# SAFETY DATA SHEET

ExxonMobil

DCPD CONCENTRATE

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

### 1.1 Product identifier

**Product name** : DCPD CONCENTRATE
see Section 16 for Synonyms

**EC number** : 270-736-7

**CAS number** : 68477-53-2

**Product description** : Olefin

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

**Intended Use** : Chemical feedstock

| Identified uses |
|---|
| Use in polymer production - Industrial<br>Polymer processing - Industrial<br>Manufacture of substance<br>Distribution of substance<br>Use as an intermediate<br>Formulation and (re)packing of substances and mixtures<br>Use in coatings - Industrial<br>Use as a fuel - Industrial<br>Use in rubber production and processing<br>Use as a fuel - Professional |

**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. 3, H226
Acute Tox. 4, H302
Acute Tox. 3, H331
Skin Irrit. 2, H315
Eye Irrit. 2, H319
Muta. 1B, H340
Carc. 1B, H350
Repr. 2, H361d
STOT SE 3, H335
STOT SE 3, H336
STOT RE 1, H372 (blood)
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** :
H226 - Flammable liquid and vapour.
H302 - Harmful if swallowed.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H331 - Toxic if inhaled.
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.
H372 - Causes damage to organs through prolonged or repeated exposure. (blood)
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.
P260 - Do not breathe 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 + P352 - IF ON SKIN: 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 + P311, P340 - IF INHALED: Call a POISON CENTER or doctor. 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), steam-cracked, c5-12 fraction

**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

## SECTION 3: Composition/information on ingredients

| Product/ingredient name | Identifiers | % | Classification | Type |
|---|---|---|---|---|
| distillates (petroleum), steam-cracked, c5-12 fraction | REACH #: 01-2119493702-34<br>EC: 270-736-7<br>CAS: 68477-53-2 | 100 | Flam. Liq. 3, H226<br>Acute Tox. 4, H302<br>Acute Tox. 3, H331<br>Skin Irrit. 2, H315<br>Eye Irrit. 2, H319<br>Muta. 1B, H340<br>Carc. 1B, H350<br>Repr. 2, H361d<br>STOT SE 3, H336<br>STOT RE 1, H372 (blood)<br>Asp. Tox. 1, H304<br>Aquatic Chronic 2, H411 | [1] |
| 3a,4,7,7a-tetrahydro-4,7-methanoindene | REACH #: 01-2119463601-44<br>EC: 201-052-9<br>CAS: 77-73-6 | 35 - 80 | Flam. Liq. 3, H226<br>Acute Tox. 4, H302<br>Acute Tox. 2, H330<br>Skin Irrit. 2, H315<br>Eye Irrit. 2, H319<br>Repr. 2, H361d<br>STOT SE 3, H335<br>STOT RE 2, H373 (central nervous)<br>Asp. Tox. 1, H304<br>Aquatic Acute 1, H400 (M=1)<br>Aquatic Chronic 2, H411 | [1] |
| methyldicyclopentadiene | CAS: 16327-42-7 | 0 - 20 | Flam. Liq. 3, H226<br>Acute Tox. 4, H302<br>Acute Tox. 2, H330<br>Skin Irrit. 2, H315<br>Eye Irrit. 2, H319<br>Repr. 2, H361d<br>STOT SE 3, H335<br>Asp. Tox. 1, H304<br>Aquatic Chronic 2, H411 | [1] |
| benzene | REACH #: 01-2119447106-44<br>EC: 200-753-7<br>CAS: 71-43-2 | 1.4 - 20 | Flam. Liq. 2, H225<br>Skin Irrit. 2, H315<br>Eye Irrit. 2, H319<br>Muta. 1B, H340<br>Carc. 1A, H350<br>STOT RE 1, H372 (blood)<br>Asp. Tox. 1, H304<br>Aquatic Chronic 3, H412 | [1] |
| 5-(1-propenyl)norborn-2-ene | CAS: 7158-40-9 | 0 - 17 | Flam. Liq. 3, H226<br>Acute Tox. 4, H332<br>Skin Irrit. 2, H315<br>Skin Sens. 1B, H317<br>STOT RE 2, H373<br>Asp. Tox. 1, H304<br>Aquatic Chronic 2, H411 | [1] |
| methylcyclopenta-1,3-diene | EC: 247-757-5<br>CAS: 26519-91-5 | 0 - 15 | Flam. Liq. 3, H226<br>Acute Tox. 4, H332<br>Skin Irrit. 2, H315<br>Eye Irrit. 2, H319<br>Asp. Tox. 1, H304 | [1] |

## SECTION 3: Composition/information on ingredients

| | | | | |
|---|---|---|---|---|
| toluene | UK (GB) REACH #: UK-01-8199965928-7<br>REACH #: 01-2119471310-51<br>EC: 203-625-9<br>CAS: 108-88-3 | 0 - 8 | Aquatic Chronic 2, H411<br>Flam. Liq. 2, H225<br>Skin Irrit. 2, H315<br>Repr. 2, H361d<br>STOT SE 3, H336<br>STOT RE 2, H373 (central nervous system (CNS))<br>Asp. Tox. 1, H304<br>Aquatic Chronic 3, H412 | [1] |
| 1,3-butadiene | REACH #: 01-2119471988-16<br>EC: 203-450-8<br>CAS: 106-99-0 | 0 - 1 | Flam. Gas 1A, H220<br>Press. Gas (Liq.), H280<br>Muta. 1B, H340<br>Carc. 1A, H350<br>**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.

**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.

# SECTION 4: First aid measures

## 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

**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** : 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.

## SECTION 5: Firefighting measures

**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. Do not breathe vapour or mist.

**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".

### 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 breathe vapour or mist. Do not swallow. 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.

**Loading/Unloading Temperature** : Ambient

**Transport Temperature** : Ambient

**Transport Pressure** : Ambient

## 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**

**Named substances**

| Name | Notification and MAPP threshold | Safety report threshold |
|---|---|---|
| Petroleum products and alternative fuels (a) gasolines and naphthas, (b) kerosenes (including jet fuels), (c) gas oils (including diesel fuels, home heating oils and gas oil blending streams) (d) heavy fuel oils (e) alternative fuels serving the same purposes and with similar properties as regards flammability and environmental hazards as the products referred to in points (a) to (d) | 2500 tonne | 25000 tonne |

**Danger criteria**

| Category | Notification and MAPP threshold | Safety report threshold |
|---|---|---|
| H2<br>P5c<br>E2 | 50 tonne<br>5000 tonne<br>200 tonne | 200 tonne<br>50000 tonne<br>500 tonne |

**Storage Temperature** : Ambient

**Storage Pressure** : Ambient

## SECTION 7: Handling and storage

**Suitable Containers/ Packing** : Barges, Tankers

**Suitable Materials and Coatings** : Epoxy Phenolics, Fluorinated Silicone Rubber, steel, Inorganic Zinc Coatings, Nylon 66, polypropylene

**Unsuitable Materials and Coatings** : Natural Rubber, Vinyl Coatings, polyethylene, Epoxy Resin-Aluminum Combinations, Synthetic Rubber

### 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 |
|---|---|
| 3a,4,7,7a-tetrahydro-4,7-methanoindene | **EH40/2005 WELs (United Kingdom (UK), 1/2020)**<br>TWA 8 hours: 5 ppm.<br>TWA 8 hours: 27 mg/m³.<br>**ACGIH TLV (United States, 1/2024)**<br>TWA 8 hours: 0.5 ppm.<br>STEL 15 minutes: 1 ppm.<br>**ExxonMobil (COMPANY)**<br>TWA 8 hours: 5 mg/m³. |
| 1,3-pentadiene | **ExxonMobil (COMPANY)**<br>TWA 8 hours: 10 ppm. |
| benzene | **EH40/2005 WELs (United Kingdom (UK), 1/2020)** Absorbed through skin.<br>TWA 8 hours: 1 ppm.<br>TWA 8 hours: 3.25 mg/m³.<br>**EU OEL (Europe, 3/2024)** Absorbed through skin.<br>TWA 8 hours: 0.5 ppm.<br>TWA 8 hours: 1.65 mg/m³.<br>**ACGIH TLV (United States, 1/2024)** Absorbed through skin.<br>TWA 8 hours: 0.02 ppm.<br>**ExxonMobil (COMPANY)** Absorbed through skin.<br>STEL 15 minutes: 1 ppm.<br>TWA 8 hours: 0.2 ppm. |
| toluene | **EH40/2005 WELs (United Kingdom (UK), 1/2020)** Absorbed through skin.<br>STEL 15 minutes: 384 mg/m³.<br>TWA 8 hours: 191 mg/m³.<br>TWA 8 hours: 50 ppm.<br>STEL 15 minutes: 100 ppm.<br>**EU OEL (Europe, 1/2022)** Absorbed through skin.<br>TWA 8 hours: 192 mg/m³.<br>TWA 8 hours: 50 ppm.<br>STEL 15 minutes: 384 mg/m³.<br>STEL 15 minutes: 100 ppm.<br>**ACGIH TLV (United States, 1/2024)** Ototoxicant.<br>TWA 8 hours: 20 ppm. |
| 1,3-butadiene | **EH40/2005 WELs (United Kingdom (UK), 1/2020)**<br>TWA 8 hours: 1 ppm.<br>TWA 8 hours: 2.2 mg/m³.<br>**EU OEL (Europe, 3/2024)**<br>TWA 8 hours: 1 ppm.<br>TWA 8 hours: 2.2 mg/m³.<br>**ACGIH TLV (United States, 1/2024)** |

## SECTION 8: Exposure controls/personal protection

| | |
|---|---|
| | TWA 8 hours: 2 ppm.<br>TWA 8 hours: 4.4 mg/m³. |

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), steam-cracked, c5-12 fraction | DNEL | Long term Inhalation | 3.25 mg/m³ | Workers | Systemic |
| | DNEL | Long term Dermal | 0.34 mg/kg bw/day | Workers | Systemic |
| 3a,4,7,7a-tetrahydro-4,7-methanoindene | DNEL | Long term Inhalation | 2.3 mg/m³ | Workers | Systemic |
| | DNEL | Long term Dermal | 0.34 mg/kg bw/day | Workers | Systemic |
| | DNEL | Long term Inhalation | 0.49 mg/m³ | General population | Systemic |
| | DNEL | Long term Dermal | 0.14 mg/kg bw/day | General population | Systemic |
| | DNEL | Long term Oral | 0.1 mg/kg bw/day | General population | Systemic |
| toluene | DNEL | Long term Dermal | 384 mg/kg bw/day | Workers | Systemic |
| | DNEL | Long term Dermal | 226 mg/kg bw/day | General population | Systemic |
| | DNEL | Long term Oral | 8.13 mg/kg bw/day | General population | Systemic |
| | DNEL | Long term Inhalation | 56.5 mg/m³ | General population | Systemic |
| | DNEL | Long term Inhalation | 192 mg/m³ | Workers | Systemic |
| 1,3-butadiene | DNEL | Long term Inhalation | 0.066 mg/m³ | General population | Systemic |
| | DNEL | Long term Inhalation | 2.21 mg/m³ | Workers | Systemic |

**PNECs**

| Product/ingredient name | Compartment Detail | Value | Method Detail |
|---|---|---|---|
| 3a,4,7,7a-tetrahydro-4,7-methanoindene | Soil | 0.86 mg/kg | - |
| | Fresh water sediment | 5.49 mg/kg dwt | - |
| | Marine water sediments | 5.49 mg/kg dwt | - |
| | Sewage treatment plant | 0.85 mg/l | - |
| | Marine water | 0.029 mg/l | - |
| | Fresh water | 0.029 mg/l | - |
| toluene | Marine water | 0.68 mg/l | - |
| | Sewage treatment plant | 13.61 mg/l | - |
| | Fresh water | 0.68 mg/l | - |
| | Marine water sediments | 16.39 mg/kg dwt | - |
| | Fresh water sediment | 16.39 mg/kg dwt | - |
| | Soil | 2.89 mg/kg | - |

### 8.2 Exposure controls

## SECTION 8: Exposure controls/personal protection

**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.

**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 AX)

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

# Section 9. Physical and chemical properties and safety characteristics

| | | |
|---|---|---|
| **Appearance** | | |
| **Physical state** | : | Liquid. [Clear] |
| **Colour** | : | Colorless to Yellow |
| **Odour** | : | Pungent petroleum |
| **Odour threshold** | : | Not available. |
| **pH** | : | Not applicable. |
| **Melting point/freezing point** | : | Not available. |
| **Boiling point or initial boiling point and boiling range** | : | 51.7 to 188.5°C (125.1 to 371.3°F) [In-house method ,] |
| **Flash point** | : | Closed cup: <40.4°C (<104.7°F) [In-house method ,] |
| **Evaporation rate** | : | Not available. |
| **Flammability** | : | Flammable liquids - Category 3 |
| **Lower and upper explosive (flammable) limits** | : | Lower: 1% [In-house method ,]<br>Upper: 8% |
| **Vapour pressure** | : | 43.5 to 393.78 mm Hg [37.8 °C] |
| **Relative vapour density** | : | Not available. |
| **Relative density** | : | 0.82 to 0.94 [In-house method ,] |
| **Solubility in water** | : | Negligible |
| **Partition coefficient: n-octanol/ water** | : | Not applicable. |
| **Auto-ignition temperature** | : | Not available. |
| **Decomposition temperature** | : | Not available. |
| **Viscosity** | : | 1.16 to 5.2 cSt [-20 °C]Not applicable. |
| **Particle characteristics** | | |
| **Median particle size** | : | Not applicable. |
| **Hygroscopic** | : | No |

# 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. See Footnote |
| **10.5 Incompatible materials** | : | Reactive or incompatible with the following materials:,oxidising materials,See Footnote |
| **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), steam-cracked, c5-12 fraction | LC50 Oral | Rat | 590 mg/kg | - |
| | LC50 Inhalation Vapour | Rat | 1.723 mg/l | 4 hours |
| | LD50 Dermal | Rabbit | >2000 mg/kg | - |
| 3a,4,7,7a-tetrahydro-4,7-methanoindene | LC50 Inhalation Vapour | Rat | 1.723 mg/l | 6 hours |
| | LD50 Oral | Rat | 590 mg/kg | - |

**Conclusion/Summary**

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

**Dermal** : Minimally 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), steam-cracked, c5-12 fraction | 500 | N/A | N/A | 3 | N/A |
| distillates (petroleum), steam-cracked, c5-12 fraction | 500 | N/A | N/A | 3 | N/A |
| 3a,4,7,7a-tetrahydro-4,7-methanoindene | 590 | N/A | N/A | 1.972 | N/A |
| methyldicyclopentadiene | 500 | N/A | N/A | 0.5 | N/A |
| benzene | 2500 | N/A | N/A | N/A | N/A |
| 5-(1-propenyl)norborn-2-ene | N/A | N/A | N/A | 11 | N/A |
| methylcyclopenta-1,3-diene | N/A | N/A | N/A | 11 | 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.

# SECTION 11: Toxicological information

## 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. Based on assessment of the components.

## Specific target organ toxicity (repeated exposure)

| | | |
|---|---|---|
| distillates (petroleum), steam-cracked, c5-12 fraction | Category 1 | blood |

**Conclusion/Summary** : May cause damage to organs through 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), steam-cracked, c5-12 fraction | Category 1 |

**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. 1,3- Butadiene. 1,3-Butadiene is a multi-site carcinogen in rodents. Epidemiology studies indicate an association between exposure to 1,3-butadiene and leukemia in humans. Mutations have been observed in in-vitro and in-vivo rodent assays. Although several older studies had conflicting results, a newer screening study in rats showed no adverse reproductive or developmental effects. 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. TOLUENE : Concentrated, prolonged or deliberate inhalation may cause brain and nervous system damage. Prolonged and repeated exposure of pregnant animals (> 1500 ppm) have been reported to cause adverse fetal developmental effects.

**Product** : Middle distillates with cracked stocks: Carcinogenic in animal tests. Caused mutations in-vitro. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/ infiltration/accumulation, and reduction in lung function. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema. High vapour/aerosol concentrations (attainable at elevated temperatures well above ambient) are irritating to the eyes and respiratory tract and may cause headaches, dizziness, anaesthesia, drowsiness, unconsciousness, and other central nervous system effects. 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 3.2 mg/l<br>Acute ErL50 1.5 mg/l<br><br>Acute LL50 6.3 mg/l<br>Acute NOEL 1.1 mg/l | daphnia - *Daphnia magna*<br>Algae - *Pseudokirchneriella subcapitata*<br>Fish - *Oncorhynchus mykiss*<br>Algae - *Pseudokirchneriella subcapitata* | 48 hours<br>96 hours<br><br>96 hours<br>96 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 | 0 % - 28 days | - | 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 at a moderate rate in air

### 12.3 Bioaccumulative potential

**Conclusion/Summary** : Material -- Has the potential to bioaccumulate.

### 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), steam-cracked, c5-12 fraction | 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.

## SECTION 13: Disposal considerations

**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

| | 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** | III | III | III | III |
| **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** 30
**Limited quantity** 5 L
**Tunnel code** (D/E)

**ADN** : The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.
CMR, F, 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
**Special provisions** 223
Flash point <40.4 °C C.C.

## SECTION 14: Transport information

**IATA** : The environmentally hazardous substance mark may appear if required by other transportation regulations.
**Quantity limitation** Passenger and Cargo Aircraft: 60 L. Packaging instructions: 355. Cargo Aircraft Only: 220 L. Packaging instructions: 366. Limited Quantities - Passenger Aircraft: 10 L. Packaging instructions: Y344.
**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-CYCLOPENTADIENE DIMER (MOLTEN)

**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

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.

#### Named substances

| Name |
|---|
| Petroleum products and alternative fuels (a) gasolines and naphthas, (b) kerosenes (including jet fuels), (c) gas oils (including diesel fuels, home heating oils and gas oil blending streams) (d) heavy fuel oils (e) alternative fuels serving the same purposes and with similar properties as regards flammability and environmental hazards as the products referred to in points (a) to (d) |

#### Danger criteria

| Category |
|---|
| H2 |
| P5c |
| E2 |

#### National regulations

## SECTION 15: Regulatory information

| Product/ingredient name | List name | Name on list | Classification | Notes |
|---|---|---|---|---|
| benzene | EH40/2005 WELs<br>ACGIH TLV | -<br> | Carc<br>A1 | -<br> |
| toluene | ACGIH TLV | - | A4 | - |
| 1,3-butadiene | EH40/2005 WELs<br>ACGIH TLV | - | Carc<br>A2 | - |

**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)** : Restrictions Apply

**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)** : Not determined.

**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**

## SECTION 16: Other information

| Classification | Justification |
|---|---|
| Flam. Liq. 3, H226 | Expert judgment |
| Acute Tox. 4, H302 | Expert judgment |
| Acute Tox. 3, H331 | Expert judgment |
| Skin Irrit. 2, H315 | Expert judgment |
| Eye Irrit. 2, H319 | Expert judgment |
| Muta. 1B, H340 | Expert judgment |
| Carc. 1B, H350 | Expert judgment |
| Repr. 2, H361d | Expert judgment |
| STOT SE 3, H335 | Expert judgment |
| STOT SE 3, H336 | Expert judgment |
| STOT RE 1, H372 (blood) | Expert judgment |
| Asp. Tox. 1, H304 | Expert judgment |
| Aquatic Chronic 2, H411 | Expert judgment |

**Full text of abbreviated H statements**

| | |
|---|---|
| H220 | Extremely flammable gas. |
| H225 | Highly flammable liquid and vapour. |
| H226 | Flammable liquid and vapour. |
| H280 | Contains gas under pressure; may explode if heated. |
| H302 | Harmful if swallowed. |
| H304 | May be fatal if swallowed and enters airways. |
| H315 | Causes skin irritation. |
| H317 | May cause an allergic skin reaction. |
| H319 | Causes serious eye irritation. |
| H330 | Fatal if inhaled. |
| H331 | Toxic if inhaled. |
| H332 | Harmful if inhaled. |
| 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. |
| H372 | Causes damage to organs through prolonged or repeated exposure. |
| H373 | May cause damage to organs through prolonged or repeated exposure. |
| H400 | Very toxic to aquatic life. |
| H411 | Toxic to aquatic life with long lasting effects. |
| H412 | Harmful to aquatic life with long lasting effects. |

**Full text of classifications**

| | |
|---|---|
| Acute Tox. 2 | ACUTE TOXICITY - Category 2 |
| Acute Tox. 3 | ACUTE TOXICITY - Category 3 |
| Acute Tox. 4 | ACUTE TOXICITY - Category 4 |
| Aquatic Acute 1 | SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 |
| 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. 1B | CARCINOGENICITY - Category 1B |
| Eye Irrit. 2 | SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2 |
| Flam. Gas 1A | FLAMMABLE GASES - Category 1A |
| Flam. Liq. 2 | FLAMMABLE LIQUIDS - Category 2 |
| Flam. Liq. 3 | FLAMMABLE LIQUIDS - Category 3 |
| Muta. 1B | GERM CELL MUTAGENICITY - Category 1B |
| Press. Gas (Liq.) | GASES UNDER PRESSURE - Liquefied gas |
| Repr. 2 | REPRODUCTIVE TOXICITY - Category 2 |
| Skin Irrit. 2 | SKIN CORROSION/IRRITATION - Category 2 |
| Skin Sens. 1B | SKIN SENSITISATION - Category 1B |
| STOT RE 1 | SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 1 |
| STOT RE 2 | SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2 |
| STOT SE 3 | SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3 |

## SECTION 16: Other information

**Date of issue/ Date of revision** : 29 January 2025

**Date of previous issue** : 28 January 2025

**Version** : 1.03

**THIS SDS COVERS THE FOLLOWING MATERIALS :**

CDC TK 503 & TK 506 (TCC); DCPD - T010 bottom (NDG); Dicyclopentadiene rich; Fill Escorez 8000 (NDG); T022 bottom (insolubles)

**Product code** : 1150330

**Notice to reader**

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## Annex to the extended Safety Data Sheet (eSDS)

**Industrial**

## Identification of the substance or mixture

**Product definition** : UVCB

**Code** : 1150330

**Product name** : PC AIBU DCPD STREAMS-DCPD OLIGOMERS

## 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
**Polymerisation. -** PROC03
**Intermediate polymer storage -** PROC04
**Additivation and stabilisation -** PROC03
**Mixing operations (open systems) -** PROC05
**Pelletising -** PROC06
**Pelletisation and pellet screening -** PROC14
**Storage -** PROC02
**Equipment maintenance -** PROC08a
**Finishing operations -** PROC03
**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): 2 500 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 1
Maximum daily site tonnage (kg/day): 25 000 kg/day
Regional use tonnage (tonnes/year): 2 500 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): 0.0005<br>Release fraction to soil from process (initial release prior to RMM): 0.0001<br>Release fraction to wastewater from process (initial release prior to RMM): 0.0001 |
| **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.<br>Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).<br>Treat air emission to provide a typical removal efficiency of: 80 %<br>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.<br>Prevent discharge of undissolved substance to or recover from onsite wastewater.<br>Sludge should be incinerated, contained or reclaimed. |
| **Conditions and measures related to municipal sewage treatment plant** | : | Assumed domestic sewage treatment plant flow ($m^3$/day): 2 000 $m^3$/day<br>Estimated substance removal from wastewater via municipal sewage treatment: 94.9 %<br>Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow] (kg/day): 50 000 kg/day<br>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 94.9 % |
| **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 (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.
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. Avoid all possible sources of ignition (spark or flame). - 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. Clear up spills immediately and dispose of waste safely. 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 |
| **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** | : | Covers percentage substance in the product up to 100 %. |
| **Frequency and duration of use/exposure** | : | Covers daily exposures up to 8 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. |

**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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 4: Material transfers**

| | | |
|---|---|---|
| **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 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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 5: Polymerisation**

Bulk and Batch

| | | |
|---|---|---|
| **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 temperaure. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Ensure operation is undertaken outdoors.<br>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 6: Polymerisation.**

Bulk and Batch

| | | |
|---|---|---|
| **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 1 hour |
| **Other operational conditions affecting worker exposure** | : | Operation is carried out at elevated temperature (> 20°C above ambient temperature) |
| **Technical conditions and measures at process level (source) to prevent release** | : | Ensure operation is undertaken outdoors.<br>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 7: Intermediate polymer 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** | : | Covers daily exposures up to 8 hours |
| **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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 8: Additivation and stabilisation**

| | | |
|---|---|---|
| **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 |

| | | |
|---|---|---|
| **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. |

**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** | : | Covers percentage substance in the product up to 100 %. |
| **Frequency and duration of use/exposure** | : | Covers daily exposures up to 8 hours |
| **Other operational conditions affecting worker exposure** | : | Assumes use at not more than 20°C above ambient temperaure.<br>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 10: Pelletising**

| | | |
|---|---|---|
| **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 hour |
| **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.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 11: Pelletisation and pellet screening**

| | | |
|---|---|---|
| **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 |
| **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.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 12: 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 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** | : | Sample via a closed loop or other system to avoid exposure.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 13: Equipment 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 |
| **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.<br>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 14: Finishing operations**

| | | |
|---|---|---|
| **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 1 hour |
| **Other operational conditions affecting worker exposure** | : | Assumes use at not more than 20°C above ambient temperaure.<br>Ensure operation is undertaken outdoors. |
| **Technical conditions and measures at process level (source) to prevent release** | : | 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 15: Bulk transfers**

| | | |
|---|---|---|
| **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 |
| **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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 16: Transport**

| | | |
|---|---|---|
| **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 |
| **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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

## 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 4.20.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: 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: Polymerisation.**

**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: Pelletising**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 11: 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: 12: Storage**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 13: Equipment maintenance**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 14: Finishing operations**

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

**Exposure estimation and reference to its source - Workers: 15: Bulk transfers**

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

**Exposure estimation and reference to its source - Workers: 16: 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.<br>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.<br>Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.<br>Required removal efficiency for air can be achieved using on-site 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.<br>Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.<br>Risk management measures are based on qualitative risk characterisation.<br>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** : 1150330

**Product name** : PC AIBU DCPD STREAMS-DCPD OLIGOMERS

## Section 1 - Title

**Short title of the exposure scenario** : Polymer processing - Industrial

**List of use descriptors** :
**Identified use name:** Polymer processing - Industrial
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC14, PROC21
**Sector of end use:** SU03, SU10
**Subsequent service life relevant for that use:** No.
**Environmental Release Category:** ERC04

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

**Health Contributing scenarios** :
**General measures applicable to all activities -** PROC01, PROC02, PROC03, PROC04, PROC05, PROC06, PROC08a, PROC08b, PROC09, PROC13, PROC14, PROC21
**Bulk transfers (closed systems) -** PROC01, PROC02
**Bulk transfers -** PROC08b
**Bulk transfers -** PROC09
**Bulk weighing -** PROC01, PROC02
**Small scale weighing -** PROC09
**Additive premixing -** PROC03, PROC04, PROC05
**Calendering (including Banburys) -** PROC06
**Production of articles by dipping and pouring -** PROC13
**Extrusion and masterbatching -** PROC14
**Injection moulding of articles -** PROC14
**Equipment maintenance -** PROC08a
**Storage -** PROC02

**Processes and activities covered by the exposure scenario** : Processing of formulated polymers including material transfers, additives handling (e. g. pigments, stabilisers, fillers, plasticisers, etc.), moulding, curing and forming activities, material re-works, storage and associated maintenance.

## 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): 5 000 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 1
Maximum daily site tonnage (kg/day): 50 000 kg/day
Regional use tonnage (tonnes/year): 5 000 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): 0.00001
Release fraction to soil from process (initial release prior to RMM): 0
Release fraction to wastewater from process (initial release prior to RMM): 0.005

| | | |
|---|---|---|
| **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.<br>Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation).<br>Treat air emission to provide a typical removal efficiency of: 80 %<br>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.<br>Sludge should be incinerated, contained or reclaimed. |
| **Conditions and measures related to municipal sewage treatment plant** | : | Assumed domestic sewage treatment plant flow ($m^3$/day): 2 000 $m^3$/day<br>Estimated substance removal from wastewater via municipal sewage treatment: 94.9 %<br>Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow] (kg/day): 50 000 kg/day<br>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 94.9 % |
| **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 (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.
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. Avoid all possible sources of ignition (spark or flame). - 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. Clear up spills immediately and dispose of waste safely. 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 |
| **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 (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 |
| **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 enhanced general ventilation by mechanical means.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 4: Bulk transfers**

| | | |
|---|---|---|
| **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 1 hour |
| **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.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 5: Bulk transfers**

| | | |
|---|---|---|
| **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 temperaure. |
| **Ventilation control measures** | : | Ensure material transfers are under containment or extract ventilation.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 6: Bulk weighing**

| | | |
|---|---|---|
| **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 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** | : | Handle substance within a closed system. |
| **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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 7: Small scale weighing**

| | | |
|---|---|---|
| **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 |
| **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.<br>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 8: Additive premixing**

| | | |
|---|---|---|
| **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 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).<br>Provide enhanced general ventilation by mechanical means.<br>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** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 9: Calendering (including Banburys)**

| | | |
|---|---|---|
| **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** | : | Operation is carried out at elevated temperature (> 20°C above ambient temperature) |
| **Ventilation control measures** | : | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 10: Production of articles by dipping and pouring**

| | | |
|---|---|---|
| **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 |
| **Other operational conditions affecting worker exposure** | : | Assumes use at not more than 20°C above ambient temperaure. |
| **Ventilation control measures** | : | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.<br>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 11: Extrusion and masterbatching**

| | | |
|---|---|---|
| **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 |
| **Other operational conditions affecting worker exposure** | : | Assumes use at not more than 20°C above ambient temperaure. |
| **Ventilation control measures** | : | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 12: Injection moulding of articles**

| | | |
|---|---|---|
| **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 |
| **Other operational conditions affecting worker exposure** | : | Assumes use at not more than 20°C above ambient temperaure. |
| **Ventilation control measures** | : | Provide extract ventilation to material transfer points and other openings.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 13: Equipment 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** | : | 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** | : | Drain down system prior to equipment break-in or maintenance.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 14: 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** | : | Covers daily exposures up to 8 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).<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

## 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 4.21a.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 (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: Bulk transfers**

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

**Exposure estimation and reference to its source - Workers: 5: Bulk transfers**

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

**Exposure estimation and reference to its source - Workers: 6: Bulk weighing**

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

**Exposure estimation and reference to its source - Workers: 7: Small scale weighing**

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

**Exposure estimation and reference to its source - Workers: 8: Additive premixing**

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

**Exposure estimation and reference to its source - Workers: 9: Calendering (including Banburys)**

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

**Exposure estimation and reference to its source - Workers: 10: Production of articles by dipping and pouring**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 11: Extrusion and masterbatching**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 12: Injection moulding of articles**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 13: Equipment maintenance**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 14: 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 enable the derivation of a DNEL for carcinogenic 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** : 1150330

**Product name** : PC AIBU DCPD STREAMS-DCPD OLIGOMERS

## 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
**Material 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): 600 000 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 0.24
Maximum daily site tonnage (kg/day): 2 000 000 kg/day
Regional use tonnage (tonnes/year): 2 500 000 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): 0.00005
Release fraction to soil from process (initial release prior to RMM): 0.0001
Release fraction to wastewater from process (initial release prior to RMM): 0.00001

**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.<br>Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation).<br>Treat air emission to provide a typical removal efficiency of =: 90 %<br>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.<br>Prevent discharge of undissolved substance to or recover from onsite wastewater.<br>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<br>Estimated substance removal from wastewater via municipal sewage treatment: 94.9 %<br>Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow]: 2 000 000 kg/day<br>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 94.9 % |
| **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)**

| | | |
|---|---|---|
| **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 temperaure. |
| **Technical conditions and measures at process level (source) to prevent release** | : | 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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 4: 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** | : | 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** | : | 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).<br>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** | : | Covers percentage substance in the product up to 100 %. |
| **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. |

| | | |
|---|---|---|
| **Ventilation control measures** | : | Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**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** | : | 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).<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**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 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

| | | |
|---|---|---|
| **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 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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 9: Material transfers**

Bulk transfers/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 1 hours |
| **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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**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 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 a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| **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 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).<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

## 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: Material transfers**

**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.
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** : 1150330

**Product name** : PC AIBU DCPD STREAMS-DCPD OLIGOMERS

## 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): 5 000 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): 50 000 kg/day
Regional use tonnage (tonnes/year): 2 500 000 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): 0.0001
Release fraction to wastewater from process (initial release prior to RMM): 0.0001

**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** | : | Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation).<br>Treat air emission to provide a typical removal efficiency of =: 90 %<br>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.<br>Prevent discharge of undissolved substance to or recover from onsite wastewater.<br>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<br>Estimated substance removal from wastewater via municipal sewage treatment: 94.9 %<br>Not applicable as there is no release to wastewater.<br>Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow]: 160 000 kg/day<br>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 94.9 % |
| **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 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)**

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. |
| **Ventilation control measures** | : | Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 4: 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** | : | 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 temperature, unless stated differently. |
| **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).<br>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** | : | 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 hour. |

| | | |
|---|---|---|
| **Other operational conditions affecting worker exposure** | : | Assumes use at not more than 20°C above ambient temperature, unless stated differently. |
| **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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**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). |

**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** | : | Carry out in a vented booth or extracted enclosure.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**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.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**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.<br>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** | : | 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** | : | Transfer via enclosed lines.<br>Ensure operation is undertaken outdoors.<br>Sample via a closed loop or other system to avoid 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 |

## 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.<br>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.<br>Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.<br>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.<br>Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.<br>Risk management measures are based on qualitative risk characterisation.<br>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** : 1150330

**Product name** : PC AIBU DCPD STREAMS-DCPD OLIGOMERS

## 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
**Material 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: 0.015
Maximum daily site tonnage (kg/day): 50 000 kg/day
Regional use tonnage (tonnes/year): 1 000 000 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): 0.00005
Release fraction to soil from process (initial release prior to RMM): 0.001
Release fraction to wastewater from process (initial release prior to RMM): 0.0001

**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.<br>Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).<br>Treat air emission to provide a typical removal efficiency of =: 80 %<br>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.<br>Prevent discharge of undissolved substance to or recover from onsite wastewater.<br>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<br>Estimated substance removal from wastewater via municipal sewage treatment: 94.9 %<br>Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow]: 50 000 kg/day<br>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 94.9 % |
| **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)**

**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 temperaure.

**Technical conditions and measures at process level (source) to prevent release** : 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

**Personal protection** : Wear suitable gloves tested to EN374.

**Contributing scenario controlling worker exposure for 4: 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** : 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** : 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** : Covers percentage substance in the product up to 100 %.

**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.

| | | |
|---|---|---|
| **Ventilation control measures** | : | Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**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** | : | 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** | : | 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).<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**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 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

| | | |
|---|---|---|
| **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 temperaure. |
| **Ventilation control measures** | : | Ensure material transfers are under containment or extract ventilation.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 9: Material transfers**

Bulk transfers/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 1 hour |
| **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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**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 temperaure. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Drain down and flush system prior to equipment break-in or maintenance.<br>Retain drain-downs in sealed storage pending disposal or for subsequent recycle. |
| **Ventilation control measures** | : | Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Provide extract ventilation to points where emissions occur. |
| **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 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).<br>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: Material transfers**

**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.
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** : 1150330

**Product name** : PC AIBU DCPD STREAMS-DCPD OLIGOMERS

## Section 1 - Title

**Short title of the exposure scenario** : Formulation and (re)packing of substances and mixtures

**List of use descriptors** : **Identified use name:** Formulation and (re)packing of substances and mixtures
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC14, PROC15
**Sector of end use:** SU03, SU10
**Subsequent service life relevant for that use:** No.
**Environmental Release Category:** ERC02

**Environmental contributing scenarios** : **General exposures -** ERC02

**Health Contributing scenarios** : **General measures applicable to all activities -** PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC14, PROC15
**General exposures (closed systems) -** PROC01, PROC02
**General exposures -** PROC03
**General exposures (open systems) -** PROC04
**Batch processes at elevated temperatures -** PROC03
**Process sampling -** PROC03
**Laboratory activities -** PROC15
**Bulk transfers -** PROC08b
**Mixing operations (open systems) -** PROC05
**Transfer from/pouring from containers -** PROC08a
**Drum/batch transfers -** PROC08b
**Production of preparation or articles by tabletting, compression, extrusion or pelletisation -** PROC14
**Drum and small package filling -** PROC09
**Equipment cleaning and maintenance -** PROC08a
**Storage -** PROC02

**Processes and activities covered by the exposure scenario** : Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

## 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): 30 000 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 0.02
Maximum daily site tonnage (kg/day): 100 000 kg/day
Regional use tonnage (tonnes/year): 1 500 000 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 (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements): 0.0001<br>Release fraction to soil from process (initial release prior to RMM): 0.0001<br>Release fraction to wastewater from process (initial release prior to RMM): 0.00005 |
| **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.<br>No secondary wastewater treatment required.<br>Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).<br>Treat air emission to provide a typical removal efficiency of: 0 %<br>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.<br>Sludge should be incinerated, contained or reclaimed. |
| **Conditions and measures related to municipal sewage treatment plant** | : | Assumed domestic sewage treatment plant flow ($m^3$/day): 2 000 $m^3$/day<br>Estimated substance removal from wastewater via municipal sewage treatment: 94.9 %<br>Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow] (kg/day): 100 000 kg/day<br>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 94.9 % |
| **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 (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** | : | 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 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).<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.<br>Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 4: 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** | : | 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** | : | 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).<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 5: General exposures (open 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 1 hour |
| **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.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 6: Batch processes at elevated temperatures**

| | | |
|---|---|---|
| **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 operation for more than 15 minutes. |
| **Other operational conditions affecting worker exposure** | : | Operation is carried out at elevated temperature (> 20°C above ambient temperature) |
| **Technical conditions and measures at process level (source) to prevent release** | : | Handle substance within a closed system. |
| **Ventilation control measures** | : | Provide extract ventilation to points where emissions occur.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 7: 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** | : | 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** | : | 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).<br>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 |

| | | |
|---|---|---|
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 8: 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 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 9: Bulk transfers**

| | | |
|---|---|---|
| **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 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** | : | Carry out in a vented booth or extracted enclosure. |

**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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 10: Mixing operations (open 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 1 hour |
| **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).<br>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: Transfer from/pouring from containers**

Manual

| | | |
|---|---|---|
| **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 operation for more than 15 minutes. |
| **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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 12: Drum/batch transfers**

| | | |
|---|---|---|
| **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 1 hour |
| **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). |

**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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 13: Production of preparation or articles by tabletting, compression, extrusion or pelletisation**

| | | |
|---|---|---|
| **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 1 hour |
| **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). |

**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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 14: 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** | : | 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. |
| **Ventilation control measures** | : | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 15: 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 temperaure. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Drain down and flush system prior to equipment break-in or maintenance.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.<br>Wear suitable coveralls to prevent exposure to the skin. |
| **Respiratory protection** | : | Wear a respirator conforming to EN140 with type A filter or better. |

**Contributing scenario controlling worker exposure for 16: 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 temperaure. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Ensure operation is undertaken outdoors.<br>Store substance within a closed system. |
| **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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

## 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 2.2.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: Batch processes at elevated temperatures**

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

**Exposure estimation and reference to its source - Workers: 7: Process sampling**

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

**Exposure estimation and reference to its source - Workers: 8: Laboratory activities**

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

**Exposure estimation and reference to its source - Workers: 9: Bulk transfers**

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

**Exposure estimation and reference to its source - Workers: 10: 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: 11: Transfer from/pouring from containers**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 12: 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: 13: Production of preparation or articles by tabletting, compression, extrusion or pelletisation**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 14: 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: 15: 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: 16: 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** : 1150330

**Product name** : PC AIBU DCPD STREAMS-DCPD OLIGOMERS

## Section 1 - Title

**Short title of the exposure scenario** : Use in coatings - Industrial

**List of use descriptors** : **Identified use name:** Use in coatings - Industrial
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC15
**Sector of end use:** SU03
**Subsequent service life relevant for that use:** No.
**Environmental Release Category:** ERC04

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

**Health Contributing scenarios** : **General measures applicable to all activities -** PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC15
**General exposures (closed systems) -** PROC01, PROC02
**Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing -** PROC02
**Mixing operations (closed systems) -** PROC03
**Film formation - air drying -** PROC04
**Mixing operations (open systems) -** PROC05
**Spraying (automatic/robotic) -** PROC07
**Manual spraying -** PROC07
**Material transfers -** PROC08a, PROC08b
**Roller, spreader, flow application -** PROC10
**Dipping, immersion and pouring -** PROC13
**Laboratory activities -** PROC15
**Transfer from/pouring from containers -** PROC09
**Production of preparation or articles by tabletting, compression, extrusion or pelletisation -** PROC14
**Equipment cleaning and maintenance -** PROC08a
**Storage -** PROC02

**Processes and activities covered by the exposure scenario** : Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.

## 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): 2 500 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 1
Maximum daily site tonnage (kg/day): 25 000 kg/day
Regional use tonnage (tonnes/year): 2 500 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<br>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<br>Release fraction to soil from process (initial release prior to RMM): 0<br>Release fraction to wastewater from process (initial release prior to RMM): 0.0001 |
| **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.<br>Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation).<br>Treat air emission to provide a typical removal efficiency of =: 90 %<br>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.<br>Prevent discharge of undissolved substance to or recover from onsite wastewater.<br>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<br>Estimated substance removal from wastewater via municipal sewage treatment: 94.9 %<br>Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow]: 25 000 kg/day<br>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 94.9 % |
| **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 (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/Use in contained 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 temperaure. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Handle substance within a closed system. |
| **Ventilation control measures** | : | Ensure material transfers are under containment or extract ventilation.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 4: Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing**

| | | |
|---|---|---|
| **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. |
| **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).<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 5: Mixing operations (closed systems)**

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 temperaure. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Handle substance within a closed system. |
| **Ventilation control measures** | : | Provide enhanced general ventilation by mechanical means.<br>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: Film formation - air drying**

| | | |
|---|---|---|
| **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 temperaure. |
| **Ventilation control measures** | : | Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |
| **Respiratory protection** | : | Wear a respirator conforming to EN140 with type A filter or better. |

**Contributing scenario controlling worker exposure for 7: Mixing operations (open systems)**

Preparation of material for application

| | | |
|---|---|---|
| **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 1 hour |
| **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).<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |
| **Respiratory protection** | : | Wear a respirator conforming to EN140 with type A filter or better. |

**Contributing scenario controlling worker exposure for 8: Spraying (automatic/robotic)**

| | | |
|---|---|---|
| **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** | : | Carry out in a vented booth provided with laminar airflow.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 9: Manual spraying**

| | | |
|---|---|---|
| **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 temperaure. |
| **Ventilation control measures** | : | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| **Respiratory protection** | : | Wear a respirator conforming to EN140 with type A filter or better. |

**Contributing scenario controlling worker exposure for 10: Material transfers**

| | | |
|---|---|---|
| **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 hour |
| **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.<br>Provide a good standard of controlled ventilation (10 to 15 air changes per hour).<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |
| **Respiratory protection** | : | Wear a respirator conforming to EN140 with type A filter or better. |

**Contributing scenario controlling worker exposure for 11: Roller, spreader, flow application**

| | | |
|---|---|---|
| **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 1 hour |
| **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 controlled ventilation (10 to 15 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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |
| **Respiratory protection** | : | Wear a respirator conforming to EN140 with type A filter or better. |

**Contributing scenario controlling worker exposure for 12: Dipping, immersion and pouring**

| | | |
|---|---|---|
| **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 temperaure. |
| **Ventilation control measures** | : | Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Provide extract ventilation to points where emissions occur. |
| **Organisational measures to prevent/limit releases, dispersion and exposure** | : | Avoid manual contact with wet work pieces. |

**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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |
| **Respiratory protection** | : | Wear a respirator conforming to EN140 with type A filter or better. |

**Contributing scenario controlling worker exposure for 13: 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 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 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 14: Transfer from/pouring from containers**

Material transfers/Drum/batch transfers

| | | |
|---|---|---|
| **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 1 hours |
| **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.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |
| **Respiratory protection** | : | Wear a respirator conforming to EN140 with type A filter or better. |

**Contributing scenario controlling worker exposure for 15: Production of preparation or articles by tabletting, compression, extrusion or pelletisation**

| | | |
|---|---|---|
| **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 1 hours |
| **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.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |
| **Respiratory protection** | : | Wear a respirator conforming to EN140 with type A filter or better. |

**Contributing scenario controlling worker exposure for 16: 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 temperaure. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Drain down and flush system prior to equipment break-in or maintenance.<br>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 17: Storage**

Air care, instant action (aerosol sprays)

| | | |
|---|---|---|
| **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. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Ensure operation is undertaken outdoors.<br>or<br>Handle substance within a closed system. |
| **Ventilation control measures** | : | Ensure material transfers are under containment or extract ventilation.<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

## 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 4.3a.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: Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing**

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

**Exposure estimation and reference to its source - Workers: 5: Mixing operations (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: Film formation - air drying**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 7: 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: 8: Spraying (automatic/robotic)**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 9: Manual spraying**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 10: Material transfers**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 11: Roller, spreader, flow application**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 12: Dipping, immersion and pouring**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 13: Laboratory activities**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 14: Transfer from/pouring from containers**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 15: Production of preparation or articles by tabletting, compression, extrusion or pelletisation**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 16: 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: 17: 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.<br>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.<br>Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.<br>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.<br>Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.<br>Risk management measures are based on qualitative risk characterisation.<br>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** : 1150330

**Product name** : PC AIBU DCPD STREAMS-DCPD OLIGOMERS

## 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 -** PROC03
**General exposures (closed systems) -** PROC01, PROC02
**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): 1 300 000 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 1
Maximum daily site tonnage (kg/day): 4 200 000 kg/day
Regional use tonnage (tonnes/year): 1 300 000 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): 0.00002
Release fraction to soil from process (initial release prior to RMM): 0
Release fraction to wastewater from process (initial release prior to RMM): 0.0000001

**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.<br>Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation).<br>Treat air emission to provide a typical removal efficiency of =: 95 %<br>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.<br>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<br>Estimated substance removal from wastewater via municipal sewage treatment: 94.9 %<br>Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow]: 5 400 000 kg/day<br>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 94.9 % |
| **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** | : | Covers percentage substance in the product up to 100 %. |
| **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. |
| **Ventilation control measures** | : | Ensure material transfers are under containment or extract ventilation.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

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

| | | |
|---|---|---|
| **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. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Use drum pumps. |
| **Ventilation control measures** | : | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 5: General exposures**

Closed systems/Use in contained batch processes/Outdoor

| | | |
|---|---|---|
| **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. |
| **Ventilation control measures** | : | Handle substance within a predominantly closed system provided with extract ventilation.<br>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 6: 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 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).<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 7: 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 temperaure. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Drain down and flush system prior to equipment break-in or maintenance.<br>Retain drain-downs in sealed storage pending disposal or for subsequent recycle. |
| **Ventilation control measures** | : | Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| **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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. |
| **Respiratory protection** | : | Wear a respirator conforming to EN140 with type A filter or better. |

**Contributing scenario controlling worker exposure for 8: Vessel and container cleaning**

| | | |
|---|---|---|
| **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. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Drain down and flush system prior to equipment break-in or maintenance.<br>Retain drain-downs in sealed storage pending disposal or for subsequent recycle. |
| **Ventilation control measures** | : | Provide extract ventilation to points where emissions occur. |
| **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 |

**Contributing scenario controlling worker exposure for 9: 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** | : | 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** | : | Sample via a closed loop or other system to avoid exposure.<br>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).<br>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 |
| **Personal protection** | : | Wear suitable gloves tested to EN374. |

**Contributing scenario controlling worker exposure for 10: Use as a fuel**

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 1 hour |
| **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.<br>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 11: Disposal of wastes**

| | | |
|---|---|---|
| **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 1 hour |
| **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** | : | Sample via a closed loop or other system to avoid 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 |

## 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**

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

**Exposure estimation and reference to its source - Workers: 6: 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: 7: 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: 8: 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: 9: Storage**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 10: 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: 11: 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** : 1150330

**Product name** : PC AIBU DCPD STREAMS-DCPD OLIGOMERS

## Section 1 - Title

**Short title of the exposure scenario** : Use in rubber production and processing

**List of use descriptors** : **Identified use name:** Use in rubber production and processing
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14, PROC15, PROC21
**Sector of end use:** SU10
**Subsequent service life relevant for that use:** No.
**Environmental Release Category:** ERC01, ERC04, ERC06d

**Environmental contributing scenarios** : **General exposures -** ERC01, ERC04, ERC06d

**Health Contributing scenarios** : **General measures applicable to all activities -** PROC01, PROC02, PROC03, PROC04, PROC05, PROC06, PROC07, PROC08a, PROC08b, PROC09, PROC13, PROC14, PROC15, PROC21
**Material transfers -** PROC01, PROC02
**Transfer of material from one container to another -** PROC08b
**Bulk weighing -** PROC01, PROC02
**Small scale weighing -** PROC09
**Additive premixing -** PROC03, PROC04, PROC05
**Transfer from/pouring from containers -** PROC08b, PROC09
**Calendering (including Banburys) -** PROC06
**Pressing uncured rubber blanks -** PROC14
**Vulcanisation -** PROC06
**Cooling cured articles -** PROC06
**Laboratory activities -** PROC15
**Equipment maintenance -** PROC08a

**Processes and activities covered by the exposure scenario** : Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, vulcanising, cooling and finishing.

## 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): 2 500 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 1
Maximum daily site tonnage (kg/day): 25 000 kg/day
Regional use tonnage (tonnes/year): 2 500 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): 0.0001
Release fraction to wastewater from process (initial release prior to RMM): 0.0005

| | | |
|---|---|---|
| **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.<br>Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).<br>Treat air emission to provide a typical removal efficiency of =: 0 %<br>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.<br>Prevent discharge of undissolved substance to or recover from onsite wastewater.<br>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<br>Estimated substance removal from wastewater via municipal sewage treatment: 94.9 %<br>Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow]: 25 000 kg/day<br>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 94.9 % |
| **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 (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: Material transfers**

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 temperaure. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Handle substance within a closed system. |
| **Ventilation control measures** | : | Ensure material transfers are under containment or extract ventilation.<br>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 4: Transfer of material from one container to another**

Material transfers

| | | |
|---|---|---|
| **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 temperaure. |
| **Ventilation control measures** | : | Ensure material transfers are under containment or extract ventilation.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 5: Bulk weighing**

| | | |
|---|---|---|
| **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. |
| **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).<br>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: Small scale weighing**

| | | |
|---|---|---|
| **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 1 hour |
| **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.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 7: Additive premixing**

| | | |
|---|---|---|
| **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 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 controlled ventilation (10 to 15 air changes per hour).<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 8: Transfer from/pouring from containers**

Material transfers

| | | |
|---|---|---|
| **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 1 hour |
| **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.<br>Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 9: Calendering (including Banburys)**

| | | |
|---|---|---|
| **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** | : | Operation is carried out at elevated temperature (> 20°C above ambient temperature) |
| **Ventilation control measures** | : | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 10: Pressing uncured rubber blanks**

| | | |
|---|---|---|
| **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. |
| **Ventilation control measures** | : | Provide a good standard of controlled ventilation (10 to 15 air changes per hour).<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 11: Vulcanisation**

| | | |
|---|---|---|
| **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** | : | Operation is carried out at elevated temperature (> 20°C above ambient temperature) |
| **Ventilation control measures** | : | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 12: Cooling cured articles**

| | | |
|---|---|---|
| **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** | : | Operation is carried out at elevated temperature (> 20°C above ambient temperature) |
| **Ventilation control measures** | : | Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 13: 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 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 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 14: Equipment 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 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 a good standard of controlled ventilation (10 to 15 air changes per hour). |
| **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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| **Respiratory protection** | : | Wear a respirator conforming to EN140 with type A filter or better. |

## 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 4.19.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: Material transfers**

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

**Exposure estimation and reference to its source - Workers: 4: Transfer of material from one container to another**

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

**Exposure estimation and reference to its source - Workers: 5: Bulk weighing**

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

**Exposure estimation and reference to its source - Workers: 6: Small scale weighing**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 7: Additive premixing**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 8: Transfer from/pouring from containers**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 9: Calendering (including Banburys)**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 10: Pressing uncured rubber blanks**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 11: Vulcanisation**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 12: Cooling cured articles**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 13: Laboratory activities**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 14: Equipment maintenance**

**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.<br>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.<br>Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.<br>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.<br>Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.<br>Risk management measures are based on qualitative risk characterisation.<br>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)

**Professional**

## Identification of the substance or mixture

**Product definition** : UVCB

**Code** : 1150330

**Product name** : PC AIBU DCPD STREAMS-DCPD OLIGOMERS

## Section 1 - Title

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

**List of use descriptors** : **Identified use name:** Use as a fuel - Professional
**Process Category:** PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC16
**Sector of end use:** SU22
**Subsequent service life relevant for that use:** No.
**Environmental Release Category:** ERC09a, ERC09b

**Environmental contributing scenarios** : **General exposures -** ERC09a, ERC09b

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

**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): 75 tonnes/year
Fraction of EU tonnage used in region: 0.1
Fraction of Regional tonnage used locally: 0.0005
Maximum daily site tonnage (kg/day): 210 kg/day
Regional use tonnage (tonnes/year): 150 000 tonnes/year

**Frequency and duration of use** : Continuous release
Emission days (days per year): 365 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): 0.00001
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** | : | No secondary wastewater treatment required.<br>Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation).<br>Treat air emission to provide a typical removal efficiency of: 0 %<br>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** | : | Not applicable. |
| **Conditions and measures related to municipal sewage treatment plant** | : | Assumed domestic sewage treatment plant flow (m³/day): 2 000 m³/day<br>Estimated substance removal from wastewater via municipal sewage treatment: 94.9 %<br>Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow] (kg/day): 1 200 kg/day<br>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 94.9 % |
| **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** | : | Covers percentage substance in the product up to 100 %. |
| **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** | : | Clear transfer lines prior to de-coupling. |
| **Ventilation control measures** | : | Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

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

| | | |
|---|---|---|
| **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 temperaure. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Use drum pumps or carefully pour from container. |
| **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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 5: Dipping, immersion and pouring**

| | | |
|---|---|---|
| **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 temperaure. |
| **Technical conditions and measures at process level (source) to prevent release** | : | Use drum pumps or carefully pour from container. |
| **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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 6: 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 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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 7: 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** | : | 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** | : | 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).<br>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: Use as a fuel**

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 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** | : | 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).<br>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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

**Contributing scenario controlling worker exposure for 9: 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** | : | 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** | : | Drain down system prior to equipment break-in or maintenance.<br>Retain drain-downs in sealed storage pending disposal or for subsequent recycle. |
| **Ventilation control measures** | : | Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| **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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| **Respiratory protection** | : | Wear a respirator conforming to EN140 with type A filter or better. |

**Contributing scenario controlling worker exposure for 10: Vessel and container cleaning**

| | | |
|---|---|---|
| **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 temperaure. |

| | | |
|---|---|---|
| **Technical conditions and measures at process level (source) to prevent release** | : | Drain down system prior to equipment break-in or maintenance.<br>Retain drain-downs in sealed storage pending disposal or for subsequent recycle. |
| **Ventilation control measures** | : | Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| **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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| **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** | : | 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 |
| **Personal protection** | : | Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |

## 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 9.12b.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: Dipping, immersion and pouring**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 6: 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: 7: General exposures**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Exposure estimation and reference to its source - Workers: 8: 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: 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: 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: 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.
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.<br>Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.<br>Risk management measures are based on qualitative risk characterisation.<br>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. |