SAFETY DATA SHEET

ExxonMobil

PIPERYLENE CUT

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

1.1 Product identifier

Product name : PIPERYLENE CUT

see Section 16 for Synonyms

EC number : 270-726-2

REACH Registration number

Registration number
01-2119480194-38-0002

CAS number : 68477-35-0

Product description : Chemical Intermediate

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

Intended Use : Intermediate

Identified uses
Manufacture of substance Distribution of substance Use as an intermediate Use as a fuel - Industrial Use in polymer production - Industrial

Uses advised against

Not applicable.

1.3 Details of the supplier of the safety data sheet

Supplier : ExxonMobil Petroleum & Chemical BV

POLDERDIJKWEG
Antwerpen B-2030 Belgium

Supplier General Contact : + 32 2 239 3111

e-mail address of person responsible for this SDS : SDS-CC@exxonmobil.com

SDS Internet Address : www.sds.exxonmobil.com

National contact

ExxonMobil Chemical Ltd.

MAILPOINT 14
MARSH LANE
FAWLEY, SOUTHAMPTON
SO45 1TX HAMPSHIRE
Great Britain

+44 (0)23-8089-3822

1.4 Emergency telephone number

National advisory body/ Poison Centre : (UK) 111

24 Hour Emergency Telephone : +44 20 3807 3798 / +1-703-527-3887 (CHEMTREC)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : UVCB

Classification according to UK CLP/GHS

Flam. Liq. 1, H224
Acute Tox. 4, H302
Acute Tox. 4, H312
Skin Irrit. 2, H315
Eye Irrit. 2, H319
Muta. 1B, H340
Carc. 1A, H350
Repr. 2, H361d
STOT SE 3, H335
STOT SE 3, H336
Asp. Tox. 1, H304
Aquatic Chronic 2, H411

The product is classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms :

Signal word : Danger

Hazard statements :
H224 - Extremely flammable liquid and vapour.
H302 + H312 - Harmful if swallowed or in contact with skin.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H335 - May cause respiratory irritation.
H336 - May cause drowsiness or dizziness.
H340 - May cause genetic defects.
H350 - May cause cancer.
H361d - Suspected of damaging the unborn child.
H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention :
P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240 - Ground and bond container and receiving equipment.
P241 - Use explosion-proof electrical, ventilating or lighting equipment.
P242 - Use non-sparking tools.
P243 - Take action to prevent static discharges.
P261 - Avoid breathing vapour.
P264 - Wash thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, protective clothing, eye protection, face protection, or hearing protection.

SECTION 2: Hazards identification

Response : P301 + P330, P331, P310 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor.
P302 + P312, P352 - IF ON SKIN: Call a POISON CENTER or doctor if you feel unwell. Wash with plenty of water.
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P304 + P312, P340 - IF INHALED: Call a POISON CENTER or doctor if you feel unwell. Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 - IF exposed or concerned: Get medical advice or attention.
P332 + P313 - If skin irritation occurs: Get medical advice/attention.
P337 + P313 - If eye irritation persists: Get medical advice/attention.
P362 + P364 - Take off contaminated clothing and wash it before reuse.
P370 + P378 - In case of fire: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.
P391 - Collect spillage.

Storage : P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 - Keep cool.
P405 - Store locked up.

Disposal : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous ingredients : distillates (petroleum), c3-6, piperylene-rich

Supplemental label elements : Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : None.

Special packaging requirements

Containers to be fitted with child-resistant fastenings : Not applicable.

Tactile warning of danger : Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII :

PBT	P	B	T	vPvB	vP	vB
N/A	N/A	N/A	Yes	N/A	N/A	N/A

Other hazards which do not result in classification : None known.

Nota : This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3: Composition/information on ingredients

3.1 Substances : UVCB

Product/ingredient name	Identifiers	%	Classification	Type
distillates (petroleum), c3-6, piperylene-rich	REACH #: 01-2119480194-38 EC: 270-726-2 CAS: 68477-35-0	100	Flam. Liq. 1, H224 Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Muta. 1B, H340 Carc. 1A, H350 Repr. 2, H361d STOT SE 3, H335 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411	[1]
trans 1.3 pentadiene	EC: 217-909-5 CAS: 2004-70-8	15 - 36	Flam. Liq. 2, H225 Asp. Tox. 1, H304	[1]
pentane	REACH #: 01-2119459286-30 EC: 203-692-4 CAS: 109-66-0	0 - 30	Flam. Liq. 1, H224 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411 EUH066	[1]
cis 1.3 pentadiene	EC: 216-401-0 CAS: 1574-41-0	10 - 30	Flam. Liq. 2, H225 Asp. Tox. 1, H304	[1]
cyclopentene	EC: 205-532-9 CAS: 142-29-0	0 - 21	Flam. Liq. 2, H225 Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Irrit. 2, H315 Asp. Tox. 1, H304	[1]
2-methyl 2-butene	EC: 208-156-3 CAS: 513-35-9	0.13 - 12	Flam. Liq. 2, H225 Acute Tox. 4, H302 Skin Irrit. 2, H315 Muta. 2, H341 Carc. 2, H351 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411	[1]
benzene	REACH #: 01-2119447106-44 EC: 200-753-7 CAS: 71-43-2	0 - 0.9	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Muta. 1B, H340 Carc. 1A, H350 STOT RE 1, H372 (blood) Asp. Tox. 1, H304 Aquatic Chronic 3, H412 **See Section 16 for the full text of the H statements declared above.**	[1]

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type

[1] Constituent

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Continue to rinse for at least 10 minutes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Get medical attention. If necessary, call a poison center or physician. Wash with plenty of soap and water.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : Adverse symptoms may include the following:
nausea or vomiting

4.3 Indication of any immediate medical attention and special treatment needed

SECTION 4: First aid measures

Notes to physician : If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately. This material, or a component, may be associated with cardiac sensitization following very high exposures (well above occupational exposure limits) or with concurrent exposure to high stress levels or heart-stimulating substances like epinephrine. Administration of such substances should be avoided.

Specific treatments : No specific treatment.

See toxicological information (Section 11)

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Specific hazards arising from the chemical : Extremely flammable liquid and vapour. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous combustion products : Incomplete combustion products, Oxides of carbon, Smoke, Fume

5.3 Advice for firefighters

Special protective actions for fire-fighters : Use standard firefighting procedures and consider the hazards of other involved materials. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. Assure an extended cooling down period to prevent re-ignition. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: Accidental release measures

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Put on appropriate personal protective equipment. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

SECTION 6: Accidental release measures

6.2 Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

6.3 Methods and material for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Eliminate all ignition sources. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. If the Flash Point exceeds the Ambient Temperature by 10 deg C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. Seek the advice of a specialist before using dispersants. Warn other shipping. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

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

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not swallow. Avoid breathing vapour or mist. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Static Accumulator : This material is a static accumulator.

SECTION 7: Handling and storage

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidising materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Seveso Directive - Reporting thresholds

Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
P5a E2	10 tonne 200 tonne	50 tonne 500 tonne

7.3 Specific end use(s)

Recommendations : Not available.

Industrial sector specific solutions : Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
trans 1.3 pentadiene	**ExxonMobil (COMPANY)** TWA 8 hours: 10 ppm.
pentane	**EH40/2005 WELs (United Kingdom (UK), 1/2020)** TWA 8 hours: 600 ppm. TWA 8 hours: 1800 mg/m³. **EU OEL (Europe, 1/2022)** TWA 8 hours: 3000 mg/m³. TWA 8 hours: 1000 ppm. **ACGIH TLV (United States, 1/2024) [Pentane]** TWA 8 hours: 1000 ppm.
cis 1.3 pentadiene	**ExxonMobil (COMPANY)** TWA 8 hours: 10 ppm.
2-methyl 2-butene	**ACGIH TLV (United States, 1/2024)** TWA 8 hours: 10 ppm. **ExxonMobil (COMPANY)** TWA 8 hours: 10 ppm.
isoprene	**ExxonMobil (COMPANY)** TWA 8 hours: 10 ppm.
3a,4,7,7a-tetrahydro-4,7-methanoindene	**EH40/2005 WELs (United Kingdom (UK), 1/2020)** TWA 8 hours: 5 ppm. TWA 8 hours: 27 mg/m³. **ACGIH TLV (United States, 1/2024)** TWA 8 hours: 0.5 ppm. STEL 15 minutes: 1 ppm. **ExxonMobil (COMPANY)** TWA 8 hours: 5 mg/m³.
benzene	**EH40/2005 WELs (United Kingdom (UK), 1/2020)** Absorbed through skin. TWA 8 hours: 1 ppm. TWA 8 hours: 3.25 mg/m³. **EU OEL (Europe, 3/2024)** Absorbed through skin.

SECTION 8: Exposure controls/personal protection

	TWA 8 hours: 0.5 ppm. TWA 8 hours: 1.65 mg/m³. **ACGIH TLV (United States, 1/2024)** Absorbed through skin. TWA 8 hours: 0.02 ppm. **ExxonMobil (COMPANY)** Absorbed through skin. STEL 15 minutes: 1 ppm. TWA 8 hours: 0.2 ppm.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

Recommended monitoring procedures : Reference should be made to monitoring standards, such as the following: British Standard BS EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) British Standard BS EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) British Standard BS EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
distillates (petroleum), c3-6, piperylene-rich	DNEL	Long term Dermal	23.7 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	8.4 mg/m³	Workers	Systemic
pentane	DNEL	Long term Oral	214 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	214 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	3000 mg/m³	Workers	Systemic
	DNEL	Long term Dermal	432 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	643 mg/m³	General population	Systemic

PNECs

Product/ingredient name	Compartment Detail	Value	Method Detail
distillates (petroleum), c3-6, piperylene-rich	Marine water	0.25 mg/l	-
	Sewage treatment plant	0.96 mg/l	-
	Fresh water	0.25 mg/l	-
	Marine water sediments	23.7 mg/kg dwt	-
	Fresh water sediment	23.7 mg/kg dwt	-
	Soil	6.2 mg/kg	-
pentane	Fresh water sediment	1.2 mg/kg dwt	-
	Sewage treatment plant	3.6 mg/l	-
	Fresh water	0.23 mg/l	-
	Marine water	0.23 mg/l	-
	Soil	0.55 mg/kg	-
	Marine water sediments	1.2 mg/kg dwt	-

8.2 Exposure controls

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 8: Exposure controls/personal protection

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. > 8 hours (breakthrough time): Viton, minimum 0.71 mm thickness or comparable protective barrier material

CEN standards EN 420 and EN 374 provide general requirements and lists of glove types.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Recommended: organic vapour filter (Type A)

European Committee for Standardization (CEN) standards EN 136, 140 and 405 provide respirator masks and EN 149 and 143 provide filter recommendations.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Section 9. Physical and chemical properties and safety characteristics

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties

Appearance

Physical state : Liquid. [Clear]

Colour : Colorless to Yellow

Odour : Pungent petroleum

Odour threshold : Not available.

pH : Not applicable.

Melting point/freezing point : <-100°C (<-148°F) [Technical literature]

Section 9. Physical and chemical properties and safety characteristics

Boiling point or initial boiling point and boiling range : 30.8°C (87.4°F) [In-house method ,]

Flash point : Closed cup: <-15°C (<5°F) [In-house method ,]

Evaporation rate : Not available.

Flammability : Flammable liquids - Category 1

Lower and upper explosive (flammable) limits : Lower: 1.1% [In-house method ,]
Upper: 10.7%

Vapour pressure : 337.53 to 438.79 mm Hg [20 °C] [In-house method ,]
459.04 to 694.56 mm Hg [37.8 °C] [In-house method ,]

Relative vapour density : Not available.

Relative density : 0.682 to 0.702 [In-house method ,]

Solubility in water : Negligible

Partition coefficient: n-octanol/water : 2.2 to 5 [Technical literature]

Auto-ignition temperature : 288 to 315°C (550.4 to 599°F) [Technical literature]

Decomposition temperature : Not available.

Viscosity : 0.36 cSt [20 °C] [In-house method ,]

Particle characteristics

Median particle size : Not applicable.

SECTION 10: Stability and reactivity

10.1 Reactivity : No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability : The product is stable.

10.3 Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

10.5 Incompatible materials : Reactive or incompatible with the following materials:,oxidising materials,Strong oxidisers

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

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Test	Species	Result	Duration
distillates (petroleum), c3-6, piperylene-rich	LC50 Inhalation Vapour	Rat	>5200 mg/m³	4 hours
	LD50 Dermal	Rabbit	1183 mg/kg	-
	LD50 Oral	Rat	1592 mg/kg	-
distillates (petroleum), c3-6, piperylene-rich	LD50 Dermal	Rabbit	1183 mg/kg	-
cyclopentene	LD50 Dermal	Rabbit	1231 mg/kg	-
	LD50 Oral	Rat	1656 mg/kg	-

SECTION 11: Toxicological information

Conclusion/Summary

Inhalation : Minimally Toxic. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 403

Dermal : Slightly toxic. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 402

Oral : Slightly toxic. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 401

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
distillates (petroleum), c3-6, piperylene-rich	500	1100	N/A	N/A	N/A
distillates (petroleum), c3-6, piperylene-rich	500	1100	N/A	N/A	N/A
trans 1.3 pentadiene	2500	N/A	N/A	N/A	N/A
cis 1.3 pentadiene	2500	N/A	N/A	N/A	N/A
cyclopentene	1656	1231	N/A	N/A	N/A
2-methyl 2-butene	500	N/A	N/A	N/A	N/A
benzene	2500	N/A	N/A	N/A	N/A

Irritation/Corrosion

Conclusion/Summary

Skin : Irritating to the skin. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 404

Eyes : Irritating and will injure eye tissue. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 405

Respiratory : May be irritating to the respiratory tract. The effects are reversible. No end point data for material.

Respiratory or skin sensitization

Conclusion/Summary

Skin : Not expected to be a skin sensitizer. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 406

Respiratory : Not expected to be a respiratory sensitizer. No end point data for material.

Mutagenicity

Conclusion/Summary : May cause genetic defects. No end point data for material. Based on assessment of the components.

Carcinogenicity

Conclusion/Summary : May cause cancer. No end point data for material. Based on assessment of the components.

Reproductive toxicity

Conclusion/Summary : May damage the unborn child. No end point data for material. Based on assessment of the components.

Specific target organ toxicity (single exposure)

Not available.

Conclusion/Summary : May cause drowsiness or dizziness. May cause respiratory irritation. No end point data for material.

Specific target organ toxicity (repeated exposure)

distillates (petroleum), c3-6, piperylene-rich Not applicable. -

Conclusion/Summary : Not expected to cause organ damage from prolonged or repeated exposure. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 408 413 422 453

Aspiration hazard

distillates (petroleum), c3-6, piperylene-rich Category 1

SECTION 11: Toxicological information

Conclusion/Summary : May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material. Data available.

Information on likely routes of exposure : Not available.

Other information

Contains : ISOPRENE: Produced mutations and cancer in laboratory animals. The relevance of these findings to humans is uncertain. DICYCLOPENTADIENE: Repeated inhalation exposure of dicyclopentadiene produced damage to the kidney of male rats only. These effects are believed to be species specific and are not relevant to humans. BENZENE: Caused cancer (acute myeloid leukemia and myelodysplastic syndrome), damage to the blood-producing system, and serious blood disorders in human studies. Caused genetic effects and effects on the immune system in laboratory animal and some human studies. Caused toxicity to the fetus and cancer in laboratory animal studies.

Product : Exposure to this material, or one of its components, in situations where there is the potential for high levels, such as in confined spaces or with abuse, may result in abnormal heart rhythm (arrhythmia). High-level exposure to hydrocarbons (above occupational exposure limits) may initiate arrhythmia in a worker that is undergoing stress or is taking a heart-stimulating substance such as epinephrine, a nasal decongestant, or an asthma or cardiovascular drug. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Section 12. Ecological information

The information given is based on data for the material, components of the material, or for similar materials, through the application of bridging principals.

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
-	Acute EL50 75.6 mg/l data for similar materials	Algae - *Pseudokirchneriella subcapitata*	72 hours
	Acute EL50 6.96 mg/l data for similar materials	daphnia - *Daphnia magna*	48 hours
	Acute LL50 14.1 mg/l data for similar materials	Fish - *Oncorhynchus mykiss*	96 hours
	Acute NOEL 20.7 mg/l data for similar materials	Algae - *Pseudokirchneriella subcapitata*	72 hours

Conclusion/Summary

Acute toxicity : Toxic to aquatic life.

Chronic toxicity : Toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
-	Ready Biodegradability	9 % - 28 days	data for similar materials	water

Biodegradability : Material -- Expected to biodegrade slowly.

Hydrolysis : Material -- Transformation due to hydrolysis not expected to be significant.

Photolysis : Material -- Transformation due to photolysis not expected to be significant.

Atmospheric Oxidation : Material -- Expected to degrade rapidly in air

12.3 Bioaccumulative potential

Not determined.

Section 12. Ecological information

12.4 Mobility in soil

Mobility : Material -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

12.5 Results of PBT and vPvB assessment

Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
distillates (petroleum), c3-6, piperylene-rich	N/A	N/A	N/A	Yes	N/A	N/A	N/A

12.6 Other adverse effects

Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

Special precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14: Transport information

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	UN3295	UN3295	UN3295	UN3295
14.2 UN proper shipping name	HYDROCARBONS, LIQUID, N.O.S.	HYDROCARBONS, LIQUID, N.O.S.	HYDROCARBONS, LIQUID, N.O.S.	Hydrocarbons, liquid, n.o.s.
14.3 Transport hazard class(es)	3 	3 	3 	3 
14.4 Packing group	I	I	I	I
14.5 Environmental hazards	Yes.	Yes.	Yes.	Yes. The environmentally hazardous substance mark is not required.

Additional information

ADR/RID : The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.
Hazard identification number 33
Limited quantity 500 ml
Tunnel code (D/E)

ADN : The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.
CMR, N2

IMDG : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.
Emergency schedules F-E, S-D
Flash point <-15 °C C.C.

IATA : The environmentally hazardous substance mark may appear if required by other transportation regulations.
Quantity limitation Passenger and Cargo Aircraft: 1 L. Packaging instructions: 351. Cargo Aircraft Only: 30 L. Packaging instructions: 361. Limited Quantities - Passenger Aircraft: Forbidden. Packaging instructions: Forbidden.
Special provisions A3, A324

14.6 Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to IMO instruments

Proper shipping name : 1,3-PENTADIENE (greater than 50%), CYCLOPENTENE AND ISOMERS, MIXTURE

Remarks : **Liquid bulk cargoes:**
Ship type: 2
Pollution category: Y

SECTION 15: Regulatory information

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

UK (GB)/REACH

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

SECTION 15: Regulatory information

None of the components are listed.

Ozone depleting substances

Not listed.

Prior Informed Consent (PIC)

Not listed.

Persistent Organic Pollutants

Not listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : None.

Seveso Directive

This product is controlled under the Seveso Directive.

Danger criteria

Category
P5a E2

National regulations

Product/ingredient name	List name	Name on list	Classification	Notes
benzene	EH40/2005 WELs ACGIH TLV	-	Carc A1	-

EU regulations

Industrial emissions (integrated pollution prevention and control) - Air : Not listed

Industrial emissions (integrated pollution prevention and control) - Water : Not listed

Inventory list

Australia inventory (AIIC) : All components are listed or exempted.

Canada inventory (DSL-NDSL) : All components are listed or exempted.

China inventory (IECSC) : Not determined.

Japan inventory (CSCL) : Not determined.

Japan inventory (Industrial Safety and Health Act) : Not determined.

New Zealand Inventory of Chemicals (NZIoC) : Not determined.

Philippines inventory (PICCS) : Not determined.

Korea inventory (KECI) : All components are listed or exempted.

Taiwan Chemical Substances Inventory (TCSI) : All components are listed or exempted.

United States inventory (TSCA 8b) : All components are active or exempted.

15.2 Chemical safety assessment : This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
GB CLP = UK CLP (EC No 1272/2008) on the Classification, Labelling and Packaging of Substances and Mixtures as amended by (EU Exit) Regulations 2019 No. 720 and amendments
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = GB CLP-specific Hazard statement
N/A = Not available
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
SGG = Segregation Group
vPvB = Very Persistent and Very Bioaccumulative

Procedure used to derive the classification

Classification	Justification
Flam. Liq. 1, H224	Expert judgment
Acute Tox. 4, H302	Expert judgment
Acute Tox. 4, H312	Expert judgment
Skin Irrit. 2, H315	Expert judgment
Eye Irrit. 2, H319	Expert judgment
Muta. 1B, H340	Expert judgment
Carc. 1A, H350	Expert judgment
Repr. 2, H361d	Expert judgment
STOT SE 3, H335	Expert judgment
STOT SE 3, H336	Expert judgment
Asp. Tox. 1, H304	Expert judgment
Aquatic Chronic 2, H411	Expert judgment

Full text of abbreviated H statements

H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H351	Suspected of causing cancer.
H361d	Suspected of damaging the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
EUH066	Repeated exposure may cause skin dryness or cracking.

Full text of classifications

Acute Tox. 4	ACUTE TOXICITY - Category 4
Aquatic Chronic 2	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2
Aquatic Chronic 3	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3
Asp. Tox. 1	ASPIRATION HAZARD - Category 1
Carc. 1A	CARCINOGENICITY - Category 1A
Carc. 2	CARCINOGENICITY - Category 2
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Flam. Liq. 1	FLAMMABLE LIQUIDS - Category 1
Flam. Liq. 2	FLAMMABLE LIQUIDS - Category 2
Muta. 1B	GERM CELL MUTAGENICITY - Category 1B
Muta. 2	GERM CELL MUTAGENICITY - Category 2

SECTION 16: Other information

Repr. 2	REPRODUCTIVE TOXICITY - Category 2
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2
STOT RE 1	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 1
STOT SE 3	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3

Date of issue/ Date of revision : 29 January 2025

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Version : 1.03

THIS SDS COVERS THE FOLLOWING MATERIALS :

BT01 ovh (BR); JSR piperylene (Tonen); PIP cut; Piperylene; T022 ovh (NDG); TK 16566 (BR)

Product code : 1161407

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Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : UVCB

Code : 1161407

Product name : PC AIBU DISTILLATES (PETROLEUM),C3-6,PIPERYLENE-RICH

Section 1 - Title

Short title of the exposure scenario : Manufacture of substance

List of use descriptors : **Identified use name:** Manufacture of substance
Process Category: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15
Sector of end use: SU03, SU08, SU09, SU10
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC01, ERC04

Environmental contributing scenarios : **General exposures -** ERC01, ERC04

Health Contributing scenarios : **General measures applicable to all activities -** PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15
General exposures (closed systems) - PROC01, PROC02
General exposures - PROC03
General exposures (open systems) - PROC04
Process sampling - PROC08b
Laboratory activities - PROC15
Bulk transfers - PROC08b
Equipment cleaning and maintenance - PROC08a
Storage - PROC02

Processes and activities covered by the exposure scenario : Manufacture of the substance or use as an intermediate, process chemical or extracting agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (ncluding marine vessel/barge, road/rail car and bulk container).

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: General exposures

Product characteristics : Predominantly hydrophobic
Substance is complex UVCB.

Amounts used : Annual site tonnage (tonnes/year): 50 000 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 1
Maximum daily site tonnage (kg/day): 170 000 kg/day
Regional use tonnage (tonnes/year): 50 000 tonnes/year

Frequency and duration of use : Continuous release
Emission days (days per year): 300 days per year

Environment factors not influenced by risk management : Local freshwater dilution factor 40
Local marine water dilution factor 100

Other operational conditions of use affecting environmental exposure : Release fraction to air from process (initial release prior to RMM): 0.05
Release fraction to soil from process (initial release prior to RMM): 0.0001
Release fraction to wastewater from process (initial release prior to RMM): 0.003

Technical conditions and measures at process level (source) to prevent release : Common practices vary across sites thus conservative process release estimates used.

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	If discharging to municipal sewage treatment plant, no on-site wastewater treatment required. Risk from environmental exposure is driven by wastewater treatment plant microbes. Treat air emission to provide a typical removal efficiency of =: 90 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 75.3 %
Organisational measures to prevent/limit release from site	:	Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to municipal sewage treatment plant	:	Assumed domestic sewage treatment plant flow: 10 000 m³/day Estimated substance removal from wastewater via municipal sewage treatment: 95.5 % Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow]: 920 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 95.5 %
Conditions and measures related to external treatment of waste for disposal	:	During manufacturing, no waste of the substance is generated.
Conditions and measures related to external recovery of waste	:	During manufacturing, no waste of the substance is generated.

Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

General measures (carcinogens)

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Cleaning manufacturing equipment for maintenance purposes. Exposure (Potential) : Only allow access to authorised persons. Ensure operatives are trained to minimise exposures. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100 %.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 3: General exposures (closed systems)

With sample collection

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Technical conditions and measures at process level (source) to prevent release	:	Ensure operation is undertaken outdoors. Handle substance within a closed system.
Ventilation control measures	:	Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 4: General exposures

Closed systems

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Avoid carrying out activities involving exposure for more than 4 hours
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Technical conditions and measures at process level (source) to prevent release	:	Handle substance within a closed system.
Ventilation control measures	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 5: General exposures (open systems)

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Avoid carrying out activities involving exposure for more than 4 hours
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.

Ventilation control measures	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 6: Process sampling

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Avoid carrying out activities involving exposure for more than 1 hours
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Technical conditions and measures at process level (source) to prevent release	:	Sample via a closed loop or other system to avoid exposure.
Ventilation control measures	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 7: Laboratory activities

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Technical conditions and measures at process level (source) to prevent release	:	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.
Ventilation control measures	:	Provide enhanced general ventilation by mechanical means.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 8: Bulk transfers

Open systems/Closed systems

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.

Ventilation control measures	:	Ensure material transfers are under containment or extract ventilation. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 9: Equipment cleaning and maintenance

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Technical conditions and measures at process level (source) to prevent release	:	Ensure operation is undertaken outdoors. Drain down and flush system prior to equipment break-in or maintenance. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.
Organisational measures to prevent/limit releases, dispersion and exposure	:	Clear spills immediately.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented
Respiratory protection	:	Wear a respirator conforming to EN140 with type A filter or better.

Contributing scenario controlling worker exposure for 10: Storage

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Technical conditions and measures at process level (source) to prevent release	:	Store substance within a closed system.
Ventilation control measures	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Provide extract ventilation to material transfer points and other openings.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Section 3 - Exposure estimation and reference to its source

Website:	:	Not applicable.

Exposure estimation and reference to its source - Environment: 1: General exposures

Exposure assessment (environment):	:	Hydrocarbon Block Method (Petrorisk)
Exposure estimation and reference to its source	:	ESVOC SPERC 1.1.v1

Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 3: General exposures (closed systems)

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 4: General exposures

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 5: General exposures (open systems)

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 6: Process sampling

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 7: Laboratory activities

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 8: Bulk transfers

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 9: Equipment cleaning and maintenance

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 10: Storage

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	:	Further details on scaling and control technologies are provided in SPERC factsheet. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Health	:	Available hazard data do not support the need for a DNEL to be established for other health effects. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Risk management measures are based on qualitative risk characterisation. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH CSA

Environment	:	Not available.
Health	:	Not available.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : UVCB

Code : 1161407

Product name : PC AIBU DISTILLATES (PETROLEUM),C3-6,PIPERYLENE-RICH

Section 1 - Title

Short title of the exposure scenario : Distribution of substance

List of use descriptors : **Identified use name:** Distribution of substance
Process Category: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09, PROC15
Sector of end use: SU03, SU08, SU09
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC01, ERC02, ERC03, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07

Environmental contributing scenarios : **General exposures -** ERC01, ERC02, ERC03, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07

Health Contributing scenarios : **General measures applicable to all activities -** PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09, PROC15
General exposures (closed systems) - PROC01, PROC02
General exposures - PROC03
General exposures (open systems) - PROC04
Process sampling - PROC03
Laboratory activities - PROC15
Bulk transfers - PROC08b
Drum and small package filling - PROC09
Equipment cleaning and maintenance - PROC08a
Storage - PROC02

Processes and activities covered by the exposure scenario : Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: General exposures

Product characteristics : Predominantly hydrophobic
Substance is complex UVCB.

Amounts used : Annual site tonnage (tonnes/year): 1000 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 0.002
Maximum daily site tonnage (kg/day): 10 000 kg/day
Regional use tonnage (tonnes/year): 500 000 tonnes/year

Frequency and duration of use : Continuous release
Emission days (days per year): 100 days per year

Environment factors not influenced by risk management : Local freshwater dilution factor 10
Local marine water dilution factor 100

Other operational conditions of use affecting environmental exposure : Release fraction to air from process (initial release prior to RMM): 0.001
Release fraction to soil from process (initial release prior to RMM): 0.00001
Release fraction to wastewater from process (initial release prior to RMM): 0.00001

Technical conditions and measures at process level (source) to prevent release : Common practices vary across sites thus conservative process release estimates used.

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	If discharging to municipal sewage treatment plant, no on-site wastewater treatment required. Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). Treat air emission to provide a typical removal efficiency of =: 90 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 0 %
Organisational measures to prevent/limit release from site	:	Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to municipal sewage treatment plant	:	Assumed domestic sewage treatment plant flow: 2 000 m³/day Estimated substance removal from wastewater via municipal sewage treatment: 95 % Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow]: 170 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 95 %
Conditions and measures related to external treatment of waste for disposal	:	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	:	External recovery and recycling of waste should comply with applicable local and/or national regulations.

Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

General measures (carcinogens)

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Cleaning manufacturing equipment for maintenance purposes. Exposure (Potential) : Only allow access to authorised persons. Ensure operatives are trained to minimise exposures. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100 %.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 3: General exposures (closed systems)

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100 %.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures at process level (source) to prevent release	:	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Ensure operation is undertaken outdoors.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 4: General exposures

Closed systems / With sample collection

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100 %.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperature, unless stated differently.
Technical conditions and measures at process level (source) to prevent release	:	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Ensure operation is undertaken outdoors.
Ventilation control measures	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 5: General exposures (open systems)

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperature, unless stated differently.
Technical conditions and measures at process level (source) to prevent release	:	Sample via a closed loop or other system to avoid exposure. Ensure operation is undertaken outdoors.
Ventilation control measures	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 6: Process sampling

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100 %.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures at process level (source) to prevent release : Sample via a closed loop or other system to avoid exposure.

Ventilation control measures : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Handle substance within a predominantly closed system provided with extract ventilation.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 7: Laboratory activities

Product characteristics : Liquid

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100 %.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures at process level (source) to prevent release : Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 8: Bulk transfers

Open systems/Closed systems

Product characteristics : Liquid

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100 %.

Frequency and duration of use/exposure : Avoid carrying out activities involving exposure for more than 4 hours

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures at process level (source) to prevent release : Ensure operation is undertaken outdoors.

Ventilation control measures : Ensure material transfers are under containment or extract ventilation.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 9: Drum and small package filling

Product characteristics : Liquid

Concentration of substance in mixture or article : Covers percentage substance in the product up to 100 %.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Ventilation control measures	:	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of controlled ventilation (10 to 15 air changes per hour).

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 10: Equipment cleaning and maintenance

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100 %.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperature, unless stated differently.
Technical conditions and measures at process level (source) to prevent release	:	Drain down and flush system prior to equipment break-in or maintenance. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.
Organisational measures to prevent/limit releases, dispersion and exposure	:	Clear spills immediately.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented
Respiratory protection	:	Wear a respirator conforming to EN140 with type A filter or better.

Contributing scenario controlling worker exposure for 11: Storage

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100 %.
Frequency and duration of use/exposure	:	Avoid carrying out activities involving exposure for more than 4 hours
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperature, unless stated differently.
Technical conditions and measures at process level (source) to prevent release	:	Transfer via enclosed lines. Ensure operation is undertaken outdoors. Store substance within a closed system.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Section 3 - Exposure estimation and reference to its source

Website:	:	Not applicable.

Exposure estimation and reference to its source - Environment: 1: General exposures

Exposure assessment (environment):	:	Hydrocarbon Block Method (Petrorisk)
Exposure estimation and reference to its source	:	ESVOC SPERC 1.1b.v1

Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 3: General exposures (closed systems)

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 4: General exposures

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 5: General exposures (open systems)

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 6: Process sampling

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 7: Laboratory activities

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 8: Bulk transfers

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 9: Drum and small package filling

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 10: Equipment cleaning and maintenance

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 11: Storage

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	:	Further details on scaling and control technologies are provided in SPERC factsheet. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Maximum Risk Characterization Ratios for air emissions 0.048 Maximum Risk Characterisation Ratios for waste water emissions 0.00025 Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Health	:	Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH CSA

Environment	:	Not available.
Health	:	Not available.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : UVCB

Code : 1161407

Product name : PC AIBU DISTILLATES (PETROLEUM),C3-6,PIPERYLENE-RICH

Section 1 - Title

Short title of the exposure scenario : Use as an intermediate

List of use descriptors : **Identified use name:** Use as an intermediate
Process Category: PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15
Sector of end use: SU03, SU08, SU09
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC06a

Environmental contributing scenarios : **General exposures -** ERC06a

Health Contributing scenarios : **General measures applicable to all activities -** PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15
General exposures (closed systems) - PROC01, PROC02
General exposures - PROC03
General exposures (open systems) - PROC04
Process sampling - PROC08b
Laboratory activities - PROC15
Bulk transfers - PROC08b
Equipment cleaning and maintenance - PROC08a
Storage - PROC02

Processes and activities covered by the exposure scenario : Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: General exposures

Product characteristics : Predominantly hydrophobic
Substance is complex UVCB.

Amounts used : Annual site tonnage (tonnes/year): 15 000 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 0.75
Maximum daily site tonnage (kg/day): 50 000 kg/day
Regional use tonnage (tonnes/year): 20 000 tonnes/year

Frequency and duration of use : Continuous release
Emission days (days per year): 300 days per year

Environment factors not influenced by risk management : Local freshwater dilution factor 10
Local marine water dilution factor 100

Other operational conditions of use affecting environmental exposure : Release fraction to air from process (initial release prior to RMM): 0.025
Release fraction to soil from process (initial release prior to RMM): 0.001
Release fraction to wastewater from process (initial release prior to RMM): 0.003

Technical conditions and measures at process level (source) to prevent release : Common practices vary across sites thus conservative process release estimates used.

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	If discharging to municipal sewage treatment plant, no on-site wastewater treatment required. Risk from environmental exposure is driven by freshwater sediment. Treat air emission to provide a typical removal efficiency of =: 80 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 90.8 %
Organisational measures to prevent/limit release from site	:	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to municipal sewage treatment plant	:	Assumed domestic sewage treatment plant flow: 2 000 m³/day Estimated substance removal from wastewater via municipal sewage treatment: 95.5 % Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow]: 100 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 95.5 %
Conditions and measures related to external treatment of waste for disposal	:	This substance is consumed during use and no waste from the substance is generated.
Conditions and measures related to external recovery of waste	:	This substance is consumed during use and no waste from the substance is generated.

Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

General measures (carcinogens)

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Cleaning manufacturing equipment for maintenance purposes. Exposure (Potential) : Only allow access to authorised persons. Ensure operatives are trained to minimise exposures. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100 %.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 3: General exposures (closed systems)

With sample collection

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Technical conditions and measures at process level (source) to prevent release : Ensure operation is undertaken outdoors.
Handle substance within a closed system.

Ventilation control measures : Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 4: General exposures

Closed systems

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Avoid carrying out activities involving exposure for more than 4 hours

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Technical conditions and measures at process level (source) to prevent release : Handle substance within a closed system.

Ventilation control measures : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 5: General exposures (open systems)

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Avoid carrying out activities involving exposure for more than 4 hours

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Ventilation control measures : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 6: Process sampling

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Avoid carrying out activities involving exposure for more than 1 hours

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Technical conditions and measures at process level (source) to prevent release : Sample via a closed loop or other system to avoid exposure.

Ventilation control measures : Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 7: Laboratory activities

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Technical conditions and measures at process level (source) to prevent release : Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 8: Bulk transfers

Open systems/Closed systems

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Ventilation control measures : Ensure material transfers are under containment or extract ventilation.
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 9: Equipment cleaning and maintenance

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Technical conditions and measures at process level (source) to prevent release	:	Ensure operation is undertaken outdoors. Drain down and flush system prior to equipment break-in or maintenance. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.
Organisational measures to prevent/limit releases, dispersion and exposure	:	Clear spills immediately.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented
Respiratory protection	:	Wear a respirator conforming to EN140 with type A filter or better.

Contributing scenario controlling worker exposure for 10: Storage

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Technical conditions and measures at process level (source) to prevent release	:	Store substance within a closed system.
Ventilation control measures	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Provide extract ventilation to material transfer points and other openings.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Section 3 - Exposure estimation and reference to its source

Website:	:	Not applicable.

Exposure estimation and reference to its source - Environment: 1: General exposures

Exposure assessment (environment):	:	Hydrocarbon Block Method (Petrorisk)
Exposure estimation and reference to its source	:	ESVOC SPERC 6.1a.v1

Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 3: General exposures (closed systems)

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 4: General exposures

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 5: General exposures (open systems)

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 6: Process sampling

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 7: Laboratory activities

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 8: Bulk transfers

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 9: Equipment cleaning and maintenance

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 10: Storage

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	:	Further details on scaling and control technologies are provided in SPERC factsheet. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Health	:	Available hazard data do not support the need for a DNEL to be established for other health effects. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Risk management measures are based on qualitative risk characterisation. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH CSA

Environment	:	Not available.
Health	:	Not available.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : UVCB

Code : 1161407

Product name : PC AIBU DISTILLATES (PETROLEUM),C3-6,PIPERYLENE-RICH

Section 1 - Title

Short title of the exposure scenario : Use as a fuel - Industrial

List of use descriptors : **Identified use name:** Use as a fuel - Industrial
Process Category: PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC16
Sector of end use: SU03
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC07

Environmental contributing scenarios : **General exposures -** ERC07

Health Contributing scenarios : **General measures applicable to all activities -** PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC16
Bulk transfers - PROC08b
Drum/batch transfers - PROC08b
General exposures (closed systems) - PROC01, PROC02, PROC03
Equipment cleaning and maintenance - PROC08a
Vessel and container cleaning - PROC08a
Storage - PROC01, PROC02
Use as a fuel - PROC03, PROC16
Disposal of wastes - PROC08a

Processes and activities covered by the exposure scenario : Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: General exposures

Product characteristics : Predominantly hydrophobic
Substance is complex UVCB.

Amounts used : Annual site tonnage (tonnes/year): 10 000 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 1
Maximum daily site tonnage (kg/day): 33 000 kg/day
Regional use tonnage (tonnes/year): 10 000 tonnes/year

Frequency and duration of use : Continuous release
Emission days (days per year): 300 days per year

Environment factors not influenced by risk management : Local freshwater dilution factor 10
Local marine water dilution factor 100

Other operational conditions of use affecting environmental exposure : Release fraction to air from process (initial release prior to RMM): 0.05
Release fraction to soil from process (initial release prior to RMM): 0
Release fraction to wastewater from process (initial release prior to RMM): 0.00001

Technical conditions and measures at process level (source) to prevent release : Common practices vary across sites thus conservative process release estimates used.

Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater sediment. Treat air emission to provide a typical removal efficiency of =: 95 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: >=0 %
Organisational measures to prevent/limit release from site	:	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to municipal sewage treatment plant	:	Assumed domestic sewage treatment plant flow: 2 000 m³/day Estimated substance removal from wastewater via municipal sewage treatment: 95.5 % Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow]: 31 000 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 95.5 %
Conditions and measures related to external treatment of waste for disposal	:	This substance is consumed during use and no waste from the substance is generated.
Conditions and measures related to external recovery of waste	:	This substance is consumed during use and no waste from the substance is generated.

Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

General measures (carcinogens)

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Cleaning manufacturing equipment for maintenance purposes. Exposure (Potential) : Only allow access to authorised persons. Ensure operatives are trained to minimise exposures. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100 %.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 3: Bulk transfers

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Ventilation control measures : Ensure material transfers are under containment or extract ventilation. Provide enhanced general ventilation by mechanical means.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 4: Drum/batch transfers

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Technical conditions and measures at process level (source) to prevent release : Use drum pumps.

Ventilation control measures : Ensure material transfers are under containment or extract ventilation.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 5: General exposures (closed systems)

Use in contained batch processes

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Technical conditions and measures at process level (source) to prevent release : Handle substance within a closed system.

Ventilation control measures	:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Provide enhanced general ventilation by mechanical means. Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 6: Equipment cleaning and maintenance

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Technical conditions and measures at process level (source) to prevent release	:	Drain down and flush system prior to equipment break-in or maintenance. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.
Ventilation control measures	:	Provide enhanced general ventilation by mechanical means.
Organisational measures to prevent/limit releases, dispersion and exposure	:	Clear spills immediately.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented
Respiratory protection	:	Wear a respirator conforming to EN140 with type A filter or better.

Contributing scenario controlling worker exposure for 7: Vessel and container cleaning

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Technical conditions and measures at process level (source) to prevent release	:	Drain down and flush system prior to equipment break-in or maintenance. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.
Organisational measures to prevent/limit releases, dispersion and exposure	:	Clear spills immediately.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented
Respiratory protection	:	Wear a respirator conforming to EN140 with type A filter or better.

Contributing scenario controlling worker exposure for 8: Storage

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Technical conditions and measures at process level (source) to prevent release : Store substance within a closed system.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 9: Use as a fuel

Closed systems

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Ventilation control measures : Handle substance within a predominantly closed system provided with extract ventilation.
Provide enhanced general ventilation by mechanical means.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 10: Disposal of wastes

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Technical conditions and measures to control dispersion from source towards the worker : Ensure operation is undertaken outdoors.

Ventilation control measures : Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Section 3 - Exposure estimation and reference to its source

Website: : Not applicable.

Exposure estimation and reference to its source - Environment: 1: General exposures

Exposure assessment (environment): : Hydrocarbon Block Method (Petrorisk)

Exposure estimation and reference to its source : ESVOC SPERC 7.12a.v1

Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 3: Bulk transfers

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 4: Drum/batch transfers

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 5: General exposures (closed systems)

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 6: Equipment cleaning and maintenance

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 7: Vessel and container cleaning

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 8: Storage

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 9: Use as a fuel

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 10: Disposal of wastes

Exposure assessment (human):	:	Not applicable.
Exposure estimation and reference to its source	:	Not applicable.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment	:	Further details on scaling and control technologies are provided in SPERC factsheet. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Health	:	Available hazard data do not support the need for a DNEL to be established for other health effects. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Risk management measures are based on qualitative risk characterisation. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH CSA

Environment	:	Not available.
Health	:	Not available.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition : UVCB

Code : 1161407

Product name : PC AIBU DISTILLATES (PETROLEUM),C3-6,PIPERYLENE-RICH

Section 1 - Title

Short title of the exposure scenario : Use in polymer production - Industrial

List of use descriptors : **Identified use name:** Use in polymer production - Industrial
Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC06, PROC08a, PROC08b, PROC14
Sector of end use: SU08, SU09, SU10, SU11, SU12, SU13
Subsequent service life relevant for that use: No.
Environmental Release Category: ERC04, ERC07

Environmental contributing scenarios : **General exposures -** ERC04, ERC07

Health Contributing scenarios : **General measures applicable to all activities -** PROC01, PROC02, PROC03, PROC04, PROC05, PROC06, PROC08a, PROC08b, PROC14
General exposures (closed systems) - PROC01
Material transfers - PROC08b
Polymerisation - PROC02, PROC03
Finishing operations - PROC03
Intermediate polymer storage - PROC04
Additivation and stabilisation - PROC03
Mixing operations (open systems) - PROC05
Pelletisation and pellet screening - PROC06, PROC08b
Storage - PROC02
Equipment maintenance - PROC08a
Bulk transfers - PROC03
Transport - PROC08b

Processes and activities covered by the exposure scenario : Manufacture of polymers from monomers in continuous and batch processes. Including production, re-cycling and recovery, degassing, discharging, reactor maintenance and immediate polymer product formation (i.e. compounding, pelletisation, product off-gassing)

Section 2 - Exposure controls

Contributing scenario controlling environmental exposure for 1: General exposures

Product characteristics : Predominantly hydrophobic
Substance is complex UVCB.

Amounts used : Annual site tonnage (tonnes/year): 15 000 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 0.75
Maximum daily site tonnage (kg/day): 50 000 kg/day
Regional use tonnage (tonnes/year): 20 000 tonnes/year

Frequency and duration of use : Continuous release
Emission days (days per year): 300 days per year

Environment factors not influenced by risk management : Local freshwater dilution factor 10
Local marine water dilution factor 100

Other operational conditions of use affecting environmental exposure : Release fraction to air from process (initial release prior to RMM): 0.01
Release fraction to soil from process (initial release prior to RMM): 0.0001
Release fraction to wastewater from process (initial release prior to RMM): 0.003

Technical conditions and measures at process level (source) to prevent release	:	Common practices vary across sites thus conservative process release estimates used.
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	:	If discharging to municipal sewage treatment plant, no on-site wastewater treatment required. Risk from environmental exposure is driven by freshwater sediment. Treat air emission to provide a typical removal efficiency of =: 80 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 90.8 %
Organisational measures to prevent/limit release from site	:	Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to municipal sewage treatment plant	:	Assumed domestic sewage treatment plant flow: 2 000 m³/day Estimated substance removal from wastewater via municipal sewage treatment: 95.5 % Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow]: 100 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 95.5 %
Conditions and measures related to external treatment of waste for disposal	:	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	:	External treatment and disposal of waste should comply with applicable local and/or national regulations.

Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.
Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.
Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

General measures (carcinogens)

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Cleaning manufacturing equipment for maintenance purposes. Exposure (Potential) : Only allow access to authorised persons. Ensure operatives are trained to minimise exposures. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Covers percentage substance in the product up to 100 %.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 3: General exposures (closed systems)

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Technical conditions and measures at process level (source) to prevent release : Handle substance within a closed system.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 4: Material transfers

Bulk transfers

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Ventilation control measures : Ensure material transfers are under containment or extract ventilation. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 5: Polymerisation

Bulk/Batch

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 25%.

Frequency and duration of use/exposure : Avoid carrying out activities involving exposure for more than 4 hour

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Technical conditions and measures at process level (source) to prevent release : Ensure operation is undertaken outdoors.

Ventilation control measures : Provide extract ventilation to material transfer points and other openings.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 6: Finishing operations

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 5%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Ventilation control measures : Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 7: Intermediate polymer storage

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 5%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Technical conditions and measures at process level (source) to prevent release : Store substance within a closed system.

Ventilation control measures : Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 8: Additivation and stabilisation

Product characteristics : Liquid

Concentration of substance in mixture or article : Limit the substance content in the product to 5%.

Frequency and duration of use/exposure : Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting worker exposure : Assumes use at not more than 20°C above ambient temperaure.

Ventilation control measures : Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene : Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 9: Mixing operations (open systems)

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 5%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Ventilation control measures	:	Provide enhanced general ventilation by mechanical means. Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 10: Pelletisation and pellet screening

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 5%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Ventilation control measures	:	Ensure material transfers are under containment or extract ventilation. Provide enhanced general ventilation by mechanical means. Provide extract ventilation to points where emissions occur.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 11: Storage

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 5%.
Frequency and duration of use/exposure	:	Avoid carrying out activities involving exposure for more than 1 hour
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Technical conditions and measures at process level (source) to prevent release	:	Store substance within a closed system.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 12: Equipment maintenance

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 25%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Technical conditions and measures at process level (source) to prevent release	:	Drain down system prior to equipment break-in or maintenance. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.
Organisational measures to prevent/limit releases, dispersion and exposure	:	Clear spills immediately.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented
Respiratory protection	:	Wear a respirator conforming to EN140 with type A filter or better.

Contributing scenario controlling worker exposure for 13: Bulk transfers

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 5%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Ventilation control measures	:	Ensure material transfers are under containment or extract ventilation.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Contributing scenario controlling worker exposure for 14: Transport

Product characteristics	:	Liquid
Concentration of substance in mixture or article	:	Limit the substance content in the product to 5%.
Frequency and duration of use/exposure	:	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting worker exposure	:	Assumes use at not more than 20°C above ambient temperaure.
Ventilation control measures	:	Ensure material transfers are under containment or extract ventilation.

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

Advice on general occupational hygiene	:	Assumes a good basic standard of occupational hygiene is implemented

Section 3 - Exposure estimation and reference to its source

Website: : Not applicable.

Exposure estimation and reference to its source - Environment: 1: General exposures

Exposure assessment (environment): : Hydrocarbon Block Method (Petrorisk)

Exposure estimation and reference to its source : Not available.

Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 3: General exposures (closed systems)

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 4: Material transfers

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 5: Polymerisation

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 6: Finishing operations

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 7: Intermediate polymer storage

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 8: Additivation and stabilisation

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 9: Mixing operations (open systems)

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 10: Pelletisation and pellet screening

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 11: Storage

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 12: Equipment maintenance

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 13: Bulk transfers

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Exposure estimation and reference to its source - Workers: 14: Transport

Exposure assessment (human): : Not applicable.

Exposure estimation and reference to its source : Not applicable.

Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment : Further details on scaling and control technologies are provided in SPERC factsheet.
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Health : Available hazard data do not support the need for a DNEL to be established for other health effects.
Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.
Risk management measures are based on qualitative risk characterisation.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH CSA

Environment : Not available.

Health : Not available.