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

1.1 Product identifier

Trade name : Methyl Isobutyl Carbinol

Product code : S1216

Registration number EU : 01-2119473979-13-0001

Synonyms: 1,3-dimethyl 1-butanol, 4-methylpentan-2-ol, Methyl Amyl

Alcohol, MIBC

CAS-No. : 108-11-2

EC-No. : 203-551-7

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

Use of the Sub- : Solvent.

stance/Mixture Please refer to section 16 and/or the annexes for the regis-

tered uses under REACH.

Uses advised against :

This product must not be used in applications other than those listed in Section 1 without first seeking the advice of the sup-

plier.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier : Shell Chemicals Europe B.V.

PO Box 2334 3000 CH Rotterdam

Netherlands

Telephone : +31 (0)10 441 5137 / +31 (0)10 441 5191 Telefax : +31 (0)20 716 8316 / +31 (0)20 713 9230

Contact for Safety Data : sccmsds@shell.com

Sheet

1.4 Emergency telephone number

+44 (0) 1235 239 670 (This telephone number is available 24 hours per day, 7 days per

week)

Poison Centre: (+41) 145

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable liquids, Category 3 H226: Flammable liquid and vapour.

Eye irritation, Category 2 H319: Causes serious eye irritation.

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Specific target organ toxicity - single exposure, Category 3, Respiratory system

H335: May cause respiratory irritation.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms





Signal word : Warning

Hazard statements : PHYSICAL HAZARDS:

H226 Flammable liquid and vapour.

HEALTH HAZARDS:

H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

ENVIRONMENTAL HAZARDS:

Not classified as environmental hazard according to

CLP criteria.

Precautionary statements : Prevention:

P210 Keep away from heat, hot surfaces, sparks, open

flames and other ignition sources. No smoking.

P280 Wear protective gloves/ protective clothing/ eye protec-

tion/ face protection.

Response:

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower. P370 + P378 In case of fire: Use appropriate media to extin-

guish.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and

easy to do. Continue rinsing.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container

tightly closed.

Disposal:

P501 Dispose of contents/ container to an approved waste

disposal plant.

2.3 Other hazards

The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB.

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Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger.

Even with proper grounding and bonding, this material can still accumulate an electrostatic charge.

If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable airvapour mixtures can occur.

SECTION 3: Composition/information on ingredients

3.1 Substances

Components

Chemical name	CAS-No.	Concentration (% w/w)
	EC-No.	, ,
4-methylpentan-2-ol	108-11-2	100
	203-551-7	

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : In general no treatment is necessary, however, obtain medical

advice.

Protection of first-aiders : When administering first aid, ensure that you are wearing the

appropriate personal protective equipment according to the

incident, injury and surroundings.

If inhaled : Remove to fresh air. If rapid recovery does not occur,

transport to nearest medical facility for additional treatment.

In case of skin contact : Remove contaminated clothing. Immediately flush skin with

large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If needed, transport

to the nearest medical facility for additional treatment.

In case of eye contact : Immediately flush eye(s) with plenty of water.

Remove contact lenses, if present and easy to do. Continue

rinsing.

Transport to the nearest medical facility for additional treat-

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ment.

If swallowed : If swallowed, do not induce vomiting: transport to nearest

medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

Rinse mouth.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Respiratory irritation signs and symptoms may include a tem-

porary burning sensation of the nose and throat, coughing,

and/or difficulty breathing.

Skin irritation signs and symptoms may include a burning sen-

sation, redness, or swelling.

Eye irritation signs and symptoms may include a burning sen-

sation, redness, swelling, and/or blurred vision.

Ingestion may result in nausea, vomiting and/or diarrhoea.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Call a doctor or poison control center for guidance.

Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Alcohol-resistant foam, water spray or fog. Dry chemical pow-

der, carbon dioxide, sand or earth may be used for small fires

only.

Unsuitable extinguishing

media

None

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-

fighting

The vapour is heavier than air, spreads along the ground and

distant ignition is possible.

Carbon monoxide may be evolved if incomplete combustion

occurs.

5.3 Advice for firefighters

Special protective equipment :

for firefighters

Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to

relevant Standards (e.g. Europe: EN469).

Specific extinguishing meth-

ods

Standard procedure for chemical fires.

Further information : Clear fire area of all non-emergency personnel.

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Keep adjacent containers cool by spraying with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Observe the relevant local and international regulations

Notify authorities if any exposure to the general public or the

environment occurs or is likely to occur.

Local authorities should be advised if significant spillages

cannot be contained.

The vapour is heavier than air, spreads along the ground and

distant ignition is possible.

Vapour may form an explosive mixture with air.

6.1.1 For non emergency personnel: Avoid contact with skin, eyes and clothing.

Isolate hazard area and deny entry to unnecessary or unpro-

tected personnel.

Stay upwind and keep out of low areas.

6.1.2 For emergency responders: Avoid contact with skin, eyes and clothing.

Isolate hazard area and deny entry to unnecessary or unpro-

tected personnel.

Stay upwind and keep out of low areas.

6.2 Environmental precautions

Environmental precautions

Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bond-

ing and grounding (earthing) all equipment. Ventilate contaminated area thoroughly. Monitor area with combustible gas indicator.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up

For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

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6.4 Reference to other sections

For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet., For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures : Avoid breathing of or direct contact with material. Only use in

well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see

Section 8 of this Safety Data Sheet.

Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this

material.

Ensure that all local regulations regarding handling and stor-

age facilities are followed.

Advice on safe handling : Avoid contact with skin, eyes and clothing.

Use local exhaust ventilation if there is risk of inhalation of

vapours, mists or aerosols.

Bulk storage tanks should be diked (bunded).

Extinguish any naked flames. Do not smoke. Remove ignition

sources. Avoid sparks.

Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to

reduce the risk.

The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flamma-

ble.

Properly dispose of any contaminated rags or cleaning mate-

rials in order to prevent fires.

Do NOT use compressed air for filling, discharging, or han-

dling operations.

Product Transfer : Refer to guidance under Handling section.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers

: The vapour is heavier than air. Beware of accumulation in pits and confined spaces. Refer to section 15 for any additional specific legislation covering the packaging and storage of this

product.

Packaging material : Suitable material: For containers, or container linings use mild

steel, stainless steel.

Unsuitable material: Natural, butyl, neoprene or nitrile rubbers.

Container Advice : Containers, even those that have been emptied, can contain

explosive vapours. Do not cut, drill, grind, weld or perform

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similar operations on or near containers.

7.3 Specific end use(s)

Specific use(s) : Please refer to section 16 and/or the annexes for the regis-

tered uses under REACH.

Ensure that all local regulations regarding handling and stor-

age facilities are followed.

See additional references that provide safe handling practices: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices

on Static Electricity).

IEC/TS 60079-32-1: Electrostatic hazards, guidance

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
4-methylpentan-2-	108-11-2	TWA	20 ppm	CH SUVA
ol			85 mg/m3	
	Further inform	nation: Toxic by skin	resorption possible; Substan	ces, which are
	easily absored through the skin, can give by additional skin resoption a sub-			
	stancial higher risk compared to only inhalation by the airways., National Insti-			
	tute for Occupational Safety and Health			
4-methylpentan-2-		STEL	20 ppm	CH SUVA
ol			85 mg/m3	
	Further information: Toxic by skin resorption possible; Substances, which are			
	easily absored through the skin, can give by additional skin resoption a sub-			
	stancial higher risk compared to only inhalation by the airways., National Insti-			
	tute for Occupational Safety and Health			

Biological occupational exposure limits

No biological limit allocated.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
4-methylpentan-2-ol	Workers	Inhalation	Acute systemic effects	208 mg/m3
4-methylpentan-2-ol	Workers	Inhalation	Acute local effects	104 mg/m3
4-methylpentan-2-ol	Workers	Inhalation	Long-term systemic effects	83 mg/m3
4-methylpentan-2-ol	Workers	Inhalation	Long-term local ef- fects	83 mg/m3
4-methylpentan-2-ol	Workers	Dermal	Long-term systemic effects	11,8 mg/kg bw/day

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4-methylpentan-2-ol	Consumers	Inhalation	Acute systemic effects	155,2 mg/m3
4-methylpentan-2-ol	Consumers	Inhalation	Acute local effects	52,1 mg/m3
4-methylpentan-2-ol	Consumers	Inhalation	Long-term systemic effects	14,7 mg/m3
4-methylpentan-2-ol	Consumers	Inhalation	Long-term local ef- fects	14,7 mg/m3
4-methylpentan-2-ol	Consumers	Dermal	Long-term systemic effects	4,2 mg/kg bw/day
4-methylpentan-2-ol	Consumers	Oral	Long-term systemic effects	4,2 mg/kg bw/day

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name		Environmental Compartment	Value
4-methylpentan-2-ol			
Remarks:	Exposure assessments have not been presented for the environment		
	therefore	PNEC values not required.	

8.2 Exposure controls

Engineering measures

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex. Use sealed systems as far as possible.

Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.

Local exhaust ventilation is recommended.

Firewater monitors and deluge systems are recommended.

Eye washes and showers for emergency use.

Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:

General Information

Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

Define procedures for safe handling and maintenance of controls.

Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.

Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.

Drain down system prior to equipment break-in or maintenance.

Retain drain downs in sealed storage pending disposal or subsequent recycle.

Personal protective equipment

Read in conjunction with the Exposure Scenario for your specific use contained in the Annex. The provided information is made in consideration of the PPE directive (Council Directive 89/686/EEC) and the CEN European Committee for Standardisation (CEN) standards.

Personal protective equipment (PPE) should meet recommended national standards. Check with

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PPE suppliers.

Eye protection Wear goggles for use against liquids and gas.

Wear full face shield if splashes are likely to occur.

Approved to EU Standard EN166.

Hand protection

Remarks Where hand contact with the product may occur the use of

gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. Longer term protection: Butyl rubber. Nitrile rubber. Incidental contact/Splash protection: PVC or neoprene rubber gloves. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

Skin and body protection

Wear antistatic and flame-retardant clothing, if a local risk assessment deems it so.

Skin protection is not required under normal conditions of use.

For prolonged or repeated exposures use impervious clothing

over parts of the body subject to exposure.

If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to relevant Standard, and provide employee skin care programmes. Protective clothing approved to EU Standard EN14605.

Respiratory protection

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing appa-

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ratus.

Where air-filtering respirators are suitable, select an appro-

priate combination of mask and filter.

If air-filtering respirators are suitable for conditions of use: Select a filter suitable for organic gases and vapours [Type A

boiling point > 65°C (149°F)] meeting EN14387.

Thermal hazards : Not applicable

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state Liquid.

Colour clear

Odour sweet

Odour Threshold Data not available

Melting / freezing point Data not available

130 - 133 °C Boiling point/boiling range

Flammability

Flammability (solid, gas) Not applicable

Lower explosion limit and upper explosion limit / flammability limit

Upper flammability limit Upper explosion limit /

Upper flammability limit 5,5 %(V)

Lower explosion limit / Lower flammability limit

Lower flammability limit 1 %(V)

Flash point 41 °C

Method: IP 170

305 °C Auto-ignition temperature

Method: ASTM E-659

Decomposition temperature

Decomposition tempera-

Data not available

ture

рΗ Data not available

Viscosity

Viscosity, dynamic 5,2 mPa.s (20 °C)

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Method: ASTM D445

Viscosity, kinematic : Data not available

Solubility(ies)

Water solubility : 16 g/l (20 °C)

Partition coefficient: n-

octanol/water

log Pow: < 3

Vapour pressure : 420 Pa (20 °C)

Relative density : 0,81 (20 °C)

Method: ASTM D4052

Density : 806 - 808 kg/m3 (20 °C)

Method: ASTM D4052

Relative vapour density : 3,5

Particle characteristics

Particle size : Data not available

9.2 Other information

Explosive properties : Not applicable

Oxidizing properties : Data not available

Evaporation rate : 0,3

Method: ASTM D 3539, nBuAc=1

Conductivity: > 10,000 pS/m

A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid, This material is not expected to be

a static accumulator.

Surface tension : 22,7 mN/m, 20 °C

Molecular weight : 102,18 g/mol

SECTION 10: Stability and reactivity

10.1 Reactivity

The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.

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10.2 Chemical stability

No hazardous reaction is expected when handled and stored according to provisions

10.3 Possibility of hazardous reactions

Hazardous reactions : Reacts with strong oxidising agents.

10.4 Conditions to avoid

Conditions to avoid : Avoid heat, sparks, open flames and other ignition sources.

Prevent vapour accumulation.

In certain circumstances product can ignite due to static elec-

tricity.

10.5 Incompatible materials

Materials to avoid : Strong oxidising agents.

10.6 Hazardous decomposition products

Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Information on likely routes of:

exposure

Inhalation is the primary route of exposure although absorption may occur through skin contact or following accidental

ingestion.

Acute toxicity

Product:

Acute oral toxicity : LD50 (Rat): > 2000 - <=5000 mg/kg

Remarks: May be harmful if swallowed.

Acute inhalation toxicity : (Rat): Remarks: Low toxicity by inhalation.

No deaths at highest tested dose.

Acute dermal toxicity : LD50 (Rabbit): > 2000 - <=5000 mg/kg

Remarks: May be harmful in contact with skin.

Skin corrosion/irritation

Product:

Remarks : Causes mild skin irritation.

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Serious eye damage/eye irritation

Product:

Remarks : Causes serious eye irritation.

Respiratory or skin sensitisation

Product:

Remarks : Not a sensitiser.

Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Product:

Genotoxicity in vivo : Remarks: No evidence of mutagenic activity.

Germ cell mutagenicity- As-

sessment

This product does not meet the criteria for classification in

categories 1A/1B.

Carcinogenicity

Product:

Remarks : Not a carcinogen.

Based on available data, the classification criteria are not met.

Carcinogenicity - Assess-

ment

This product does not meet the criteria for classification in

categories 1A/1B.

Material	GHS/CLP Carcinogenicity Classification
4-methylpentan-2-ol	No carcinogenicity classification.

Reproductive toxicity

Product:

Effects on fertility

Remarks: Not a developmental toxicant., Based on available data, the classification criteria are not met., Does not impair

fertility.

Reproductive toxicity - As-

sessment

: This product does not meet the criteria for classification in

categories 1A/1B.

STOT - single exposure

Product:

Remarks : May cause respiratory irritation.

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STOT - repeated exposure

Product:

Remarks Based on available data, the classification criteria are not met.

Aspiration toxicity

Product:

Not an aspiration hazard., Based on available data, the classification criteria are not met.

11.2 Information on other hazards

Endocrine disrupting properties

Product:

Assessment The substance/mixture does not contain components consid-

> ered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at

levels of 0.1% or higher.

Further information

Product:

Remarks Classifications by other authorities under varying regulatory

frameworks may exist.

Remarks Unless indicated otherwise, the data presented is representa-

tive of the product as a whole, rather than for individual com-

ponent(s).

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish Remarks: Practically non toxic:

LL/EL/IL50 > 100 mg/l

Toxicity to daphnia and other : Remarks: Practically non toxic:

aquatic invertebrates

LL/EL/IL50 > 100 mg/l

Toxicity to algae/aquatic plants : Remarks: Practically non toxic:

LL/EL/IL50 > 100 mg/l

Toxicity to fish (Chronic tox-

icity)

Remarks: Data not available

Toxicity to daphnia and other :

aquatic invertebrates (Chron-

Remarks: $NOEC/NOEL > 10 - \langle =100 \text{ mg/l} \rangle$

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ic toxicity)

Toxicity to microorganisms

Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l

12.2 Persistence and degradability

Product:

Biodegradability : Remarks: Readily biodegradable.

Oxidises rapidly by photo-chemical reactions in air.

12.3 Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

12.4 Mobility in soil

Product:

Mobility : Remarks: Dissolves in water.

12.5 Results of PBT and vPvB assessment

Product:

Assessment : The substance does not fulfill all screening criteria for persis-

tence, bioaccumulation and toxicity and hence is not consid-

ered to be PBT or vPvB..

12.6 Endocrine disrupting properties

Product:

Assessment : The substance/mixture does not contain components considered to

have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Product:

Additional ecological infor-

mation

Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Recover or recycle if possible.

It is the responsibility of the waste generator to determine the

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> toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.

Do not dispose into the environment, in drains or in water

courses.

Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment. Waste, spills or used product is dangerous waste.

Disposal should be in accordance with applicable regional. national, and local laws and regulations.

Local regulations may be more stringent than regional or national requirements and must be complied with.

MARPOL - see International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) which provides technical aspects at controlling pollutions from ships.

Contaminated packaging

Drain container thoroughly.

After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard.

Do not, puncture, cut, or weld uncleaned drums. Send to drum recoverer or metal reclaimer.

Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand. Disposal should be in accordance with applicable regional, national, and local laws and regulations.

Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.

SECTION 14: Transport information

14.1 UN number or ID number

ADN : 2053 **ADR** 2053 RID 2053 **IMDG** 2053 IATA 2053

14.2 UN proper shipping name

ADN : METHYL ISOBUTYL CARBINOL **ADR** METHYL ISOBUTYL CARBINOL RID METHYL ISOBUTYL CARBINOL

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IMDG : METHYL ISOBUTYL CARBINOL

IATA : Methyl isobutyl carbinol

14.3 Transport hazard class(es)

ADN : 3
ADR : 3
RID : 3
IMDG : 3
IATA : 3

14.4 Packing group

ADN

Packing group : III
Classification Code : F1
Labels : 3

CDNI Inland Water Waste : NST 8963 Solvent

Agreement

ADR

Packing group : III
Classification Code : F1
Hazard Identification Number : 30
Labels : 3

RID

Packing group : III
Classification Code : F1
Hazard Identification Number : 30
Labels : 3

IMDG

Packing group : III Labels : 3

IATA

Packing group : III Labels : 3

14.5 Environmental hazards

ADN

Environmentally hazardous : no

ADR

Environmentally hazardous : no

RID

Environmentally hazardous : no

IMDG

Marine pollutant : no

14.6 Special precautions for user

Remarks : Special Precautions: Refer to Section 7, Handling & Storage,

for special precautions which a user needs to be aware of or

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needs to comply with in connection with transport.

14.7 Maritime transport in bulk according to IMO instruments

Pollution category : Z

Ship type : 3; Must be Double Hulled Product name : Methyl amyl alcohol

Additional Information: This product may be transported under nitrogen blanketing.

Nitrogen is an odourless and invisible gas. Exposure to nitrogen enriched atmospheres displaces available oxygen which may cause asphyxiation or death. Personnel must observe strict safety precautions when involved with a confined space entry. Transport in bulk according to Annex II of Marpol and

the IBC Code

SECTION 15: Regulatory information

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

REACH - List of substances subject to authorisation

(Annex XIV)

: Product is not subject to Authorisa-

tion under REACH.

REACH - Candidate List of Substances of Very High

Concern for Authorisation (Article 59).

This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH),

Article 57).

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

P5c FLAMMABLE LIQUIDS

Waters Protection Ordinance (WPO 814.201)

Water pollution class : Swiss Class B, (www.tankportal.ch)

Other regulations:

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Product is subject to Stoerfallverordnung (StFV).

The components of this product are reported in the following inventories:

DSL : Listed

IECSC : Listed

ENCS : Listed

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KECI : Listed

PICCS : Listed

TSCA : Listed

TCSI : Listed

NZIoC : Listed

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of other abbreviations

CH SUVA : Switzerland. Limit values at the work place

CH SUVA / TWA : Time Weighted Average CH SUVA / STEL : Short Term Exposure Limit

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA -European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI -Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA

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- Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Training advice : Provide adequate information, instruction and training for op-

erators.

Other information : For Industry guidance and tools on REACH please visit the

CEFIC website at http://cefic.org/Industry-support.

The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not consid-

ered to be PBT or vPvB.

A vertical bar (|) in the left margin indicates an amendment

from the previous version.

Sources of key data used to compile the Safety Data

Sheet

The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU

IUCLID date base, EC 1272 regulation, etc).

Classification of the mixture: Classification procedure:

Flam. Liq. 3 H226 On basis of test data.

Eye Irrit. 2 H319 Expert judgement and weight of evi-

dence determination.

STOT SE 3 H335 Expert judgement and weight of evi-

dence determination.

Identified Uses according to the Use Descriptor System

Uses - Worker

Title : Manufacture of substance

- Industrial

Uses - Worker

Title : Use as an intermediate

- Industrial

Uses - Worker

Title : Distribution of substance

- Industrial

Uses - Worker

Title : Formulation & (re)packing of substances and mixtures

- Industrial

Uses - Worker

Title : Use in Oil and Gas field drilling and production operations

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- Industrial

Uses - Worker

Title : Functional Fluids

- Industrial

Uses - Worker

Title : Functional Fluids

- Professional

Uses - Worker

Title : Use in laboratories

- Industrial

Uses - Worker

Title : Use in laboratories

- Professional

Uses - Worker

Title : Mining chemicals

- Industrial

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

CH / EN

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Exposure Scenario - Worker

30000000384	0000000384		
SECTION 1	EXPOSURE SCENARIO TITLE		
Title	Manufacture of substance- Industrial		
Use Descriptor	Sector of Use: SU 3, SU8, SU9 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15 Environmental Release Categories: ERC1, ERC4		
Scope of process	Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.		

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
Additional Information	No exposure assessment presented for the environment.	
Section 2.1	Control of Worker Exposure	
Product Characteristics		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP	
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100%.,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).		

Contributing Scenarios

General measures (skin irritants).

Risk Management Measures

Avoid direct skin contact with product. Identify potential are for indirect skin contact. Wear gloves (tested to EN374) if

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 any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (eye irritants).	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.
General exposures (closed systems)PROC1PROC2PROC3	No other specific measures identified.
General exposures (open systems)PROC4	No other specific measures identified.

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Process samplingPROC8b	Avoid carrying out activities involving exposure for more than 15 minutes.
Laboratory activitiesPROC15	No other specific measures identified.
Bulk transfers(open systems)PROC8b	No other specific measures identified.
Bulk transfers(closed systems)PROC8b	No other specific measures identified.
Equipment cleaning and maintenancePROC8a	No other specific measures identified.
Storage.PROC1PROC2	Store substance within a closed system.

Section 2.2	Control of Environmental Exposure	
No exposure assessment presented for the environment.		

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The ECETOC TRA tool has b	peen used to estimate workplace exposures unless otherwise

indicated.

Section 3.2 -Environment No exposure assessment presented for the environment.

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 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.

Section 4.2 - Environment

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

30000000385	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use as an intermediate- Industrial
Use Descriptor	Sector of Use: SU 3, SU8, SU9 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15 Environmental Release Categories: ERC1, ERC4
Scope of process	Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES
Additional Information	No exposure assessment presented for the environment.
Section 2.1	Control of Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100%.,
Frequency and Duration of Use	
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).	

Contributing Scenarios

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 contamina-

tion/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.

General measures (eye irri-

tants).

Avoid direct eye contact with product, also via contamination on hands.

General exposures (closed No other specific measures identified.

systems)PROC1PROC2PROC3

General exposures (open systems)PROC4

No other specific measures identified.

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Process samplingPROC8b	Avoid carrying out activities involving exposure for more than 15 minutes.
Laboratory activitiesPROC15	No other specific measures identified.
Bulk transfers(open systems)PROC8b	No other specific measures identified.
Bulk transfers(closed systems)PROC8b	No other specific measures identified.
Equipment cleaning and maintenancePROC8a	No other specific measures identified.
Storage.PROC1PROC2	Store substance within a closed system.

Section 2.2	Control of Environmental Exposure	
No exposure assessment presented for the environment.		

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise	

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

Section 3.2 - Environment

No exposure assessment presented for the environment.

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 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.

Section 4.2 - Environment

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

30000000386	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Distribution of substance- Industrial
Use Descriptor	Sector of Use: SU 3, SU8, SU9 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15 Environmental Release Categories: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7
Scope of process	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
Additional Information	No exposure assessment presented for the environment.	
Section 2.1	Control of Worker Exposure	
Product Characteristics		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP	
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100%.,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		
Assumes a good basic standard of occupational hygiene is implemented.		

Assumes use at not more than 20°C above ambient temperature (unless stated differently).

Contributing Scenarios	Risk Management Measures
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 any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (eye irritants).	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.
General exposures (closed systems)PROC1	No other specific measures identified.
General exposures.with occasional controlled expo-	No other specific measures identified.

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sure.PROC2	
General exposures (closed systems)Batch processPROC3	No other specific measures identified.
General exposures (open systems)PROC4	Provide extraction ventilation at points where emissions occur.
Process samplingPROC3	No other specific measures identified.
Laboratory activi- tiesPROC15	No other specific measures identified.
Bulk transfers(closed systems)PROC8b	No other specific measures identified.
Bulk transfers(open systems)PROC8b	No other specific measures identified.
Drum and small package fillingPROC9	Clear spills immediately.
Equipment cleaning and maintenancePROC8b	Retain drain downs in sealed storage pending disposal or for subsequent recycle.
Storage.PROC1PROC2	Store substance within a closed system.
Section 2.2	Control of Environmental Exposure
No exposure assessment presented for the environment.	

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise	

indicated.

Section 3.2 - Environment

No exposure assessment presented for the environment.

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 4.1 - Health	
D I' (I DAI/AA) EL LA D'LAA	

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.

Section 4.2 -Environment	
No exposure assessment presented for the environment.	

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Exposure Scenario - Worker

30000000387	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Formulation & (re)packing of substances and mixtures- Industrial
Use Descriptor	Sector of Use: SU 10 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15 Environmental Release Categories: ERC2
Scope of process	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
Additional Information	No exposure assessment presented for the environment.	
Section 2.1	Control of Worker Exposure	
Product Characteristics	Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP	
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100%.,	
Frequency and Duration of Use		
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Conditions affecting Exposure		

Assumes a good basic standard of occupational hygiene is implemented. Assumes use at not more than 20°C above ambient temperature (unless stated differently).

Contributing Scenarios	Risk Management Measures
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 any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (eye irritants).	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.
General exposures (closed systems)PROC1	No other specific measures identified.
General exposures (closed	No other specific measures identified.

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General exposures (closed systems)Batch processPROC3 General exposures (open systems)PROC4 Batch processes at elevated temperaturesPROC3 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Batch processes at elevated temperaturesPROC3 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Process samplingPROC3 No other specific measures identified. Laboratory activitiesPROC15 Bulk transfersDedicated facilityPROC8b Mixing operations (open systems)PROC5 Transfer from/pouring from containersManualPROC8a Drum/batch transfersDedicated facilityPROC8b Drum/batch transfersDedicated facilityPROC8b No other specific measures identified. Use drum pumps or carefully pour from containers. No other specific measures identified. Use drum pumps or carefully pour from container. No other specific measures identified. No other specific measures identified. Drum and small package fillingPROC9 Equipment cleaning and maintenancePROC8a Storage.PROC1PROC2 Store substance within a closed system. Section 2.2 Control of Environmental Exposure	systems)with occasional controlled exposure.PROC2		
systems)PROC4 cur. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Batch processes at elevated temperaturesPROC3 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Process samplingPROC3 No other specific measures identified. Laboratory activitiesPROC15 Bulk transfersDedicated facilityPROC8b Mixing operations (open systems)PROC5 Transfer from/pouring from containersManualPROC8a Drum/batch transfersDedicated facilityPROC8b Production or preparation or articles by tabletting, compression, extrusion or pelletisationPROC14 Drum and small package fillingPROC9 Equipment cleaning and maintenancePROC8a Storage.PROC1PROC2 Store substance within a closed system.	systems)Batch pro- cessPROC3	·	
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Process samplingPROC3 No other specific measures identified. Laboratory activitiesPROC15 Bulk transfersDedicated facilityPROC8b Mixing operations (open systems)PROC5 Transfer from/pouring from containersManualPROC8a Drum/batch transfersDedicated facilityPROC8b Production or preparation or articles by tabletting, compression, extrusion or pelletisationPROC14 Drum and small package fillingPROC9 Equipment cleaning and maintenancePROC8a Storage.PROC1PROC2 Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). No other specific measures identified. Clear transfer lines prior to de-coupling. Clear spills immediately. Remotely vent displaced vapours. No other specific measures identified. Use drum pumps or carefully pour from container. Vo other specific measures identified. No other specific measures identified. No other specific measures identified. Drain down system prior to equipment opening or maintenance. Storage.PROC1PROC2 Store substance within a closed system.		cur. , or: Provide a good standard of general ventilation (not less than	l
Laboratory activitiesPROC15 Bulk transfersDedicated facilityPROC8b Mixing operations (open systems)PROC5 Transfer from/pouring from containersManualPROC8a Drum/batch transfersDedicated facilityPROC8b Production or preparation or articles by tabletting, compression, extrusion or pelletisationPROC14 Drum and small package fillingPROC9 Equipment cleaning and maintenancePROC8a Storage.PROC1PROC2 No other specific measures identified. Use drum pumps or carefully pour from container. Use drum pumps or carefully pour from container. No other specific measures identified. No other specific measures identified. No other specific measures identified. Storage.PROC1PROC2 Store substance within a closed system.		Provide a good standard of general ventilation (not less than	ı
Bulk transfersDedicated facilityPROC8b Clear transfer lines prior to de-coupling. Clear spills immediately. Remotely vent displaced vapours. Mixing operations (open systems)PROC5 Transfer from/pouring from containersManualPROC8a Drum/batch transfersDedicated facilityPROC8b Production or preparation or articles by tabletting, compression, extrusion or pelletisationPROC14 Drum and small package fillingPROC9 Equipment cleaning and maintenancePROC8a Storage.PROC1PROC2 Clear transfer lines prior to de-coupling. Clear spills immediately. Remotely vent displaced vapours. No other specific measures identified. Storage.PROC1PROC2 Store substance within a closed system.	Process samplingPROC3	No other specific measures identified.	
Clear spills immediately. Remotely vent displaced vapours. Mixing operations (open systems)PROC5 Transfer from/pouring from containersManualPROC8a Drum/batch transfersDedicated facilityPROC8b Production or preparation or articles by tabletting, compression, extrusion or pelletisationPROC14 Drum and small package fillingPROC9 Equipment cleaning and maintenancePROC8a Storage.PROC1PROC2 Clear spills immediately. Remotely vent displaced vapours. No other specific measures identified. No other specific measures identified. No other specific measures identified. Storage.PROC1PROC2 Store substance within a closed system.		No other specific measures identified.	
Transfer from/pouring from containersManualPROC8a Drum/batch transfersDedicated facilityPROC8b Production or preparation or articles by tabletting, compression, extrusion or pelletisationPROC14 Drum and small package fillingPROC9 Equipment cleaning and maintenancePROC8a Storage.PROC1PROC2 Use drum pumps or carefully pour from container. No other specific measures identified. No other specific measures identified. No other specific measures identified. Drain down system prior to equipment opening or maintenance. Storage.PROC1PROC2 Store substance within a closed system.		Clear spills immediately.	
Transfer from/pouring from containersManualPROC8a Drum/batch transfersDedicated facilityPROC8b Production or preparation or articles by tabletting, compression, extrusion or pelletisationPROC14 Drum and small package fillingPROC9 Equipment cleaning and maintenancePROC8a Storage.PROC1PROC2 Use drum pumps or carefully pour from container. No other specific measures identified. No other specific measures identified. Production or preparation or articles by tabletting, compression, extrusion or pelletisationPROC14 Drum and small package fillingPROC9 Equipment cleaning and maintenancePROC8a Storage.PROC1PROC2 Store substance within a closed system.		No other specific measures identified.	
Cated facilityPROC8b Production or preparation or articles by tabletting, compression, extrusion or pelletisationPROC14 Drum and small package fillingPROC9 Equipment cleaning and maintenancePROC8a No other specific measures identified. No other specific measures identified. Drain down system prior to equipment opening or maintenance. Storage.PROC1PROC2 Store substance within a closed system.	Transfer from/pouring from	Use drum pumps or carefully pour from container.	
or articles by tabletting, compression, extrusion or pelletisationPROC14 Drum and small package fillingPROC9 Equipment cleaning and maintenancePROC8a Drain down system prior to equipment opening or maintenance. Storage.PROC1PROC2 Store substance within a closed system.		·	
Equipment cleaning and maintenancePROC8a Drain down system prior to equipment opening or maintenance. Storage.PROC1PROC2 Store substance within a closed system.	or articles by tabletting, compression, extrusion or	No other specific measures identified.	
maintenancePROC8a nance. Storage.PROC1PROC2 Store substance within a closed system.		No other specific measures identified.	
	Equipment cleaning and		
Section 2.2 Control of Environmental Exposure	Storage.PROC1PROC2	Store substance within a closed system.	
No exposure assessment presented for the environment.		Control of Environmental Exposure	

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The ECETOC TRA tool has I indicated.	peen used to estimate workplace exposures unless otherwise

Section 3.2 -Environment

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No exposure assessment presented for the environment.

SECTION 4 GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO

Section 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.

Section 4.2 - Environment

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

30000000388	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in Oil and Gas field drilling and production operations- Industrial
Use Descriptor	Sector of Use: SU 3 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b Environmental Release Categories: ERC4
Scope of process	Oil field well drilling and production operations (including drilling muds and well cleaning) including material transfers, onsite formulation, well head operations, shaker room activities and related maintenance.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES
Additional Information	No exposure assessment presented for the environment.
Section 2.1	Control of Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100%.,
Frequency and Duration o	f Use
Covers daily exposures up t	o 8 hours (unless stated differently).
Other Operational Condition	ons affecting Exposure
Assumes a good basic stan-	dard of occupational hygiene is implemented.

Assumes a good basic standard of occupational hygiene is implemented.

Assumes use at not more than 20°C above ambient temperature (unless stated differently).

Contributing Scenarios	Risk Management Measures
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 any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (eye irritants).	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.
Bulk transfers from tote tanks and supply vesselsPROC8b	Transfer via enclosed lines. Clear transfer lines prior to de-coupling.
Filling/ preparation of	Use drum pumps or carefully pour from container.

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equipment from drums or containers.PROC8b	
Drilling mud (re-)formulationUse in contained batch process- esPROC3	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Drill floor operationsPROC4	Ensure operation is undertaken outdoors. , or: Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Operation of solids filtering equipmentelevated temperaturePROC4	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.
Cleaning of solids filtering equipmentPROC8a	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Treatment and disposal of filtered solidsPROC3	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Process samplingPROC3	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
General exposures (closed systems)PROC1	No other specific measures identified.
Pouring from small containersPROC8a	No other specific measures identified.
General exposures (open systems)PROC4	Provide extraction ventilation at points where emissions occur. Use drum pumps or carefully pour from container.
Equipment cleaning and maintenancePROC8a	Drain down system prior to equipment opening or maintenance.
Storage.PROC1PROC2	Store substance within a closed system.
Section 2.2	Control of Environmental Exposure
No exposure assessment pre	esented for the environment.

SECTION 3	EXPOSURE ESTIMATION
Section 3.1 - Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise	
indicated.	

Section 3.2 -Environment
No exposure assessment presented for the environment.

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE
	EXPOSURE SCENARIO

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Section 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.

Section 4.2 - Environment

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

30000000389	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Functional Fluids- Industrial
Use Descriptor	Sector of Use: SU 3 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9 Environmental Release Categories: ERC7
Scope of process	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES
Additional Information	No exposure assessment presented for the environment.
Section 2.1	Control of Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100%.,
Frequency and Duration of	Use
Covers daily exposures up to 8 hours (unless stated differently).	
Other Operational Conditions affecting Exposure	
Assumes a good basic stand	dard of occupational hygiene is implemented.
Assumes use at not more than 20°C above ambient temperature (unless stated differently).	

Contributing Scenarios	Risk Management Measures
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 any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (eye irritants).	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.
Bulk transfers(closed systems)PROC1PROC2PROC3	No other specific measures identified.
Drum/batch transfersDedicate facilityPROC8b	No other specific measures identified.
Filling of arti- cles/equipment(closed sys-	No other specific measures identified.

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tems)PROC9	
ManualFilling/ preparation of equipment from drums or con-	No other specific measures identified.
tainers.PROC8a	
General exposures (closed systems)PROC2	No other specific measures identified.
General exposures (open systems)PROC4	No other specific measures identified.
General exposures (open systems)elevated temperature-PROC4	Provide extraction ventilation at points where emissions occur.
Equipment cleaning and maintenancePROC8a	No other specific measures identified.
Storage.PROC1PROC2	Store substance within a closed system.

Section 2.2	Control of Environmental Exposure	
No exposure assessment presented for the environment.		

SECTION 3	EXPOSURE ESTIMATION	
Section 3.1 - Health		
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise		
indicated.		

Section 3.2 - Environment

No exposure assessment presented for the environment.

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 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.

Section 4.2 -Environment

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

30000000390	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Functional Fluids- Professional
Use Descriptor	Sector of Use: SU 22 Process Categories: PROC1, PROC2, PROC3, PROC8a, PROC9, PROC20 Environmental Release Categories: ERC9a, ERC9b
Scope of process	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
Additional Information	No exposure assessment presented for the environment.	
Section 2.1	Control of Worker Exposure	
Product Characteristics		
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP	
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100%.,	
Frequency and Duration of	f Use	
Covers daily exposures up to 8 hours (unless stated differently).		
Other Operational Condition	ons affecting Exposure	
Assumes a good basic stand	dard of occupational hygiene is implemented.	
Assumes use at not more than 20°C above ambient temperature (unless stated differently).		

Contributing Scenarios	Risk Management Measures
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 any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (eye irritants).	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.
Drum/batch transfersPROC8a	Use drum pumps or carefully pour from container.
Transfer from/pouring from co tainersFilling/ preparation of equipment from drums or con- tainers.PROC9	

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General exposures (closed	No other specific measures identified.
systems)PROC1PROC2PROC3	·
Operation of equipment contain-	No other specific measures identified.
ing engine oils and simi-	·
lar.(closed systems)PROC20	
Operation of equipment contain-	Provide extraction ventilation at points where emissions oc-
ing engine oils and simi-	cur.
lar.(closed systems)elevated	
temperaturePROC20	
Remanufacture of reject arti-	Provide a good standard of general ventilation (not less than
clesPROC9	3 to 5 air changes per hour).
	,
Equipment cleaning and	Drain down system prior to equipment opening or mainte-
maintenancePROC8a	nance.
Storage.PROC1PROC2	Store substance within a closed system.
	·

Section 2.2	Control of Environmental Exposure	
No exposure assessment presented for the environment.		

SECTION 3	EXPOSURE ESTIMATION	
Section 3.1 - Health		
The ECETOC TRA tool has be indicated.	peen used to estimate workplace exposures unless otherwise	

Section 3.2 - Environment

No exposure assessment presented for the environment.

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 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.	

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.

Section 4.2 -Environment	
No exposure assessment presented for the environment.	

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Exposure Scenario - Worker

SECTION 2

EVENOURE COEMARIO TITLE
EXPOSURE SCENARIO TITLE
Use in laboratories- Industrial
Sector of Use: SU 3
Process Categories: PROC10, PROC15
Environmental Release Categories: ERC2, ERC4
Use of the substance within laboratory settings, including
material transfers and equipment cleaning.

OPERATIONAL CONDITIONS AND RISK MANAGEMENT

SECTION 2	MEASURES
Additional Information	No exposure assessment presented for the environment.
Section 2.1	Control of Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100%.,
Frequency and Duration of	
	o 8 hours (unless stated differently).
Other Operational Condition	
	dard of occupational hygiene is implemented. an 20°C above ambient temperature (unless stated differently).
Contributing Scenarios	Risk Management Measures
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 any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (eye irritants).	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.
Laboratory activi- tiesPROC15	No other specific measures identified.
CleaningPROC10	No other specific measures identified.
Section 2.2	Control of Environmental Exposure
No exposure assessment pr	esented for the environment.

SECTION 3	EXPOSURE ESTIMATION

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Section 3.1 - Health

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

Section 3.2 - Environment

No exposure assessment presented for the environment.

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE
	EXPOSURE SCENARIO

Section 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.

Section 4.2 - Environment

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

30000000392	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Use in laboratories- Professional
Use Descriptor	Sector of Use: SU 22 Process Categories: PROC10, PROC15 Environmental Release Categories: ERC8a
Scope of process	Use of small quantities within laboratory settings, including material transfers and equipment cleaning.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES
Additional Information	No exposure assessment presented for the environment.
Section 2.1	Control of Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100%.,
Frequency and Duration of	Use
Covers daily exposures up to	8 hours (unless stated differently).
Other Operational Conditio	
	ard of occupational hygiene is implemented. In 20°C above ambient temperature (unless stated differently).
Contributing Scenarios	Risk Management Measures
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 any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (eye irritants).	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.
Laboratory activi- tiesPROC15	No other specific measures identified.
CleaningPROC10	No other specific measures identified.
Section 2.2	Control of Environmental Exposure
No exposure assessment pre	esented for the environment.

SECTION 3	EXPOSURE ESTIMATION

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Section 3.1 - Health

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

Section 3.2 - Environment

No exposure assessment presented for the environment.

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO

Section 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.

Section 4.2 - Environment

No exposure assessment presented for the environment.

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Exposure Scenario - Worker

containersPROC9

30000000393	
SECTION 1	EXPOSURE SCENARIO TITLE
Title	Mining chemicals- Industrial
Use Descriptor	Sector of Use: SU 3 Process Categories: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9 Environmental Release Categories: ERC4
Scope of process	Covers the use of the substance in extraction processes at mining operations, including material transfers, winning and separation activities, and substance recovery and disposal.

SECTION 2	OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES
Additional Information	No exposure assessment presented for the environment.
Section 2.1	Control of Worker Exposure
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100%.,
Frequency and Duration of	Use
Covers daily exposures up to	8 hours (unless stated differently).
Other Operational Condition	ons affecting Exposure
Assumes a good basic stand	lard of occupational hygiene is implemented.
Assumes use at not more that	an 20°C above ambient temperature (unless stated differently).
Contributing Scenarios	Risk Management Measures
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 any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (eye irritants).	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.
Bulk transfers(closed systems)PROC2	Transfer via enclosed lines.
Drum/batch transfersDedicated facilityPROC8b	No other specific measures identified.
ManualPouring from small	No other specific measures identified.

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General exposures (closed systems)PROC3	No other specific measures identified.
General exposures (open systems)PROC5	Restrict area of openings to equipment.
phase separation(open systems)PROC4	No other specific measures identified.
ion exchange process- es(closed systems)PROC2	No other specific measures identified.
Process samplingPROC3	No other specific measures identified.
Equipment cleaning and maintenancePROC8a	Drain down system prior to equipment opening or maintenance.
Storage.PROC1	Store substance within a closed system.
Section 2.2	Control of Environmental Exposure
No exposure assessment pre	esented for the environment.

SECTION 3	EXPOSURE ESTIMATION	
Section 3.1 - Health		
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise		
indicated.		

Section 3.2 - Environment

No exposure assessment presented for the environment.

SECTION 4	GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO
Section 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.

Section 4.2 - Environment

No exposure assessment presented for the environment.