used for environmental risk assessment. Used Petrorisk model
Additional information can be found in REACH guidance (Report published on the methodologies employed in the environmental risk assessment of petroleum substances).

Exposure scenario

ES04: Use at industrial sites - Use in lubricants

Section 1 - Title

Title	ES04: Use at industrial sites - Use in lubricants
Environmental release category(ies)	- ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Specific Environmental Release Category	- ESVOC SPERC 4.6a.v2
Process category(ies)	- PROC1 - Use in closed process, no likelihood of exposure - PROC2 - Use in closed, continuous process with occasional controlled exposure - PROC3 - Use in closed batch process (synthesis or formulation) - PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises - PROC7 - Industrial spraying - PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities - PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - PROC10 - Roller application or brushing - PROC13 - Treatment of articles by dipping and pouring - PROC17 - Lubrication at high energy conditions and in partly open process - PROC18 - Greasing at high energy conditions - PROC28 - Manual maintenance (cleaning and repair) of machinery

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SPERC 4.6a.v2

Remarks Basis for daily use amount at site: MSPERC

Amounts used	
Value	50,000
Units	kg/d
Remarks	Daily use amount at site

Value	10 %
Remarks	Percentage of EU tonnage used at regional scale

Value	100 %
Remarks	Percentage of Regional tonnage used at local scale

Value	<=100
Units	t(ons)/year
Remarks	Annual use amount at site

Product characteristics

Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.5 %, 232 kg/d
Release fraction to wastewater from process (initial release prior to RMM)	3E-4 %, 0.139 kg/d
Release fraction to soil from process (initial release prior to RMM)	0.1 %, - kg/d
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Assumed domestic sewage treatment plant flow	STP: >=2E3 m^3/d
Sludge treatment	No application of sewage sludge to soil
Remarks	Biological STP: Site specific. Biological wastewater treatment (WWT) may involve the use of both industrial and municipal WWT facilities. The prevalence of each type of facility was assessed in a survey of WWT technologies at 81 European chemical facilities that included both large integrated facilities and smaller dedicated stand-alone sites. The operations at these facilities included the production and formulation of a wide range of chemicals and solvents for use in a wide range of downstream applications. The survey results indicated that a majority (i.e. 89%) of the chemical facilities used a dedicated industrial wastewater treatment facility; a much smaller percentage utilized a municipal treatment plant capable of handling both industrial and domestic wastewater. Despite the limited reliance on municipal treatment facilities, their usage is conservatively assumed to exist as a normal operating condition during the production, formulation, and downstream use of solvents. The biological STP is site specific and the releases to the various compartments have been set by the assessor. Default EUSES settings.

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM). Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor. Oil-water separation (e.g. via oil water separators, oil skimmers, or dissolved air flotation) is required. The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance.

Waste management	
Soil	not applicable - no direct release to soil
Remarks	Release factor to external waste: 1 %. Waste generation has been reported in a life cycle assessment of the base fluids used in the formulation of lubricants. This operation provides a reasonable surrogate for functional fluid use. A comparative life cycle assessment of the manufacture of base fluids for lubricants.

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors. All unrecovered waste is handled as an industrial waste that can be incinerated

Control of worker exposure	
Process category(ies)	**PROC1 - Use in closed process, no likelihood of exposure** **PROC2 - Use in closed, continuous process with occasional controlled exposure** **PROC3 - Use in closed batch process (synthesis or formulation)** **PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises** **PROC7 - Industrial spraying** **PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities** **PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities** **PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)** **PROC10 - Roller application or brushing** **PROC13 - Treatment of articles by dipping and pouring** **PROC17 - Lubrication at high energy conditions and in partly open process** **PROC18 - Greasing at high energy conditions** **PROC28 - Manual maintenance (cleaning and repair) of machinery**
Covers concentrations up to	100 %
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High
Remarks	Exposure assessment and risk characterization are not required for man via the environment as no hazard has been identified for long term systemic effects Exposure assessment and risk characterization are not required for workers as no hazard has been identified for human health
Conditions and measures related to personal protection, hygiene and health evaluation	PPE20: If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to EN 374 and provide employee skin care programs
Organisational measures to prevent /limit releases, dispersion and exposure	E14: Aspiration hazard. Do not ingest. If swallowed then seek immediate medical assistance. Keep good industrial hygiene
Additional good practice advice beyond the REACH Chemical Safety Report	Assumes a good basic standard of occupational hygiene is implemented. Avoid splashing. Decontaminate tools, equipment and personal protective equipment in a segregated area. Clear up spills immediately and dispose of waste safely. Ensure operatives are trained to minimise exposures.
Operational conditions	Industrial

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SPERC 4.6a.v2

Predicted No Effect Concentration (PNEC) Substance is a hydrocarbon UVCB. Hydrocarbons, C11-C13, isoalkanes, <2% aromatics, does not demonstrate acute fish and invertebrate toxicity, and alga toxicity at loadings up to 1000 mg/L. Substance is not readily biodegradable.

Calculation method The hydrocarbon block method was used for environmental risk assessment.

Remarks As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater fish (short-term). Danio rerio OECD Guideline 203.	LL50: > 100 mg/L (96h)	-
Freshwater fish (long-term). Oncorhynchus mykiss QSAR modeled data.	PETROTOX (v4.0): EL10: 27 mg/L (60d)	-
Freshwater invertebrates (short-term). Daphnia magna. OECD Guideline 202.	EL50: > 100 mg/L (24h)	-
Freshwater invertebrates (long-term). Daphnia magna. OECD Guideline 211.	NOELR: >10.2 mg/L (21d)	-
Algae and aquatic plants. Pseudokirchnerella subcapitata. OECD Guideline 201.	EL50: > 100 mg/L (72h) NOELR: =100 mg/L (72h)	-

Derived No Effect Level (DNEL) There is no basis for setting a DNEL for certain human health endpoints when the available data for this effect does not provide quantitative dose-response information, but there exist toxicity data of a qualitative nature. The endpoints for which the available data may trigger a qualitative risk characterisation includes aspiration and defatting of the skin. An aspiration hazard is a non-quantifiable hazard determined by physical properties that can only occur following accidental oral exposure or non-intended uses. Repeated exposure may cause skin dryness and cracking, is generally applied to petroleum substances and solvents that have the capacity to extract lipids from the skin and that are not classified as irritant. There is no test method and the effect cannot be quantified. A DNEL cannot be derived.

Section 4 - Guidance to check compliance with the exposure scenario

Available hazard data does not support the need for a DNEL to be established for other health effects. Substance is a hydrocarbon UVCB. The hydrocarbon block method was used for environmental risk assessment. Used Petrorisk model
Additional information can be found in REACH guidance (Report published on the methodologies employed in the environmental risk assessment of petroleum substances).

Exposure scenario

ES05: Use at industrial sites - Use in metal working fluids/rolling oils

Section 1 - Title

Title	ES05: Use at industrial sites - Use in metal working fluids/rolling oils
Environmental release category(ies)	- ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Specific Environmental Release Category	- ESVOC SPERC 4.7a.v3
Process category(ies)	- PROC1 - Use in closed process, no likelihood of exposure - PROC2 - Use in closed, continuous process with occasional controlled exposure - PROC3 - Use in closed batch process (synthesis or formulation) - PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises - PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) - PROC7 - Industrial spraying - PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities - PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) - PROC10 - Roller application or brushing - PROC13 - Treatment of articles by dipping and pouring - PROC17 - Lubrication at high energy conditions and in partly open process - PROC28 - Manual maintenance (cleaning and repair) of machinery

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SPERC 4.7a.v3

Remarks Basis for daily use amount at site: MSPERC

Amounts used	
Value	5,000
Units	kg/d
Remarks	Daily use amount at site

Value	10 %
Remarks	Percentage of EU tonnage used at regional scale

Value	100 %
Remarks	Percentage of Regional tonnage used at local scale

Value	<=42.6
Units	t(ons)/year
Remarks	Annual use amount at site

Product characteristics	
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	5 %, 1.25E3 kg/d
Release fraction to wastewater from process (initial release prior to RMM)	3E-4 %, 0.075 kg/d
Release fraction to soil from process (initial release prior to RMM)	0 %, - kg/d
Remarks	Indoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Assumed domestic sewage treatment plant flow	STP: >=2E3 m^3/d
Sludge treatment	No application of sewage sludge to soil
Remarks	Biological STP: Site specific. Biological wastewater treatment (WWT) may involve the use of both industrial and municipal WWT facilities. The prevalence of each type of facility was assessed in a survey of WWT technologies at 81 European chemical facilities that included both large integrated facilities and smaller dedicated stand-alone sites. The operations at these facilities included the production and formulation of a wide range of chemicals and solvents for use in a wide range of downstream applications. The survey results indicated that a majority (i.e. 89%) of the chemical facilities used a dedicated industrial wastewater treatment facility; a much smaller percentage utilized a municipal treatment plant capable of handling both industrial and domestic wastewater. Despite the limited reliance on municipal treatment facilities, their usage is conservatively assumed to exist as a normal operating condition during the production, formulation, and downstream use of solvents. The biological STP is site specific and the releases to the various compartments have been set by the assessor. Default EUSES settings.

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM). Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor. RMM limiting release to water: Oil-water separation (e.g. via oil water separators, oil skimmers, or dissolved air flotation) is required.

Waste management	
Soil	not applicable - no direct release to soil
Remarks	Release factor to external waste: 10 %. The quoted value was derived from a life cycle assessment for the commercial production of base fluids used in the formulation of lubricants. This operation provides a reasonable surrogate for the manufacture of metal working fluids for use in the parts fabrication industry. The highest reported solid waste factor of 1% was judged to be representative of other metal working fluids. An uncertainty factor of 10 has been applied to this value based on the anticipated variability of this factor across different industry sectors.

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors. All unrecovered

	waste is handled as an industrial waste that can be incinerated Solvent-containing liquid cleaning wastes are handled as hazardous waste and disposed of via thermal or catalytic incineration capable of efficiently converting volatile organic compounds to carbon dioxide and water. Hazardous waste handling conforms with the requirements of the Waste Framework Directive and includes procedures that minimize release during production, collection, storage, transportation, and treatment. These measures include a ban on the mixing of waste types, suitable packaging and labelling, and detailed documentation on the sources, quantities, and characteristics of the waste.

Control of worker exposure	
Process category(ies)	**PROC1 - Use in closed process, no likelihood of exposure** **PROC2 - Use in closed, continuous process with occasional controlled exposure** **PROC3 - Use in closed batch process (synthesis or formulation)** **PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises** **PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)** **PROC7 - Industrial spraying** **PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities** **PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities** **PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)** **PROC10 - Roller application or brushing** **PROC13 - Treatment of articles by dipping and pouring** **PROC17 - Lubrication at high energy conditions and in partly open process** **PROC28 - Manual maintenance (cleaning and repair) of machinery**
Covers concentrations up to	100 %
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High
Remarks	Exposure assessment and risk characterization are not required for man via the environment as no hazard has been identified for long term systemic effects Exposure assessment and risk characterization are not required for workers as no hazard has been identified for human health
Conditions and measures related to personal protection, hygiene and health evaluation	PPE20: If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to EN 374 and provide employee skin care programs
Organisational measures to prevent /limit releases, dispersion and	E14: Aspiration hazard. Do not ingest. If swallowed then seek immediate medical assistance. Keep good industrial hygiene

exposure	
Additional good practice advice beyond the REACH Chemical Safety Report	Assumes a good basic standard of occupational hygiene is implemented. Avoid splashing. Decontaminate tools, equipment and personal protective equipment in a segregated area. Clear up spills immediately and dispose of waste safely. Ensure operatives are trained to minimise exposures.
Operational conditions	Industrial

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Specific Environmental Release Category - ESVOC SPERC 4.7a.v3

Predicted No Effect Concentration (PNEC) Substance is a hydrocarbon UVCB. Hydrocarbons, C11-C13, isoalkanes, <2% aromatics, does not demonstrate acute fish and invertebrate toxicity, and alga toxicity at loadings up to 1000 mg/L. Substance is not readily biodegradable.

Calculation method The hydrocarbon block method was used for environmental risk assessment.

Remarks As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater fish (short-term). Danio rerio OECD Guideline 203.	LL50: > 100 mg/L (96h)	-
Freshwater fish (long-term). Oncorhynchus mykiss QSAR modeled data.	PETROTOX (v4.0): EL10: 27 mg/L (60d)	-
Freshwater invertebrates (short-term). Daphnia magna. OECD Guideline 202.	EL50: > 100 mg/L (24h)	-
Freshwater invertebrates (long-term). Daphnia magna. OECD Guideline 211.	NOELR: >10.2 mg/L (21d)	-
Algae and aquatic plants. Pseudokirchnerella subcapitata. OECD Guideline 201.	EL50: > 100 mg/L (72h) NOELR: =100 mg/L (72h)	-

Derived No Effect Level (DNEL) There is no basis for setting a DNEL for certain human health endpoints when the available data for this effect does not provide quantitative dose-response information, but there exist toxicity data of a qualitative nature. The endpoints for which the available data may trigger a qualitative risk characterisation includes aspiration and defatting of the skin. An aspiration hazard is a non-quantifiable hazard determined by physical properties that can only occur following accidental oral exposure or non-intended uses. Repeated exposure may cause skin dryness and cracking, is generally applied to petroleum substances and solvents that have the capacity to extract lipids from the skin and that are not classified as irritant. There is no test method and the effect cannot be quantified. A DNEL cannot be derived.

Section 4 - Guidance to check compliance with the exposure scenario

Available hazard data does not support the need for a DNEL to be established for other health effects. Substance is a hydrocarbon UVCB. The hydrocarbon block method was used for environmental risk assessment. Used Petrorisk model
Additional information can be found in REACH guidance (Report published on the methodologies employed in the environmental risk assessment of petroleum substances).

Exposure scenario

ES06: Use at industrial sites - Polymer production

Section 1 - Title

Title	ES06: Use at industrial sites - Polymer production
Environmental release category(ies)	- ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
Process category(ies)	- PROC1 - Use in closed process, no likelihood of exposure - PROC2 - Use in closed, continuous process with occasional controlled exposure - PROC3 - Use in closed batch process (synthesis or formulation) - PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises - PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) - PROC6 - Calendaring operations - PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities - PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising - PROC28 - Manual maintenance (cleaning and repair) of machinery

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Amounts used	
Value	<=2.125
Units	t(ons)/day
Remarks	Daily use amount at site

Value	10 %
Remarks	Percentage of EU tonnage used at regional scale

Value	<=42.5
Units	t(ons)/year
Remarks	Annual use amount at site

Product characteristics	
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High

Other operational conditions of use affecting environmental exposure	
Type	ERC
Release fraction to air from process (initial release prior to RMM)	100 %, 2.13E3 kg/d

Release fraction to wastewater from process (initial release prior to RMM)	100 %, 2.13E3 kg/d
Release fraction to soil from wide dispersive use (regional only)	5 %
Remarks	Indoor use. Water contact during use. Surface water flow rate: >=1.8E4 m^3/d

Conditions and measures related to municipal sewage treatment plant	
Assumed domestic sewage treatment plant flow	STP: >=2E3 m^3/d
Sludge treatment	Application of the STP sludge on agricultural soil: Yes
Remarks	Biological STP: Standard

Control of worker exposure	
Process category(ies)	**PROC1 - Use in closed process, no likelihood of exposure** **PROC2 - Use in closed, continuous process with occasional controlled exposure** **PROC3 - Use in closed batch process (synthesis or formulation)** **PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises** **PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)** **PROC6 - Calendaring operations** **PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities** **PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities** **PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelettising** **PROC28 - Manual maintenance (cleaning and repair) of machinery**
Covers concentrations up to	100 %
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High
Remarks	Exposure assessment and risk characterization are not required for man via the environment as no hazard has been identified for long term systemic effects Exposure assessment and risk characterization are not required for workers as no hazard has been identified for human health
Conditions and measures related to personal protection, hygiene and health evaluation	PPE20: If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to EN 374 and provide employee skin care programs
Organisational measures to prevent /limit releases, dispersion and exposure	E14: Aspiration hazard. Do not ingest. If swallowed then seek immediate medical assistance. Keep good industrial hygiene
Additional good practice advice	Assumes a good basic standard of occupational hygiene is implemented. Avoid splashing.

beyond the REACH Chemical Safety Report	Decontaminate tools, equipment and personal protective equipment in a segregated area. Clear up spills immediately and dispose of waste safely. Ensure operatives are trained to minimise exposures.
Operational conditions	Industrial

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Predicted No Effect Concentration (PNEC) Substance is a hydrocarbon UVCB. Hydrocarbons, C11-C13, isoalkanes, <2% aromatics, does not demonstrate acute fish and invertebrate toxicity, and alga toxicity at loadings up to 1000 mg/L. Substance is not readily biodegradable.

Calculation method The hydrocarbon block method was used for environmental risk assessment.

Remarks As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater fish (short-term). Danio rerio OECD Guideline 203.	LL50: > 100 mg/L (96h)	-
Freshwater fish (long-term). Oncorhynchus mykiss QSAR modeled data.	PETROTOX (v4.0): EL10: 27 mg/L (60d)	-
Freshwater invertebrates (short-term). Daphnia magna. OECD Guideline 202.	EL50: > 100 mg/L (24h)	-
Freshwater invertebrates (long-term). Daphnia magna. OECD Guideline 211.	NOELR: >10.2 mg/L (21d)	-
Algae and aquatic plants. Pseudokirchnerella subcapitata. OECD Guideline 201.	EL50: > 100 mg/L (72h) NOELR: =100 mg/L (72h)	-

Derived No Effect Level (DNEL) There is no basis for setting a DNEL for certain human health endpoints when the available data for this effect does not provide quantitative dose-response information, but there exist toxicity data of a qualitative nature. The endpoints for which the available data may trigger a qualitative risk characterisation includes aspiration and defatting of the skin. An aspiration hazard is a non-quantifiable hazard determined by physical properties that can only occur following accidental oral exposure or non-intended uses. Repeated exposure may cause skin dryness and cracking, is generally applied to petroleum substances and solvents that have the capacity to extract lipids from the skin and that are not classified as irritant. There is no test method and the effect cannot be quantified. A DNEL cannot be derived.

Section 4 - Guidance to check compliance with the exposure scenario

Available hazard data does not support the need for a DNEL to be established for other health effects. Substance is a hydrocarbon UVCB. The hydrocarbon block method was used for environmental risk assessment. Used Petrorisk model
Additional information can be found in REACH guidance (Report published on the methodologies employed in the environmental risk assessment of petroleum substances).

Exposure scenario

ES07: Widespread use by professional workers - Use in coatings

Section 1 - Title

Title	ES07: Widespread use by professional workers - Use in coatings
Environmental release category(ies)	- ERC8a - Wide dispersive indoor use of processing aids in open systems - ERC8d - Wide dispersive outdoor use of processing aids in open systems
Specific Environmental Release Category	- ESVOC SPERC 8.3b.v2
Process category(ies)	- PROC1 - Use in closed process, no likelihood of exposure - PROC2 - Use in closed, continuous process with occasional controlled exposure - PROC3 - Use in closed batch process (synthesis or formulation) - PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises - PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) - PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities - PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities - PROC10 - Roller application or brushing - PROC11 - Non industrial spraying - PROC13 - Treatment of articles by dipping and pouring - PROC15 - Use as laboratory reagent - PROC19 - Hand-mixing with intimate contact and only PPE available - PROC28 - Manual maintenance (cleaning and repair) of machinery

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems
Specific Environmental Release Category - ESVOC SPERC 8.3b.v2

Amounts used	
Value	<=4.11E-4
Units	t(ons)/day
Remarks	Daily local widespread use amount

Value	10 %
Remarks	Percentage of EU tonnage used at regional scale

Value	0.05 %
Remarks	Percentage of Regional tonnage used at local scale

Product characteristics	
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High

Other operational conditions of use affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	98 %, - kg/d
Release fraction to wastewater from process (initial release prior to RMM)	1 %, 4.11E-3 kg/d
Release fraction to soil from process (initial release prior to RMM)	1 %, - kg/d
Remarks	Indoor use. Outdoor use. Water contact during use.

Conditions and measures related to municipal sewage treatment plant	
Remarks	Biological STP: Standard. Unused and spent products and solutions should be appropriately labelled and stored for eventual recovery or disposal as hazardous waste. A suitable unbreakable and closable container should be used when storing and shipping hazardous materials. The containers must be solvent compatible, leakproof, and free of any defects. Contaminated debris such as disposable paper towels, brushes, rollers, masks, transfer vessels, and wipes that may contain small amounts of solvent residue need to be handled as hazardous waste and properly disposed of in a manner that is consistent with local, regional, and national regulations. Direct disposal of waste into a municipal sewer system needs to conform with all applicable laws and regulations. A spill plan needs to be available that outlines the steps to be taken to minimize any potential health and environmental threats.

Technical and organisational measures	
Remarks	No obligatory Risk Management Measures (RMM). RMM limiting release to water: The release to water is modified after biological treatment at a standard municipal sewage treatment plant (STP) with an effluent flow rate of 2,000 m3/day. Emissions to air are minimized when the product is used in accordance with the manufacturers' instructions and/or the established practices. Emissions to soil are minimized when the product is used in accordance with the manufacturers' instructions and / or the established practices.

Waste management	
Soil	not applicable - no direct release to soil
Remarks	Release factor to external waste: 2 %. The waste generation factor was taken from an Emission Scenario Document (ESD) for the professional application of a decorative coating. The factor represents the amount of solvent waste that remains unused in the paint can and the waste that remains on the brushes and rollers following application. An adjustment factor has not been applied to this value since the assessment is representative of use conditions associated with a wide range of professional cleaning products.

Conditions and measures related to external treatment of waste for disposal	
Disposal	Residual raw materials are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications.
Waste treatment methods	Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapors. All unrecovered waste is handled as an industrial waste that can be incinerated

Control of worker exposure	
Process category(ies)	**PROC1 - Use in closed process, no likelihood of exposure** **PROC2 - Use in closed, continuous process with occasional controlled exposure** **PROC3 - Use in closed batch process (synthesis or formulation)** **PROC4 - Use in batch and other process (synthesis) where**

	opportunity for exposure arises **PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)** **PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities** **PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities** **PROC10 - Roller application or brushing** **PROC11 - Non industrial spraying** **PROC13 - Treatment of articles by dipping and pouring** **PROC15 - Use as laboratory reagent** **PROC19 - Hand-mixing with intimate contact and only PPE available** **PROC28 - Manual maintenance (cleaning and repair) of machinery**
Covers concentrations up to	100 %
Physical form of product	Liquid
Vapour pressure	0.04 kPa
Temperature vapour pressure	@ 20 °C
Level of dustiness	High
Volatility	High
Remarks	Exposure assessment and risk characterization are not required for man via the environment as no hazard has been identified for long term systemic effects Exposure assessment and risk characterization are not required for workers as no hazard has been identified for human health
Conditions and measures related to personal protection, hygiene and health evaluation	PPE20: If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to EN 374 and provide employee skin care programs
Organisational measures to prevent /limit releases, dispersion and exposure	E14: Aspiration hazard. Do not ingest. If swallowed then seek immediate medical assistance. Keep good industrial hygiene
Additional good practice advice beyond the REACH Chemical Safety Report	Assumes a good basic standard of occupational hygiene is implemented. Avoid splashing. Decontaminate tools, equipment and personal protective equipment in a segregated area. Clear up spills immediately and dispose of waste safely. Ensure operatives are trained to minimise exposures.
Operational conditions	Industrial

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8a - Wide dispersive indoor use of processing aids in open systems
- ERC8d - Wide dispersive outdoor use of processing aids in open systems

Specific Environmental Release Category - ESVOC SPERC 8.3b.v2

Predicted No Effect Concentration (PNEC) Substance is a hydrocarbon UVCB. Hydrocarbons, C11-C13, isoalkanes, <2% aromatics, does not demonstrate acute fish and invertebrate toxicity, and alga toxicity at loadings up to 1000 mg/L. Substance is not readily biodegradable.

Calculation method The hydrocarbon block method was used for environmental risk assessment.
Remarks As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater fish (short-term). Danio rerio OECD Guideline 203.	LL50: > 100 mg/L (96h)	-
Freshwater fish (long-term). Oncorhynchus mykiss QSAR modeled data.	PETROTOX (v4.0): EL10: 27 mg/L (60d)	-
Freshwater invertebrates (short-term). Daphnia magna. OECD Guideline 202.	EL50: > 100 mg/L (24h)	-
Freshwater invertebrates (long-term). Daphnia magna. OECD Guideline 211.	NOELR: >10.2 mg/L (21d)	-
Algae and aquatic plants. Pseudokirchnerella subcapitata. OECD Guideline 201.	EL50: > 100 mg/L (72h) NOELR: =100 mg/L (72h)	-

Derived No Effect Level (DNEL) There is no basis for setting a DNEL for certain human health endpoints when the available data for this effect does not provide quantitative dose-response information, but there exist toxicity data of a qualitative nature. The endpoints for which the available data may trigger a qualitative risk characterisation includes aspiration and defatting of the skin. An aspiration hazard is a non-quantifiable hazard determined by physical properties that can only occur following accidental oral exposure or non-intended uses. Repeated exposure may cause skin dryness and cracking, is generally applied to petroleum substances and solvents that have the capacity to extract lipids from the skin and that are not classified as irritant. There is no test method and the effect cannot be quantified. A DNEL cannot be derived.

Section 4 - Guidance to check compliance with the exposure scenario

Available hazard data does not support the need for a DNEL to be established for other health effects. Substance is a hydrocarbon UVCB. The hydrocarbon block method was used for environmental risk assessment. Used Petrorisk model
Additional information can be found in REACH guidance (Report published on the methodologies employed in the environmental risk assessment of petroleum substances).