

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 CHEMICAL PRODUCT IDENTIFICATION

HEATING GAS OIL

Uses: Manufacture, distribution, formulation & (re)packing, use as a fuel.

1.2 COMPANY IDENTIFICATION

MOTOR OIL (HELLAS), Corinth Refineries S.A.
Agiioi Theodoroi, Corinthia, P.O. BOX 23, 20100 Corinth
Contact numbers: 0030 27410 48602, 0030 27410 48702
Emergency telephone: 0030 27410 48602

2. HAZARDS IDENTIFICATION

CLASSIFICATION/LABELING OF PRODUCT: [According to Directive 1999/45/EC (DPD)]

Xn; Harmful
Xi; Irritant
Carc. Cat. 2
N; Dangerous for the environment

Symbols



Xn – harmful



Xi – irritant



N - dangerous for the environment

R phrases: R20, R38, R45, R48/21, R51/53, R65

Additional information about the full text of each classification can be found in Section 16.

HEALTH

- At ambient temperature, there is no severe hazard of exposure to gas oil vapors, due to the relatively low volatility.
- Provided that the required precautions are taken, the hazards for health are minimized given that the storage and the handling of the product are conducted in closed systems.
- The presence of polycyclic aromatic hydrocarbons in gas oil is regarded as harmful especially if it is derived from pyrolysis/hydrogen cracking processes.

ENVIRONMENT

- Pollution of aquatic receiver with gas oil may induce mortality to aquatic organisms.
- Pollution of soil with large quantities of gas oil may induce penetration of part of the product into aquifer.

SAFETY

- Fire hazard if the product is heated at a temperature higher than the flash point.
- The gas oil when ignited is violently burned.
- The low –relatively to the more volatile petroleum products- vapor pressure reduces the hazard of formation of an explosive atmosphere.
- Hazard of electrostatic charge accumulation in the liquid, which may induce ignitive electrical discharge.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture of hydrotreated and hydrodesulfurized gas oil. May also contain several additives at <0.1% v/v each.

Hazardous ingredients:

CAS No	EC No	Index No	REACH Registration No	% [weight]	Name	Classification according to 67/548/EEC	Classification according to Regulation (EC) No 1272/2008 (CLP)
64742-80-9	265-183-3	649-223-00-0	01-2119480406-37-0048	0-100	Distillates (petroleum), hydrodesulphurised middle; Gas oil — unspecified	Xn; Harmful Xi; Irritant Carc. Cat. 2 N; Dangerous for the environment	Flam. Liquid 3 Acute Tox. 4 Skin Irrit. 2 Asp. Tox. 1 Carc. 1B STOT Rep. Exp. 2 Aquatic Chronic 2
64742-46-7	265-148-2	649-221-00-X	01-2119489867-12-0012	100-0	Distillates (petroleum), hydrotreated middle; Gas oil — unspecified	Xn; Harmful Xi; Irritant Carc. Cat. 2 N; Dangerous for the environment	Flam. Liquid 3 Acute Tox. 4 Skin Irrit. 2 Asp. Tox. 1 Carc. 1B STOT Rep. Exp. 2 Aquatic Chronic 2

4. FIRST AID MEASURES

GENERAL INFORMATION

- The isolation of area from all possible sources of ignition is necessary.
- The area where the casualty is transferred must be well ventilated.
- The clothing prior of being removed must be wetted with water in order to avoid the hazard of static electricity.

INHALATION

Take the casualty to a quiet, cool and well ventilated environment. Remove immediately the casualty from the incident area.

A. If the casualty is conscious:

- Place the casualty in the recovery position with the feet slightly raised.
- Loose tight clothing and cover with a blanket.
- Obtain medical advice.

B. If the casualty is unconscious or is conscious but breathes with difficulty:

- Obtain medical advice immediately.
- Place the casualty in the recovery position with the feet slightly raised.
- Loose tight clothing, and cover with a blanket.
- Supply oxygen, check respiration and pulse.
- If necessary, administer cardio-pulmonary resuscitation.

C. If the casualty does not breathe:

- Artificial Respiration.
- Obtain medical advice immediately.
- Place the casualty in the recovery position with the feet slightly raised.
- Loose tight clothing, and cover with a blanket.
- When the respiration recurs, supply oxygen.
- If necessary, administer cardio-pulmonary resuscitation.

SKIN CONTACT

- Remove the casualty from the area of the incident.
- Remove contaminated clothing of the casualty.
- Wash thoroughly the affected skin area using cold water and inert soap.
- If the skin seems dry, apply carefully lanolin ointment.
- If skin has blisters and seems irritated, continue washes with plenty of sterilized water and obtain medical advice immediately.

EYE CONTACT

- Remove the casualty from the area of the incident.
- Wash the eyes with plenty of water for 15' with the eyelids open.
- Obtain medical advice – refer to the ophthalmologist if the pain or the irritation persists after washing.
- Do not administer eye drops or other fluid without medical approval.

INGESTION

- Take the casualty to a quiet, cool and well ventilated environment.
- Do NOT induce vomiting (hazard of pneumonic complications)
- Place the casualty in the recovery position with the feet slightly raised.
- Loose tight clothing, and cover with a blanket.
- Obtain medical advice.
- In case a gastric lavage is necessary, this must be carried out after endotracheal intubation due to hazard of aspiration into the lungs and the evocation of pulmonary edema.

5. FIRE-FIGHTING MEASURES

During fire fighting, keep safety distances. The emergency exits must be left free. Large fires are handled by specially trained personnel. Its incomplete combustion may generate carbon monoxide. Above the flash point, gases are released, which, when mixed with air may explode or ignite if placed near ignition sources.

5.1 FIRE EXTINGUISHING MATERIALS

- The most effective fire fighting media are dry powder, foam, carbon dioxide or water in thin dispersion.
- In limited fires, sand can also be used.

5.2 FIRE FIGHTING MEANS THAT SHOULD NOT BE USED FOR SAFETY REASONS

- Use of water only for the cooling of fire exposed tanks and vessels.

5.3 SPECIFIC HAZARDS

Containers that are exposed to high temperatures (due to fire) should be cooled with water in order to avoid the rise of internal pressure, which may lead to a rupture of the container. Overheated surfaces may induce ignition, even without spark or bare flame. Vapors may accumulate and spread along long distances resulting in ignition.

5.4 SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING

- In case of fire of great extent, the use of fire-resistant uniforms and of self-contained breathing apparatus is required.

6. ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PROTECTION

- Isolate the leak and remove all possible ignition sources.

6.2 ENVIRONMENTAL PROTECTION

- The access to drains, ditches and receiving waters must be avoided.
- In case of release of large quantities of gas oil into soil, evacuate immediately the area from the people not involved in the handling of the incident, alert the local authorities.
- For large releases, alert the neighborhood estimated to be in greater hazard.
- For large releases of gas oil into the sea, alert the coast guard, the nearest ports, the local authorities and the ship-owner company regarding the event.

6.3 CLEANING METHODS

LAND SPILLAGE

- Restrict the leaking quantity using an inert material or washing with water.
- In case of leak or stagnation without fire, use water spray for the dispersion of the released vapors and the protection of the personnel handling the incident.

ATTENTION! The stagnant quantities render the surfaces slippery.

SPILLAGE AT THE SEA

- The release into the sea from ships is handled according to the Annex of the Protocol of 1978 of the International Convention of 1973 «Prevention of marine pollution from ships» (MARPOL 73/78) and its amendments.
- The released quantity is confined using floating barges and is removed by means of suitable materials.

7. HANDLING AND STORAGE

7.1 HANDLING

- Ensure adequate ventilation and, as far as possible, avoid the inhalation of the vapors generated during use.
- Do not use of the product as a detergent or a solvent.
- Production and transport of gas oil should be done through closed systems in order to avoid danger for health and environment.

7.2 STORAGE

- The storage tanks of the product must be located in an area with adequate ventilation, away from heat and ignition sources.
- Keep the storage and handling temperature of gas oil at the ambient temperature in order to ensure a sufficient quality of the product, and minimize the fume generation.
- The grounding of the storage areas, of the transport and sampling systems is necessary.
- When there is the possibility of generating high concentration vapors the installation of a local ventilation system or vapor dilution system is necessary.
- When there is the possibility of release of high concentration vapors (as in the case of high temperatures), suitable measures (adequate ventilation, use of respiratory protection) for the minimization of the exposure must be taken.
- The storage areas of large quantities of gas oil are stored must be equipped with special fire fighting systems and Emergency plans according to the relative Legislation.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 EXPOSURE LIMITS

Temperature of loading / unloading / storage, °C: Ambient temperature

- American Conference of Governmental Industrial Hygienists (ACGIH), 2002 :
Gas oil mist: TLV – TWA (8-hr exposure limit) : 5mg/ m³
The establishment of TLV – TWA is under study (8-hr exposure limit) : 350 mg/m³
Total hydrocarbons, gas fumes: TLV – TWA (8-hr exposure limit) : 100 mg/m³

8.2 EXPOSURE CONTROLS

- Under standard conditions, a hazardous exposure to gas oil vapors is unlikely to occur, due to its relatively low volatility. High concentrations may be generated at increased temperature.
- Avoid swallowing, eye and skin contact, as well as inhalation of gas oil vapors.
- The most hazardous route is regarded to be the prolonged skin contact.

8.2.1 OCCUPATIONAL EXPOSURE CONTROLS

- Cleaning, inspection and maintenance of the gas oil storage tanks require special procedures and precautions, such as the issue of work permits, evacuation of the tanks from gases (gas freeing), use of safety belts and personal breathing apparatus.
- The most dangerous exposure is prolonged contact with skin.

PERSONAL PROTECTIVE EQUIPMENT (according to the Directive 89/686/EEC)

- In case of skin contact, the use of impermeable nitrile gloves, suitable protective clothing and safety footwear is necessary.
- In case of eye contact, the use of goggles or face shields is necessary for the protection of the eyes.
- Use of full face masks with filters against hydrocarbon mist/vapors in case of small leaks.
- During cleaning and inspection of equipment, as well as in incidents of great release, use self-contained breathing apparatus and whole body protection (impermeable uniform, boots, gloves).
- In case of fire of great extent, the use of fire-resistant uniforms and self-contained breathing apparatus is required.

ATTENTION!

- Contaminated protective clothing must be cautiously washed after each use.
- Footwear impregnated with product must be disposed of.
- The installation of safety showers and eye washers at the workplaces is recommended.

8.2.2 ENVIRONMENTAL EXPOSURE CONTROLS

- Given the relatively low volatility of the product, the main route of its release to the environment is the possible release of a quantity through pipelines and storage tanks or during its transportation. This quantity reaches the aquatic receiver and the soil, while the most volatile ingredients (saturated HCs below C₁₄ and aromatic HCs below C₁₁) are evaporated.
- A significant control of the losses to the environment is carried out using both the upgraded specifications of the product as well as the technical measures of the Directives 96/61/EEC and 2001/80/EEC.

9. PHYSICAL AND CHEMICAL PROPERTIES

Clear liquid, with characteristic odor. Dyes and markers can be used to indicate tax status and prevent fraud.

- Flash point, °C : 55 (min)
- Viscosity at 40 °C, cSt : 6 (max)

Detailed information on physical and chemical properties can be provided upon request.

10. STABILITY AND REACTIVITY

Under standard conditions, it is a stable product and it does not cause hazardous chemical reactions.

10.1 CONDITIONS THAT SHOULD BE AVOIDED

High temperature, heat sources, bare flames and other ignition sources.

10.2 MATERIALS THAT MUST BE AVOIDED

Halogens, strong oxidizing agents.

10.3 HAZARDOUS DECOMPOSITION PRODUCTS

It is not decomposed at ambient temperature.

10.4 HAZARDOUS THERMAL DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide, nitrogen oxides, sulphur dioxide, incombustible hydrocarbons, polycyclic aromatic hydrocarbons, particles.

11. TOXICOLOGICAL INFORMATION

- Regarding the direct toxicity of gas oil, the following values are suggestively reported:
 - LD50 (through digestion, skin contact) > 2000 mg/kg
 - LC50 (through inhalation) > 5 mg/lit
- There are indications that gas oil derived from pyrolysis (cracked) has a carcinogenic effect. For streams derived from hydrogen cracking there are some indications for possible carcinogenic effect, while the streams derived from atmospheric distillation, according to the available data, have no such effect.
- No mutagenic effect has been established.

INHALATION

- Due to the low volatility of gas oil, there is no inhalation hazard at standard temperatures.
- At high temperatures and in inadequate ventilation conditions, the vapour inhalation gradually induces irritation to the nose and the throat, headache, nausea and confusion.
- Prolonged inhalation of high concentrations of gas oil vapours results in the suppression of the respiratory and nervous system causing loss of consciousness.
- Exposure to concentrations of gas oil mist exceeding 5 mg/m³ induces irritation of the mucous membranes of the upper respiratory route.

SWALLOWING

- In case of swallowing of large gas oil quantities (due to mishandling), irritation of the gastrointestinal route is caused.
- Vomiting is possible to be induced, however this SHOULD be avoided.
- Aspiration into lungs directly or after vomiting induces damage to the lung tissues with possible hazard for chemical pneumonitis (in severe cases, this may be fatal).

SKIN CONTACT

- Prolonged or/and repeated skin contact of gas oil is possible to induce dryness, irritation, dermatitis.
- Non compliance with the personal hygiene rules during prolonged or/and repeated skin contact results in the formation of pimples and spots that may evolve to malignant minor tumors.

EYE CONTACT

- Eye contact with liquid droplets induces temporary acute pain and redness.
- Exposure to high concentrations of gas oil mist or vapours (at high temperatures) induces a slight irritation of the eyes.

12. ECOLOGICAL INFORMATION

- When gas oil reaches receiving waters, it generates hydrocarbon layers that float and expand along the surface.
- For lighter ingredients, evaporation is the most probable process.
- In air, hydrocarbon vapours react rapidly with hydroxyl radicals with half-life time less than a day.

- The photooxidation of liquid hydrocarbons on the surface of receiving waters is considered to be the main process for the polycyclic aromatic hydrocarbons.
- The majority of the gas oil ingredients are absorbed as a sediment.
- Gas oil does not contain hydrocarbons with significant solubility in water as to represent a serious hazard of direct toxic reaction for the aquatic life.
- However, in cases of pollution of receiving waters with large quantities of product, mortality to aquatic organisms and long-term adverse effects to aquatic environment are induced. Indicatively, the following are reported:

Fish	LC ₅₀ (24h)	: 31 mg/l
Daphnia	EL ₅₀ (48h)	: 20 mg/l
Algae	EC50 (72h)	: 22 mg/lt
- Furthermore, it is possible to observe a direct toxic effect to marine organisms (birds and marine mammals) while the quantity that reaches the coasts generate significant pollution. The restoration requires several weeks.
- Regarding bioaccumulation, lower molecular weight ingredients are decomposed relatively rapidly under aerobic conditions, while the higher molecular weight hydrocarbons (especially the polycyclic aromatic ones) are biodegraded at a slow rate.
- In anaerobic conditions, the biodegradation rates of gas oil ingredients are negligible.
- Practically, the bioaccumulation tendency is limited due to the metabolic process. The logKow values range from 3.9 up to > 6. It is reported that the most common ingredients found in clams were naphthalenes and methyl-naphthalenes.
- In case of contact of soil with small quantities of gas oil, a percentage will be evaporated while the remaining amount will be absorbed from the upper aerobic layers of the soil.
- In case of soil pollution with large quantities of gas oil, a significant percentage will penetrate into anaerobic soil layers with the possibility of entering to underground aquifers. By means of the groundwater flow there is the possibility of polluting the drinkable water as well. It is considered to be unlikely that these ingredients will be maintained for long periods as to generate a hazard for the public health.

13. DISPOSAL CONSIDERATIONS

- If the product must be disposed of (after a tank cleaning or in case of accidental release), this must comply with the relative Legislation and the approval of the local authorities.
- The significantly contaminated materials must be incinerated.
- It must not be disposed of to sewers.

14. TRANSPORT INFORMATION

Usual means of transport: Tank liners, trucks, trains.

Transport temperature, °C: Ambient temperature (< 40 °C).

Road/Rail Transport: ADR/RID 2003, ΠΔ 104/99 and its amendments (ΦΕΚ 509B/2000 and 1232B/2001), Directives 94/55/EEC and 96/49/EEC and their amendments.

- Class : 3
- Classification code : F1
- Packing group : III
- Label : 3
- Hazard Information Number : 30
- UN number : 1202
- Shipping : IMDG – IMO Code 2002 και ΠΔ 405/96
- Class : 3.3
- Packing number : III

15. REGULATORY INFORMATION

According to DSD-DPD (Directive 67/548/EEC)

Indication of danger



Xn – harmful



Xi – irritant



N - dangerous for the environment

Risk phrases

- R20 harmful by inhalation
- R38 irritating to skin
- R45 may cause cancer
- R48/21 harmful: danger of serious damage to health by prolonged exposure in contact with skin
- R51/53 toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

R65 harmful: may cause lung damage if swallowed

Safety phrases

S23 do not breathe gas/fumes/vapour/spray
S24 avoid contact with skin
S36/37 wear suitable protective clothing and gloves
S45 in case of accident or if you feel unwell, seek medical advice immediately
S51 use only in well-ventilated areas
S53 avoid exposure - obtain special instructions before use
S61 avoid release to the environment. refer to special instructions/safety data sheets
S62 if swallowed, do not induce vomiting: seek medical advice immediately and show this container or label

16. OTHER INFORMATION

• FULL TEXT OF RISK PHRASES:

R20 harmful by inhalation
R38 irritating to skin
R45 may cause cancer
R48/21 harmful: danger of serious damage to health by prolonged exposure in contact with skin
R51/53 toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R65 harmful: may cause lung damage if swallowed

• INSTRUCTIONS FOR TRAINING

The information of the present Safety Data Sheet can be used for training purposes.

• RECOMMENDED LIMITATIONS OF USE

Manufacture, distribution, formulation & (re)packing, use as a fuel.

• MAIN SOURCES FOR THE PREPARATION OF THE PRESENT SHEET

REGULATION (EC) 1907/2006, REGULATION (EC) No 1272/2008, ΑΧΣ 47/ΦΕΚ431Β/95, Υ.Α. 265/2002/2002 (ΦΕΚ 1214/Β/19.9.2002), Υ.Α. 195/2002/2002 (ΦΕΚ 907/Β/17.7.2002), Υ.Α. 378/94/1994 (ΦΕΚ 705/Β/20.9.1994), Αποφ.508/91/1991 (ΦΕΚ 886/Β/30.10.1991).

• ADDITIONAL INFORMATION

Revision 8: October 2011, Original publication: January 1995. Amendments in the present Material Safety Data Sheet, in reference to the previous publication, mainly in points 2, 3, 8, 9, 15 and 16.

Note: MOTOR OIL (HELLAS) – CORINTH REFINERIES S.A. specifies that the above information refers only to the specific product, as described above and only when not used in combination with another product, or used differently than specified. The information is accurate according to our current state of knowledge and experience of the product up and until the above mentioned date of issue.

MOTOR OIL (HELLAS) – CORINTH REFINERIES S.A. specifies that it is exempts from all legal responsibility and losses or damage caused from the use of the product described above.

The above information and guidelines are at the disposal of users to assess as satisfactory according to the use of any particular substance. For further information, please contact the company at the above telephone numbers or address.

Exposure Scenarios

1. Manufacture of Other Gas Oils (Non-carcinogenic feed-stock: Xn; R20, Xi; R38, Xn; R65, N; R51/53) - Industrial Exposure Scenario

Section 1 Exposure Scenario Title Other Gas Oils (Xn; R20, Xi; R38, Xn; R65, N; R51/53)	
Title	
Manufacture of Substance	
Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Categories	1, 2, 3, 4, 8a, 8b, 15 <i>Further information on the mapping and allocation of PROC codes is contained in Table 9.1.</i>
Environmental Release Categories	1, 4
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, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.
General exposures (Closed systems)	Handle substance within a closed system
General exposures (Open systems)	Wear suitable gloves tested to EN374
Process Sampling	No other specific measures identified
Bulk closed loading and unloading	Handle substance within a closed system. Wear suitable gloves tested to EN374
Bulk open loading and unloading	Wear suitable gloves tested to EN374
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Laboratory activities	No other specific measures identified
Bulk storage	Store substance within a closed system.

Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 2 to 3	
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.0e6
Fraction of Regional tonnage used locally	0.31
Annual site tonnage (tonnes/year)	6.0e5
Maximum daily site tonnage (kg/day)	2.0e6
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-5
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used .	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency > (%)	89.8
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of > (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.3
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.3
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	3.6e6
Assumed domestic sewage treatment plant flow (m^3/d)	10000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated.	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 5 and 6	
Section 3 Exposure Estimation	

3.1. Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.
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 onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERCfactsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4]. Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID section 13- "Site-Specific Production" worksheet [DSU6].

2. Manufacture of Other Gas Oils (Carcinogenic or unknown feed-stock: Xn; R45, Xn; R48/21, Xn; R20, Xi; R38, Xn; R65, N; R51/53)- Industrial

Exposure Scenario

Section 1 Exposure Scenario Title Other Gas Oils (Xn; R45, Xn; R48/21, Xn; R20, Xi; R38, Xn; R65, N; R51/53)	
Title	
Manufacture of Substance	
Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Categories	1, 2, 3, 8a, 8b, 15 <i>Further information on the mapping and allocation of PROC codes is contained in Table 9.1.</i>
Environmental Release Categories	1, 4
Specific Environmental Release Category	ESVOC SpERC 1.1. v1
Processes, tasks, activities covered	
Manufacture of the substance or use as an intermediate or process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP.

Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
General measures (irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if direct hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.
General exposures (Closed systems)	Handle substance within a predominantly closed system provided with extract ventilation. Ensure material transfers are under containment or extract ventilation
Process Sampling	Sample via a closed loop or other system intended to avoid exposure
Bulk closed loading and unloading	Ensure material transfers are under containment or extract ventilation. Wear suitable gloves tested to EN374
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Retain drain down in sealed storage pending disposal or for subsequent recycle Deal with spills immediately.
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure
Bulk Storage	Store substance within a closed system.
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 2 to 3	
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.0e6
Fraction of Regional tonnage <i>i</i> used locally	0.31
Annual site tonnage (tonnes/year)	6.0e5
Maximum daily site tonnage (kg/day)	2.0e6
Frequency and duration of use	
Continuous release [FD2].	

Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-5
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR9].	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency > (%)	89.8
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of > (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.3
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.3
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (kg/d)	3.6e6
Assumed domestic sewage treatment plant flow (m ³ /d)	10000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External treatment and disposal of waste should comply with applicable regulations [ERW1]	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 5 and 6	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard	

data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

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 onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>) [DSU4]. Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID section 13- "Site-Specific Production" worksheet [DSU6].

3. Distribution of Other Gas Oils (Xn; R20, XI; R38, Xn; R65, N; R51/53)- Industrial Exposure Scenario

Section 1 Exposure Scenario Title Other Gas Oils (Xn; R20, XI; R38, Xn; R65, N; R51/53)	
Title	
Distribution of Substance	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1,2, 3, 4, 8a, 8b, 9, 15 <i>Further information on the mapping and allocation of PROC codes is contained in Table 9.1.</i>
Environmental Release Categories	1,2, 3,4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered	
Bulk loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, maintenance and associated laboratory activities.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.
General exposures (Closed systems)	Handle substance within a closed system
General exposures (Open systems)	Wear suitable gloves tested to EN374
Process sampling	No other specific measures identified
Laboratory activities	No other specific measures identified
Bulk closed loading and unloading	Handle substance within a closed system E47 Wear suitable gloves tested to EN374 PPE 15
Bulk open loading and unloading	Wear suitable gloves tested to EN374
Drum and small pack filling	Wear suitable gloves tested to EN374

Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance.. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 2 to 3	
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.0e6
Fraction of Regional tonnage used locally	0.002
Annual site tonnage (tonnes/year)	3.9e3
Maximum daily site tonnage (kg/day)	3.9e4
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	100
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	1.0e-6
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency > (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of > (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.3
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.3
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (kg/d)	1.2e7
Assumed domestic sewage treatment plant flow (m ³ /d)	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable regulations [ETW3]	

Conditions and measures related to external recovery of waste
External treatment and disposal of waste should comply with applicable regulations [ERW1].
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 5 and 6
Section 3 Exposure Estimation
3.1. Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.
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 onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

4. Distribution of Other Gas Oils (Xn; R45, Xn; R48/21, Xn; R20, XI; R38, Xn; R65, N; R51/53) - Industrial

Exposure Scenario

Section 1 Exposure Scenario Title Other Gas Oils (Xn; R45, Xn; R48/21, Xn; R20, XI; R38, Xn; R65, N; R51/53)	
Title	
Distribution of Substance	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 8a, 8b, 15 <i>Further information on the mapping and allocation of PROC codes is contained in Table 9.1.</i>
Environmental Release Categories	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1 b.v1
Processes, tasks, activities covered	
Bulk loading (including marine vessel/barge, rail/road car and IBC loading) of substance within closed or contained systems, including incidental exposures during its sampling, storage, unloading, maintenance and associated laboratory activities.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	

Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
General measures (irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if direct hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.
General exposures (Closed systems)	Ensure material transfers are under containment or extract ventilation.
Process Sampling	Sample via a closed loop or other system intended to avoid exposure
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure
Bulk closed loading and unloading	Ensure material transfers are under containment or extract ventilation. Wear suitable gloves tested to EN374
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Wear suitable gloves tested to EN374. Retain drain down in sealed storage pending disposal or for subsequent recycle. Deal with spills immediately.
Storage	Store substance within a closed system.
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 2 to 3	
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.0e6
Fraction of Regional tonnage ; used locally	0.002
Annual site tonnage (tonnes/year)	3.9e3
Maximum daily site tonnage (kg/day)	3.9e4
Frequency and duration of use	
Continuous release [FD2].	

Emission days (days/year)	100
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	1.0e-6
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency > (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of > (%)	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from wastewater [OMS1]. Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.3
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.3
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	1.2e7
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External treatment and disposal of waste should comply with applicable regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 5 and 6	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available	

hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

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

5. Formulation & (Re) packing of Other Gas Oils (Xn; R20, XI; R38, Xn; R65, N; R51/53) - Industrial Exposure Scenario

Section 1 Exposure Scenario Title Other Gas Oils (Xn; R20, XI; R38, Xn; R65, N; R51/53)	
Title	
Formulation & (Re)packing of Other Gas Oils	
Use Descriptor	
Sector(s) of Use	3, 10
Process Categories	1,2, 3,4, 5, 8a, 8b, 9, 14, 15 <i>Further information on the mapping and allocation of PROC codes is contained in Table 9.1.</i>
Environmental Release Categories	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, pelletization, extrusion, large and small scale packing, maintenance, sampling and associated laboratory activities.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.
General exposures (closed systems)	Handle substance within a closed system
General exposures (open systems)	Wear suitable gloves tested to EN374
Process sampling	No other specific measures identified
Drum and batch transfers	Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training
Bulk transfers	Handle substance within a closed system. Wear suitable gloves tested to EN374
Mixing operations (open systems)	Provide extract ventilation to points where emissions occur. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training
Production or preparation	Wear suitable gloves tested to EN374

or articles by tableting, compression, extrusion or pelletisation	
Drum and small package filling	Wear suitable gloves tested to EN374
Laboratory activities	No other specific measures identified
Equipment clean down and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 2 to 3	
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.9e6
Fraction of Regional tonnage used locally	0.016
Annual site tonnage (tonnes/year)	3.0e4
Maximum daily site tonnage (kg/day)	1.0e5
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (after typical onsite RMMs, consistent with EU Solvent Emissions Directive requirements)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	2.0e-5
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR9].	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency > (%)	38.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of > (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.3
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.3

Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (kg/d)	1.1e6
Assumed domestic sewage treatment plant flow (m ³ /d)	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External treatment and disposal of waste should comply with applicable regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 5 and 6	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
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 onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].	

6. Formulation & (Re) packing of Other Gas Oils (Xn; R45, Xn; R48/21, Xn; R20, Xi; R38, Xn; R65, N; R51/53) - Industrial

Exposure Scenario

Section 1 Exposure Scenario Title Other Gas Oils (Xn; R45, Xn; R48/21, Xn; R20, Xi; R38, Xn; R65, N; R51/53)	
Title	
Formulation & (Re)packing of Other Gas Oils	
Use Descriptor	
Sector(s) of Use	3, 10
Process Categories	1, 2, 3, 8a, 8b, 15 <i>Further information on the mapping and allocation of PROC codes is contained in Table 9.1.</i>
Environmental Release Categories	2
Specific Environmental Release Category	ESVOC SpERC 2.2.v1
Processes, tasks, activities covered	
Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.	
Assessment Method	

See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
General measures (irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if direct hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.
General exposures (Closed systems)	Handle substance within a predominantly closed system provided with extract ventilation
Process Sampling	Sample via a closed loop or other system intended to avoid exposure
Bulk transfers	Ensure material transfers are under containment or extract ventilation.
Drum and batch transfers	Ensure material transfers are under containment or extract ventilation
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Wear suitable gloves tested to EN374. Retain drain down in sealed storage pending disposal or for subsequent recycle. Deal with spills immediately.
Storage	Store substance within a closed system.
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 2 to 3	
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1

Regional use tonnage (tonnes/year)	1.9e6
Fraction of Regional tonnage used locally	0.016
Annual site tonnage (tonnes/year)	3.0e4
Maximum daily site tonnage (kg/day)	1.0e5
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (after typical onsite RMMs, consistent with EU Solvent Emissions Directive requirements)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	2.0e-5
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR9].	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency > (%)	38.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of > (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.3
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.3
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	1.1e6
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External treatment and disposal of waste should comply with applicable regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 5 and 6	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

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

7. Use of Other Gas Oils (Xn; R20, Xi; R38, Xn; R65, N; R51/53) as a Fuel - Industrial Exposure Scenario

Section 1 Exposure Scenario Title Other Gas Oils (Xn; R20, Xi; R38, Xn; R65, N; R51/53)	
Title	
Use as a Fuel	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1,2, 3, 8a, 8b, 16 <i>Further information on the mapping and allocation of PROC codes is contained in Table 9.1.</i>
Environmental Release Categories	7
Specific Environmental Release Category	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additives and additive components) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.
Bulk transfers	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Drum/batch transfers	Wear suitable gloves tested to EN374.
Use as a fuel (closed systems)	No other specific measures identified
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to type EN374) in combination with 'basic' employee training
Storage	Store substance within a closed system.
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 2 to 3	
Section 2.2 Control of environmental exposure	
Product characteristics	

Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.5e6
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	1.5e6
Maximum daily site tonnage (kg/day)	5.0e6
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	5.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency > (%)	97.5
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of > (%)	56.8
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.3
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97.5
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	5.0e6
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2].	
Conditions and measures related to external recovery of waste	
External treatment and disposal of waste should comply with applicable regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 5 and 6	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	

Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.
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 onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

8. Use of Other Gas Oils (Xn; R45, Xn; R48/21, Xn; R20, XI; R38, Xn; R65, N; R51/53) as a Fuel - Industrial

Exposure Scenario

Section 1 Exposure Scenario Title Other Gas Oils (Xn; R45, Xn; R48/21, Xn; R20, XI; R38, Xn; R65, N; R51/53)	
Title	
Use as a Fuel	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1,2, 3, 8a, 8b, 16 <i>Further information on the mapping and allocation of PROC codes is contained in Table 9.1.</i>
Environmental Release Categories	7
Specific Environmental Release Category	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions

General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
General measures (irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if direct hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.
Bulk transfers	Ensure material transfers are under containment or extract ventilation
Drum and batch transfers	Ensure material transfers are under containment or extract ventilation
Use as a fuel (closed systems)	Handle within closed systems
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Wear suitable gloves tested to EN374. Retain drain down in sealed storage pending disposal or for subsequent recycle. Deal with spills immediately.
Storage	Store substance within a closed system.
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 2 to 3	
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.5e6
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	1.5e6
Maximum daily site tonnage (kg/day)	5.0e6
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	5.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	

Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1 b]. Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency > (%)	97.5
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of > (%)	56.8
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.3
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97.5
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	5.0e6
Assumed domestic sewage treatment plant flow (m ³ /d)	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2].	
Conditions and measures related to external recovery of waste	
External treatment and disposal of waste should comply with applicable regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 5 and 6	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
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 onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].	

9. Use of Other Gas Oils (Xn; R20, Xi; R38, Xn; R65, N; R51/53) as a Fuel - Professional Exposure Scenario

Section 1 Exposure Scenario Title Other Gas Oils (Xn; R20, Xi; R38, Xn; R65, N; R51/53)	
Title	
Use as a Fuel	
Use Descriptor	
Sector(s) of Use	22
Process Categories	1,2, 3, 8a, 8b, 16 <i>Further information on the mapping and allocation of PROC codes is contained in Table 9.1.</i>
Environmental Release Categories	9a, 9b
Specific Environmental Release Category	ESVOC SpERC9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additives and additive components) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.
Bulk transfers	Wear suitable gloves tested to EN374.
Drum/batch transfers	Use drum pumps or carefully pour from container E64 Wear suitable gloves tested to EN374.
Refuelling activities	Wear suitable gloves tested to EN374
Use as a fuel (closed systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) or Ensure operation is undertaken outdoors
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with basic employee training
Storage	Store substance within a closed system
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 2 to 3	
Section 2.2 Control of environmental exposure	

Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	4.0e5
Fraction of Regional tonnage used locally	0.0005
Annual site tonnage (tonnes/year)	2.0e2
Maximum daily site tonnage (kg/day)	5.4e2
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-4
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion) [TCR1j]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency > (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of > (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.3
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.3
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	2.4e5
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2].	
Conditions and measures related to external recovery of waste	
External treatment and disposal of waste should comply with applicable regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 5 and 6	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2. Environment	

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.
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 onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

10. Use of Other Gas Oils (Xn; R45, Xn; R48/21, Xn; R20, XI; R38, Xn; R65, N; R51/53) as a Fuel - Professional

Exposure Scenario

Section 1 Exposure Scenario Title Other Gas Oils (Xn; R45, Xn; R48/21, Xn; R20, XI; R38, Xn; R65, N; R51/53)	
Title	
Use as a Fuel	
Use Descriptor	
Sector(s) of Use	22
Process Categories	1,2, 3, 8a, 8b, 16 <i>Further information on the mapping and allocation of PROC codes is contained in Table 9.1.</i>
Environmental Release Categories	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented

Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
General measures (irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if direct hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin effects that may develop.
Bulk transfers	Ensure material transfers are under containment or extract ventilation
Drum/batch transfers	Ensure material transfers are under containment or extract ventilation. Wear suitable gloves tested to EN374
Refuelling activities	Ensure material transfers are under containment or extract ventilation. Wear suitable gloves tested to EN374
Use as a fuel (closed systems)	No special precautions identified E11 8
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with basic employee training. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clear spillages immediately.
Storage	Store substance within a closed system
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 2 to 3	
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	4.0e5
Fraction of Regional tonnage used locally	0.0005
Annual site tonnage (tonnes/year)	2.0e2
Maximum daily site tonnage (kg/day)	5.4e2
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	

Release fraction to air from process (initial release prior to RMM)	1.0e-4
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion) [TCR1]. No wastewater treatment required [TCR6].	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency > (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of > (%)	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.3
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.3
Maximum allowable site tonnage ($M_{Sa,fe}$) based on release following total wastewater treatment removal (kg/d)	2.2e5
Assumed domestic sewage treatment plant flow (m ³ /d)	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2].	
Conditions and measures related to external recovery of waste	
External treatment and disposal of waste should comply with applicable regulations [ERW1].	
Additional information on the basis for the allocation of the identified OCs and RMMs is contained in Appendices 5 and 6	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
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 onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>) [DSU4].