

ATZ FLUX GAS OIL

REV.: B

DATE: 21/12/2015

PREPARED BY: ICARO S.r.l

FOR: ALMA PETROLI S.p.A.

1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND COMPANY/ORGANIZATION

1.1 Product identification

Name of substance/mixture:	ATZ FLUX GAS OIL
Synonyms	Gas oil (petroleum), primary distillates. Gas oils (petroleum), straight-run
CAS number	64741-43-1
EC number	265-043-1
Index number	n.d.
Registration number	01-2119488519-20-0030
Chemical formula	The substance is an UVCB complex (prC3), and thus it is not possible to provide a molecular formula.
Molecular weight	The substance is an UVCB complex (prC3), and thus it is not possible to provide a molecular formula.

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

Common uses fuel for heating and other industrial uses

Uses identified in the chemical safety report: general list of applications:

Industrial use (G26): manufacturing of substance (GEST1_I), use as an intermediate (GEST1B_I), distribution of substance (GEST1A_I) formulation & (re)packing of substances and mixtures (GEST2_I), use in Oil and Gas field drilling and production operations (GEST5_I)-

Professional use (G27): use in Oil and Gas field drilling and production operations (GEST5_P).

Consumer (G28): not envisaged

Uses advised against: the relevant uses are listed above. No other uses are recommended unless an assessment is made prior to such use, indicating that the related risks are controlled.

Consult the annex for a complete list of the uses for which an exposure scenario is envisaged

1.3 Information on the supplier of the safety data sheet:

Company name	ALMA PETROLI S.p.A.
Address	Via di Roma 67 - Via Baiona 195
City / Country	Ravenna Italy
Telephone	0039-0544-34317- 0039-0544-696411
E-mail of competent technician	info@almapetroli.com

1.4 Emergency telephone number:

Poison centre - Telephone consultation operative (24/7):

Niguarda Hospital Milan Tel: 0039 02 66101029,

Poison centre Pavia: Tel. 0039 0382 24444,

Poison centre Bergamo: Tel: 0039 800 883300,

Poison centre Foggia: Tel 0039-0881-732326,

Poison centre Florence: Tel 0039-055-7947819,

Poison centre Policlinico Umberto I Rome: Tel 0039-06-490663,

Poison centre Policlinico "A.Gemelli": Tel 0039-06-3054343,

Poison centre Cardarelli Naples: Tel: 0039-081-5453333/7472870

Alma Petroli - Sciascia Antonino (Employer) - Mob. 0039-3461305790 (24/7)

Alma Petroli - Fabbri Maurizio (RSPP) - Mob. 0039-3461321422 (24/7)

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2. IDENTIFICATION OF THE HAZARDS

Physical-chemical hazards: flammable liquids and vapours

Health hazards: the substance is harmful if inhaled. Given its low viscosity, the product can be inhaled into the lungs either following direct swallowing or after spontaneous or induced vomiting; this can give rise to chemical pneumonia. May cause damage to organs through prolonged or repeated exposure

Environmental hazards: the substance is toxic for aquatic organisms with long-term adverse effects in the aquatic environment.

2.1 Classification of the substance or mixture

Flamm Liq.3;	H226
Asp. Tox 1:	H304
Acute Tox 4:	H332
STOT Rep.Exp.2:	H373 (liver, spleen and bone marrow)
Aquatic Chronic 2:	H411

The list of H-phrases is reported in section 16.

2.2 Elements in the label



Signal word: **HAZARD**

Hazard indications:

H226:	Flammable liquid and vapours
H304:	May be fatal if swallowed and enters airways
H332:	Harmful if inhaled
H373:	May cause damage to organs through prolonged or repeated exposure
H411:	Toxic to aquatic life with long lasting effects
EUH066:	Exposure may cause skin dryness and cracking

Precautionary statements:

Prevention

P210:	Keep away from sources of heat, hot surfaces, sparks, open flames or other sources of ignition. Do not smoke
P261:	Avoid breathing mist/vapours/spray
P273:	Avoid release to the environment

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P280: Wear protective gloves/protective clothing/eye protection/face protection

Reaction

P301+310: IF SWALLOWED: immediately call a POISON CENTER or doctor/physician

P332+313: If skin irritation occurs: get medical advice/attention

P331: DO NOT induce vomiting

Disposal

P501: Dispose of contents/container in compliance with It. Leg. Dec. 152/06 and subsequent amendments and integrations

Additional information: Not available

2.3 Other hazards

When heated the product emits vapours that may form flammable, explosive mixtures with air. The vapours are heavier than air: they can accumulate in confined or low-lying spaces, propagate at ground level and can lead to the risk of fire and explosion, even from a distance. There is the risk of thermal burns if the product comes into direct contact with the skin or eyes since it is handled at high temperatures.

The product does not meet the PBT or vPvB classification criteria as per REACH annex XIII.

3. COMPOSITION / INFORMATION ON THE INGREDIENTS

3.1 Substances

UVCB substance: "Complex combination of hydrocarbons produced by distillation of crude oil. It is composed of hydrocarbons generally containing between C11 and C25 carbon atoms and having a boiling point in the 205°C - 400°C range (approx.)."

Name	EC no.	CAS no.	Index no.	Registration no.
ATZ FLUX GAS OIL	265-043-1	64741-43-1	n.d.	01-2119488519-20-0030

3.2 Mixtures

n.a.

4 FIRST AID MEASURES

4.1 Description of first aid measures

Eye contact: Rinse cautiously with water for several minutes (814). Remove contact lenses, if this can be done easily (808). If irritation, blurred vision or swelling occurs and persists, obtain medical advice from a specialist (721).

Skin contact: remove contaminated clothing, contaminated footwear and dispose of safely (811). Wash the affected area with soap and water (847). Seek medical attention if skin irritation, swelling or redness develops and persists (817).

For minor thermal burns, cool the injured area (705). Hold the burned area under cold running water for at least five minutes, or until the pain subsides (709). Body hypothermia must be avoided (659). See sect. 2.3.

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When using high-pressure equipment, injection of product can occur (850). If high-pressure injuries occur, immediately seek professional medical attention (718). Do not wait for symptoms to develop (686).

Ingestion/aspiration: Do not induce vomiting as there is high risk of aspiration (680). Do not give anything by mouth to an unconscious person (679).

In the event of spontaneous vomiting, keep the casualty's head down to prevent the risk of breathing vomit into the lungs.

Inhalation: Inhalation of vapours at ambient temperature is unlikely because of the low vapour pressure of the product. Exposure to vapours may however occur when the product is handled at high temperatures with poor ventilation (696). In case of symptoms arising from inhalation of fumes, mists or vapours (744), transfer the casualty to a quiet and well ventilated place if safe to do so (804).

If the casualty is unconscious (716) and not breathing (790) ensure that there is no obstruction to breathing and give artificial respiration by trained personnel (694). If necessary, give external cardiac massage and obtain medical advice (723).

If the casualty is breathing (660), place in the recovery position (724). Administer oxygen if necessary (649).

4.2 Primary symptoms and effects, both acute and delayed

May cause skin irritation (825), slight eye irritation (826), irritation of the respiratory tract due to excess fume, mists or vapour exposure (767). If swallowed: few or no symptoms expected (700). If any, nausea and diarrhoea might occur (711).

4.3 Indication of any immediate medical attention and special treatment needed

In case of ingestion, always assume that aspiration has occurred (740). Send the casualty immediately to hospital (823). Do not wait for symptoms to develop (686).

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

The substance is flammable

Small scale fires: earth or sand (872), carbon dioxide (852), foam (859), dry chemical powder (856).

Large scale fires: foam (859), water fog (887). Note: sprayed water can only be used by specially trained personnel. Other inert gases (subject to regulations) (870)

Unsuitable extinguishing media: Do not use direct water jets on the burning product (855), they could cause splattering and spread the fire (881). Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam (873).

5.2 Special hazards arising from the substance or mixture

Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates, gases, including carbon monoxide (867), H₂S (Hydrogen sulphide), SO_x (sulphur oxides) or H₂SO₄ (sulphuric acid) (861) unidentified organic and inorganic compounds (886).

5.3 Recommendations for fire-fighting personnel

In case of a large fire or in confined or poorly ventilated spaces, wear full fire resistant protective clothing and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode (864).

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6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Stop or contain leak at the source, if safe to do so (1006). Avoid direct contact with released material (903). Stay upwind (1003). In case of large spillages, alert occupants in downwind areas (956). Keep non-involved personnel away from the area of spillage. Alert emergency personnel (968). Except in case of small spillages (925), the feasibility of any actions should always be assessed and advised, if possible, by a trained, competent person in charge of managing the emergency (1007). Eliminate all ignition sources if safe to do so (e.g. electricity, sparks, fires, flares) (920).

Small spillages (995): normal antistatic working clothes are usually adequate (983).

Large spillages: full body suit of chemically resistant and antistatic material (973). Work gloves providing adequate chemical resistance, specifically to aromatic hydrocarbons (1028). Gloves made of PVA (polyvinyl alcohol) are not water-resistant, and are not suitable for emergency use (933). Work helmet (1030). Antistatic non-skid safety shoes or boots (899). Chemically resistant. Goggles or face shield, if splashes or contact with eyes is possible or anticipated (934). Respiratory protection: a half or full-face respirator with filter(s) for organic vapours (and when applicable for H₂S) (892) or a Self-Contained Breathing Apparatus (SCBA) can be used according to the extent of spill and predictable amount of exposure (895). If the situation cannot be completely assessed, or if an oxygen deficiency is possible, only SCBA's should be used (951).

6.2 Environmental precautions

Prevent product from entering sewers, rivers or other bodies of water (985).

6.3 Methods and materials for containment and cleaning

Spills on the ground: If necessary dike the product with dry earth, sand or similar non-combustible materials (940). Large spillages may be cautiously covered with foam, if available, to limit fire risk (970). Do not use direct jets (918). When inside buildings or confined spaces, ensure adequate ventilation (1022). Absorb spilled product with suitable non-combustible materials (896). If it is necessary to store any contaminated materials for subsequent safe disposal, only suitable containers (airtight, sealed, waterproof, and earthed) should be used (939). In case of soil contamination, remove contaminated soil and treat in accordance with local regulations (959).

Leaks into water: In case of small spillages in closed waters (e.g.: in ports) (957), contain product with floating barriers or other equipment (958). Collect spilled product by absorbing with specific floating absorbents (910). Large spillages (972): if possible, large spillages in open waters should be contained with floating barriers or other mechanical means (948). The use of dispersants should be advised by an expert, and, if required, approved by local authorities (1012). If possible, collect the product and contaminated materials with mechanical means, and store/dispose of according to relevant regulations (945).

Recommended measures are based on the most likely spillage scenarios for this material. Local conditions (wind, air temperature, wave/current direction and speed) may significantly influence the choice of appropriate actions (990). For this reason, local experts should be consulted when necessary (930).

6.4 Reference to other sections

For more information regarding personal protective equipment see section "Exposure control/personal protection" (1086).

6.5 Additional information

No additional information available

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7. HANDLING AND STORAGE

7.1 Precautions for safe handling

7.1.1 Protective measures

Ensure that all relevant regulations regarding handling and storage facilities of flammable products are followed (1080).

Take precautionary measures against static electricity (1140). Ground/bond containers, tanks and transfer/receiving equipment (1087). The vapour is heavier than air (1137). Beware of accumulation in pits and confined spaces (1051). Keep away from heat/sparks/open flames/hot surfaces (1097). Do not smoke. Avoid contact with skin and eyes (1041). Do not swallow (1072). Do not breathe vapours (1070).

Use and store only outdoors or in a well-ventilated area (1148). Avoid contact with the product (1045). Use adequate personal protective equipment as needed (1146). Do not use compressed air for filling, discharging or handling operations (1073). Prevent the risk of slipping. Avoid release to the environment.

For more information regarding personal protective equipment and operational conditions see "Exposure scenarios" (1085).

7.1.2 Indications regarding hygiene in the workplace

Ensure that proper housekeeping measures are in place (1081). Contaminated material should not be allowed to accumulate in the workplaces and should never be kept inside the pockets (1061). Keep away from food and beverages (1096). Avoid contact with skin (1042). Do not eat, drink or smoke when using this product (1041). Wash the hands thoroughly after handling (1156). Do not reuse contaminated clothing.

7.2 Conditions for safe storage, including any incompatibilities

Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation (1127). Storage installations should be designed with adequate bunds so as to prevent ground and water pollution in case of leaks or spills (1129). Cleaning, inspection and maintenance of internal structure of storage tanks must be performed only by properly equipped and qualified personnel as defined by national, local or company regulations (1054), after having cleaned out the tank. Before entering storage tanks and commencing any operation in a confined area, check the atmosphere for oxygen content and flammability (1050). Store separately from oxidising agents (1153). Store in a well-ventilated place (1131).

Recommended materials (1117): use mild steel, stainless steel for containers, or container linings (1116). Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use (1125). Compatibility should be checked with the manufacturer (1055).

If the product is supplied in containers (1094) keep only in the original container or in a suitable container for this kind of product (1099).

Keep containers tightly closed and properly labelled (1098). Protect from the sunlight (1114).

Light hydrocarbon vapours can build up in the headspace of containers (1100). These can cause flammability / explosion hazards (1138). Empty containers may contain combustible product residues (1077). Do not weld, solder, drill, cut or incinerate empty containers, unless they have been properly cleaned (1075).

7.3 Specific final uses

See attached exposure scenarios

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8. EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 Control parameters

Gas oil (Diesel fuel)

ACGIH 2014:

TLV®-TWA: 100 mg/m³

Mineral oil:

ACGIH 2014:

TLV®-TWA: Exposure must be kept to the barest minimum (slightly or mediumly refined mineral oil):

TLV®-TWA: 5 mg/m³ (pure, highly or differently refined mineral oil)

Monitoring procedure: see It. Leg. Dec. 81/2008 and subsequent amendments and integrations or good industrial hygiene practices.

DNEL (Derived No-Effect Level)

Exposure routes	DNEL Workers				DNEL general population			
	Chronic, local effects	Chronic, systemic effects Note b	Acute, local effects	Acute, systemic effects	Chronic, local effects	Chronic, systemic effects Note e	Acute, local effects	Acute, systemic effects
oral	n.a.	n.a.	n.a.	n.a.	n.a.	1 mg/kg/24 hours	n.a.	n.a.
skin	Note (a) for 13 weeks Note (c) for chronic exposure	2.9 mg/kg/8 hours	Note (a)	Note (a)	Note (d)	Note (d)	Note (d)	Note (d)
inhalation	Note (a)	16 mg/m ³ /8 hours	Note (a)	1500 mg/m ³ /15 min	Note (d)	Note (d)	Note (d)	Note (d)

Note a: no hazard has been identified for this route of exposure

Note b: long-term systemic effects include non reproductive effects and effects on fertility or development

Note c: no information on threshold effect or dose descriptor.

Note d: A DNEL is not necessary because no exposure is envisaged

Note e: long-term systemic effects include reproductive effects and effects on fertility or development

DMEL (Derived Minimum Effect Level)

Not identified because no adequate dose indicator is available.

PNEC(S) (Predicted No Effect Concentration)

See attached exposure scenarios.

8.2 Exposure control

8.2.1 Suitable technical checks

Minimise exposure to mist/ vapours/sprays. Before entering storage tanks and commencing any operation in a confined area, check the atmosphere for oxygen content.

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8.2.2 Personal protection measures

(a) Eye/face protection:

In the absence of systems for containment, and if contact with the eyes/face is possible, head and facial protection (protective shield and/or safety goggles) should be used (EN 166).

(b) Skin protection:

i) Hand protection

In the absence of containment systems, and if contact with the skin is possible, use hydrocarbon-resistant gloves with long cuffs that are plush lined and, if necessary, thermally insulated. Materials assumed to be adequate: nitril, PVC or PVA (polyvinyl alcohol) with index of protection against chemical agents of at least 5 (permeation time > 240 minutes). Use gloves under the conditions and respecting the limits set by the manufacturer. If necessary, see UNI EN 374. Gloves must be periodically inspected and changed in case of wear, perforations or contaminations.

ii) Other

If the clothing becomes contaminated, replace and clean immediately.

(c) Respiratory protection:

In confined spaces:

Use approved respiratory protection equipment: full face mask with cartridge/filter type AX (brown for organic vapours with low boiling point). If exposure levels cannot be determined or estimated with adequate confidence, or an oxygen deficiency is possible, only SCBA's should be used (EN 529).

In the absence of systems for containment:

Use approved respiratory protection equipment: full face mask with cartridge/filter type AX (brown for organic vapours with low boiling point).

(d) Thermal hazards: see previous letter b)



8.2.3 Environmental exposure control

Avoid release to the environment (1046) Storage installations should be designed with adequate bunds so as to prevent ground and water pollution in case of leaks or spills (1129).

Prevent discharge of undissolved substance to or recover from onsite wastewater. (TRC14)

For greater details, see attached exposure scenarios.

8.3 Other

No additional information available.

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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on essential physical and chemical properties

a) Appearance	liquid
b) Odour	of petroleum
c) Olfactory threshold	n.d.
d) pH	n.a.
e) Melting/freezing point	From - 21 to +6°C ASTM 1999 CONCAWE 2010°
f) Initial boiling point and boiling range	165°C 165°C - >375°C (Test report GE10-01296.001)
g) Flash point	69°C Pensky Martens (ISO 2719) (Test report 15PR03975)
h) Evaporation rate	n.a.
i) Flammability (solids, gases)	n.a.
j) Upper/lower flammability or explosive limits	LEL 1% - UEL 6%
k) Vapour pressure	0.4 kPa at 40°C (ASTM1991)
l) Vapour density	n.a.
m) Density	895 kg/m ³ at 15°C (ASTM D1298) (Test report GE10-01296.001)
n) Solubility	solubility in water not applicable since it is an UVCB substance
o) Partition coefficient (n-octanol/water)	not applicable since it is an UVCB substance
p) Self-ignition temperature	>240°C CONCAWE 2010a
q) Decomposition temperature	n.a.
r) Viscosity	3.212 mm ² /s at 40°C ASTM D445 (Test report GE10-01296.001)
s) Explosive properties	none of the chemical groups associated with the molecule have explosive properties (Ref. column 2 of the REACH in annex VII)
t) Oxidising properties	non oxidizing (on the basis of the chemical structure, the substance does not react exothermally with combustible materials. Ref. column 2 of the REACH in annex VII)

9.2 Additional information

The characteristic analysis methods are the nationally and internationally recognized methods reported, for the most part, in the product commercial specifications.

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10. STABILITY AND REACTIVITY

10.1 Reactivity

The substance does not present any further hazard related to reactivity, above and beyond those reported in the following subsections

10.2 Chemical stability

This substance is stable as regards its inherent properties.

10.3 Possibility of dangerous reactions

Contact with strong oxidizers (peroxides, chromates, etc.) may cause a fire hazard. A mixture with nitrates or other strong oxidisers (e.g. chlorates, perchlorates, liquid oxygen) may create an explosive mass (611). Sensitivity to heat, friction or shock cannot be assessed in advance (618).

10.4 Conditions to be avoided

Store separately from oxidising agents (1133).

Keep away from heat/sparks/open flames/hot surfaces (1907). Do not smoke

Prevent the formation of electrostatic charges

10.5 Non-compatible materials

Strong oxidizers

10.6 Hazardous decomposition products

The product does not decompose when used for the envisaged purposes

11. TOXICOLOGICAL INFORMATION

11.1 Toxicokinetics, metabolism and distribution

No in vivo data are available on the toxicokinetics of gas oil.

Experimental studies, performed in animals, have shown absorption through the lungs. Considerations on the chemical-physical properties suggest that the highly breathable aerosols of poorly water soluble substances having log Pow values higher than zero are absorbed to a certain extent by the airways. In the absence of further information, it is assumed that 50% of the dose of gas oil aerosol inhaled is absorbed by the lungs in both animals and man.

No data are available on absorption of gas oil through the skin; however repeated toxicity studies indicate that a certain degree of absorption through the skin is possible. Application of the SPINKERM model indicates that absorption of gas oil through the skin is most likely low (estimated skin flow: 0.0001058 mg cm⁻²/hour for human skin). Nevertheless, since the reliability of this value is not known, to be on the safe side, complete absorption of gas oil through the skin is assumed.

11.2 Toxicological information

a) Acute toxicity:

Oral route

Acute oral toxicity of samples belonging to the category of straight run middle gas oils has been assessed in a series of studies. All studies have highlighted a LD50 oral > 2000 mg/kg. Given these results, the standards on hazardous substances do not require any classification.

Below is a summary of the most representative studies found in the registration file.

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Method	Result	Comments	Source
Oral Route			
RAT (F/M) ORAL (forced feeding) OECD Guideline 401	LD50: > 5000 mg/kg (M/F)	Key study reliable without restrictions CAS 64741-44-2	API (1985a)

Inhalation route

Some studies have been performed in the rat to evaluate acute toxicity by inhalation of straight run middle gas oils category products. Given these results, the substance requires a classification of Acute Tox. 4 H332: (Harmful if inhaled).

Below is a summary of the most representative studies found in the registration file.

Method	Result	Comments	Source
Inhalation route			
RAT (M/F) Aerosol mixture OECD Guideline 403	LC50 mg/l/4 hours: 1.78 (F) LC50 mg/l/4 hours: 1.72 (M) LC50 mg/l/4 hours: 1.82 (M/F)	Key study CAS 64741-44-2 Reliable without restrictions	API (1987)

Cutaneous route

Acute oral toxicity of samples belonging to the category of straight run middle gas oils has been assessed in a series of studies. All studies have highlighted a LD50 skin > 2000 mg/kg. Given these results, the standards on hazardous substances do not require any classification.

Below is a summary of the most representative studies found in the registration file.

Method	Result	Comments	Source
Cutaneous route			
RABBIT OECD Guideline 402	LD50 >2000 mg/kg (M/F)	Key study CAS 64741-44-2 Reliable without restrictions	API (1985a)

b) Corrosion/skin irritation

No specific studies are available on the corrosiveness of said substance. Considering the information derived from studies performed in animals and the nature of the substance, no corrosive action is expected.

The skin irritation potential of samples belonging to the category of this product was tested in a large number of studies, generally performed in rabbits. Only some studies show minor skin irritation. These results do not require any classification. Below is a summary of the most representative studies found in the registration file.

Method	Result	Comments	Source
RABBIT Patch test (on each animal, two sites with intact skin and 2 sites with abraded skin) Observation at 24/72 hours OECD Guideline 404	Non irritant Average erythema score: 1.8 of max. 4 (intact skin) Average edema score: 1.58 of max. 4 (intact skin)	Key study Reliable with restrictions CAS 64741-44-2	API (1985a)

c) Severe eye lesions/severe eye irritation

The eye irritation potential of samples belonging to this product category was tested in a large number of studies, generally performed in rabbits. The conclusions of these studies indicate that there is no significant irritation to the eyes and thus the substance is not classified as eye irritant under the standards on hazardous substances.

Below is a summary of the most representative studies found in the registration file.

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Method	Result	Comments	Source
RABBIT Observation at 24/48/72 hours OECD Guideline 405	Non irritant Average cornea score: 0 of max 80 (average) Average iris score: 0 of max 10 (average) Average conjunctiva score: 0 of max 20 (average)	Key study Reliable without restrictions CAS 64741-44-2	API (1985a)

d) Sensitization of respiratory tract and skin

Sensitization of respiratory tract

Information not available. This endpoint is not required by REACH.

Sensitization of skin

A skin sensitization study was performed for the category of straight run middle gas oils. The results obtained from this study indicate that there is no potential for skin sensitization and thus no substance classification is required under the standards on hazardous substances.

Below is a summary of the most representative studies found in the registration file.

Method	Result	Comments	Source
GUINEA PIG Buehler test Guideline 406	Non sensitizing	Support study Reliable without restrictions CAS 64741-44-2	API (1985a)

e) Germ cell mutagenicity

The mutagenic potential of samples belonging to the category of straight run middle gas oils has been studied in a series of in vivo and in vitro tests and through read-across with the category "Other Gas Oils". These studies have shown very "borderline" genotoxic potential, and thus the standards on hazardous substances do not require any classification.

Below is a summary of the most representative studies found in the registration file.

Method	Result	Comments	Source
In vitro gene mutation (Ames Test) in Salmonella thyphimurium TA 98 Doses: 5, 10, 15, 20, 30, 40, 50, 60 µl/plate OECD Guideline 471	Positive with metabolic activation (marginally mutagenic)	Key study Reliable with restrictions CAS:64741-44-2 and CAS68814-87-9	Deiningner, G., Jungen, H., Wenzel-Hartung, R. (1991)
In vivo chromosomal aberration test RAT (M/ F) Administration: Intraperitoneal Doses: 300, 1000, 3000 mg/kg OECD Guideline 475	Genotoxicity: Negative	Key study Reliable without restrictions CAS 64741-44-2	American Petroleum Institute (API) 1985c

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f) Carcinogenicity

Prolonged exposure to straight run gas oils may cause severe skin irritation that can evolve into skin tumours (see study reported below). In the absence of irritation, onset of tumours has NOT been found. Therefore, for straight run gas oils, the standards on hazardous substances do not require any classification.

Method	Result	Comments	Source
MOUSE (male) exposure: 24 months Doses: 50 µl Exposure for half a lifetime (3 times a week) OECD 453	Result: a 22% incidence of neoplasia was found in the animals treated	Key study Reliable with restrictions CAS: 64741-44-2	API (1989)

g) Toxicity for reproduction

Toxicity for reproduction:

To date, the number of studies is inadequate to determine the impact of gas oils on human fertility. Therefore, it is not possible to assign a classification under the standards on substances. Nevertheless, regarding registration as per REACH regulations, a test has been proposed to study fertilization over two generations.

Toxicity for development/teratogenesis:

The studies on development have proved positive only at doses that also caused toxicity in the mother. Therefore no classification of the substance is required under the standards on hazardous substances.

Below is a summary of the most representative studies found in the registration file.

Method	Result	Comments	Source
RAT Means of exposure: skin Doses: 0, 8, 30, 125, 500 mg/kg/day Exposure: Pre- and post-natal OECD 414	NOAEL (maternal toxicity): 30 mg/kg/day reduced food intake, increased liver weight and variations in blood parameters. NOAEL (toxicity for development): 30 mg/kg/day, miscarriage, decrease foetal weight, skeletal anomalies.	Key study Reliable without restrictions CAS 68915-97-9	Mobil (1995)

h) Specific target organ toxicity (STOT) - single exposure:

No specific target organ toxicity following single exposure

i) Specific target organ toxicity (STOT) - repeated exposure

A NOAEL of 30 mg/kg/day for skin exposure and a NOAEC of 1.75 mg/l for read-across were found.

On the basis of the results obtained, the substance is classified STOT Rep.Exp.2 H373 as per CLP Regulation.

Below is a summary of the most representative studies found in the registration file.

It must be pointed out that the registration dossier does not contain any information regarding oral exposure (tests for repeated oral toxicity are not required because the main exposure routes in humans are skin and inhalation - ref. column 2, Annex IX of the Reach regulation)

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Method	Result	Comments	Source
Inhalation			
RAT (M/F) Inhalation (aerosol) Exposure: 13 weeks (subchronic) OECD Guideline 413	NOAEC: >1.71 mg/l systemic effects (male/female) NOAEC: 0.88 mg/l local effects (lung weight) (male/female)	Key study Read-across Reliable with restrictions Diesel fuel	Lock, S., Dalbey, W. Schmoyer, R., Griesemer, K. (1984)
Skin			
RAT (M/F) Exposure: 13 weeks OECD Guideline 411	NOAEL (systemic effects): 30 ml/kg/day (M/ F) NOEL (local effects: skin irritation): 500 ml/kg/day (M/ F) LOAEL (systemic effects): 125 ml/kg/day (M/ F)	Key study Reliable with restrictions CAS 68334-30-5	Mobil (1992) Feuston, M.H., Low, L.K., Hamilton, C.E., Mackerer, C.R. (1994)

j) Aspiration hazard:

Since straight run gas oils have a viscosity of $< 20.5 \text{ mm}^2/\text{s}$ at 40°C the product might be breathed into the lungs according to the criteria in annex I, part 3 of Regulation 1272/2008.

Therefore it is classified as Asp. Tox. 1 H304 (May be fatal if swallowed and enters airways).

Additional information

No additional information available

12. ECOLOGICAL INFORMATION

On the basis of the ecological information reported below, regarding toxicity in fish, invertebrates and algae, and on the basis of the criteria indicated in the standards on hazardous substances, straight run gas oil is classified as hazardous for the environment H411, toxic to aquatic organisms, may cause long-term adverse effects.

12.1 Toxicity

Below is a summary of the most representative studies found in the registration file.

Endpoint	Result	Comments
Aquatic toxicity		
Invertebrates Daphnia magna Short term OECD 202 (Immobilization tests for Daphnia sp) Method EU C.2 (Acute toxicity for Daphnia)	EL50 (24 h): > 1000 EL50 (48 h): 210 mg/l NOEL (48 h): 46 mg/l	Key study Reliable without restrictions CAS 68334-30-5 Read-Across Girling A and Cann, B (1996b)
Invertebrates Daphnia magna Long term QSAR modelled data	NOEL 21/days: 0.167 mg/l	Key study Reliable with restrictions QSAR Redman, et al.(2010b)

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Endpoint	Result	Comments
Aquatic toxicity		
Algae Raphidocelis subcapitata Short term OECD 201 (Algal growth inhibition test) Method EU C.3. (Algal inhibition test)	EbL50 (72 h): 25 mg/l ErL50 (72 h): 78 mg/l NOEL (72 h): 3 mg/l	Key study Girling, A and Cann, B (1996a) Reliable with restrictions Read-across CAS 68334-30-5
Fish Oncorhynchus mykiss Short term	LL50 96/hours: 1.301 mg/l	Key study Reliable with restrictions QSAR Redman, et al.(2010b)
Fish Oncorhynchus mykiss Long term	NOEL 14 days: 0.068 mg/l	Key study Reliable with restrictions QSAR Redman, et al.(2010b)

12.2 Persistence and degradability

Abiotic degradability

Hydrolysis: straight run gas oils are resistant to hydrolysis because they lack a hydrolytically reactive functional group. Therefore, this process does not lead to any measurable degradation substance losses in the environment.

Photolysis in air: endpoint not required by REACH

Photolysis in water and soil: endpoint not required by REACH

Biotic degradability in water/sediments/soil: the standard tests for this endpoint are not applicable to UVCB substances

12.3 Bioaccumulation potential

The standard tests for this endpoint are not applicable to UVCB substances.

12.4 Mobility in the soil

Koc absorption: the standard tests for this endpoint are not applicable to UVCB substances

12.5 Results of PBT and vPvB evaluation

Comparison with the criteria established in annex XIII of REACH regulation

Persistence evaluation: some hydrocarbon structures contained in this category show characteristics deemed P (Persistent) or vP (very Persistent).

Bioaccumulation potential evaluation: the structure of most hydrocarbons contained in this category do NOT present characteristics deemed vB (very Bioaccumulative) although some components do present characteristics deemed B (Bioaccumulative).

Toxicity evaluation: for the structures with characteristics of P and B, toxicity was evaluated although none of the main components met the toxicity criteria except anthracene which has been confirmed to be PBT. Since anthracene is present in concentrations < 0.1%, the product is not deemed PBT/vPvB.

12.6 Other adverse effects

None.

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13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Do not discharge on the ground or in sewers, tunnels or waterways. To dispose of waste derived from this product, including empty uncleaned containers, comply with It. Leg. Dec. 152/06 and subsequent amendments and integrations

European Waste Catalogue Code: 13 07 03* (It. legislative decree no. 152/06 and subsequent amendments and integrations), the code indicated provides only general indication, based on the original composition of the product and the envisaged uses thereof. The user (producer of the wastes) is responsible for choosing the most appropriate code to apply according to the actual use of the product, any alterations and contaminations. The product 'as is' does not contain halogenated compounds.

Disposal of containers: Do not dispose of the containers in the environment. Dispose of them in compliance with current local standards. Do not drill, cut, grind, weld, solder, burn or incinerate empty containers or drums, unless they have been drained and cleaned.

14. TRANSPORT INFORMATION

14.1 UN number:

1202

14.2 UN shipping name:

GAS OIL

14.3 Hazard classes related to transport:

Land/rail transport (ADR/RID)	Class 3 Classification code: F1 Hazard ID number: 30
Maritime transport (IMDG)	Class 3
Air transport (IATA):	Class 3, Flamm liquid

14.4 Packaging groups:

III, Label 3 + Environmental Hazard mark

14.5 Environmental hazard:

Substance dangerous for the environment as per ADR, RID, ADN and IMDG regulations

14.6 Special precautions for users (transport operations):

Wear chemically resistant gloves (tested to EN374) (PPE15).

14.7 Bulk transport as per annex II of the MARPOL Convention 73/78 and IBC code

Not applicable

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14.8 Other

Tunnel restriction code (ADR): D/E

15. REGULATORY INFORMATION**15.1 Specific health, safety and environment standards and legislation for the substance or mixture**

- Title VII Authorization as per REACH (Reg. EC no. 1907/2006 and subsequent amendments and integrations): substance not subject to authorization
- Title VIII Restrictions as per REACH (Reg. EC n. 1907/2006 and subsequent amendments and integrations): item 3, annex XVII: hazardous substances/liquid mixtures;

Other EU regulations and national transpositions:

- Seveso category (Dir. 2012/18/UE) It. legislative decree no. 105/2015):

Annex I part 1:

category P5a- Flammable liquids

category E2- Hazardous for the aquatic environment, chronic toxicity category 2

Annex 1, part 2 category 34-Petroleum products and alternative fuels,

- Title IX (transposition of Dir. 98/24/EC) of It. Leg. Decree 81/08 and subsequent amendments and integrations: dangerous chemical agent
- Title IX (transposition of Dir. 97/42/EC and 99/38/EC and It. Leg. Dec 81/08: not applicable because not carcinogenic

For waste disposal, see It. leg. Dec. 152/06 and subsequent amendments and integrations

A chemical safety assessment has been performed

16. OTHER INFORMATION

List of pertinent hazard statements:

These phrases are presented as a source of information and do not necessarily correspond to the product classification

H Hazard indications

H226: Flammable liquid and vapours

H304: May be fatal if swallowed and enters airways

H332: Harmful if inhaled

H373: May cause damage to organs through prolonged or repeated exposure.

H411: Toxic to aquatic life with long lasting effects

EUH066: Exposure may cause skin dryness and cracking

Indications for training:

Provide workers who may be exposed to the substance with adequate training as outlined in this safety data sheet.

Main bibliography and sources of data:

Registration file

Key to abbreviations and acronyms:

ACGIH = American Conference of Governmental Industrial Hygienists

CSR = Chemical Safety Report

EC50 = Effective concentration, 50%

IC50 = Inhibitory concentration, 50%

Klimisch = Criterion for assessing reliability of method used.

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LC50 = Lethal Concentration, 50%
 LD50 = Average lethal Dose
 n.a. = not applicable
 n.d. = not available
 PBT = Persistent, bioaccumulative, toxic substance
 s.m.i: = Subsequent Modifications and Additions
 CNS = Central nervous system
 STOT = Specific target organ toxicity
 (STOT) RE = Repeated exposure
 (STOT) SE = Single exposure
 Key Study= Most pertinent study
 TLV®TWA = Threshold limit value – time weighted average
 TLV®STEL = Threshold limit value – short term exposure limit
 UVCB = substances of Unknown or Variable composition
 vPvB = very Persistent and very Bioaccumulative

Drafted on 29/11/2010
 Revision date 01/10/2014
 Reason for Rev00: Update to comply with Annex I of EU Regulation 453/2010, of EC CLP Regulation 1272/2008 including the 4th ATP (Adaptations to Technical Progress) envisaged for substances since 1.12.14, of DSD Regulation (67/548/EEC) including the 31th ATP.
 Revision date 04/05/2015
 Reason for Rev. A: Update emergency telephone numbers. Update to 5th ATP
 Revision date 21/12/2015
 Reason for Rev. B: Update the following sections: 2, 8, 11, 14, 15, 16 and exposure scenarios

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ANNEX 1

**EXPOSURE SCENARIOS
STRAIGHT RUN GAS OIL.**

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Name of identified use	Sector	Sector of Use (SU)	Chemical Product Category (PC)	Process categories (PROC)	Environmental Release Category (ERC)	Specific Environmental Release Category (SpERC)
Manufacture of the substance (GEST1_I)	Industrial (G26)	3, 8, 9	n. a.	1, 2, 3, 4, 8a, 8b, 15	1	ESVOC SpERC 1.1.v1
Use as an intermediate (GEST1B_I)	Industrial (G26)	3, 8, 9	n. a.	1, 2, 3, 4, 8a, 8b, 15	6a	ESVOC SpERC 6.1a.v1
Distribution of the substance (GEST1A_I)	Industrial (G26)	3,8,9	n. a.	1, 2, 3, 4, 8a, 8b, 9, 15	4, 5, 6a, 6b, 6c, 6d, 7	ESVOC SpERC 1.1b.v1
Formulation & (re)packing of substances and mixtures (GEST2_I)	Industrial (G26)	3, 10	n. a.	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	2	ESVOC SpERC 2.2.v1
Use in Oil and Gas field drilling and production operations (GEST5_I)	Industrial (G26)	3	n.a.	1, 2, 3, 4, 8a, 8b	4	Qualitative evaluation
-Use in Oil and Gas field drilling and production operations (GEST5_P)	Professional (G27)	22	n.a.	1, 2, 3, 4, 8a, 8b	8d	Qualitative evaluation

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1. Production of Straight Run Gas Oil – Industrial sector

Section 1- Exposure scenario for Straight Run Gas oil (H304, H332, H373, H411)	
Title	
Manufacturing of the substance	
Use descriptors	
Sector of use	3, 8, 9
Process category	1, 2, 3, 4, 8a, 8b, 15
Environmental Release Category	1
Specific Environmental Release Category	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities (GES1_I).	
Evaluation Method	
See section 3	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristics	
Physical state of product	Liquid with potential for aerosol generation [CS138]
Vapour pressure (kPa)	Liquid, vapour pressure < 0.5 kPa under standard conditions (OC3).
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) (G13).
Amounts used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) (G2).
Human factors not influenced by risk management	Not applicable
Other operating conditions involving exposure	The operation is performed at a temperature of not more than 20°C , unless indicated otherwise G15 Assumes a good basic standard of occupational hygiene is implemented (G1).
Contributing exposure scenarios	
RMM	
General exposures - closed systems (no sampling) (CS15)	No other specific measures identified (EI20). Wear suitable gloves tested to EN374 (PPE15)
General exposures (sample collection) (CS15)	Handle substance within a predominantly closed system provided with extract ventilation (E49). Ensure samples are obtained under containment or extract ventilation (E76). Wear suitable gloves tested to EN374 (PPE15).
General exposures (CS15)	Handle substance within a closed system (E47). Ensure samples are obtained under containment or extract ventilation (E76).
General exposures (open systems) (CS16)	Wear suitable gloves tested to EN374 (PPE15). Provide extract ventilation to points where emissions occur (E54). Clear transfer lines prior to de-coupling (E39). Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (E40).
Sampling during the process (CS2)	No other specific measures identified (EI20). Ensure samples are obtained under containment or extract ventilation (E76). Wear chemically resistant gloves (tested to EN374) in combination with basic employee training (PPE16). Avoid splashing (C&H15).
Laboratory activities (CS36)	No other specific measures identified (EI20). Handle in a fume cupboard or under extract ventilation (E83). Wear suitable gloves tested to EN374 (PPE15).

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Bulk closed loading and unloading (CS501)	Handle substance within a closed system (E47). Wear suitable gloves tested to EN374 (PPE15). Use ventilation to extract vapours from freshly coated articles/objects and surfaces (E56). Avoid splashing (C&H15). Perform activity away from sources of substance emission or release (E77).
Bulk open loading and unloading (CS503)	Wear suitable gloves tested to EN374 (PPE15). Ensure that the material is transferred under extraction ventilation or containment conditions (E66). Clear transfer lines prior to de-coupling (E39). Perform activity away from sources of substance emission or release (E77).
Equipment cleaning and maintenance (CS39)	Drain down system prior to equipment break-in or maintenance (E65). Retain drain downs in sealed storage pending disposal or for subsequent recycle (E55). Clear spills immediately (C&H13). Wear chemically resistant gloves (tested to EN374) in combination with basic employee training (PPE16). Wear suitable coveralls to prevent exposure to the skin (PPE27).
Bulk product storage (CS85)	Store substance within a closed system (E84). Avoid dip sampling (E42).
Section 2.2 Environmental exposure control	
Product Characteristics	
The substance is an UVCB complex (PrC3). Predominantly hydrophobic (PrC4a)	
Amounts used	
Fraction of EU tonnage used in region (A1)	0.1
Regional use tonnage (tonnes/year) (A2)	7.7 E+05
Fraction of Regional tonnage used locally (A3)	0.78
Annual site tonnage (tonnes/year) (A5)	6.0 E+05
Maximum daily site tonnage (kg/day) (A4)	2.0E+06
Frequency and duration of use	
Continuous release (FD2)	
Emission Days (days/year) (FD4)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor (EF1)	10
Local marine water dilution factor (EF2)	100
Other operating conditions that affect environmental exposure	
Fraction release to air by process (initial release prior to RMM) (OOC4)	1.0 E-02
Fraction release to wastewater by process (initial release prior to RMM) (OOC5).	3.0 E-05
Fraction release to soil by process (initial release prior to RMM) (OOC6).	0.0001
Technical measures and conditions at the process level (source) to prevent releases	
Common practices vary across sites thus conservative process release estimates are used (TCS1)	
Site-level technical measures and measures to reduce or minimise discharges, atmospheric emissions or releases into the soil	
Risk from environmental exposure is driven by freshwater sediment (TCR1b). Prevent discharge of undissolved substance to or recover from onsite wastewater (TCR14). If discharging to domestic sewage treatment plant, no onsite wastewater treatment is required (TCR9).	
Treat air emission to provide a typical removal efficiency of (%) (TCR7).	90
Treat wastewater on site (prior to starting water discharge) to provide the required removal efficiency of \geq (%):	93.8
If discharging to domestic sewage treatment plant, provide the required removal efficiency on site of \geq (%)	0
Organisation measures to prevent/limit release from site (1286)	
Do not apply industrial sludge to natural soils (OMS2). Sludge should be incinerated, contained or reclaimed (OMS3)	
Conditions and measures related to municipal sewage treatment plant (1273)	
Estimated substance removal from wastewater via domestic sewage treatment (%) (STP3).	94.1
Total efficiency of removal from wastewater after onsite and offsite RMMs (domestic	94.1

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treatment plant) (%) (STP4)	
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d) (STP6).	2 E+06
Assumed domestic sewage treatment plant flow (m^3/d) (STP5)	10000
Conditions and measures related to external treatment of waste for disposal (1272)	
External treatment and disposal of waste should comply with applicable local and/or national regulations. (ETW3)	
Conditions and measures related to external recovery of waste (1271)	
External recovery and recycling of waste should comply with applicable local and/or national regulations (ERW1).	
Section 3 Exposure estimate	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated (G21).	
3.2 Environment	
The Hydrocarbon Block Method (HBM) has been used to calculate environmental exposure with the Petrorisk model (EE2).	
Section 4	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 3 are implemented (G22). Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels (G23).	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures (DSU1). Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination (DSU2). Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination (DSU3). Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) (DSU4). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file – “Site-Specific Production” worksheet (DSU6).	

2. Use of Straight Run Gas Oil as intermediate – Industrial sector

Section 1- Exposure scenario for Straight Run Gas oil H304, H332, H373, H411	
Title	
Use of substance as intermediate [GEST1B_I]	
Use descriptors	
Sector of use	3, 8, 9
Process category	1, 2, 3, 4, 8a, 8b, 15
Environmental Release Category	6a
Specific Environmental Release Category	ESVOC SpERC 6.1a.v1
Processes, tasks, activities covered	
Use of substance as intermediate agent. Includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk containers).	
Evaluation Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristics	
Physical state of product	Liquid with potential for aerosol generation [CS138]
Vapour pressure (kPa)	Liquid, vapour pressure < 0.5 kPa under standard conditions (OC3)
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) (G13)
Amounts used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) (G2)
Human factors not influenced by risk management	Not applicable
Other operating conditions involving exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently (G15). Assumes a good basic standard of occupational hygiene is implemented. (G1)
Contributing exposure scenarios	
RMM	
General exposures - closed systems (no sampling) (CS15)	No other specific measures identified (EI20). Wear suitable gloves tested to EN374 (PPE15)
General exposures (sample collection) (CS15)	Handle substance within a predominantly closed system provided with extract ventilation (E49). Ensure samples are obtained under containment or extract ventilation (E76). Wear suitable gloves tested to EN374 (PPE15).
General exposures (CS15)	Handle substance within a closed system (E47). Ensure samples are obtained under containment or extract ventilation (E76).
General exposures (open systems) (CS16)	Wear suitable gloves tested to EN374 (PPE15). Provide extract ventilation to points where emissions occur (E54). Clear transfer lines prior to de-coupling (E39). Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (E40).
Sampling during the process (CS2)	No other specific measures identified (EI20). Ensure samples are obtained under containment or extract ventilation (E76). Wear chemically resistant gloves (tested to EN374) in combination with basic employee training (PPE16). Avoid splashing (C&H15), Ensure operation is undertaken outdoors (E69).
Laboratory activities (CS36)	No other specific measures identified (EI20). Handle in a fume cupboard or under extract ventilation (E83). Wear suitable gloves tested to EN374 (PPE15).
Bulk closed loading and unloading (CS501)	Handle substance within a closed system (E47). Wear suitable gloves tested to EN374 (PPE15). Use ventilation to extract vapours from freshly coated articles/objects and surfaces (E56). Avoid splashing (C&H15). Perform activity

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	away from sources of substance emission or release (E77).
Bulk open loading and unloading (CS503)	Wear suitable gloves tested to EN374 (PPE15). Ensure that the material is transferred under extraction ventilation or containment conditions (E66). Clear transfer lines prior to de-coupling (E39). Perform activity away from sources of substance emission or release (E77).
Equipment cleaning and maintenance (CS39)	Drain down system prior to equipment break-in or maintenance (E65). Retain drain downs in sealed storage pending disposal or for subsequent recycle (E55). Clear spills immediately (C&H13). Wear chemically resistant gloves (tested to EN374) in combination with basic employee training (PPE16). Wear suitable coveralls to prevent exposure to the skin (PPE27).
Bulk product storage (CS85)	Store substance within a closed system (E84). Avoid dip sampling (E42).
Section 2.2 Environmental exposure control	
Product Characteristics	
The substance is an UVCB complex. [PrC3] Predominantly hydrophobic. [PrC4a]	
Amounts used	
Fraction of EU tonnage used in region (A1)	0.1
Regional use tonnage (tonnes/year) (A2)	5.1 E+04
Fraction of Regional tonnage used locally (A3)	0.29
Annual site tonnage (tonnes/year) (A5)	1.5 E+04
Maximum daily site tonnage (kg/day) (A4)	5.0 E+04
Frequency and duration of use	
Continuous release (FD2)	
Emission Days (days/year) (FD4)	300
Environmental factors not affected by management risks	
Local freshwater dilution factor (EF1)	10
Local marine water dilution factor (EF2)	100
Other operating conditions that affect environmental exposure	
Fraction release to air by process (initial release prior to RMM) (OOC4)	1.0 E-3
Fraction release to wastewater by process (initial release prior to RMM): (OOC5)	3.0 E-5
Fraction release to soil by process (initial release prior to RMM): (OOC6)	0.001
Technical measures and conditions at the process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates are used (TCS1)	
Technical measures and conditions at the site level to reduce or minimise discharges, atmospheric emissions or leaks	
Risk from environmental exposure is driven by freshwater sediment (TCR1b). Prevent discharge of undissolved substance to or recover from onsite wastewater (TCR14). If discharging to domestic sewage treatment plant, no onsite wastewater treatment required (TCR9).	
Treat air emission to provide a typical removal efficiency of (%) (TCR7).	80
Treat wastewater on site (prior to starting water discharge) to provide the required removal efficiency of \geq (%):	50.4
If discharging to domestic sewage treatment plant, provide the required removal efficiency on site of \geq (%)	0.0
Organization of measures to prevent leaks on site	
Do not apply industrial sludge to natural soils. (OMS2) Industrial sludge should be incinerated, contained or reclaimed (OMS3).	
Conditions and measures related to city recovery plan	
Estimated substance removal from wastewater via domestic sewage treatment (%) (STP3).	94.1
Total efficiency of removal from wastewater after onsite and offsite RMMs (domestic treatment plant) (%) (STP4)	94.1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d) (STP6).	4.2 E+05

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Assumed domestic sewage treatment plant flow (m3/d) (STP5)	2000
Conditions and measures related to external treatment of wastes	
External treatment and disposal of waste should comply with applicable local and/or national regulations. (ETW3)	
Conditions and measures related to recovery treatment of wastes	
External recovery and recycling of waste should comply with applicable local and/or national regulations. (ERW1).	
Additional basic information for assignment of the identifying OCs and RMMs can be found in the PETRORISK file.	
Section 3 Exposure estimate	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated (G21).	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. (EE2)	
Section 4	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 3 are implemented (G22). Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels (G23).	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. (DSU1) Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. (DSU2) Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination (DSU3). Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). (DSU4)	

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3. Distribution of Straight Run Gas Oil – Industrial sector

Section 1- Exposure scenario for Straight Run Gas oil H304, H332, H373, H411	
Title	
Distribution of the substance [GEST1A_I]	
Use descriptors	
Sector of use	3, 8, 9
Process category	1, 2, 3, 4, 8a, 8b, 9, 15
Environmental Release Category	4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered	
Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of bulk substance, including its sampling, storage, unloading maintenance and associated laboratory activities [GEST1A_I].	
Assessment method See Section 3	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristics	
Physical state of product	Liquid with potential for aerosol generation [CS138]
Vapour pressure (kPa)	Liquid, vapour pressure < 0.5 kPa under standard conditions (OC3).
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) (G13)
Amounts used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) (G2)
Human factors not influenced by risk management	Not applicable
Other operating conditions involving exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently (G15). Assumes a good basic standard of occupational hygiene is implemented (G1).
Contributing exposure scenarios	
RMM	
General exposures - closed systems (no sampling) (CS15)	No other specific measures identified (E120). Handle substance within a closed system (E47).
General exposures (sample collection) (CS15)	Handle substance within a closed system (E47). Ensure that the material is transferred under extraction ventilation or containment conditions (E66).
General exposures (CS15)	Handle substance within a closed system (E47). Ensure samples are obtained under containment or extract ventilation (E76).
General exposures (open systems) (CS16)	Wear suitable gloves tested to EN374 (PPE15). Clear transfer lines prior to de-coupling (E39). Ensure that the material is transferred under extraction ventilation or containment conditions (E66).
Sampling during the process (CS2)	No other specific measures identified (E120). Ensure samples are obtained under containment or extract ventilation (E76). Wear suitable gloves tested to EN374 (PPE15). Avoid dip sampling (E42).
Laboratory activities (CS36)	No specific measures identified (E118). Handle in a fume cupboard or under extract ventilation (E83). Wear suitable gloves tested to EN374 (PPE15).
Bulk closed loading and unloading (CS501)	Handle substance within a closed system (E47). Wear suitable gloves tested to EN374 (PPE15). Use ventilation to extract vapours from freshly coated articles/objects and surfaces (E56). Avoid splashing (C&H15). Perform activity away from sources of substance emission or release (E77).
Bulk open loading and unloading (CS503)	Ensure that the material is transferred under extraction ventilation or containment conditions (E66). Clear transfer lines prior to de-coupling (E39).

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	Ensure operation is undertaken outdoors (E69). Wear suitable gloves tested to EN374 (PPE15).
Bulk open loading and unloading (CS503)	Ensure that the material is transferred under extraction ventilation or containment conditions (E66). Clear transfer lines prior to de-coupling (E39). Ensure operation is undertaken outdoors (E69). Wear suitable gloves tested to EN374 (PPE15).
Drum and small package filling (CS6)	Fill containers/cans at dedicated fill points supplied with local extract ventilation (E51). Clear spills immediately (C&H13). Wear suitable gloves tested to EN374 (PPE15). Put lids on containers immediately after use (E9).
Equipment cleaning and maintenance (CS39)	Apply vessel entry procedures including use of forced supplied air (AP15). Drain down system prior to equipment break-in or maintenance (E65). Transfer via enclosed lines (E52). Retain drain downs in sealed storage pending disposal or for subsequent recycle (E55). Wear chemically resistant gloves (tested to EN374) in combination with basic employee training (PPE16). Wear suitable coveralls to prevent exposure to the skin (PPE27).
Storage (CS67)	Store substance within a closed system (E84). Transfer via enclosed lines (E52). Avoid dip sampling (E42).
Section 2.2	
Product Characteristics	
The substance is an UVCB complex. (PrC3) Predominantly hydrophobic. (PrC4a)	
Amounts used	
Fraction of EU tonnage used in region (A1)	0.1
Regional use tonnage (tonnes/year) (A2)	7.7 E+05
Fraction of Regional tonnage used locally (A3)	0.002
Annual site tonnage (tonnes/year) (A5)	1.5 E+03
Maximum daily site tonnage (kg/day) (A4)	1.5 E+04
Frequency and duration of use	
Continuous release. (FD2)	
Emission Days (days/year) (FD4)	100
Environmental factors not affected by management risks	
Local freshwater dilution factor (EF1)	10
Local marine water dilution factor (EF2)	100
Other operating conditions that affect environmental exposure	
Fraction release to air by process (initial release prior to RMM) (OOC4)	1.0 E-03
Fraction release to wastewater by process (initial release prior to RMM): (OOC5)	1.0 E-06
Fraction release to soil by process (initial release prior to RMM): (OOC6)	0.00001
Technical measures and conditions at the process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates are used (TCS1).	
Technical measures and conditions at the site level to reduce or minimise discharges, atmospheric emissions or leaks	
Risk from environmental exposure is driven by freshwater sediment. (TCR1b). No wastewater treatment required (TCR6).	
Treat air emission to provide a typical removal efficiency of (%) (TCR7).	90
Treat wastewater on site (prior to starting water discharge) to provide the required removal efficiency of \geq (%):	0
If discharging to domestic sewage treatment plant, provide the required removal efficiency on site of \geq (%)	0
Organization of measures to prevent leaks on site	
Do not apply industrial sludge to natural soils (OMS2). Sludge should be incinerated, contained or reclaimed. (OMS3).	
Conditions and measures related to city recovery plan	

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Estimated substance removal from wastewater via domestic sewage treatment (%) (STP3).	94.1
Total efficiency of removal from wastewater after onsite and offsite RMMs (domestic treatment plant) (%) (STP4)	94.1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d) (STP6).	3.9 E+06
Assumed domestic sewage treatment plant flow (m3/d): (STP5)	2000
Conditions and measures related to external treatment of wastes	
External treatment and disposal of waste should comply with applicable local and/or national regulations (ETW3).	
Conditions and measures related to recovery treatment of wastes	
External recovery and recycling of waste should comply with applicable local and/or national regulations (ERW1).	
Additional basic information for assignment of the identifying OCs and RMMs can be found in the PETRORISK file.	
Section 3 Exposure estimate	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated (G21).	
3.2 Environment	
The HBM (Hydrocarbon Block Method) has been used to calculate environmental exposure with the Petrorisk model (EE2).	
Section 4	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 3 are implemented (G22). Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels (G23).	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures (DSU1). Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination (DSU2). Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination (DSU3). Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html)(DSU4)	

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4. Formulation and (Re)packaging of Straight Run Gas Oil – Industrial sector

Section 1- Exposure scenario for Straight Run Gas oil H304, H332, H373, H411	
Title	
Formulation & (re)packaging of the substance and mixtures (GEST2_I)	
Use descriptors	
Sector of use	3.10
Process category	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15
Environmental Release Category	2
Specific Environmental Release Category	ESVOC SpERC 2.2.v1
Processes, tasks, activities covered	
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities (GES2_I)	
Evaluation Method	
See Section 3	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristics	
Physical state of product	Liquid with potential for aerosol generation [CS138]
Vapour pressure (kPa)	Liquid, vapour pressure < 0.5 kPa under standard conditions (OC3).
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) (G13)
Amounts used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) (G2)
Human factors not influenced by risk management	Not applicable
Other operating conditions involving exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently (G15). Assumes a good basic standard of occupational hygiene is implemented (G1).
Contributing exposure scenarios	
RMM	
General exposures - closed systems (no sampling) (CS15)	No other specific measures identified (EI20). Handle substance within a closed system (E47).
General exposures (sample collection) (CS15)	Handle substance within a closed system (E47). Ensure that the material is transferred under extraction ventilation or containment conditions (E66).
General exposures (CS15)	Handle substance within a closed system (E47). Ensure samples are obtained under containment or extract ventilation (E76).
General exposures (open systems) (CS16)	Wear suitable gloves tested to EN374 (PPE15). Clear transfer lines prior to de-coupling (E39). Ensure that the material is transferred under extraction ventilation or containment conditions (E66).
Batch processes at elevated temperatures (CS136)	Provide extract ventilation to points where emissions occur (E54).
Batch processes at elevated temperatures - vapours	Provide extract ventilation to points where emissions occur (E54).
Sampling during the process (CS2)	No other specific measures identified (EI20). Ensure samples are obtained under containment or extract ventilation (E76). Wear suitable gloves tested to EN374 (PPE15). Avoid dip sampling (E42).
Laboratory activities (CS36)	No specific measures identified (EI18). Handle in a fume cupboard or under extract ventilation (E83). Wear suitable gloves tested to EN374 (PPE15).

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Bulk transfers (CS14) Dedicated facility (CS81)	Handle substance within a closed system (E47). Perform activity away from sources of substance emission or release (E77). Use ventilation to extract vapours from freshly coated articles/objects and surfaces (E56). Wear suitable gloves tested to EN374 (PPE15). Avoid splashing (C&H15).
Mixing operations (open systems) (CS30)	Provide extract ventilation to points where emissions occur (E54). Wear suitable gloves tested to EN374 (PPE15).
Mixing operations (open systems, vapour phase) (CS30)	Provide extract ventilation to points where emissions occur (E54). Wear suitable gloves tested to EN374 (PPE15).
Manual transfer/pouring from containers (CS22+CS34)	Use drum pumps or carefully pour from container (E64). Wear chemically resistant gloves (tested to EN374) in combination with basic employee training (PPE16).
Drum/batch transfers (CS8)	Provide extract ventilation to points where emissions occur (E54). Use drum pumps or carefully pour from container (E64). Avoid spillage when withdrawing pump (C&H16). Wear suitable gloves tested to EN374 (PPE15).
Production or preparation of articles by tableting, compression, extrusion or pelletisation (CS100)	Provide extract ventilation to points where emissions occur (E54). Wear suitable gloves tested to EN374 (PPE15).
Drum and small package filling (CS6).	Fill containers/cans at dedicated fill points supplied with local extract ventilation (E51). Clear spills immediately (C&H13). Wear suitable gloves tested to EN374 (PPE15). Put lids on containers immediately after use (E9).
Equipment cleaning and maintenance (CS39).	Apply vessel entry procedures including use of forced supplied air (AP15). Drain down system prior to equipment break-in or maintenance (E65). Transfer via enclosed lines (E52). Wear chemically resistant gloves (tested to EN374) in combination with basic employee training (PPE16). Wear suitable coveralls to prevent exposure to the skin (PPE27). Retain drain downs in sealed storage pending disposal or for subsequent recycle (E55).
Storage (CS67)	Store substance within a closed system (E84). Transfer via enclosed lines (E52). Avoid dip sampling (E42).
Section 2.2	
Product Characteristics	
The substance is an UVCB complex . (PrC3) Predominantly hydrophobic (PrC4a)	
Amounts used	
Fraction of EU tonnage used in region (A1)	0.1
Regional use tonnage (tonnes/year) (A2)	7.1 E+05
Fraction of Regional tonnage used locally (A3)	0,042
Annual site tonnage (tonnes/year) (A5)	3.0 E+04
Maximum daily site tonnage (kg/day) (A4)	1.0 E+05
Frequency and duration of use	
Continuous release (FD2)	
Emission Days (days/year) (FD4)	300
Environmental factors not affected by management risks	
Local freshwater dilution factor (EF1)	10
Local marine water dilution factor (EF2)	100
Other operating conditions that affect environmental exposure	
Fraction release to air by process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements): (OOC11)	1.0 E-02
Fraction release to wastewater by process (initial release prior to RMM): (OOC5)	2.0 E-05
Fraction release to soil by process (initial release prior to RMM): (OOC6)	0.0001
Technical measures and conditions at the process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates are used (TCS1).	

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Technical measures and conditions at the site level to reduce or minimise discharges, atmospheric emissions or leaks	
Risk from environmental exposure is driven by freshwater sediment (TCR1b). Prevent discharge of undissolved substance to or recover from onsite wastewater (TCR14) If discharging to domestic sewage treatment plant, no onsite wastewater treatment required (TCR9)	
Treat air emission to provide a typical removal efficiency of (%) (TCR7).	0
Treat wastewater on site (prior to starting water discharge) to provide the required removal efficiency of \geq (%):	62.8
If discharging to domestic sewage treatment plant, provide the required removal efficiency on site of \geq (%)	0
Organization of measures to prevent leaks from the site	
Do not apply industrial sludge to natural soils (OMS2) Sludge should be incinerated, contained or reclaimed. (OMS3).	
Conditions and measures related to city recovery plan	
Estimated substance removal from wastewater via domestic sewage treatment (%) (STP3).	94.1
Total efficiency of removal from wastewater after onsite and offsite RMMs (domestic treatment plant) (%) (STP4)	94.1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d) (STP6).	6.3 E+05
Assumed domestic sewage treatment plant flow (m3/d): (STP5)	2000
Conditions and measures related to external treatment of wastes	
External treatment and disposal of waste should comply with applicable local and/or national regulations (ETW3).	
Conditions and measures related to recovery treatment of wastes	
External recovery and recycling of waste should comply with applicable local and/or national regulations (ERW1).	
Additional basic information for assignment of the identifying OCs and RMMs can be found in the PETRORISK file.	
Section 3 Exposure estimate	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated (G21).	
3.2 Environment	
The HBM (Hydrocarbon Block Method) has been used to calculate environmental exposure with the Petrorisk model (EE2).	
Section 4	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 3 are implemented (G22). Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels (G23).	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures (DSU1) Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination (DSU2) Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination (DSU3) Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) (DSU4).	

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5. Use in Oil and Gas field drilling and production operations for Straight Run Gas Oil – Industrial Sector

Section 1- Exposure scenario for Straight Run Gas oil H304, H332, H373, H411	
Title	
Use in Oil and Gas field drilling and production operations [GEST5_I]	
Use descriptors	
Sector of use	3
Process category	1, 2, 3, 4, 8a, 8b
Environmental Release Category	4
Specific Environmental Release Category	Qualitative evaluation
Processes, tasks, activities covered	
Oil field well drilling operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance. (GES5_I)	
Evaluation Method	
See Section 3	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristics	
Physical state of product	Liquid with potential for aerosol generation [CS138]
Vapour pressure (kPa)	Liquid, vapour pressure < 0.5 kPa under standard conditions (OC3).
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) (G13)
Amounts used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) (G2)
Human factors not influenced by risk management	Not applicable
Other operating conditions involving exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently (G15). Assumes a good basic standard of occupational hygiene is implemented (G1).
Contributing exposure scenarios	
RMM	
Transfer of bulk products and dedicated facility (CS14 CS81)	Transfer via enclosed lines (E52). Ensure operation is undertaken outdoors (E69). Wear suitable gloves tested to EN374 (PPE15). Clear spills immediately (C&H13). Clear transfer lines prior to de-coupling (E39).
Filling/preparation of equipment from drums or containers (CS45 CS81)	Use drum pumps or carefully pour from container (E64). Avoid spillage when withdrawing pump (C&H16). Wear suitable gloves tested to EN374 (PPE15).
Milling, grinding and similar activities - Use in contained batch processes (CS512 CS37)	No other specific measures identified (EI20). Handle substance within a predominantly closed system provided with extract ventilation (E49). Ensure the ventilation system is regularly maintained and tested (E74). Wear suitable gloves tested to EN374 (PPE15).
Drill floor operations (CS116)	Wear suitable gloves tested to EN374 (PPE15). Wear suitable coveralls to prevent exposure to the skin (PPE27). Wear rubber boots (PPE28).
Operation of solids filtering equipment (CS118)	Provide the operation with a properly sited receiving hood (E71). Re-circulation of exhaust air is not recommended (E88). Ensure the ventilation system is regularly maintained and tested (E74). Wear suitable gloves tested to EN374 (PPE15).
Operation of solids filtering equipment - vapour exposures (CS118)	

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Cleaning of solids filtering equipment (CS120)	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (E40). Wear chemically resistant gloves (tested to EN374) in combination with specific activity training (PPE16).
Treatment and disposal of filtered solids (CS121)	No other specific measures identified (EI20). Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (E40). Provide extract ventilation to points where emissions occur (E54). Ensure the ventilation system is regularly maintained and tested (E74). Wear suitable gloves tested to EN374 (PPE15).
Sampling during the process (CS2)	No other specific measures identified (EI20). Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (E40). Ensure operation is undertaken outdoors (E69). Wear suitable gloves tested to EN374 (PPE15).
General exposures - closed systems (no sampling) (CS15)	No other specific measures identified (EI20). Wear suitable gloves tested to EN374 (PPE15).
Pouring from small containers (CS9) non-dedicated facility (CS82)	Carefully pour from containers (E62). Wear suitable gloves tested to EN374 (PPE15).
General exposures (open systems) (CS16)	Ensure operation is undertaken outdoors (E69). Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (E40). Wear suitable gloves tested to EN374 (PPE15).
Equipment cleaning and maintenance (CS39)	Drain down system prior to equipment break-in or maintenance (E65). Wear chemically resistant gloves (tested to EN374) in combination with specific activity training (PPE16). Retain drain downs in sealed storage pending disposal or for subsequent recycle (E55). Clear spills immediately (C&H13). Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (E40).
General exposures - closed systems (CS15)	No other specific measures identified (EI20). Wear suitable gloves tested to EN374 (PPE15).
Storage (CS67)	Store substance within a closed system (E84). Ensure that the material is transferred under extraction ventilation or containment conditions (E66). Avoid dip sampling (E42).
Section 2.2	
Product Characteristics	
The substance is an UVCB complex . (PrC3) Predominantly hydrophobic (PrC4a)	
Amounts used	
Fraction of EU tonnage used in region (A1)	1
Regional use tonnage (tonnes/year) (A2)	2.26 E+04
Fraction of Regional tonnage used locally (A3)	Not applicable
Annual site tonnage (tonnes/year) (A5)	Not applicable
Maximum daily site tonnage (kg/day) (A4)	Not applicable
Frequency and duration of use	
Emission Days (days/year) (FD4)	Not applicable
Environmental factors not affected by management risks	
Local marine water dilution factor (EF2)	Not applicable
Other operating conditions that affect environmental exposure	
Fraction release to air by process (initial release prior to RMM): (OOC4)	Not applicable
Fraction release to wastewater by process (initial release prior to RMM): (OOC5)	Not applicable
Technical measures and conditions at the process level (source) to prevent release	
Discharge to aquatic environment is restricted (see Section 4.2).	
Technical measures and conditions at the site level to reduce or minimise discharges, atmospheric emissions or leaks	
Not applicable	

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Treat air emission to provide a typical removal efficiency of (%) (TCR7).	Not applicable
Treat wastewater on site (prior to starting water discharge) to provide the required removal efficiency of \geq (%):	Not applicable
If discharging to domestic sewage treatment plant, provide the required removal efficiency on site of \geq (%)	Not applicable
Organization of measures to prevent leaks from the site	
Prevent environmental discharge consistent with regulatory requirements. (OMS4)	
Conditions and measures related to city recovery plan	
Estimated substance removal from wastewater via domestic sewage treatment (%) (STP3).	Not applicable
Total efficiency of removal from wastewater after onsite and offsite RMMs (domestic treatment plant) (%) (STP4)	Not applicable
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d) (STP6).	Not applicable
Assumed domestic sewage treatment plant flow (m3/d): (STP5)	Not applicable
Conditions and measures related to external treatment of wastes	
External treatment and disposal of waste should comply with applicable local and/or national regulations (ETW3).	
Conditions and measures related to recovery treatment of wastes	
External recovery and recycling of waste should comply with applicable local and/or national regulations (ERW1).	
Section 3 Exposure estimate	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated (G21).	
3.2 Environment	
Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment. Qualitative approach used to conclude safe use.	
Section 4	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 3 are implemented (G22). Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels (G23).	
4.2 Environment	
Disposal in the aquatic environment is limited by law. The industry prohibits such operations (DSU9). 10SPAR Commission 2009. Discharges, spills and emission from offshore oil and gas installations in 2007, which includes an evaluation of the data gathered in 2006 and 2007).	

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6. Use in Oil and Gas field drilling and production operations for Straight Run Gas Oil – Professional use

Section 1- Exposure scenario for Straight Run Gas oil H304, H332, H373, H411	
Title	
Use in Oil and Gas field drilling and production operations [GEST5_I]	
Use descriptors	
Sector of use	22
Process category	1, 2, 3, 4, 8a, 8b
Environmental Release Category	8d
Specific Environmental Release Category	Qualitative evaluation
Processes, tasks, activities covered	
Oil field well drilling operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance. (GES5_P)	
Evaluation Method	
See Section 3	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product Characteristics	
Physical state of product	Liquid with potential for aerosol generation [CS138]
Vapour pressure (kPa)	Liquid, vapour pressure < 0.5 kPa under standard conditions (OC3).
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) (G13)
Amounts used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) (G2)
Human factors not influenced by risk management	Not applicable
Other operating conditions involving exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently (G15). Assumes a good basic standard of occupational hygiene is implemented (G1).
Contributing exposure scenarios	
RMM	
Transfer of bulk products and dedicated facility (CS14 CS81)	Transfer via enclosed lines (E52). Ensure operation is undertaken outdoors (E69). Wear suitable gloves tested to EN374 (PPE15). Clear spills immediately (C&H13). Clear transfer lines prior to de-coupling (E39).
Filling/preparation of equipment from drums or containers (CS45 CS81)	Use drum pumps or carefully pour from container (E64). Avoid spillage when withdrawing pump (C&H16). Wear suitable gloves tested to EN374 (PPE15).
Milling, grinding and similar activities - Use in contained batch processes (CS512 CS37)	No other specific measures identified (EI20). Handle substance within a predominantly closed system provided with extract ventilation (E49). Ensure the ventilation system is regularly maintained and tested (E74). Wear suitable gloves tested to EN374 (PPE15).
Drill floor operations (CS116)	Wear suitable gloves tested to EN374 (PPE15). Wear suitable coveralls to prevent exposure to the skin (PPE27). Wear rubber boots (PPE28).
Operation of solids filtering equipment (CS118)	Provide the operation with a properly sited receiving hood (E71). Re-circulation of exhaust air is not recommended (E88). Ensure the ventilation system is regularly maintained and tested (E74). Wear suitable gloves tested to EN374 (PPE15).
Operation of solids filtering equipment - vapour exposures (CS118)	

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Cleaning of solids filtering equipment (CS120)	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (E40). Wear chemically resistant gloves (tested to EN374) in combination with specific activity training (PPE16).
Treatment and disposal of filtered solids (CS121). Use in contained batch processes (CS37)	No other specific measures identified (EI20). Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (E40). Provide extract ventilation to points where emissions occur (E54). Ensure the ventilation system is regularly maintained and tested (E74). Wear suitable gloves tested to EN374 (PPE15).
Sampling during the process (CS2)	No other specific measures identified (EI20). Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (E40). Ensure operation is undertaken outdoors (E69). Wear suitable gloves tested to EN374 (PPE15).
General exposures - closed systems (no sampling) (CS15)	No other specific measures identified (EI20). Wear suitable gloves tested to EN374 (PPE15).
Pouring from small containers (CS9) non-dedicated facility (CS82)	Carefully pour from containers (E62). Wear suitable gloves tested to EN374 (PPE15).
General exposures (open systems) (CS16)	Ensure operation is undertaken outdoors (E69). Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (E40). Wear suitable gloves tested to EN374 (PPE15).
Equipment cleaning and maintenance (CS39)	Drain down system prior to equipment break-in or maintenance (E65). Wear chemically resistant gloves (tested to EN374) in combination with specific activity training (PPE16). Retain drain downs in sealed storage pending disposal or for subsequent recycle (E55). Clear spills immediately (C&H13). Provide a good standard of controlled ventilation (10 to 15 air changes per hour) (E40).
General exposures - closed systems (CS15)	No other specific measures identified (EI20). Wear suitable gloves tested to EN374 (PPE15).
Storage (CS67)	Store substance within a closed system (E84). Ensure that the material is transferred under extraction ventilation or containment conditions (E66). Avoid dip sampling (E42).
Section 2.2	
Product Characteristics	
The substance is an UVCB complex . (PrC3) Predominantly hydrophobic (PrC4a)	
Amounts used	
Fraction of EU tonnage used in region (A1)	1
Regional use tonnage (tonnes/year) (A2)	2.26 E+04
Fraction of Regional tonnage used locally (A3)	Not applicable
Annual site tonnage (tonnes/year) (A5)	Not applicable
Maximum daily site tonnage (kg/day) (A4)	Not applicable
Frequency and duration of use	
Emission Days (days/year) (FD4)	Not applicable
Environmental factors not affected by management risks	
Local marine water dilution factor (EF2)	Not applicable
Other operating conditions that affect environmental exposure	
Fraction release to air by process (initial release prior to RMM): (OOC4)	Not applicable
Fraction release to wastewater by process (initial release prior to RMM): (OOC5)	Not applicable
Technical measures and conditions at the process level (source) to prevent release	
Discharge to aquatic environment is restricted (see Section 4.2).	
Technical measures and conditions at the site level to reduce or minimise discharges, atmospheric emissions or leaks	
Not applicable	

ATZ FLUX GAS OIL

REV.: B

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Treat air emission to provide a typical removal efficiency of (%) (TCR7).	Not applicable
Treat wastewater on site (prior to starting water discharge) to provide the required removal efficiency of \geq (%):	Not applicable
If discharging to domestic sewage treatment plant, provide the required removal efficiency on site of \geq (%)	Not applicable
Organization of measures to prevent leaks from the site	
Prevent environmental discharge consistent with regulatory requirements. (OMS4)	
Conditions and measures related to city recovery plan	
Estimated substance removal from wastewater via domestic sewage treatment (%) (STP3).	Not applicable
Total efficiency of removal from wastewater after onsite and offsite RMMs (domestic treatment plant) (%) (STP4)	Not applicable
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d) (STP6).	Not applicable
Assumed domestic sewage treatment plant flow (m3/d): (STP5)	Not applicable
Conditions and measures related to external treatment of wastes	
External treatment and disposal of waste should comply with applicable local and/or national regulations (ETW3).	
Conditions and measures related to recovery treatment of wastes	
External recovery and recycling of waste should comply with applicable local and/or national regulations (ERW1).	
Section 3 Exposure estimate	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated (G21).	
3.2 Environment	
The HBM (Hydrocarbon Block Method) has been used to calculate environmental exposure with the Petrorisk model (EE2).	
Section 4	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 3 are implemented (G22). Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels (G23).	
4.2 Environment	
Disposal in the aquatic environment is limited by law. The industry prohibits such operations (DSU9). 10SPAR Commission 2009. Discharges, spills and emission from offshore oil and gas installations in 2007, which includes an evaluation of the data gathered in 2006 and 2007).	