

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

- **1.1 Product identifier**
- **Trade name:** Marine Diesel 0.1%S (DMA Type)
- **Main constituent:** Distillates (petroleum), hydrodesulfurized middle
- **CAS Number:** 64742-80-9
- **EC number:** 265-183-3
- **Registration number:** 01-2119480406-37-xxxx
- **1.2 Relevant identified uses of the substance or mixture and uses advised against**
- **INDUSTRIAL USES**
 - (1) Manufacture of substance
 - (2) Distribution of substance
- **PROFESSIONAL USES**
 - (3) Use as a fuel
- **CONSUMER USES** None
- **Uses advised against** Identified uses of the product are given above. Other uses are not supported.
- **1.3 Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
HELLENIC PETROLEUM S.A.
8A, Chimarras Str, 151 25, Maroussi, Greece
Tel. +30 210 6302 000
Fax. +30 210 6302 510/511
- **Further information obtainable from:** reach@helpe.gr
- **1.4 Emergency telephone number:**



National Emergency Centre: 166
National Poison Centre: (+30) 210 7793777

SECTION 2: HAZARDS IDENTIFICATION

- **2.1 Classification of the substance or mixture**
- **2.1.1 Classification according to Regulation (EC) No 1272/2008**

Flam. Liq. 3	H226	Flammable liquid and vapour.
Asp. Tox. 1	H304	May be fatal if swallowed and enters airways.
Skin Irrit. 2	H315	Causes skin irritation.
Acute Tox. 4	H332	Harmful if inhaled.
Carc. 1B	H350	May cause cancer.
STOT RE 2	H373	May cause damage to blood, thymus and liver through prolonged or repeated exposure.
Aquatic Chronic 2	H411	Toxic to aquatic life with long lasting effects.

- **2.2 Label elements**
- **Labelling according to Regulation (EC) No 1272/2008**
The substance is classified and labelled according to the CLP regulation.

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· **Hazard pictograms**



GHS02 GHS07 GHS08 GHS09

· **Signal word** Danger

· **Hazard-determining components of labelling:**

Distillates (petroleum), hydrodesulfurized middle

· **Hazard statements**

H226 Flammable liquid and vapour.

H304 May be fatal if swallowed and enters airways.

H315 Causes skin irritation.

H332 Harmful if inhaled.

H350 May cause cancer.

H373 May cause damage to the blood, thymus and liver through prolonged or repeated exposure.

H411 Toxic to aquatic life with long lasting effects.

· **Precautionary statements**

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

P201 Obtain special instructions before use.

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273 Avoid release to the environment.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.

P331 Do NOT induce vomiting.

· **Additional labelling requirements:** Restricted to professional users due to classification as carcinogenic Category 1B, except for fuel uses.

· **2.3 Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** The substance does not meet the criteria for PBT in accordance with Annex XIII.

· **vPvB:** The substance does not meet the criteria for vPvB in accordance with Annex XIII.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

· **3.1 Chemical characterisation: Substances**

Description:

A complex combination of hydrocarbons obtained from a petroleum stock by treating with hydrogen to convert organic sulfur to hydrogen sulfide which is removed. It consists of hydrocarbons having carbon numbers predominantly in the range of C11 through C25 and boiling in the range of approximately 205 °C to 400 °C (401°F to 752°F). Contains 3mg/l marker quinizarine.

· **CAS No. Description**

64742-80-9 Distillates (petroleum), hydrodesulfurized middle

· **Identification number(s)**

· **EC number:** 265-183-3

· **Registration number:** 01-2119480406-37-xxxx

· **Concentration (%w/w):** ≤100%

· **Impurities and stabilising additives:** None.

· **Classification according to Regulation (EC) No. 1272/2008**

Flam.Liquid 3; H226

Asp.Tox 1; H304

Skin Irrit 2; H315

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Acute Tox 4; H332
Carc 1B; H350
STOT Rep. Exp 2; H373
Aquatic Chronic 2; H411

• **Additional information:**

Substance "Distillates (petroleum), hydrodesulfurised middle" is a UVCB substance and member of the CONCAWE category "Other Gasoils".

• **Additional information:**

Note N: The classification as a carcinogen need not apply if the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen. This note applies only to certain complex oil-derived substances in Part 3.

O I N 12 : Classification as Flammable Liquid Category 3 need not apply if it can be shown that the flash point of the substance does not meet EC CLP criteria for classification.

O I N 14: The EC CLP classifications as Causes damage to organs through prolonged or repeated exposure by skin (H373) need not apply if the substance is not classified as carcinogenic.

SECTION 4: FIRST AID MEASURES

• **4.1 Description of first aid measures**

• **General information:**

Spillages make surfaces slippery.

Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply.

Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces.

(Subject to applicability) Hydrogen sulphide (H₂S) can accumulate in the headspace of product storage tanks and reach potentially hazardous concentrations.

• **Following inhalation:**

Inhalation is unlikely because of the low vapour pressure of the substance at ambient temperature.

Exposure to vapours may occur when the substance is handled at high temperatures with poor ventilation.

In case of symptoms arising from inhalation of product fumes, mists or vapour : Remove casualty to a quiet and well ventilated place if safe to do so.

If casualty is unconscious and:

(1) Not breathing – ensure that there is no obstruction to breathing and give artificial respiration by trained personnel. If necessary, give external cardiac massage and obtain medical assistance.

(2) Breathing – place in the recovery position. Administer oxygen if necessary.

Obtain medical assistance if breathing remains difficult.

(Subject to applicability) If there is any suspicion of inhalation of H₂S (hydrogen sulphide):

(1) Rescuers must wear breathing apparatus, belt and safety rope, and follow rescue procedures.

(2) Remove casualty to fresh air and keep at rest in a position comfortable for breathing.

(3) Immediately begin artificial respiration if breathing has ceased.

(4) Provision of oxygen may help.

(5) Obtain medical advice for further treatment.

• **Following skin contact:**

Remove contaminated clothing, contaminated footwear and dispose of safely.

Immediately wash with water and soap and rinse thoroughly.

Seek medical attention if skin irritation, swelling or redness develops and persists.

For minor thermal burns, cool the burn.

Hold the burned area under cold running water for at least five minutes, or until the pain subsides.

Body hypothermia must be avoided.

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(Subject to applicability – use as fuel or functional fluid) When using high-pressure equipment, injection of product can occur. If high-pressure injuries occur, immediately seek professional medical attention. Do not wait for symptoms to develop.

• **Following eye contact:**

Rinse opened eye for several minutes under running water.

Remove contact lenses, if possible.

If irritation, blurred vision or swelling occurs and persists, obtain medical advice from a specialist.

• **Following ingestion/aspiration:**

In case of ingestion, always assume that aspiration has occurred. The casualty should be sent immediately to hospital. Do not wait for symptoms to develop.

Do not induce vomiting as there is high risk of aspiration.

Do not give anything by mouth to an unconscious person.

• **4.2 Most important symptoms and effects, both acute and delayed**

Irritation of the respiratory tract due to excess fume mists or vapour exposure

Reddening

May be slightly irritating to skin

Slight eye irritation

Nausea

Diarrhoea

• **Notes for the doctor:**

INHALATION

If there is any suspicion of over exposure to H₂S (hydrogen sulphide) the casualty must be treated for poisoning.

Individuals with pre-existing lung disorders may have increased susceptibility of the effects of exposure.

SKIN CONTACT

High-pressure injection may drive fluid into the skin even through gloves or overalls. Diagnostic examination (e.g. radiographic or ultrasound) of the affected area may help to determine the distance of spread from the injection site. Primary treatment consists of surgical decompression and debridement.

INGESTION/ASPIRATION

Induction of vomiting is contraindicated. Activated charcoal is ineffective.

In cases of known or suspected aspiration, continuous monitoring of the patient for pulmonary oedema and/or aspiration for at least 48-72 hours following ingestion/aspiration is highly recommended.

Aspiration is commonly initially asymptomatic and may occur without any signs of vomiting. In most cases, the effects of aspiration are often muted, slow and insidious in onset during the early stages. In a minority of cases, aspiration may be recognized from the history of events, by a smell of hydrocarbons on the breath, signs of vomiting or symptoms such as choking or coughing.

• **4.3 Indication of any immediate medical attention and special treatment needed**

Treat accordingly depending on the type of exposure.

SECTION 5: FIREFIGHTING MEASURES

• **5.1 Extinguishing media**

• **Suitable extinguishing media:**

Foam (specifically trained personnel only)

Water fog (specifically trained personnel only)

Dry chemical powder

Carbon dioxide

Other inert gases (subject to regulations)

Sand or earth

• **Unsuitable extinguishing media:**

Do not use direct water jets on the burning product.

Simultaneous use of foam and water on the same surface is to be avoided.

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· **5.2 Special hazards arising from the substance or mixture**

This product will float and can be reignited on surface water.

· **Hazardous combustion products:**

Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide and unidentified organic and inorganic compounds. If sulfur compounds are present in appreciable amounts, combustion products may include also H₂S and SO_x (sulfur oxides) or sulfuric acid.

· **5.3 Advice for fire-fighters**

· **Other protective equipment for fire-fighters:**

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

· **Specific fire-fighting methods:** None available.

SECTION 6: ACCIDENTAL RELEASE MEASURES

· **GENERAL INFORMATION**

(Subject to applicability) In those cases when the presence of dangerous amounts of H₂S in the leaked/spilled product is suspected or proved, additional or special actions may be warranted, including access restrictions, use of special protection equipment, procedures and personnel training.

(Subject to applicability) Concentration of H₂S in tank headspaces may reach hazardous values, especially in case of prolonged storage. This situation is especially relevant for those operations which involve direct exposure to the vapours in the tank.

(Subject to applicability) Spillages of limited amounts of product, especially in the open air when vapours will be usually quickly dispersed, are dynamic situations, which will presumably limit the exposure to dangerous concentrations. As H₂S has a density greater than ambient air, a possible exception may regard the build-up of dangerous concentrations in specific spots, like trenches, depressions or confined spaces. In all these circumstances, however, the correct actions should be assessed on a case-by-case basis.

Eliminate all ignition sources if safe to do so (e.g. electricity, sparks, fires, flares).

· **6.1 Personal precautions, protective equipment and emergency procedures**

· **6.1.1 For non-emergency personnel**

Stop or contain leak at the source, if safe to do so.

Avoid direct contact with released material.

Stay upwind.

In case of large spillages, alert occupants in downwind areas.

Keep non-involved personnel away from the area of spillage. Alert emergency personnel.

Except in case of small spillages, the feasibility of any actions should always be assessed and advised, if possible, by a trained, competent person in charge of managing the emergency.

Keep away from ignition sources.

Ensure adequate ventilation.

Need to evacuate the danger area or to consult an expert.

· **6.1.2 For emergency responders**

If required, notify relevant authorities according to all applicable regulations.

Small spillages: Normal antistatic working clothes are usually adequate.

Large spillages: Full body suit of chemically resistant and antistatic material.

PERSONAL PROTECTIVE EQUIPMENT

Work gloves providing adequate chemical resistance, specifically to aromatic hydrocarbons. Gloves made of PVA are not water-resistant, and are not suitable for emergency use.

Work helmet. Antistatic non-skid safety shoes or boots.

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Goggles and /or face shield, if splashes or contact with eyes is possible or anticipated.

A half or full-face respirator with filter(s) for organic vapours/H₂S, or a Self-contained Breathing Apparatus (SCBA) can be used according to the extent of spill and predictable amount of exposure. If the situation cannot be completely assessed, or if an oxygen deficiency is possible, only SCBA's should be used.

· **6.2 Environmental precautions**

Avoid release to the environment.

Stop or contain leak at the source, if safe to do so.

SPILLAGES ON TO LAND

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

When inside buildings or confined spaces, ensure adequate ventilation.

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

· **6.3 Methods and material for containment and cleaning up**

· **6.3.1 For containment**

SPILLAGES ON TO LAND

If necessary dike the product with dry earth, sand or similar non-combustible materials.

Large spillages may be cautiously covered with foam, if available, to limit fire risk.

Do not use direct jets.

When inside buildings or confined spaces, ensure adequate ventilation.

SPILLAGES IN WATER OR AT SEA

In case of small spillages in closed waters (i.e. ports), contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents.

If possible, large spillages in open waters should be contained with floating barriers or other mechanical means.

If this is not possible, control the spreading of the spillage and collect the product by skimming or other suitable mechanical means.

· **6.3.2 For cleaning up**

SPILLAGES ON TO LAND

Absorb spilled product with suitable non-combustible materials.

Collect free product with suitable means. Transfer collected product and other contaminated materials to suitable containers for recycle, recovery or safe disposal.

In case of soil contamination, remove contaminated soil and treat in accordance with local regulations.

SPILLAGES IN WATER OR AT SEA

The use of dispersants should be advised by an expert, and, if required, approved by local authorities.

Collect recovered product and other materials in suitable tanks or containers for recovery or safe disposal.

· **6.3.3 Other information** Not available.

· **6.4 Reference to other sections**

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

SECTION 7: HANDLING AND STORAGE

· **7.1 Precautions for safe handling**

GENERAL INFORMATION

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

Use and store only outdoors or in a well-ventilated area.

Avoid prolonged or repeated contact with skin.

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Trade name: Marine Diesel 0.1%S (DMA Type)

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Avoid release to the environment.

Keep away from heat/sparks/open flames/hot surfaces. No smoking.

(Subject to applicability) A specific assessment of inhalation risks from the presence of H₂S in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases must be made to help determine controls appropriate to local circumstances.

• **7.1.1 Protective measures**

Take precautionary measures against static electricity.

Ground/bond containers, tanks and transfer/receiving equipment.

Use explosion-proof apparatus / fittings and spark-proof tools.

The vapour is heavier than air. Beware of accumulation in pits and confined spaces.

Do not use compressed air for filling, discharging, or handling operations.

Avoid contact with skin and eyes. Do not ingest. Avoid breathing vapours.

Use personal protective equipment as required.

For more information regarding protective equipment and operational conditions refer to the Exposure Scenarios.

• **Measures to protect the environment:**

Storage installations should be designed with adequate bunds to prevent ground and water pollution in case of leaks and spills.

• **7.1.2 Advice on general occupational hygiene**

Ensure that proper housekeeping measures are in place.

Contaminated materials should not be allowed to accumulate in the workplaces and should never be kept inside the pockets.

Keep away from food and beverages.

Do not eat, drink or smoke while using the product.

Wash the hands thoroughly after handling.

Change contaminated clothes at the end of working shift.

• **7.2 Conditions for safe storage, including any incompatibilities**

• **Technical measures and storage conditions:**

Cleaning, inspection and maintenance of internal structure of storage tanks must be done only by properly equipped and qualified personnel as defined by national, local or company regulations.

Before entering storage tanks and commencing any operation in a confined area, check the atmosphere for oxygen content and flammability.

If sulphur compounds are suspected to be present in the product, check the atmosphere for hydrogen sulfide (H₂S) content.

Recommended materials: For containers, or container linings use mild steel, stainless steel.

- Unsuitable materials: Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Compatibility should be checked with the manufacturer.

• **Information about storage in one common storage facility:** Store separately from oxidising agents.

• **Further information about storage conditions:**

IF THE PRODUCT IS SUPPLIED IN CONTAINERS:

Keep only in the original container, or in a suitable container for this kind of product.

Keep containers tightly closed and properly labelled.

Protect from direct sunlight.

Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability / explosion hazard. Open slowly in order to control possible pressure release.

Empty containers may contain flammable product residues.

Do not weld, solder, drill, cut or incinerate empty containers, unless they have been properly cleaned.

• **Storage class:** 3

• **7.3 Specific end use(s)** Refer to Exposure Scenarios, attached as Annex.

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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

• **8.1 Control parameters**

• **8.1.1 Occupational Exposure /Biological Limit Values**

National Occupational Exposure Limit Values are not reported.
European Occupational Exposure Limits are not reported.
Biological Limit Values (BLVs) are not allocated.
In any case, it is advisable to reduce occupational exposure to mist or vapour to a minimum.

• **8.1.2 Information on currently recommended monitoring procedures**

Air testing in confined spaces: monitoring of the air using gas detectors (single or multiple) to detect and monitor presence of H₂S, oxygen deficient conditions and explosive atmospheres.
National Institute of Occupational Safety and Health (NIOSH): Method 5040 - ELEMENTAL CARBON (DIESEL PARTICULATE)
BS EN 1127-1:2011: Explosive atmospheres. Explosion prevention and protection. Basic concepts and methodology
BS EN 60079-0:2009: Explosive atmospheres. Equipment. General requirements
BS EN 14042:2003: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents

• **8.1.3 Applicable occupational exposure limit values and/or biological limit values for air contaminants (if formed when using the substance/mixture as intended)**

HYDROGEN SULFIDE (CAS No. 7783-06-4)

GR (GREECE) TWA: 7mg/m³, 5ppm, STEL: 14mg/m³, 10ppm
EU TWA: 7mg/m³, 5ppm, STEL: 14mg/m³, 10ppm
USA/ACGIH TWA: 1ppm, STEL: 5ppm

OSHA, Part Number: 1910, Part Title: Occupational Safety and Health Standards, Subpart: Z, Subpart Title: Toxic and Hazardous Substances, Standard Number: 1910.1000, Title: AIR CONTAMINANTS, Table Z-2

Acceptable ceiling concentration: 20ppm
Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift: 50ppm,
Maximum duration: 10 min once only, if no other meas. exp. occurs.

National Institute of Occupational Safety and Health (NIOSH): Method 6013 - HYDROGEN SULFIDE

• **8.1.4 DNEL/PNEC values**

• **DNELs:**

Oral	DN(M)EL - Chronic effects systemic	1.3 mg/kg/24h (GENERAL POPULATION) Dose descriptor: 30 mg/kg/day Starting point: 41.5 mg/kg/day Assessment factor: AF =40
Dermal	DN(M)EL - Chronic effects systemic	2.9 mg/kg (WORKERS) ((8h)) Dose descriptor: 30 mg/kg/day Starting point: 58.1 mg/kg/day Assessment factor: AF =24
Inhalation	DN(M)EL - Acute effect systemic	5000 mg/m ³ (WORKERS) ((15min)) Dose descriptor: 1560mg/m ³ /4h Starting point: 16.723mg/m ³ /15min Assessment factor: AF =7.5

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EXTENDED SAFETY DATA SHEET
According to Commission Regulation (EU) No.1907/2006

Trade name: Marine Diesel 0.1%S (DMA Type)

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Inhalation	DN(M)EL - Chronic effects systemic	16 mg/m ³ (WORKERS) ((8h)) Dose descriptor: 30 mg/kg/day Starting point: 205.1mg/m ³ /8h Assessment factor: AF =7.5
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• **Justification for (no) DN(M)EL derivation**

WORKERS:

- *Long-term exposure (inhalation):*

Local effect: No hazard identified for this route (data available).

- *Long-term exposure (dermal):*

Local effect, for 13 weeks exposure: No hazard identified for this route (data available).

Local effect, for chronic exposures: No threshold effect and/or no dose-response info available.

WORKERS/GENERAL POPULATION:

- *Acute exposure (dermal):*

Local effect: No hazard identified for this route (data available).

- *Acute exposure (inhalation):*

Local effect: No hazard identified for this route (data available).

GENERAL POPULATION:

- *Acute exposure (dermal/inhalation):*

Systemic effect: No hazard identified for this route (data available).

- *Long-term exposure (dermal/inhalation):*

Local effect: No hazard identified for this route (data available).

Systemic effect: No hazard identified for this route (data available).

• **Justification for (no) PNEC derivation**

Substance is a hydrocarbon UVCB (with a complex, unknown or variable composition). Therefore conventional methods of deriving PNECs are not appropriate and it is not possible to identify a single representative PNEC for such substances.

• **8.2 Exposure controls**

• **8.2.1 Appropriate engineering controls / Technical measures to prevent exposure**

Under normal conditions of use, exposure to vapors/mist of product is unlikely due to relative low volatility. The following advice is recommended:

Use process enclosures, local exhaust ventilation or other engineering controls to maintain airborne levels at the minimum.

Cleaning, inspection and maintenance of storage tanks require the implementation of strict confined space entry procedures. These include issuing of permits, gas freeing of tanks.

Do not enter empty storage tanks until measurements of available oxygen and hydrogen sulphide concentration and have been carried out.

• **Organisational measures to prevent exposure:**

Conduct Risk Assessment for each task related to the product.

Before a worker is placed in a job with a potential for exposure to the substance, a licensed health care professional should evaluate and document the worker's baseline health status.

• **8.2.2 Personal Protective Equipment**

• **Respiratory protection:**

CSN EN 136 - Respiratory protective devices - Full face masks - Requirements, testing, marking

EN 148-3:1999 - Respiratory protective devices: threads for facepieces. Thread connection M 45 x 3

In spaces where hydrogen sulphide may accumulate and/or oxygen deficiency is possible:

DIN EN 137 - Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking



Full face mask

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• **Protection of hands:**

EN 374: 2003 - Gloves giving protection from chemicals and micro-organisms
Provide employee skin care programmes.
Check protective gloves prior to each use for their proper condition.



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

• **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

• **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

• **Eye protection:**

If splashing is likely, wear:
EN 166:2001 - Personal eye protection - specifications



Face protection

An eyewash station / safety shower should be located near the workplace.

• **Body protection:**



Impervious protective clothing

Coveralls should be changed at the end of the work shift and cleaned as necessary to avoid transfer of product to clothes or underwear.

CSN EN 340 - Protective clothing - General requirements

BS EN 465:1995 - Protective clothing. Protection against liquid chemicals. Performance requirements for chemical protective clothing with spray-tight connections between different parts of the clothing (type 4 equipment)

BS EN 466-1:1995 Protective clothing. Protection against liquid chemicals. Performance requirements for chemical protective clothing with liquid-tight connections between different parts of the clothing (type 3 equipment)

BS EN 467:1995 Protective clothing. Protection against liquid chemicals. Performance requirements for garments providing protection to parts of the body

For loading/unloading operations:



Full head, face and neck protection

CSN EN 397 - Industrial safety helmets

In case of large scale fires:

Fire resistant coveralls.

DIN EN 137 - Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking

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Trade name: Marine Diesel 0.1%S (DMA Type)

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EN 469 - Protective clothing for fire fighting

BS EN 1486:2007 - Protective clothing for fire-fighters. Test methods and requirements for reflective clothing for specialized fire-fighting

· 8.2.3 Environmental exposure controls

In case of product spill, an Emergency Response Plan should be followed, to minimise negative consequences.

Define appropriate site specific measures on a case by case basis.

Container contents should be completely used and containers should be emptied prior to discard.

Consult local regulations.

Local guidelines on emission limits must be applied.

· **Risk management measures** For further information, refer to Exposure Scenarios attached as annex.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

· 9.1 Information on basic physical and chemical properties

· General Information

· Appearance:	Clear, Bright.
· Form:	Liquid
· Colour:	Dyed black
· Odour:	Characteristic
· Odour threshold:	Not determined
· pH-value:	Not determined.

· Change in condition

· Melting point/Melting range:	Not determined.
· Boiling point/Boiling range:	175-399 °C (347-750 °F)
· Flash point:	min.60 °C (min.140 °F)
· Flammability (solid, gaseous):	Not applicable.
· Ignition temperature:	≥225 °C (≥437 °F)
· Decomposition temperature:	Not determined.
· Self-igniting:	Not determined.
· Danger of explosion:	Product does not present an explosion hazard.
· Explosion limits:	
· Lower:	The substance is not explosive.
· Upper:	The substance is not explosive.
· Vapour pressure at 40 °C (104 °F):	0.4 kPa (EN13016-1)
· Density:	Not determined.
· Relative density at 15 °C (59 °F)	0.890 g/cm ³ (7.427 lbs/gal)
· Vapour density	Not determined.
· Evaporation rate	Not determined.
· Solubility in / Miscibility with water:	Not determined (UVCB).
· Partition coefficient (n-octanol/water):	Not determined (UVCB).
· Viscosity:	
· Dynamic:	Not determined.
· Kinematic at 40 °C (104 °F):	2.0-6.0 cSt (ISO 3104)

· **9.2 Other information** No further relevant information available.

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Trade name: Marine Diesel 0.1%S (DMA Type)

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SECTION 10: STABILITY AND REACTIVITY

- **10.1 Reactivity**
Not self-reactive.
Does not undergo exothermic decomposition when heated.
Does not react with water.
- **10.2 Chemical stability** Stable under normal conditions of use.
- **Conditions to avoid** No decomposition if used according to specifications.
- **10.3 Possibility of hazardous reactions** No dangerous reactions known.
- **10.4 Conditions to avoid**
Extremely high temperatures.
Heat sources, sparks, open flames and ignition sources.
- **10.5 Incompatible materials**
Halogens
Strong oxidising agents
Strong acids
Alkalis
- **10.6 Hazardous decomposition products**
Product does not decompose under ambient temperatures and normal storage.
Products of thermal degradation:
Carbon monoxide and carbon dioxide
Nitrogen oxides
Sulphur dioxide
Hydrogen sulphide
Unburned hydrocarbons
Polynuclear aromatic hydrocarbons
Particulates

SECTION 11: TOXICOLOGICAL INFORMATION

- **11.1 Information on toxicological effects**
Substance "Distillates (petroleum), hydrodesulfurised middle" is a UVCB substance and member of the CONCAWE category "Other Gasoils".
Information below, applies to all category members.

• **A) Acute toxicity:**

Oral	LD50	>5000 mg/kg bw (rat) ((Equivalent) OECD 401) Dose: 5000ml/kg bw Duration of exposure: 14 days
Dermal	LD50	>2000 mg/kg bw (rabbit) ((Equivalent) OECD 402) Dose: 2000mg/kg bw Duration of exposure: 24h
Inhalation	LC50	4600 mg/m ³ air (rat) ((Equivalent) OECD 403) Dose: 0-7.3 mg/L aerosol Duration of exposure: 4h

• **B) Skin corrosion/irritation:**

Irritation of skin	Irritating	(rabbit) ((Equivalent) OECD 404) Erythema score: 2.75 Oedema score: 3.1 Duration of exposure: 24h
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Trade name: Marine Diesel 0.1%S (DMA Type)

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· C) Serious eye damage/irritation:

Irritation of eyes	Not irritating	(rabbit) ((Equivalent) OECD 405) Overall irritation score: 2 (key study 1) Overall irritation score: 1 (key study 2)
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· D) Respiratory or skin sensitisation:

Skin Sensitisation	Negative	(guinea pig) ((Equivalent) OECD 406) Test material: Hydrodesulfurised middle distillate (CAS 64742-80-9) Dose: 10% v/v in paraffin oil
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· E) Germ cell mutagenicity (Genetic toxicity in vitro/in vivo)

Negative (In vitro)	Bacterial reverse mutation assay (e.g. Ames test) (gene mutation) Test material: Diesel 2 (CAS 64742-46-7)
Marginally mutagenic (In vitro)	Bacterial reverse mutation assay (gene mutation) ((Equivalent) OECD 471) Dose: 0-60µl/plate Test material: Straight run hydrodesulfurised gas oil (CAS 64742-80-9)

· F) Carcinogenicity

Carcinogenic	(mouse) ((Equivalent) OECD 451) Dose: 0, 28.5, 50, 100% (nominal concentration) Duration of exposure: 104 weeks
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· G) Toxicity to reproduction

i. **Effects on fertility** A two-generation reproduction toxicity test (OECD 416) is proposed to fulfill the data requirement.

ii. **Developmental toxicity**

NOAEL (developmental toxicity)	30 mg/kg bw/day (rat) (OECD 414) Dose: 0 - 8 - 30 - 125 - 500 mg/kg/day Duration of exposure: 0-19 days (once daily)
NOAEL (maternal toxicity)	30 mg/kg bw/day (rat) (OECD 414) Dose: 0 - 8 - 30 - 125 - 500 mg/kg/day Duration of exposure: 0-19 days (once daily)
NOAEL (postnatal toxicity)	125 mg/kg bw/day (rat) (OECD 414) Dose: 0 - 8 - 30 - 125 - 500 mg/kg/day Duration of exposure: 0-19 days (once daily) Test material: Heavy atmospheric gas oil (CAS 68915-97-9)

· H) STOT single exposure No available information.

· I) STOT repeated exposure

Dermal	LOAEL (local)	30 mg/kg/day (rat) ((Equivalent) OECD 411) Dose: 0, 30, 125, 500, 2000mg/kg/day Duration of exposure: 13 weeks (5 days/week)
	LOAEL (systemic)	30 mg/kg/day (rat) Dose: 0, 30, 125, 500, 2000mg/kg/day Duration of exposure: 13 weeks (5 days/week)
	NOAEL	25 mg/kg bw/day (rat) ((Equivalent) OECD) Male Dose: 0, 8, 25, 125, 500, 1250mg/kg/day Duration of exposure: 13 weeks (5 days/week) 125 mg/kg bw/day (rat) ((Equivalent) OECD 411) Female Dose: 0, 8, 25, 125, 500, 1250mg/kg/day Duration of exposure: 13 weeks (5 days/week)
Inhalative	NOAEC (local)	0.88 mg/L air (rat) ((Equivalent) OECD 413) Dose: 0 - 0.35 - 0.88 - 1.71mg/L (analytical conc.) Duration of exposure: 13 weeks (twice/week)
	NOAEC (systemic)	>1.71 mg/L air (rat) ((Equivalent) OECD 413) Dose: 0 - 0.35 - 0.88 - 1.71mg/L (analytical conc.) Duration of exposure: 13 weeks (twice/week)

(Contd. on page 14)

Trade name: Marine Diesel 0.1%S (DMA Type)

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· J) Aspiration hazard:

Meets the criteria with kinematic viscosity less than 7cSt /sec at 40°C. Product is classified for aspiration hazard.

SECTION 12: ECOLOGICAL INFORMATION

· 12.1 Toxicity

Substance "Distillates (petroleum), hydrodesulfurised middle" is a UVCB substance and member of the CONCAWE category "Other Gasoils". Information below, applies to all category members.

· 12.1.1 Aquatic toxicity

• Short-term toxicity to fish	LL ₅₀ (96 h, freshwater): 21 mg/L (OECD 203) (Oncorhynchus mykiss)
• Short-term toxicity to aquatic invertebrates	EL ₅₀ (48 h, freshwater): 68 mg/L (OECD 202) (Daphnia magna)
• Long-term toxicity to fish	NOEL (14 d, freshwater): 0.069 mg/L (PETROTOX computer model) (Oncorhynchus mykiss)
• Long-term toxicity to aquatic invertebrates	NOEL (21 d, freshwater): 0.163 mg/L (by PETROTOX computer model) (Daphnia magna)
• Effects on algae / cyanobacteria	ErL ₅₀ (72 h): 22 mg/L
• Toxicity to aquatic microorganisms	EL ₅₀ (40 h): > 1000 mg/L (PETROTOX model) (Tetrahymena pyriformis)

· 12.1.2 Sediment toxicity

Substance is complex (UVCB). Standard tests for sediment toxicity cannot be applied.

· 12.1.3 Terrestrial toxicity

Substance is complex (UVCB). Standard tests for terrestrial toxicity cannot be applied. According to REACH Annex X, studies on long-term or reproductive toxicity to birds do not need to be conducted due to the existence of a large mammalian dataset.

· 12.2 Persistence and degradability

· 12.2.1 Persistence Assessment

An evaluation of representative hydrocarbon structures, indicate some structures meet the Persistent (P) or very Persistent (vP) criteria.

· 12.2.2 Stability

-- Hydrolysis:

Substance is resistant to hydrolysis because it lacks a functional group that is hydrolytically reactive. Therefore, this fate process will not contribute to a measurable degradative loss of this substance from the environment.

-- Phototransformation in air:

Substance is complex (UVCB). Standard tests for atmospheric oxidation half-lives cannot be applied.

-- Phototransformation in water/soil:

It does not have the potential to undergo photolysis in water and soil, and this fate process will not contribute to a measurable degradative loss of this substance from the environment.

· 12.2.3 Biodegradation Substance is readily biodegradable.

· 12.3 Bioaccumulative potential

Substance is complex (UVCB). Standard tests for bioaccumulative potential cannot be applied.

However, constituents of representative hydrocarbon structures show measured or predicted values for log kow in the range of 4 and are considered potentially bioaccumulative.

· 12.4 Mobility in soil

Floats on water. If product enters soil, one or more constituents will be mobile and may contaminate groundwater.

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Trade name: Marine Diesel 0.1%S (DMA Type)

(Contd. of page 14)

Large volumes may penetrate soil and could contaminate groundwater.

• **12.5 Results of PBT and vPvB assessment**

Anthracene is not present in this substance at greater than 0.1% w/w.

- **PBT:** Substance does not fulfil the criteria.
- **vPvB:** Substance does not fulfil the criteria.

• **12.6 Other adverse effects**

Emission characterization is not required because the substance does not fulfill the PBT/vPvB criteria.

SECTION 13: DISPOSAL CONSIDERATIONS

• **13.1 Waste treatment methods**

• **13.1.1 Product / Packaging disposal**

When it is required to dispose of this product - for example following a spillage or tank cleaning operations - this should be done through a recognised waste contractor.

• **Recommendation**

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

• **Recommendation:**

These codes can be given only as a suggestion, according to the original composition of the product, and its intended (foreseeable) use(s). The final user has the responsibility for the attribution of the most suitable code, according to the actual use(s) of the material, contaminations or alterations.

• **13.1.2 Waste treatment - relevant information**

Do not apply industrial sludge to natural soils. Follow local regulations.

• **13.1.3 Sewage disposal - relevant information** Do not dispose in sewerage.

• **13.1.4 Other disposal recommendations**

The waste generator is responsible for the determination of the waste classification and disposal methods according to local regulations.

• **13.2 Additional information** Not available.

SECTION 14: TRANSPORT INFORMATION

• **14.1 UN-Number**

• **ADR, ADN, IMDG, IATA** UN1202

• **14.2 UN proper shipping name**

• **ADR, ADN** 1202 GAS OIL, ENVIRONMENTALLY HAZARDOUS
 • **IMDG Code** GAS OIL, MARINE POLLUTANT
 • **ICAO-TI/IATA-DGR** GAS OIL

• **14.3 Transport hazard class(es)**

• **ADR, IMDG**




• **Class** 3 Flammable liquids.
 • **Label** 3

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Trade name: Marine Diesel 0.1%S (DMA Type)

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<ul style="list-style-type: none"> · AND(R) · ADN/R Class: 	3
<ul style="list-style-type: none"> · ICAO-TI/IATA-DGR 	
	
<ul style="list-style-type: none"> · Class · Label 	3 Flammable liquids. 3
<ul style="list-style-type: none"> · 14.4 Packing group · ADR, IMDG, IATA · Packing Instructions: 	III ADR: P001, IBC03, LP01, R001 ICAO-TI/IATA-DGR: New LTD Qty / Net Qty: Y344/10.0L New PAX PI / Net Qty: 355/60.0L New CAO PI / Net Qty: 366/220.0L
<ul style="list-style-type: none"> · Special packing provisions: · Mixed packing provisions: · Portable Tanks and Bulk Containers: 	None MP19 T2, TP1
<ul style="list-style-type: none"> · 14.5 Environmental Hazards 	Product contains environmentally hazardous substances: Fuels, diesel
<ul style="list-style-type: none"> · IMDG Code Environmental Hazards: Marine pollutant: 	Yes Symbol (fish and tree)
<ul style="list-style-type: none"> · Special marking (ADR/RID): 	Symbol (fish and tree)
<ul style="list-style-type: none"> · 14.6 Special precautions for user · EMS Number: · Tunnel restriction code · Limited quantities (LQ) · Excepted quantities (EQ) 	Warning: Flammable liquids. F-E,S-E D/E 5L Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
<ul style="list-style-type: none"> · 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: 	Not applicable. However, this product is a liquid and if transported in bulk covered under MARPOL 73/78, Annex I.
<ul style="list-style-type: none"> · 14.8 Transport/Additional information: 	The dangerous goods list provides a choice between GAS OIL, DIESEL FUEL or HEATING OIL, LIGHT for the proper shipping name. For gas oil petroleum substances the GAS OIL name will usually be the most appropriate. For marine (IMDG) and air (ICAO/IATA) transport the proper shipping name UN 1202 GAS OIL, DIESEL FUEL or HEATING OIL, LIGHT is applied to gas oil with a closed flash-point of between 23 °C and 60 °C, and an initial boiling point of greater than 35 °C.
<ul style="list-style-type: none"> · ADR Special provisions · Legislative Issues 	363, 640M, 664 -- The regulations for land transport (ADR/RID) and transport by inland waterway (ADNR) contain a

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EXTENDED SAFETY DATA SHEET
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Trade name: Marine Diesel 0.1%S (DMA Type)

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· Remarks:

derogation that requires gas oil, diesel fuel and heating fuel, light with a flash-point of above 60° and not more than 100 °C to be classified as UN 1202.

Although this requirement does not apply to transport by sea (IMDG) and air (ICAO/IATA), it is advised that UN 1202 is applied to gas oils with a closed flash-point of between 23 °C and 100 °C, and an initial boiling point of greater than 35 °C for all types of transport.

-- When transport is by inland waterway (ADNR) the use of UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. will apply to substances that are being transported in packages. UN 3082 can be used provided the substance cannot be assigned to other entries in classes 1 – 8, and provided the substance cannot be assigned to other entries in class 9. UN 3082 belongs to Class 9 Miscellaneous dangerous substances and articles and Classification code M6 applies.

-- For transport by inland waterway (ADNR) in bulk in a tank vessel UN 3082 can be used provided the substance does not meet the classification criteria of any other class or substance within Class 9.

-- ADN(R) will only applied until end 2010 and from 1.1.2011 ADN annexed regulations (ADN 2011) entered into force also on the Rhine.

SECTION 15: REGULATORY INFORMATION

· Registration number: 01-2119480406-37-xxxx

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

· National Regulations

Presidential Decree 12/2012 - Protection of Occupational Health and Safety of Workers exposed to chemical agents (Government Gazette Issue No. 19A, 2012).

Joint Ministerial Decision No 284/2006/2007 - Harmonisation of Greek Law with Council Directive 1999/32/EC relating to a reduction in the sulphur content of certain liquid fuels and amending Directive 93/12/EEC as well as with Directive 2005/33/EC of the European Parliament and of the Council amending Directive 1999/32/EC as regards the sulphur content of marine fuels (Government Gazette Issue 1736B).

Joint Ministerial Decision No 507/2001 - Specifications and tracing/dying procedures of Marine diesel (Government Gazette Issue 484B/2001).

· European regulations

Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC (SEVESO III).

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Trade name: Marine Diesel 0.1%S (DMA Type)

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Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control).

Directive 2009/161/EU of 17 December 2009 establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC.

- **15.2 Chemical safety assessment:** A Chemical Safety Assessment has been carried out.

SECTION 16: OTHER INFORMATION

- **A) Indication of changes**

Sections 2, 11, 12, 14, 16 of the main body of the previous version of this Extended Safety Data Sheet have been revised according to the Regulation (EU) 2015/830 and article 31(9) of the Regulation (EC) 1907/2006 REACH. In addition, the exposure scenarios' annex has been revised.

- **B) Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organisation

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service

Flam. Liq. 3: Flammable liquids, Hazard Category 3

Acute Tox. 4: Acute toxicity, Hazard Category 4

Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2

Carc. 1B: Carcinogenicity, Hazard Category 1B

STOT RE 2: Specific target organ toxicity - Repeated exposure, Hazard Category 2

Asp. Tox. 1: Aspiration hazard, Hazard Category 1

Aquatic Chronic 2: Hazardous to the aquatic environment - Chronic Hazard, Category 2

- **Additional abbreviations and acronyms**

AF: Assessment Factor

CLP: Classification, Labelling and Packaging

CONCAWE: CONservation of Clean Air and Water Europe

DNEL: Derived No Effect Level

ECHA: European Chemicals Agency

ES: Exposure Scenario

LOAEL: Lowest Observed Adverse Effect Level

NOAEL: No Observed Adverse Effect Level

NOEL: No Observed Effect Level

OECD: Organisation for Economic Co-Operation and Development

PBT: Persistent, Bioaccumulative and Toxic

PNEC: Predicted No Effect Concentration

STOT: Specific Target Organ Toxicity

STOT SE: Specific Target Organ Toxicity - Single Exposure

STP: Sewage Treatment Plant

TWA: Time-Weighted-Average

UVCB: Unknown or Variable composition, Complex reaction products or Biological materials

vPvB: Very Persistent and Very Bioaccumulative

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Trade name: Marine Diesel 0.1%S (DMA Type)

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· **C) Key literature references and sources of data**

CONCAWE Report 6/10 "Compilation of selected physical-chemical properties of petroleum substances and sulfur"
CONCAWE REPORT 9/15 "Hazard Classification and Labelling of Petroleum Substances in the EEA – 2015".
OSHA, Occupational Safety & Health Administration, <http://osha.gov>

· **D) Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]**

Flam. Liq.3, H226
Asp. Tox.1, H304
Skin Irrit.2, H315
Acute Tox. 4, H332
Carc.1B, H350
STOT Rep. Exp. 2, H373
Aquatic Chronic 2, H411

· **E) Relevant H-statements (number and full text)**

H226: Flammable liquid and vapour
H304: May be fatal if swallowed and enters airways
H315: Causes skin irritation
H332: Harmful if inhaled
H350: May cause cancer
H373: May cause damage to the blood, thymus and liver through prolonged or repeated exposure
H411: Toxic to aquatic life with long lasting effects

· **F) Training advice** The information of the present document may be used for training purposes.

· **G) Further information**

DISCLAIMER OF LIABILITY The information provided only concerns the specific product and may not apply for the same material if used in combination with any other material(s) or in any process. This information is accurate and reliable according to data which Hellenic Petroleum SA has available on the above date and is given in good faith but without any warranty. The present e-SDS is supplied to customers, for them to consider and judge that the information is appropriate and complete for their particular use of the product. It is their own obligation to pass on relevant exposure scenarios and to use the relevant information to compile their own e-SDSs.

EXPOSURE SCENARIO 1 of 3	
Worker in Industrial Settings	
MARINE DIESEL	
SECTION 1: EXPOSURE SCENARIO TITLE	
	Manufacture of substance
<i>Substance name</i>	"Distillates (petroleum), hydrosulfurized middle"
<i>CAS No.</i>	64742-80-9
<i>Use descriptors</i>	
<u>Chemical product category (PC)</u>	
<u>Process category (PROC)</u>	
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8A	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8B	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC15	Use as laboratory reagent
<u>Environmental Release Category (ERC)</u>	
ERC1	Manufacture of the substance
SpERC	ESVOC SpERC 1.1v1
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).
SECTION 2: OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
<u>Section 2.1: Control of worker exposure</u>	
<i>Product characteristics</i>	
Physical form of product	With potential for aerosol generation [CS138].
Vapour pressure (kPa)	Liquid, vapour pressure < 0.5 kPa at STP [OC3].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].

Frequency and duration of use /exposure	Covers daily exposures up to 8 hours (unless stated differently) [G2].
Other Operational Conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented [G1].
	Operation is carried out at elevated temperature (> 20°C above ambient temperature) [OC7].
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens) [G18].	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 [G20].
General measures (skin irritants) [G19].	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 any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop [E3].
General exposures (closed systems) [CS15].	Handle substance within a predominantly closed system provided with extract ventilation [E49].
	Ensure material transfers are under containment or extract ventilation [E66].
Process sampling [CS2].	Sample via a closed loop or other system to avoid exposure [E8].
Bulk closed loading and unloading [CS501].	Wear suitable gloves tested to EN374 [PPE15].
	Ensure material transfers are under containment or extract ventilation [E66].
Laboratory activities [CS36].	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure [E12].
Equipment cleaning and maintenance [CS39].	Drain down and flush system prior to equipment break-in or maintenance [E55].
	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training [PPE16].
	Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4].
	Deal with spills immediately [C&H13].

Bulk product storage [CS85].	Store substance within a closed system [E84].
<u>Section 2.2: Control of environmental exposure</u>	
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)	2.2E+6
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	6.0E+5
Maximum daily site tonnage (kg/day)	2.0E+6
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].	
If discharging to domestic sewage treatment plant, additional onsite wastewater treatment required [TCR14].	

Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
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 of \geq (%)	99.1
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	81.8
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	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	99.1
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	2.0E+6
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. [ETW4]	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated. [ERW2]	
SECTION 3: EXPOSURE ESTIMATION	
3.1. Health	

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21].

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

SECTION 4: GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE

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 [G22].

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels [G23].

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects [G32].

Available hazard data do not enable the derivation of a DNEL for carcinogenic effects [G33].

Available hazard data do not support the need for a DNEL to be established for other health effects [G36].

Risk Management Measures are based on qualitative risk characterisation.[G37].

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1].

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2].

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination [DSU3].

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

Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file – “Site-Specific Production” worksheet [DSU6].

The Tier 1 analysis demonstrates that no refineries have RCRs > 1.

EXPOSURE SCENARIO 2 of 3	
Worker in Industrial Settings	
MARINE DIESEL	
SECTION 1: EXPOSURE SCENARIO TITLE	
	Distribution of substance
<i>Substance name</i>	"Distillates (petroleum), hydrodesulfurized middle"
<i>CAS No.</i>	64742-80-9
<i>Use descriptors</i>	
<u>Sector of use category (SU): Supplementary descriptor: Sectors of end-use</u>	
<u>Chemical product category (PC)</u>	
<u>Process category (PROC)</u>	
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8A	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8B	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC15	Use as laboratory reagent
<u>Environmental Release Category (ERC)</u>	
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5	Use at industrial site leading to inclusion into/onto article
ERC6A	Use of intermediate
ERC6B	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC6C	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC6D	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC7	Use of functional fluid at industrial site
SpERC	ESVOC SpERC 1.1b.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.
SECTION 2: OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
<u>Section 2.1: Control of worker exposure</u>	

Product characteristics	
Physical form of product	With potential for aerosol generation [CS138].
Vapour pressure (kPa)	Liquid, vapour pressure < 0.5 kPa at STP [OC3].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) [G2].
Other Operational Conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented [G1]. Assumes use at not more than 20°C above ambient temperature, unless stated differently [G15].
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens) [G18].	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 [G20].
General measures (skin irritants) [G19].	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 any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop [E3].
General exposures (closed systems) [CS15].	Ensure material transfers are under containment or extract ventilation [E66].
Process sampling [CS2].	Sample via a closed loop or other system to avoid exposure [E8].
Bulk closed loading and unloading [CS501].	Wear suitable gloves tested to EN374 [PPE15]. Ensure material transfers are under containment or extract ventilation [E66].
Laboratory activities [CS36].	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure [E12].
Equipment cleaning and maintenance [CS39].	Drain down and flush system prior to equipment break-in or maintenance [E55].

	Wear suitable gloves tested to EN374 [PPE15].
	Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4].
	Deal with spills immediately [C&H13].
Storage [CS67].	Store substance within a closed system [E84].
<u>Section 2.2: Control of environmental exposure</u>	
<i>Product characteristics</i>	
	Substance is complex UVCB [PrC3].
	Predominantly hydrophobic [PrC4a].
<i>Amounts used</i>	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.3E+6
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	4.7E+3
Maximum daily site tonnage (kg/day)	4.7E+4
<i>Frequency and duration of use</i>	
Continuous release [FD2].	
Emission Days (days/year)	100
<i>Environmental factors not influenced by risk management</i>	
Local freshwater dilution factor	10
Local marine water dilution factor	100
<i>Other given operational conditions affecting environmental exposure</i>	
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
<i>Technical conditions and measures at process level (source) to prevent release</i>	
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].

No wastewater treatment required [TCR6].

Treat air emission to provide the typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	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

Not applicable as there is no release to wastewater [STP1].

Estimated substance removal from wastewater via domestic sewage treatment (%)	94.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.9
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	1.4E+6
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 local and/or national regulations [ETW3].

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].

SECTION 3: EXPOSURE ESTIMATION

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21].

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

SECTION 4: GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE

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 [G22].

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels [G23].

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects [G32].

Available hazard data do not enable the derivation of a DNEL for carcinogenic effects [G33].

Available hazard data do not support the need for a DNEL to be established for other health effects [G36].

Risk Management Measures are based on qualitative risk characterisation.[G37].

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1].

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2].

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination [DSU3].

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

EXPOSURE SCENARIO 3 of 3

Worker in Professional Settings

MARINE DIESEL

SECTION 1: EXPOSURE SCENARIO TITLE

	Use as a fuel
<i>Substance name</i>	"Distillates (petroleum), hydrodesulfurized middle"
<i>CAS No.</i>	64742-80-9
Use descriptors	

Sector of use category (SU): Supplementary descriptor: Sectors of end-use

Chemical product category (PC)

Process category (PROC)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8A	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8B	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC16	Use of fuels

Environmental Release Category (ERC)

ERC9A	Widespread use of functional fluid (indoor)
ERC9B	Widespread use of functional fluid (outdoor)
SpERC	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.

SECTION 2: OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES

Section 2.1: Control of worker exposure

Product characteristics	
<i>Physical form of product</i>	With potential for aerosol generation [CS138].
<i>Vapour pressure (kPa)</i>	Liquid, vapour pressure < 0.5 kPa at STP [OC3].
<i>Concentration of substance in product</i>	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].

Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) [G2].
Other Operational Conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented [G1].
	Assumes use at not more than 20°C above ambient temperature, unless stated differently [G15].
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens) [G18].	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 [G20].
General measures (skin irritants) [G19].	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 any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop [E3].
Bulk transfers [CS14].	Ensure material transfers are under containment or extract ventilation [E66].
Drum/batch transfers [CS8].	Ensure material transfers are under containment or extract ventilation [E66].
	Wear suitable gloves tested to EN374 [PPE15].
Refuelling activities [CS507].	Ensure material transfers are under containment or extract ventilation [E66].
	Wear suitable gloves tested to EN374 [PPE15].
Use as a fuel [GEST12_I]. (closed systems) [CS107].	No specific measures identified [E18].
Equipment cleaning and maintenance [CS39].	Drain down and flush system prior to equipment break-in or maintenance [E55].
	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training [PPE16].
	Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4].
	Clear spillages immediately [C&H13].
Storage [CS67].	Store substance within a closed system [E84].

Section 2.2: Control of environmental exposure

<i>Product characteristics</i>	Substance is complex UVCB [PrC3].
	Predominantly hydrophobic [PrC4a].
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	7.1E+4
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	3.5E+1
Maximum daily site tonnage (kg/day)	9.7E+1
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	
[OOC7] Release fraction to air from wide dispersive use (regional only)	1.0E-4
[OOC8] Release fraction to wastewater from wide dispersive use	0.00001
[OOC9] Release fraction to soil from wide dispersive use (regional only)	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 [TCR1a]	
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 of ≥ (%)	0.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0.0
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	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.9
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.9
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	7.8E+3
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].	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated. [ERW3]	
SECTION 3: EXPOSURE ESTIMATION	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21].	

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

SECTION 4: GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE

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 [G22].

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels [G23].

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Available hazard data do not enable the derivation of a DNEL for carcinogenic effects [G33].

Available hazard data do not support the need for a DNEL to be established for other health effects [G36].

Risk Management Measures are based on qualitative risk characterisation.[G37].

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1].

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2].

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination [DSU3].

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