Safety data sheet

according to Regulation (EC) No. 1907/2006 (REACH)

Sulphuric acid 20 %, pure

article number: **4300**
Version: **1.0 en**

date of compilation: 2021-08-25

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

1.1 Product identifier

Identification of the substance	**Sulphuric acid** 20 %, pure
Article number	4300
Registration number (REACH)	not relevant (mixture)
Index number in CLP Annex VI	[016-020-00-8]
EC number	[231-639-5]
CAS number	[7664-93-9]

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

Relevant identified uses:	Laboratory chemical Laboratory and analytical use
Uses advised against:	Do not use for squirting or spraying. Do not use for products which come into direct contact with the skin. Do not use for products which come into contact with foodstuffs. Do not use for private purposes (household).

1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone:+49 (0) 721 - 56 06 0
Telefax: +49 (0) 721 - 56 06 149
e-mail: sicherheit@carlroth.de
Website: www.carlroth.de

Competent person responsible for the safety data sheet:	:Department Health, Safety and Environment
e-mail (competent person):	**sicherheit@carlroth.de**

1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
National Poisons Information Centre Beaumont Hospital	Beaumont Road	Dublin 9	01 809 2166	https://www.poisons.ie/

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
2.16	Substance or mixture corrosive to metals	1	Met. Corr. 1	H290
3.2	Skin corrosion/irritation	1A	Skin Corr. 1A	H314
3.3	Serious eye damage/eye irritation	1	Eye Dam. 1	H318

For full text of abbreviations: see SECTION 16

The most important adverse physicochemical, human health and environmental effects

Skin corrosion produces an irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

Signal word **Danger**

Pictograms

GHS05

Hazard statements

H290 May be corrosive to metals
H314 Causes severe skin burns and eye damage

Precautionary statements

Precautionary statements - prevention

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

Precautionary statements - response

P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P308+P311 IF exposed or concerned: Call a POISON CENTER/doctor

Hazardous ingredients for labelling: Sulphuric acid ...%

Labelling of packages where the contents do not exceed 125 ml

Signal word: **Danger**

Symbol(s)

H314	Causes severe skin burns and eye damage.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
contains:	Sulphuric acid ...%

2.3 Other hazards

Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

SECTION 3: Composition/information on ingredients

3.1 Substances

not relevant (mixture)

Molecular formula H_2O_4S

Molar mass $98{,}07\ ^{g}/_{mol} + H_2O$

3.2 Mixtures

Description of the mixture

Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes
Sulphuric acid ...%	CAS No 7664-93-9 EC No 231-639-5 Index No 016-020-00-8 REACH Reg. No 01-2119458838-20-xxxx	19 – < 22	Met. Corr. 1 / H290 Skin Corr. 1A / H314 Eye Dam. 1 / H318		B(a) GHS-HC IARC: 1 IOELV RoC "Known"

Notes

B(a): The classification refers to an aqueous solution
GHS-HC: Harmonised classification (the classification of the substance corresponds to the entry in the list according to 1272/2008/EC, Annex VI)
IARC: 1: IARC group 1: carcinogenic to humans (International Agency for Research on Cancer)
IOELV: Substance with a community indicative occupational exposure limit value
RoC NTP-RoC: Known To Be A Human Carcinogen
"Known"
:

Name of substance	Identifier	Specific Conc. Limits	M-Factors	ATE	Exposure route
Sulphuric acid ...%	CAS No 7664-93-9 EC No 231-639-5 Index No 016-020-00-8	Skin Corr. 1A; H314: C ≥ 15 % Skin Irrit. 2; H315: 5 % ≤ C < 15 % Eye Dam. 1; H318: C ≥ 15 % Eye Irrit. 2; H319: 5 % ≤ C < 15 %	-	-	

For full text of abbreviations: see SECTION 16

SECTION 4: First aid measures

4.1 Description of first aid measures

General notes

Take off immediately all contaminated clothing. Self-protection of the first aider.

Following inhalation

Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

Following skin contact

Remove mechanically (e.g. dab away using wadding or cellulose material) then thoroughly wash the affected skin with a mild cleansing agent and water. Immediate medical treatment required because corrosive injuries that are not treated are hard to cure.

Following eye contact

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist. Protect uninjured eye.

Following ingestion

Rinse mouth immediately and drink plenty of water. Call a physician immediately. If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects).

4.2 Most important symptoms and effects, both acute and delayed

Corrosion, Gastric perforation, Risk of serious damage to eyes, Risk of blindness

4.3 Indication of any immediate medical attention and special treatment needed

none

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

co-ordinate firefighting measures to the fire surroundings
water spray, alcohol resistant foam, dry extinguishing powder, BC-powder, carbon dioxide (CO_2)

Unsuitable extinguishing media

water jet

5.2 Special hazards arising from the substance or mixture

Non-combustible.

Hazardous combustion products

In case of fire may be liberated: Sulphur oxides (SOx)

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus. Wear full chemical protective clothing.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Use personal protective equipment as required. Avoid contact with skin, eyes and clothes. Do not breathe vapour/spray.

6.2 Environmental precautions

Keep away from drains, surface and ground water. The product is an acid. Before discharge into sewage plants the product normally needs to be neutralised.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains.

Advice on how to clean up a spill

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

Other information relating to spills and releases

Place in appropriate containers for disposal.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Handle and open container with care. Clear contaminated areas thoroughly.

Advice on general occupational hygiene

Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed. Store in a dry place. Hygroscopic.

Incompatible substances or mixtures

Observe hints for combined storage.

Protect against external exposure, such as

humidity

Consideration of other advice:

Specific designs for storage rooms or vessels

Recommended storage temperature: 15 – 25 °C

7.3 Specific end use(s)

No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Ceiling-C [ppm]	Ceiling-C [mg/m³]	Notation	Source
EU	sulfuric acid	7664-93-9	IOELV		0,05					t, mist	2009/161/EU
IE	sulfuric acid	7664-93-9	OELV	0,05							S.I. No. 619 of 2001

Notation

Ceiling-C	Ceiling value is a limit value above which exposure should not occur
mist	As mists
STEL	Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
t	Thoracic fraction
TWA	Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

Relevant DNELs of components of the mixture

Name of substance	CAS No	End-point	Threshold level	Protection goal, route of exposure	Used in	Exposure time
Sulphuric acid ...%	7664-93-9	DNEL	0,05 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
Sulphuric acid ...%	7664-93-9	DNEL	0,1 mg/m³	human, inhalatory	worker (industry)	acute - local effects

Relevant PNECs of components of the mixture

Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
Sulphuric acid ...%	7664-93-9	PNEC	0,003 mg/l	aquatic organisms	freshwater	short-term (single instance)
Sulphuric acid ...%	7664-93-9	PNEC	0 mg/l	aquatic organisms	marine water	short-term (single instance)
Sulphuric acid ...%	7664-93-9	PNEC	8,8 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Sulphuric acid ...%	7664-93-9	PNEC	0,002 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Sulphuric acid ...%	7664-93-9	PNEC	0,002 mg/kg	aquatic organisms	marine sediment	short-term (single instance)

8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection

Use safety goggle with side protection. Wear face protection.

Skin protection

• hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. Check leak-tightness/impermeability prior to use. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 ° C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

• type of material

FKM (fluoro rubber)

• material thickness

0,4 mm

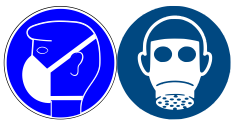
• breakthrough times of the glove material

>480 minutes (permeation: level 6)

• other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

Respiratory protection



Respiratory protection necessary at: Aerosol or mist formation. Type: E (against acidic gases like sulphur dioxide or hydrogen chloride, colour code: Yellow). Type: B-P2 (combined filters for acidic gases and particles, colour code: Grey/White).

Environmental exposure controls

Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	liquid
Colour	colourless
Odour	odourless
Melting point/freezing point	not determined
Boiling point or initial boiling point and boiling range	not determined
Flammability	non-combustible
Lower and upper explosion limit	not determined
Flash point	not determined
Auto-ignition temperature	not determined
Decomposition temperature	not relevant
pH (value)	<1 (20 °C)
Kinematic viscosity	not determined
Solubility(ies)	
Water solubility	miscible in any proportion
Partition coefficient	
Partition coefficient n-octanol/water (log value):	not relevant (inorganic)
Vapour pressure	not determined
Density	~1,14 $^{g}/_{cm^3}$ at 20 °C
Relative vapour density	information on this property is not available
Particle characteristics	not relevant (liquid)
Other safety parameters	
Oxidising properties	none

9.2 Other information

Information with regard to physical hazard classes:	
Corrosive to metals	category 1: corrosive to metals
Other safety characteristics:	
Miscibility	completely miscible with water

SECTION 10: Stability and reactivity

10.1 Reactivity

Substance or mixture corrosive to metals.

10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions

Violent reaction with: Aldehydes, Alkali (lye), Alkali metals, Ammonia (NH3), Bromates, Carbide, Chlorates, Alkaline earth metal, Halogenated hydrocarbons, Metals, Metal powder, Nitrate, Nitriles, Nitro compound, Organic substances, Perchlorates, Permanganates, Peroxides, Phosphorus, Phosphorus oxides (e.g. P2O5), Acids, Strong alkali, Water, Hydrogen peroxide

10.4 Conditions to avoid

There are no specific conditions known which have to be avoided.

10.5 Incompatible materials

different metals

Release of flammable materials with

Metals, Light metals (due to the release of hydrogen in an acid/alkaline medium)

10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

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

Test data are not available for the complete mixture.

Classification procedure

The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

Classification according to GHS (1272/2008/EC, CLP)

Acute toxicity

Shall not be classified as acutely toxic.

Acute toxicity of components of the mixture

Name of substance	CAS No	Exposure route	Endpoint	Value	Species
Sulphuric acid ...%	7664-93-9	oral	LD50	2.140 $^{mg}/_{kg}$	rat

Skin corrosion/irritation

Causes severe skin burns and eye damage.

Serious eye damage/eye irritation

Causes serious eye damage.

Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

Shall not be classified as carcinogenic.

Reproductive toxicity

Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure

Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics

• If swallowed

If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects)

• If in eyes

causes burns, Causes serious eye damage, risk of blindness

• If inhaled

cough, pain, choking, and breathing difficulties

• If on skin

causes severe burns, causes poorly healing wounds

• Other information

none

11.2 Endocrine disrupting properties

None of the ingredients are listed.

11.3 Information on other hazards

There is no additional information.

SECTION 12: Ecological information

12.1 Toxicity

Shall not be classified as hazardous to the aquatic environment.

Aquatic toxicity (acute) of components of the mixture

Name of sub-stance	CAS No	Endpoint	Value	Species	Exposure time
Sulphuric acid ...%	7664-93-9	EC50	>100 $^{mg}/_{l}$	aquatic invertebrates	48 h
Sulphuric acid ...%	7664-93-9	ErC50	>100 $^{mg}/_{l}$	algae	72 h

Biodegradation

The methods for determining the biological degradability are not applicable to inorganic substances.

12.2 Process of degradability

Data are not available.

12.3 Bioaccumulative potential

Data are not available.

12.4 Mobility in soil

Data are not available.

12.5 Results of PBT and vPvB assessment

Data are not available.

12.6 Endocrine disrupting properties

None of the ingredients are listed.

12.7 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information

Do not empty into drains.

Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.

13.2 Relevant provisions relating to waste

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process. Waste catalogue ordinance (Germany).

13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

SECTION 14: Transport information

14.1 UN number or ID number

ADR/RID/ADN	UN 2796
IMDG-Code	UN 2796
ICAO-TI	UN 2796

14.2 UN proper shipping name

ADR/RID/ADN	SULPHURIC ACID
IMDG-Code	SULPHURIC ACID
ICAO-TI	Sulphuric acid

14.3 Transport hazard class(es)

ADR/RID/ADN	8
IMDG-Code	8
ICAO-TI	8

14.4 Packing group

ADR/RID/ADN	II
IMDG-Code	II
ICAO-TI	II

14.5 Environmental hazards

non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user

Provisions for dangerous goods (ADR) should be complied within the premises.

14.7 Maritime transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN) - Additional information

Proper shipping name	SULPHURIC ACID
Particulars in the transport document	UN2796, SULPHURIC ACID, 8, II, (E)
Classification code	C1
Danger label(s)	8

Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L
Transport category (TC)	2
Tunnel restriction code (TRC)	E
Hazard identification No	80

International Maritime Dangerous Goods Code (IMDG) - Additional information

Proper shipping name	SULPHURIC ACID
Particulars in the shipper's declaration	UN2796, SULPHURIC ACID, 8, II
Marine pollutant	-
Danger label(s)	8

Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L

EmS	F-A, S-B
Stowage category	B
Segregation group	1 - Acids

International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information

Proper shipping name	Sulphuric acid
Particulars in the shipper's declaration	UN2796, Sulphuric acid, 8, II
Danger label(s)	8

Excepted quantities (EQ)	E2
Limited quantities (LQ)	0,5 L

SECTION 15: Regulatory information

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

Relevant provisions of the European Union (EU)

Restrictions according to REACH, Annex XVII

Dangerous substances with restrictions (REACH, Annex XVII)

Name of substance	Name acc. to inventory	CAS No	Restriction	No
Sulphuric acid	this product meets the criteria for classification in accordance with Regulation No 1272/2008/EC		R3	3
Sulphuric acid ...%	substances in tattoo inks and permanent make-up		R75	75

Legend

R3 1. Shall not be used in:
- ornamental articles intended to produce light or colour effects by means of different phases, for example in ornamental lamps and ashtrays,
- tricks and jokes,
- games for one or more participants, or any article intended to be used as such, even with ornamental aspects,
2. Articles not complying with paragraph 1 shall not be placed on the market.
3. Shall not be placed on the market if they contain a colouring agent, unless required for fiscal reasons, or perfume, or both, if they:
— can be used as fuel in decorative oil lamps for supply to the general public, and
— present an aspiration hazard and are labelled with H304.
4. Decorative oil lamps for supply to the general public shall not be placed on the market unless they conform to the European Standard on Decorative oil lamps (EN 14059) adopted by the European Committee for Standardisation (CEN).
5. Without prejudice to the implementation of other Union provisions relating to the classification, labelling and packaging of substances and mixtures, suppliers shall ensure, before the placing on the market, that the following requirements are met:
(a) lamp oils, labelled with H304, intended for supply to the general public are visibly, legibly and indelibly marked as follows: “Keep lamps filled with this liquid out of the reach of children”; and, by 1 December 2010, “Just a sip of lamp oil – or even sucking the wick of lamps – may lead to life-threatening lung damage”;
(b) grill lighter fluids, labelled with H304, intended for supply to the general public are legibly and indelibly marked by 1 December 2010 as follows: ‘Just a sip of grill lighter fluid may lead to life threatening lung damage’;
(c) lamps oils and grill lighters, labelled with H304, intended for supply to the general public are packaged in black opaque containers not exceeding 1 litre by 1 December 2010.’;

Legend

R75 1. Shall not be placed on the market in mixtures for use for tattooing purposes, and mixtures containing any such substances shall not be used for tattooing purposes, after 4 January 2022 if the substance or substances in question is or are present in the following circumstances:
(a) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as carcinogen category 1A, 1B or 2, or germ cell mutagen category 1A, 1B or 2, the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight;
(b) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as reproductive toxicant category 1A, 1B or 2, the substance is present in the mixture in a concentration equal to or greater than 0,001 % by weight;
(c) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as skin sensitiser category 1, 1A or 1B, the substance is present in the mixture in a concentration equal to or greater than 0,001 % by weight;
(d) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as skin corrosive category 1, 1A, 1B or 1C or skin irritant category 2, or as serious eye damage category 1 or eye irritant category 2, the substance is present in the mixture in a concentration equal to or greater than:
(i) 0,1 % by weight, if the substance is used solely as a pH regulator;
(ii) 0,01 % by weight, in all other cases;
(e) in the case of a substance listed in Annex II to Regulation (EC) No 1223/2009 (*1), the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight;
(f) in the case of a substance for which a condition of one or more of the following kinds is specified in column g (Product type, Body parts) of the table in Annex IV to Regulation (EC) No 1223/2009, the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight:
(i) “Rinse-off products”;
(ii) “Not to be used in products applied on mucous membranes”;
(iii) “Not to be used in eye products”;
(g) in the case of a substance for which a condition is specified in column h (Maximum concentration in ready for use preparation) or column i (Other) of the table in Annex IV to Regulation (EC) No 1223/2009, the substance is present in the mixture in a concentration, or in some other way, that does not accord with the condition specified in that column;
(h) in the case of a substance listed in Appendix 13 to this Annex, the substance is present in the mixture in a concentration equal to or greater than the concentration limit specified for that substance in that Appendix.
2. For the purposes of this entry use of a mixture “for tattooing purposes” means injection or introduction of the mixture into a person’s skin, mucous membrane or eyeball, by any process or procedure (including procedures commonly referred to as permanent make-up, cosmetic tattooing, micro-blading and micro-pigmentation), with the aim of making a mark or design on his or her body.
3. If a substance not listed in Appendix 13 falls within more than one of points (a) to (g) of paragraph 1, the strictest concentration limit laid down in the points in question shall apply to that substance. If a substance listed in Appendix 13 also falls within one or more of points (a) to (g) of paragraph 1, the concentration limit laid down in point (h) of paragraph 1 shall apply to that substance.
4. By way of derogation, paragraph 1 shall not apply to the following substances until 4 January 2023:
(a) Pigment Blue 15:3 (CI 74160, EC No 205-685-1, CAS No 147-14-8);
(b) Pigment Green 7 (CI 74260, EC No 215-524-7, CAS No 1328-53-6).
5. If Part 3 of Annex VI to Regulation (EC) No 1272/2008 is amended after 4 January 2021 to classify or re-classify a substance such that the substance then becomes caught by point (a), (b), (c) or (d) of paragraph 1 of this entry, or such that it then falls within a different one of those points from the one within which it fell previously, and the date of application of that new or revised classification is after the date referred to in paragraph 1 or, as the case may be, paragraph 4 of this entry, that amendment shall, for the purposes of applying this entry to that substance, be treated as taking effect on the date of application of that new or revised classification.
6. If Annex II or Annex IV to Regulation (EC) No 1223/2009 is amended after 4 January 2021 to list or change the listing of a substance such that the substance then becomes caught by point (e), (f) or (g) of paragraph 1 of this entry, or such that it then falls within a different one of those points from the one within which it fell previously, and the amendment takes effect after the date referred to in paragraph 1 or, as the case may be, paragraph 4 of this entry, that amendment shall, for the purposes of applying this entry to that substance, be treated as taking effect from the date falling 18 months after entry into force of the act by which that amendment was made.
7. Suppliers placing a mixture on the market for use for tattooing purposes shall ensure that, after 4 January 2022, the mixture is marked with the following information:
(a) the statement “Mixture for use in tattoos or permanent make-up”;
(b) a reference number to uniquely identify the batch;
(c) the list of ingredients in accordance with the nomenclature established in the glossary of common ingredient names pursuant to Article 33 of Regulation (EC) No 1223/2009, or in the absence of a common ingredient name, the IUPAC name. In the absence of a common ingredient name or IUPAC name, the CAS and EC number. Ingredients shall be listed in descending order by weight or volume of the ingredients at the time of formulation. “Ingredient” means any substance added during the process of formulation and present in the mixture for use for tattooing purposes. Impurities shall not be regarded as ingredients. If the name of a substance, used as ingredient within the meaning of this entry, is already required to be stated on the label in accordance with Regulation (EC) No 1272/2008, that ingredient does not need to be marked in accordance with this Regulation;
(d) the additional statement “pH regulator” for substances falling under point (d)(i) of paragraph 1;
(e) the statement "Contains nickel. Can cause allergic reactions." if the mixture contains nickel below the concentration limit specified in Appendix 13;
(f) the statement "Contains chromium (VI). Can cause allergic reactions." if the mixture contains chromium (VI) below the concentration limit specified in Appendix 13;
(g) safety instructions for use insofar as they are not already required to be stated on the label by Regulation (EC) No 1272/2008.
The information shall be clearly visible, easily legible and marked in a way that is indelible.
The information shall be written in the official language(s) of the Member State(s) where the mixture is placed on the market, unless the Member State(s) concerned provide(s) otherwise.
Where necessary because of the size of the package, the information listed in the first subparagraph, except for point (a), shall be included instead in the instructions for use.
Before using a mixture for tattooing purposes, the person using the mixture shall provide the person undergoing the procedure with the information marked on the package or included in the instructions for use pursuant to this paragraph.
8. Mixtures that do not contain the statement “Mixture for use in tattoos or permanent make-up” shall not be used for tattooing purposes.

Legend

9. This entry does not apply to substances that are gases at temperature of 20 °C and pressure of 101,3 kPa, or generate a vapour pressure of more than 300 kPa at temperature of 50 °C, with the exception of formaldehyde (CAS No 50-00-0, EC No 200-001-8).
10. This entry does not apply to the placing on the market of a mixture for use for tattooing purposes, or to the use of a mixture for tattooing purposes, when placed on the market exclusively as a medical device or an accessory to a medical device, within the meaning of Regulation (EU) 2017/745, or when used exclusively as a medical device or an accessory to a medical device, within the same meaning. Where the placing on the market or use may not be exclusively as a medical device or an accessory to a medical device, the requirements of Regulation (EU) 2017/745 and of this Regulation shall apply cumulatively.

List of substances subject to authorisation (REACH, Annex XIV)/SVHC - candidate list

None of the ingredients are listed. (Or Concentration of the substance in a mixture: <0.1 % Mass concentration)

Seveso Directive

2012/18/EU (Seveso III)

No	Dangerous substance/hazard categories	Qualifying quantity (tonnes) for the application of lower and upper-tier requirements	Notes
	not assigned		

Deco-Paint Directive

VOC content	0 % , -0 $^{g}/_{l}$

Industrial Emissions Directive (IED)

VOC content	0 %
VOC content **Water content was discounted**	-0 $^{g}/_{l}$

Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

none of the ingredients are listed

Regulation concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)

none of the ingredients are listed

Water Framework Directive (WFD)

List of pollutants (WFD)

Name of substance	Name acc. to inventory	CAS No	Listed in	Remarks
Sulphuric acid ...%	Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment		A)	

Legend

A) Indicative list of the main pollutants

Regulation on the marketing and use of explosives precursors

Explosives precursors which are subject to restrictions					
Name of substance	**CAS No**	**Type of registration**	**Remarks**	**Limit value**	**Upper limit value for the purpose of licensing under Article 5(3)**
Sulphuric acid ...%	7664-93-9	Annex I		15 % w/w	40 % w/w

Legend
annex I Substances which shall not be made available to members of the general public on their own, or in mixtures or substances including them, except if the concentration is equal to or lower than the limit values set out below

Regulation on drug precursors

Name of substance	CAS No	Classification	CN Code	Threshold level
Sulphuric acid ...%	7664-93-9	Category 3	2807 00 00	

Regulation on substances that deplete the ozone layer (ODS)

none of the ingredients are listed

Regulation concerning the export and import of hazardous chemicals (PIC)

none of the ingredients are listed

Regulation on persistent organic pollutants (POP)

none of the ingredients are listed

Other information

Directive 94/33/EC on the protection of young people at work. Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

UN Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances

Name of substance	CAS No	Listed in	HS code
Sulphuric acid ...%	7664-93-9	Table II	2807.00

National inventories

Country	Inventory	Status
AU	AICS	all ingredients are listed
CA	DSL	all ingredients are listed
CN	IECSC	all ingredients are listed
EU	ECSI	all ingredients are listed
EU	REACH Reg.	all ingredients are listed
JP	CSCL-ENCS	all ingredients are listed
KR	KECI	all ingredients are listed
MX	INSQ	all ingredients are listed

Country	Inventory	Status
NZ	NZIoC	all ingredients are listed
PH	PICCS	all ingredients are listed
TR	CICR	not all ingredients are listed
TW	TCSI	all ingredients are listed
US	TSCA	all ingredients are listed

Legend

AICS	Australian Inventory of Chemical Substances
CICR	Chemical Inventory and Control Regulation
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS)
DSL	Domestic Substances List (DSL)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
INSQ	National Inventory of Chemical Substances
KECI	Korea Existing Chemicals Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)
REACH Reg.	REACH registered substances
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

15.2 Chemical Safety Assessment

Chemical safety assessments for substances in this mixture were not carried out.

SECTION 16: Other information

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
2009/161/EU	Commission Directive 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
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
ADR	Accord relatif au transport international des marchandises dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)
ADR/RID/ADN	Agreements concerning the International Carriage of Dangerous Goods by Road/Rail/Inland Waterways (ADR/RID/ADN)
ATE	Acute Toxicity Estimate
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
CN Code	Combined Nomenclature
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
EC No	The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
EINECS	European Inventory of Existing Commercial Chemical Substances

Abbr.	Descriptions of used abbreviations
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
ErC50	≡ EC50: in this method, that concentration of test substance which results in a 50 % reduction in either growth (EbC50) or growth rate (ErC50) relative to the control
Eye Dam.	Seriously damaging to the eye
Eye Irrit.	Irritant to the eye
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
HS	Harmonized Commodity Description and Coding System (Harmonized System, drawn up by the World Customs Organisation)
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
index No	The Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008
IOELV	Indicative occupational exposure limit value
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
Met. Corr.	Substance or mixture corrosive to metals
NLP	No-Longer Polymer
NTP-RoC	National Toxicology Program: Report on Carcinogens
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
ppm	Parts per million
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
S.I. No. 619 of 2001	Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001
Skin Corr.	Corrosive to skin
Skin Irrit.	Irritant to skin
STEL	Short-term exposure limit
SVHC	Substance of Very High Concern
TWA	Time-weighted average
VOC	Volatile Organic Compounds

Abbr.	Descriptions of used abbreviations
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures. Regulation (EC) No. 1907/2006 (REACH), amended by 2020/878/EU.

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

Classification procedure

Physical and chemical properties. The classification is based on tested mixture.
Health hazards. Environmental hazards. The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

List of relevant phrases (code and full text as stated in chapter 2 and 3)

Code	Text
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

COLUMBUS CHEMICAL INDUSTRIES

Safety Data Sheet

Sodium Hydroxide 20% (w/w)

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sodium Hydroxide 20% (w/w)

Synonyms/Generic Names: Caustic Soda Solution

Product Number: 9641

Product Use: Industrial, Manufacturing or Laboratory use

Manufacturer: Columbus Chemical Industries, Inc.
N4335 Temkin Rd.
Columbus, WI. 53925

For More Information: 920-623-2140 (Monday-Friday 8:00-4:30)
www.columbuschemical.com

In Case of Emergency Call: CHEMTREC - 800-424-9300 or 703-527-3887 (24 Hours/Day, 7 Days/Week)

2. HAZARDS IDENTIFICATION

Hazard Not Otherwise Classified (HNOC): None

Signal Words: Danger

Pictograms:

GHS Classification:

Skin corrosion	Category 1
Serious eye damage	Category 1
Acute aquatic toxicity	Category 3

GHS Label Elements, including precautionary statements:

Hazard Statements:

H314	Causes severe skin burns and eye damage.
H401	Harmful to aquatic life.

Precautionary Statements:

P260	Do not breathe dusts or mists.
P264	Wash hands thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do not induce vomiting.

P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor/physician.
P363	Wash contaminated clothing before reuse.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local regulations.

Potential Health Effects

Eyes	Causes severe eye burns.
Inhalation	May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Skin	May be harmful if absorbed through skin. Causes skin burns.
Ingestion	May be harmful if swallowed.

NFPA Ratings

Health	3
Flammability	0
Reactivity	1
Specific hazard	Not Available

HMIS Ratings

Health	3
Fire	0
Reactivity	1

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight %	CAS #	EINECS# / ELINCS#	Formula	Molecular Weight
Sodium Hydroxide	19-21	1310-73-2	215-185-5	NaOH	40.00 g/mol
Water	Balance	7732-18-5	231-791-2	H_2O	18.00 g/mol

4. FIRST-AID MEASURES

Eyes	Rinse with plenty of water for at least 15 minutes and seek medical attention immediately.
Inhalation	Move casualty to fresh air and keep at rest. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention immediately.
Skin	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and wash using soap. Get medical attention immediately.
Ingestion	**Do Not Induce Vomiting!** Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention.

5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media	Product is not flammable. Use appropriate media for adjacent fire. Cool containers with water.
Special protective equipment and precautions for firefighters	Wear self-contained, approved breathing apparatus and full protective clothing, including eye protection and boots.
Specific hazards arising from the chemical	Emits toxic fumes (sodium oxides) under fire conditions. (See also Stability and Reactivity section).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	See section 8 for recommendations on the use of personal protective equipment.
Environmental precautions	Prevent spillage from entering drains. Any release to the environment may be subject to federal/national or local reporting requirements.
Methods and materials for containment and cleaning up	Neutralize spill. Absorb spill with noncombustible absorbent material, then place in a suitable container for disposal. Clean surfaces thoroughly with water to remove residual contamination. Dispose of all waste and cleanup materials in accordance with regulations.

7. HANDLING AND STORAGE

Precautions for safe handling
See section 8 for recommendations on the use of personal protective equipment. Use with adequate ventilation. Wash thoroughly after using. Keep container closed when not in use. Avoid formation of aerosols.

Conditions for safe storage, including any incompatibilities
Store in cool, dry well ventilated area. Keep away from incompatible materials (see section 10 for incompatibilities).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls:

Component	Exposure Limits	Basis	Entity
Sodium Hydroxide	2 mg/m^3	CEIL	ACGIH
	2 mg/m^3	PEL	OSHA
	2 mg/m^3	CEIL	NIOSH

TWA: Time Weighted Average over 8 hours of work.
TLV: Threshold Limit Value over 8 hours of work.
REL: Recommended Exposure Limit
PEL: Permissible Exposure Limit
STEL: Short Term Exposure Limit during x minutes.
IDLH: Immediately Dangerous to Life or Health
WEEL: Workplace Environmental Exposure Levels
CEIL: Ceiling

Personal Protection

Eyes	Wear chemical safety glasses or goggles, and face shield.
Inhalation	Provide local exhaust, preferably mechanical. If exposure levels are excessive, use an approved respirator.
Skin	Wear nitrile or rubber gloves, and full body covering. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Other	Not Available

Other Recommendations
Provide eyewash stations, quick-drench showers and washing facilities accessible to areas of use and handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.)	Colorless liquid.
Odor	Odorless.
Odor threshold	Not Available
pH	Not Available
Melting point/freezing point	Not Available
Initial boiling point and boiling range	Not Available
Flash point	Not Flammable
Evaporation rate	Not Available
Flammability (solid, gas)	Not Flammable
Upper/lower flammability or explosive limit	Not Explosive
Vapor pressure	Not Available
Vapor density	Not Available
Specific gravity	1.2200
Solubility (ies)	Soluble in water.
Partition coefficient: n-octanol/water	Not Available
Auto-ignition temperature	Not Applicable
Decomposition temperature	Not Available

10. STABILITY AND REACTIVITY

Chemical Stability	Stable
Possibility of Hazardous Reactions	Will not occur.
Conditions to Avoid	Not Available
Incompatible Materials	Acids, organic materials, chlorinated solvents, aluminum, phosphorus, zinc, tin.
Hazardous Decomposition Products	Sodium oxides.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Sodium Hydroxide

Skin	Not Available
Eyes	Not Available
Respiratory	Not Available
Ingestion	Not Available

Carcinogenicity

IARC	No components of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP	No components of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Signs & Symptoms of Exposure

Skin	Extent of damage depends on duration of contact. Burning, itching, redness, inflammation or swelling of exposed tissues.
Eyes	Eye burns, watering eyes.

Respiratory	Burning, choking, coughing, wheezing, laryngitis, shortness of breath, headache, nausea.
Ingestion	Burning, choking, nausea, vomiting, severe pain.

Chronic Toxicity	Not Available
Teratogenicity	Not Available
Mutagenicity	Not Available
Embryotoxicity	Not Available
Target Organ(s)	Kidney, Liver, Eyes, Skin, Mucous membranes, Respiratory system, Cardiovascular system
Reproductive Toxicity	Not Available
Respiratory/Skin Sensitization	Not Available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Sodium Hydroxide

Aquatic Vertebrate	Not Available
Aquatic Invertebrate	Not Available
Terrestrial	Not Available

Persistence and Degradability	Not Available
Bioaccumulative Potential	Not Available
Mobility in Soil	Not Available
PBT and vPvB Assessment	Not Available
Other Adverse Effects	Not Available

13. DISPOSAL CONSIDERATIONS

Waste Product or Residues	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product or residue.
Product Containers	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product container.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product may significantly change the characteristics of the material and alter the waste classification and proper disposal methods.

14. TRANSPORTATION INFORMATION

US DOT	UN1824, Sodium hydroxide solution, 8, pg II
TDG	UN1824, SODIUM HYDROXIDE SOLUTION, 8, pg II
IMDG	UN1824, SODIUM HYDROXIDE SOLUTION, 8, pg II
Marine Pollutant	No
IATA/ICAO	UN1824, Sodium hydroxide solution, 8, pg II

15. REGULATORY INFORMATION

TSCA Inventory Status	All ingredients are listed on the TSCA Active inventory.

DSL / NDSL	All ingredients are listed on the DSL inventory.
California Proposition 65	Not Listed
Rhode Island: Hazardous Substance List	Listed: Sodium Hydroxide
Massachusetts: Toxic or Hazardous Substance List, Right to Know	Not Listed
Pennsylvania: Hazardous Substance List	Listed: Sodium Hydroxide
New Jersey: Right to Know Hazardous Substance List	Listed: Sodium Hydroxide
SARA 302	Not Listed
SARA 304	Not Listed
SARA 311	Acute Health Hazard.
SARA 312	Acute Health Hazard.
SARA 313	Not Listed
WHMIS Canada	Class E: Corrosive material.

16. OTHER INFORMATION

Revision	Date
Original	12/03/2012
Revision 1	07/09/2013
Revision 2	03/21/2016
Revision 3	03/28/2022

Disclaimer: The information provided in this Safety Data Sheet (“SDS”) is correct to the best of our knowledge, information, and belief at the date of publication. The information in this SDS relates only to the specific Product identified under Section 1, and does not relate to its use in combination with other materials or products, or its use as to any particular process. Those handling, storing, or using the Product should satisfy themselves that they have current information regarding the particular way the Product is handled, stored or used and that the same is done in accordance with federal, state and local law. WE DO NOT MAKE ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING (WITHOUT LIMITATION) WARRANTIES WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN OR WITH RESPECT TO FITNESS FOR ANY PARTICULAR USE. WE DO NOT ASSUME RESPOSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, INJURY, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT.

SAFETY DATA SHEET
Diesel Exhaust Fluid (32.5%)

Section 1. IDENTIFICATION

Product Name: Diesel Exhaust Fluid (32.5%)

Synonyms: DEF (32.5%), AUS-32

Recommended use: NOx Reducing Agent from diesel combustion
Restrictions on use: Use only as directed

Manufacturer: Iowa Fertilizer Company, LLC
3550 180th St.
Wever, IA 52658
319-376-4500
319-376-4700 (24 hour)

Emergency phone number: 800-424-9300 (Chemtrec)

Section 2. HAZARD(S) IDENTIFICATION

Classification:

Physical	Health	Environmental
Not Hazardous	Not Hazardous	Not Hazardous

Label Elements: None required

Section 3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical name	CAS No.	Concentration
Water	7732-18-5	Balance
Urea	57-13-6	31.8-33.2%
Free Ammonia (Alkalinity)	7664-41-7	$\leq$ 0.2 %
Biuret	108-19-0	$\leq$ 0.3 %

Section 4. FIRST-AID MEASURES

Inhalation: Remove to fresh air. If irritation occurs or breathing is difficult, get medical attention.
Skin contact: Wash with soap and water. If irritation develops and persists, get medical attention.
Eye contact: Flush eyes with water while lifting the upper and lower lids. Get medical attention if irritation develops or persists.
Ingestion: Rinse mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to a person who is unconscious or convulsing. Get medical attention.

Most important symptoms/effects, acute and delayed: Contact with eyes may cause mild eye irritation. Prolonged skin contact may cause skin irritation. Inhalation of mists may cause upper respiratory tract irritation. Swallowing large amounts may cause gastric upset.

Indication of immediate medical attention and special treatment, if necessary: Immediate medical attention is not required under normal use conditions.

Section 5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media: Use any media that is appropriate for the surrounding material on fire. DEF is not flammable.

Specific hazards arising from the chemical: Combustion may produce oxides of carbon, nitrogen, and ammonia.

Special protective equipment and precautions for fire-fighters: Firefighters should wear full emergency equipment and NIOSH approved positive pressure self-contained breathing apparatus. Cool fire exposure containers with water.

Section 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures: Wear appropriate protective clothing and equipment.

Environmental hazards: Report spill as required by local and federal regulations.

Methods and materials for containment and cleaning up: Collect spilled material with inert material and place into a closable, labeled container for disposal. Wash spill area with water.

Section 7. HANDLING AND STORAGE

Precautions for safe handling: Avoid eye contact and prolonged skin contact. Avoid breathing mists or spray. Use with adequate ventilation. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities: Store in a cool, well-ventilated area. Protect storage container from physical damage.

Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure guidelines:

Water	None Established
Urea	10 mg/m^3 TWA AIHA WEEL
Ammonia	50 ppm TWA OSHA PEL 25 ppm TWA, 35 ppm STEL ACGIH TLV
Biuret	None Established

Appropriate engineering controls: No special ventilation required for normal use. If use generates mists, use general ventilation or local exhaust as required to maintain exposures below the occupational exposure limits.

Individual protection measures, such as personal protective equipment:
Respiratory protection: None needed under normal conditions of use.
Skin protection: None normally needed. Wear rubber or neoprene gloves for prolonged skin contact.
Eye/face protection: Safety glasses are recommended if splashing is possible.
Other: Appropriate protective clothing as needed to minimize skin contact.

Section 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Colorless Clear liquid
Odor: Slight ammonia odor.

Odor threshold: None	**pH:** 9.8-10
Melting point/freezing point: 11°F (-12°C)	**Boiling point:** 219°F (104°C)
Flash point: Not flammable	**Evaporation rate:** Not available
Flammability (solid, gas): Not applicable	
Flammable limits: LEL: Not applicable	**UEL:** Not applicable
Vapor pressure: Not available	**Vapor Density:** Not available
Relative density: 1.087-1.093 at 20°C (68°F)	**Solubility in Water:** 100%
Partition coefficient: n-octanol/water: Not available	**Auto-ignition temperature:** Not applicable
Decomposition temperature: Not applicable	**Viscosity:** Not available

Section 10. STABILITY AND REACTIVITY

Reactivity: Not reactive.
Chemical stability: Stable.
Possibility of hazardous reactions: None known.
Conditions to avoid: Do not mix with any other chemicals or products.
Incompatible materials: Avoid strong acids and oxidizing agents.
Hazardous decomposition products: Thermal decomposition may produce oxides of carbon, nitrogen, and ammonia.

Section 11. TOXICOLOGICAL INFORMATION

Inhalation: High concentrations of mists may cause nose, throat, and upper respiratory tract irritation.
Ingestion: Swallowing large amounts may cause gastrointestinal irritating and nausea.
Skin contact: Prolonged skin contact may cause skin irritation.
Eye contact: Mists or direct contact may cause mild irritation with redness and tearing.

Chronic effects: None known.

Reproductive Toxicity: None of the components have been shown to cause reproductive or developmental toxicity.

Mutagenicity: None of the components have been shown to cause mutagenic activity.

Carcinogenicity: None of the ingredients are listed as a carcinogen by IARC, NTP or OSHA.

Acute Toxicity Values:
Urea: Oral rat LD50 14,300 – 15000 mg/kg

Section 12. ECOLOGICAL INFORMATION

Ecotoxicity:
Urea: 96 hr LC50 Leuciscus idus >6810 mg/L, 24 hr EC50 daphnia magna >10000 mg/L

Persistence and degradability: Urea is rapidly hydrolyzed to ammonia and carbon dioxide in environmental systems.
Bioaccumulative potential: The potential for bioconcentration in aquatic organisms is expected to be low.
Urea Log Pow -1.59 @ 25°C
Mobility in soil: Urea is highly mobile in soil.
Other adverse effects: None known.

Section 13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all local, state and federal regulations.

Section 14. TRANSPORT INFORMATION

	UN Number	Proper shipping name	Hazard Class	Packing Group	Environmental Hazard
DOT	None	Not Regulated			
TDG	None	Not Regulated			
IMDG	None	Not Regulated			
IATA	None	Not Regulated			

Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code): Not applicable – product is transported only in packaged form.

Special precautions: None known.
STCC Code: 2818142

Section 15. REGULATORY INFORMATION

Safety, health, and environmental regulations specific for the product in question.

CERCLA: This product is not subject to CERCLA reporting requirements, however, many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.

SARA Hazard Category (311/312): Not hazardous.
SARA 313: This Product does not contain any Chemicals Subject to Annual Release Reporting Requirements Under SARA Title III, Section 313 (40 CFR 372).
EPA TSCA Inventory: All of the components of this product are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.
Canadian CEPA: All of the ingredients are listed on the Canadian Domestic Substances List.

Section 16. OTHER INFORMATION

NFPA Rating:	Health = 1	Flammability = 0	Instability = 0
HMIS Rating:	Health = 1	Flammability = 0	Physical Hazard = 0

SDS Revision History: Added STCC Code in Section 14.
Date of preparation: February 9, 2017
Date of last revision: July 13, 2016
NOTICE: The information that Iowa Fertilizer Company, LLC (the "Company") has presented here was prepared in accordance with governmental regulations, is based upon data the Company believes to be accurate as of the date of this version, applies solely to the specific product designated and may not be accurate if such product is used with any other product. THE COMPANY MAKES NO WARRANTIES OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR COURSE OF PERFORMANCE OR USAGE OF TRADE. The party purchasing, using or applying the product is responsible for determining its suitability for such party's particular use or purpose, and such party assumes all risks with respect to handling, transferring, transporting, storing, applying or otherwise using the product ("Assumed Risks"), many of which are within the exclusive control of such party. THE COMPANY HEREBY DISCLAIMS ANY AND ALL LIABILITY FOR ANY AND ALL ASSUMED RISKS. Such party is solely responsible for complying with all applicable federal, state and local laws and regulations (collectively, the "Applicable Laws") governing the handling, transfer, transportation, storage, application and use of the product. Before handling, transferring, transporting, storing, applying or otherwise using the product, such party should thoroughly review all Applicable Laws.

VEILIGHEIDSINFORMATIEBLAD

Ureum

RUBRIEK 1: Identificatie van de stof of het mengsel en van de vennootschap/onderneming

1.1 Productidentificatie

Productnaam : **Ureum**
EG nummer : 200-315-5
REACH registratie nummer : 01-2119463277-33-0001;01-2119463277-33-0002
CAS nummer : 57-13-6
Producttype : EG-MESTSTOF
Chemische formule : C-H4-N2-O

1.2 Relevant geïdentificeerd gebruik van de stof of het mengsel en ontraden gebruik

Productgebruik : Meststoffen
Toepassingsgebied : Professionele toepassingen.

1.3 Details betreffende de verstrekker van het veiligheidsinformatieblad

OCI Nitrogen BV
Mijnweg 1
P.O. Box 601
6160 AP Geleen, The Netherlands
Tel: +31(0)46 7020111
www.ocinitrogen.com

e-mail adres van de verantwoordelijke voor dit VIB : info.agro@ocinitrogen.com

1.4 Telefoonnummer voor noodgevallen

Leverancier

Telefoonnummer : (31) 46 4765555 (24/7)

RUBRIEK 2: Identificatie van de gevaren

2.1 Indeling van de stof of het mengsel

Productomschrijving : Stof met één bestanddeel

Classificatie volgens de Verordening (EG) 1272/2008 [CLP/GHS]
Niet geclassificeerd.

Indeling overeenkomstig Richtlijn 67/548/EEG [Richtlijn gevaarlijke stoffen]
Niet geclassificeerd.

Zie Rubriek 16 voor de volledige tekst van de R- of H-zinnen die hierboven staan vermeld.
Zie rubriek 11 voor meer informatie over gezondheidseffecten en symptomen.

2.2 Etiketteringselementen

Gevaarsymbolen : Niet van toepassing.
Signaalwoord : Geen signaalwoord.
Gevarenaanduidingen : Significante effecten of kritische gevaren zijn niet bekend.
Voorzorgsmaatregelen
Preventie : Niet van toepassing.
Reactie : Niet van toepassing.

RUBRIEK 2: Identificatie van de gevaren

Opslag : Niet van toepassing.

Verwijdering : Niet van toepassing.

Aanvullende etiketonderdelen : Niet van toepassing.

2.3 Andere gevaren

Stof voldoet aan criteria voor PBT overeenkomstig Verordening (EG) nr. 1907/2006, Bijlage XIII : Neen.
P: Niet beschikbaar. B: Niet beschikbaar. T: Neen.

Stof voldoet aan criteria voor zPzB overeenkomstig Verordening (EG) nr. 1907/2006, Bijlage XIII : Niet beschikbaar.

Overige gevaren die niet leiden tot classificatie : Fijne stofwolken kunnen explosieve mengsels vormen met lucht. Bij het hanteren en/of bewerken van dit materiaal kunnen stofdeeltjes ontstaan die mechanische irritatie van de ogen, huid, neus en keel kunnen veroorzaken.

RUBRIEK 3: Samenstelling en informatie over de bestanddelen

Stof/preparaat : Stof met één bestanddeel

Product-/ingrediëntennaam	Identificatiemogelijkheden	%	Classificatie	
			67/548/EEG	Verordening (EG) nr. 1272/2008 [CLP]
ureum	REACH #: 01-2119463277-33 EG: 200-315-5 CAS-nummer: 57-13-6	100	Niet geclassificeerd.	Niet geclassificeerd.

Dit product bevat geen hulpstoffen die, voor zover de huidige kennis van de producent reikt, ingedeeld zijn en bijdragen aan de indeling van het product en daarom in deze sectie vermeld moeten worden.

Arbeidshygiënische blootstellingsgrenzen, indien beschikbaar, zijn weergegeven in rubriek 8.

RUBRIEK 4: Eerstehulpmaatregelen

4.1 Beschrijving van de eerstehulpmaatregelen

Oogcontact : Spoel de ogen onmiddellijk met ruime hoeveelheden water, waarbij u de boven- en onderoogleden zo nu en dan oplicht. Ga aanwezigheid van contactlenzen na en verwijder ze. Raadpleeg een arts als irritatie optreedt.

Inademing : Het slachtoffer in de frisse lucht brengen en laten rusten in een houding die het ademen vergemakkelijkt. Zoek medische hulp als zich symptomen voordoen. Na inhalatie van afbraakproducten in geval van brand kunnen symptomen met vertraging optreden. Het slachtoffer moet mogelijk 48 uur lang onder medisch toezicht blijven.

Huidcontact : Spoel verontreinigde huid met grote hoeveelheid water. Verwijder verontreinigde kleding en schoenen. Zoek medische hulp als zich symptomen voordoen.

Inslikken : Spoel de mond met water. Het slachtoffer in de frisse lucht brengen en laten rusten in een houding die het ademen vergemakkelijkt. Als het slachtoffer het materiaal heeft doorgeslikt en bij bewustzijn is, laat u het slachtoffer kleine hoeveelheden water drinken. Zet niet aan tot braken tenzij medisch personeel aangeeft dat dit wel moet. Zoek medische hulp als zich symptomen voordoen.

RUBRIEK 4: Eerstehulpmaatregelen

Bescherming van eerste-hulpverleners : Er mag geen actie worden ondernomen als er kans is op persoonlijke ongelukken of in geval van onvoldoende training.

4.2 Belangrijkste acute en uitgestelde symptomen en effecten

Mogelijke acute gevolgen voor de gezondheid

Oogcontact : Blootstelling aan luchtconcentraties boven de vastgestelde of aanbevolen blootstellingslimieten kunnen irritatie van de ogen veroorzaken.

Inademing : Blootstelling aan luchtconcentraties boven de vastgestelde of aanbevolen blootstellingslimieten kunnen irritatie van de neus, keel en longen veroorzaken. Blootstelling aan ontledingsproducten kan gevaar voor de gezondheid opleveren. Na blootstelling kunnen ernstige gevolgen met vertraging optreden.

Huidcontact : Significante effecten of kritische gevaren zijn niet bekend.

Inslikken : Significante effecten of kritische gevaren zijn niet bekend.

Tekenen/symptomen van overmatige blootstelling

Oogcontact : Ongewenste symptomen kunnen de volgende zijn:
irritatie
roodheid

Inademing : Ongewenste symptomen kunnen de volgende zijn:
irritatie van de luchtwegen
hoesten

Huidcontact : Geen specifieke gegevens.

Inslikken : Geen specifieke gegevens.

4.3 Vermelding van de vereiste onmiddellijke medische verzorging en speciale behandeling

Opmerkingen voor arts : Na inhalatie van afbraakproducten in geval van brand kunnen symptomen met vertraging optreden. Het slachtoffer moet mogelijk 48 uur lang onder medisch toezicht blijven.

Specifieke behandelingen : Geen specifieke behandeling.

RUBRIEK 5: Brandbestrijdingsmaatregelen

5.1 Blusmiddelen

Geschikte blusmiddelen : Niet brandbaar. Gebruik een blusmiddel dat geschikt is voor de ontstane brand.

Ongeschikte blusmiddelen : Geen bekend.

5.2 Speciale gevaren die door de stof of het mengsel worden veroorzaakt

Risico's van de stof of het mengsel : Fijne stofwolken kunnen explosieve mengsels vormen met lucht.

Gevaarlijke verbrandingsproducten : Afbraakproducten kunnen onder meer zijn:
kooldioxide
koolmonoxide
stikstofoxiden
ammoniak
aminen

5.3 Advies voor brandweerlieden

Speciale voorzorgsmaatregelen voor brandbestrijders : In geval van brand, isoleer het terrein direct door alle personen uit de buurt van het incident te verwijderen. Er mag geen actie worden ondernomen als er kans is op persoonlijke ongelukken of in geval van onvoldoende training. Verplaats de reservoirs uit het brandgebied als dat zonder risico kan. Gebruik waternevel om aan het vuur blootgestelde vaten koel te houden.

RUBRIEK 5: Brandbestrijdingsmaatregelen

Speciale beschermende uitrusting voor brandweerlieden : Brandbestrijders dienen geschikte kleding te dragen en een onafhankelijk ademhalingstoestel (SCBA) dat een volledig gelaatsdeel heeft en met een overdrukmodus werkt. Kleding voor brandweerlieden (inclusief helmen, beschermende laarzen en handschoenen), overeenkomstig Europese norm EN 469, geeft een basis beschermingsniveau voor incidenten met chemische stoffen.

Extra informatie : Referenties : Rubriek 9. Fysische en chemische eigenschappen

RUBRIEK 6: Maatregelen bij het accidenteel vrijkomen van de stof of het mengsel

6.1 Persoonlijke voorzorgsmaatregelen, beschermde uitrusting en noodprocedures

Voor andere personen dan de hulpdiensten : Er mag geen actie worden ondernomen als er kans is op persoonlijke ongelukken of in geval van onvoldoende training. Evacueer omringende gebieden. Zorg dat onbeschermd en overbodig personeel niet binnenkomt. Raak gemorst materiaal niet aan en loop er niet doorheen. Sluit alle ontstekingsbronnen af. Geen open vuur en niet roken in het gevarengebied. Vermijd het inademen van stof. Draag geschikte persoonlijke beschermingsmiddelen.

Voor de hulpdiensten : Indien speciale kleding is vereist voor het hanteren van het gemorst product, lees dan ook de eventuele informatie in Rubriek 8 over geschikte en ongeschikte materialen. Zie ook de informatie onder de hoofding "Voor andere personen dan de hulpdiensten".

6.2 Milieuvoorzorgsmaatregelen : Vermijd verspreiding van gemorst materiaal en afvalmateriaal en voorkom dat dit in contact komt met bodem, waterwegen, afvoerleidingen en riool. Informeer de betreffende autoriteiten wanneer het product het milieu heeft vervuild (riolering, waterwegen, bodem of lucht)

6.3 Insluitings- en reinigingsmethoden en -materiaal

Gering morsen : Verwijder verpakkingen uit het gebied waar gemorst is. Zuig of veeg het materiaal op en plaats het in een daartoe bestemde afvalbak met etiket. Gebruik vonkvrije gereedschappen en explosievrije apparatuur. Af laten voeren door een vergunninghoudend afvalverwerkingsbedrijf.

Uitgebreid morsen : Verwijder verpakkingen uit het gebied waar gemorst is. Benader de uitstoot met de wind in de rug. Vermijd toegang tot riolen, waterwegen, kelders of gesloten ruimten. Zuig of veeg het materiaal op en plaats het in een daartoe bestemde afvalbak met etiket. Zorg dat er geen stoffige omstandigheden ontstaan en voorkom verspreiding door de wind. Gebruik vonkvrije gereedschappen en explosievrije apparatuur. Af laten voeren door een vergunninghoudend afvalverwerkingsbedrijf. Opmerking: Zie rubriek 1 voor contactadressen in noodgevallen en rubriek 13 voor afvalververwijdering.

6.4 Verwijzing naar andere rubrieken : Zie Rubriek 1 voor contactgegevens voor noodgevallen.
Zie Rubriek 8 voor informatie over geschikte persoonlijke beschermingsmiddelen.
Zie Rubriek 13 voor aanvullende informatie over afvalbehandeling.

RUBRIEK 7: Hantering en opslag

De informatie in deze rubriek bevat algemene adviezen en richtlijnen. De lijst van Aanbevolen toepassingen in Rubriek 1 moet worden geraadpleegd voor eventueel beschikbare gebruiksspecifieke informatie die gegeven wordt in de Blootstellingscenario('s).

7.1 Voorzorgsmaatregelen voor het veilig hanteren van de stof of het mengsel

RUBRIEK 7: Hantering en opslag

Beschermende maatregelen : Trek van toepassing zijnde persoonlijke beschermingsmiddelen aan (zie rubriek 8). Vermijd het inademen van stof. Vermijd stofvorming bij het hanteren en vermijd alle mogelijke ontstekingsbronnen (vonken en vlammen). Ophoping van stofdeeltjes voorkomen. Alleen gebruiken bij voldoende ventilatie. Draag het daartoe geëigende ademhalingsmasker bij onvoldoende ventilatie. Elektrische apparatuur en verlichting dient op basis van de van toepassing zijnde normen beschermd te worden om te voorkomen dat stof in contact komt met hete oppervlakken, vonken of andere ontstekingsbronnen. Neem voorzorgsmaatregelen tegen elektrostatische ontladingen. Om brand of een explosie te voorkomen, moet de statische elektriciteit tijdens overdracht afgevoerd worden door vaten en apparatuur te aarden en vast te snoeren alvorens het materiaal over te brengen.

Advies inzake algemene arbeidshygiëne : In de ruimte waar dit materiaal wordt gebruikt, opgeslagen of verwerkt, moet eten, drinken en roken verboden worden. Werknemers moeten hun handen en gezicht wassen alvorens te eten, drinken en roken. Verwijder verontreinigde kleding en beschermingsmiddelen voordat u kantines, e.d. binnengaat. Zie ook Rubriek 8 voor aanvullende informatie over hygiënische maatregelen.

7.2 Voorwaarden voor een veilige opslag, met inbegrip van incompatibele producten : Opslaan in overeenstemming met de plaatselijke regelgeving. Bewaar in een afzonderlijk, goedgekeurd gebied. Opslaan in oorspronkelijke verpakking, beschermd tegen direct zonlicht, op een droge, koele, goed geventileerde plaats, verwijderd van materiaal waarmee contact vermeden dient te worden (zie rubriek 10) en voedsel en drank. Verwijder alle ontstekingsbronnen. Gescheiden houden van oxiderende stoffen. Bewaar de verpakking goed afgesloten en verzegeld tot aan gebruik. Geopende verpakkingen dienen zorgvuldig opnieuw te worden afgesloten en dienen rechtop te worden bewaard om lekkage te voorkomen. Niet opslaan in verpakkingen zonder etiket. Neem passende maatregelen om verspreiding in het milieu te voorkomen.

7.3 Specifiek eindgebruik

Aanbevelingen : Niet beschikbaar.

Oplossingen specifiek voor de industriële sector : Niet beschikbaar.

RUBRIEK 8: Maatregelen ter beheersing van blootstelling/persoonlijke bescherming

De informatie in deze rubriek bevat algemene adviezen en richtlijnen. De lijst van Aanbevolen toepassingen in Rubriek 1 moet worden geraadpleegd voor eventueel beschikbare gebruiksspecifieke informatie die gegeven wordt in de Blootstellingscenario('s).

8.1 Controleparameters

Beroepsmatige blootstellingslimieten

Geen blootstellingslimietwaarde bekend.

Aanbevolen monitoring procedures : Wanneer dit product ingrediënten bevat met blootstellingslimieten, kan monitoring van personen, van werkplaatsomgeving of biologisch monitoren vereist zijn om de effectiviteit van de ventilatie of van andere controlemaatregelen en/of de noodzaak van het gebruik van ademhalingsbeschermingsmiddelen te bepalen. Voor methoden om de blootstelling aan chemische stoffen door inademing te bepalen en nationale richtlijnen voor de bepaling van gevaarlijke stoffen dient u de Europese Norm EN 689 te raadplegen.

DEL's (Derived Effect Levels; afgeleide effectdoses)

Product- /ingrediëntennaam	Type	Blootstelling	Waarde	Populatie	Effecten

RUBRIEK 8: Maatregelen ter beheersing van blootstelling/persoonlijke bescherming

ureum	DNEL	Langetermijn Dermaal	580 mg/kg bw/dag	Werknemers	-
	DNEL	Langetermijn Inademing	125 mg/m³	Verbruikers	-
	DNEL	Langetermijn Oraal	42 mg/dag	Verbruikers	-

PEC's (Predicted Effect Concentrations; voorspelde effectconcentraties)

Product- /ingrediëntennaam	Type	Detail compartiment	Waarde	Detailmethode
ureum	PNEC	Zoetwater	0.047 mg/l	Beoordelingsfactoren

8.2 Maatregelen ter beheersing van blootstelling

Geschikte technische beheersmaatregelen : Alleen gebruiken bij voldoende ventilatie. Wanneer door de handelingen van de gebruiker stof, rook, gas, damp of nevel ontstaat, gebruik dan een gesloten installatie, lokale afzuiging of andere technische controlemiddelen om beroepsmatige blootstelling beneden alle aanbevolen of wettelijke grenswaarden te houden. De technische controlemiddelen dienen ook gas-, damp- en stofconcentraties beneden alle explosiegrenswaarden te houden. Gebruik explosieveilige ventilatie.

Individuele beschermingsmaatregelen

Hygiënische maatregelen : Was na het hanteren van chemische producten uw handen, onderarmen en gezicht grondig voordat u eet, drinkt of naar het toilet gaat en aan het eind van de werkdag. Toepasselijke technieken moeten gebruikt worden om mogelijk verontreinigde kleding te verwijderen. Was verontreinigde kleding alvorens die opnieuw te gebruiken. Zorg ervoor dat de oogwasstations en veiligheidsdouches zich dicht bij de werkplek bevinden.

Bescherming van de ogen/het gezicht : Wanneer een risicoanalyse aangeeft dat dit noodzakelijk is om blootstelling aan spatten, nevel, gassen of stof te vermijden, dient een veiligheidsbescherming voor de ogen te worden gedragen die voldoet aan een goedgekeurde standaard. Indien de werkomstandigheden leiden tot de vorming van hoge stofconcentraties moet een stofbril worden gedragen. Aanbevolen: veiligheidsbril met zijkapjes

Bescherming van de huid

Bescherming van de handen : Wanneer een risicoanalyse aangeeft dat dit noodzakelijk is, dienen bij het hanteren van chemische producten ondoorlaatbare handschoenen te worden gedragen die resistent zijn tegen chemicaliën en die voldoen aan een goedgekeurde norm. >8 uren (doorbraaktijd): nitrilrubber (0.5 mm), natuurlijk rubber (latex) (0.5 mm), neopreen (0.5 mm), Viton® (0.4 mm) .

Lichaamsbescherming : Persoonlijke lichaamsbeschermende middelen dienen te worden gekozen op basis van de uit te voeren taak, de daarbij behorende risico's en dient door een specialist te worden goedgekeurd voordat het product wordt gebruikt. Aanbevolen: Werkkleding.

Overige huidbescherming : Geschikt schoeisel en eventuele aanvullende huidbeschermingsmaatregelen moeten worden geselecteerd op basis van de taak die wordt uitgevoerd en de risico's die daarmee gepaard gaan en deze moeten worden goedgekeurd door een deskundige voorafgaand aan de gebruik van dit product.

Bescherming van de ademhalingswegen : Wanneer een risicoanalyse aangeeft dat dit noodzakelijk is, dient u een goed passend, luchtzuiverend of luchttoevoerend ademhalingstoestel te gebruiken dat voldoet aan een goedgekeurde standaard. De keuze van een masker moet gebaseerd worden op verwachte blootstellingslimieten, de gevaren van het product en de limieten voor veilig werken van het type masker. Aanbevolen: Draag stoffiltermasker P2.

Beheersing van milieublootstelling : Uitstoot van ventilatie of bewerkingsapparatuur moet worden gecontroleerd om er zeker van te zijn dat deze voldoet aan de eisen van de milieubeschermingswetgeving. In sommige gevallen zijn gaswassers, filters of technische modificaties van de procesapparatuur nodig om de emissie terug te brengen tot een aanvaardbaar niveau.

RUBRIEK 9: Fysische en chemische eigenschappen

9.1 Informatie over fysische en chemische basiseigenschappen

Voorkomen

Fysische toestand	:	Vaste stof. [Kristallen.]
Kleur	:	Wit.
Geur	:	Geurloos./ Ammoniak. [Gering]
Geurdrempel	:	Niet beschikbaar.
pH	:	9.2 tot 9.5 [Conc. (% gewicht / gewicht): 10%]
Smeltpunt/vriespunt	:	134°C
Initieel kookpunt en kookbereik	:	Ontledingstemperatuur: 135°C
Vlampunt	:	Niet van toepassing.
Verdampingssnelheid	:	Niet beschikbaar.
Ontvlambaarheid (vast, gas)	:	Niet beschikbaar.
Verbrandingstijd	:	Niet beschikbaar.
Verbrandingssnelheid	:	Niet beschikbaar.
Bovenste/onderste ontvlambaarheids- of explosiegrenzen	:	Niet beschikbaar.
Dampspanning	:	<0.01 kPa
Dampdichtheid	:	2.07 [Lucht = 1]
Relatieve dichtheid	:	1.33 [Water = 1]
Dichtheid	:	1.33 g/cm^3 [20°C]
Oplosbaarheid	:	Gemakkelijk oplosbaar in de volgende materialen: koud water. bij 20°C
Oplosbaarheid (water)	:	6.24 g/l
Octanol/water verdelingscoëfficiënt	:	-1.73
Zelfontbrandingstemperatuur	:	Niet van toepassing.
Ontledingstemperatuur	:	135°C
Viscositeit	:	Dynamisch: 2 mPa·s (2 cP)
Ontploffingseigenschappen	:	Niet beschikbaar.
Oxyderende eigenschappen	:	Niet beschikbaar.

9.2 Overige informatie

Opmerkingen fysische/chemische eigenschappen	:	Molecuulgewicht: 60.06 g/mol Minimale ontstekingsenergie (mJ): 2.8e+006

Geen aanvullende informatie.

RUBRIEK 10: Stabiliteit en reactiviteit

10.1 Reactiviteit : Er zijn voor dit product of de bestanddelen ervan geen specifieke testgegevens beschikbaar met betrekking tot de reactiviteit.

10.2 Chemische stabiliteit : Het product is stabiel.Hygroscopisch.

10.3 Mogelijke gevaarlijke reacties : Onder normale opslagomstandigheden en bij normaal gebruik zullen geen gevaarlijke reacties optreden.

RUBRIEK 10: Stabiliteit en reactiviteit

10.4 Te vermijden omstandigheden : Vermijd stofvorming bij het hanteren en vermijd alle mogelijke ontstekingsbronnen (vonken en vlammen). Neem voorzorgsmaatregelen tegen elektrostatische ontladingen. Om brand of een explosie te voorkomen, moet de statische elektriciteit tijdens overdracht afgevoerd worden door vaten en apparatuur te aarden en vast te snoeren alvorens het materiaal over te brengen. Ophoping van stofdeeltjes voorkomen. Vermijd hoge temperaturen en vocht.

10.5 Chemisch op elkaar inwerkende materialen : Reactief of niet verenigbaar met de volgende materialen: oxyderende stoffen, zuren, alkaliën en vocht.
natriumhypochloriet
Explosief in aanwezigheid van de volgende materialen of condities: oxyderende stoffen, zuren, Perchloraatzout. Chloor, Nitrietzout. Nitraatzout.

10.6 Gevaarlijke ontledingsproducten : Onder normale omstandigheden van opslag en gebruik worden normaal geen gevaarlijke afvalproducten gevormd.

RUBRIEK 11: Toxicologische informatie

11.1 Informatie over toxicologische effecten

Acute toxiciteit

Product-/ingrediëntennaam	Resultaat	Soorten	Dosis	Blootstelling
ureum	LD50 Oraal LD50 Oraal LD50 Oraal LDLo Oraal	Muis Rat Rat Konijn	11 g/kg 8471 mg/kg 14300 mg/kg 10 g/kg	- - - -

Conclusie/Samenvatting : Niet beschikbaar.

Irritatie/corrosie

Conclusie/Samenvatting

Huid : Niet irriterend voor de huid.

Ogen : Niet irriterend voor de ogen.

Ademhaling : Niet irriterend voor het ademhalingswegen.

Overgevoeligheid veroorzakend

Conclusie/Samenvatting

Huid : Maakt de huid niet overgevoelig.

Ademhaling : Veroorzaakt geen overgevoeligheid van de longen.

Mutageniciteit

Product-/ingrediëntennaam	Test	Proef	Resultaat
ureum	Ames-test.	Proef: In vitro Proeforganisme: Bacteriën	Negatief

Conclusie/Samenvatting : Significante effecten of kritische gevaren zijn niet bekend.

Carcinogeniciteit

Conclusie/Samenvatting : Significante effecten of kritische gevaren zijn niet bekend.

Toxiciteit voor de voortplanting

Conclusie/Samenvatting : Significante effecten of kritische gevaren zijn niet bekend.

Teratogeniciteit

Conclusie/Samenvatting : Niet beschikbaar.

Toxiciteit van het specifieke doelorgaan (enkele blootstelling)

RUBRIEK 11: Toxicologische informatie

Niet beschikbaar.

Toxiciteit van het specifieke doelorgaan (herhaalde blootstelling)

Niet beschikbaar.

Gevaar voor aspiratie

Niet beschikbaar.

Informatie over de meest waarschijnlijke blootstellingsroutes : Niet beschikbaar.

Mogelijke acute gevolgen voor de gezondheid

Inademing : Blootstelling aan luchtconcentraties boven de vastgestelde of aanbevolen blootstellingslimieten kunnen irritatie van de neus, keel en longen veroorzaken. Blootstelling aan ontledingsproducten kan gevaar voor de gezondheid opleveren. Na blootstelling kunnen ernstige gevolgen met vertraging optreden.

Inslikken : Significante effecten of kritische gevaren zijn niet bekend.

Huidcontact : Significante effecten of kritische gevaren zijn niet bekend.

Oogcontact : Blootstelling aan luchtconcentraties boven de vastgestelde of aanbevolen blootstellingslimieten kunnen irritatie van de ogen veroorzaken.

Symptomen met betrekking tot de fysische, chemische en toxicologische eigenschappen

Inademing : Ongewenste symptomen kunnen de volgende zijn:
irritatie van de luchtwegen
hoesten

Inslikken : Geen specifieke gegevens.

Huidcontact : Geen specifieke gegevens.

Oogcontact : Ongewenste symptomen kunnen de volgende zijn:
irritatie
roodheid

Vertraagd optredende en directe effecten en ook chronische effecten als gevolg van kortdurende en langdurige blootstelling

Blootstelling op korte termijn

Mogelijke directe effecten : Niet beschikbaar.

Mogelijke vertraagde effecten : Niet beschikbaar.

Blootstelling op lange termijn

Mogelijke directe effecten : Niet beschikbaar.

Mogelijke vertraagde effecten : Niet beschikbaar.

Mogelijke chronische gevolgen voor de gezondheid

Niet beschikbaar.

Conclusie/Samenvatting : Niet beschikbaar.

Algemeen : Herhaaldelijk of langdurig inademen van stof kan leiden tot chronische irritatie aan de luchtwegen.

Carcinogeniciteit : Significante effecten of kritische gevaren zijn niet bekend.

Mutageniciteit : Significante effecten of kritische gevaren zijn niet bekend.

Teratogeniciteit : Significante effecten of kritische gevaren zijn niet bekend.

Effecten op de ontwikkeling : Significante effecten of kritische gevaren zijn niet bekend.

RUBRIEK 11: Toxicologische informatie

Effecten op de vruchtbaarheid : Significante effecten of kritische gevaren zijn niet bekend.

Overige informatie : Niet beschikbaar.

RUBRIEK 12: Ecologische informatie

12.1 Toxiciteit

Product-/ingrediëntennaam	Resultaat	Soorten	Blootstelling
ureum	Acuut LC50 6810 mg/l	Vis	96 uren

Conclusie/Samenvatting : Niet beschikbaar.

12.2 Persistentie en afbreekbaarheid

Product-/ingrediëntennaam	Test	Resultaat	Dosis	Inoculum
ureum	OECD 302B Inherent Biodegradability: Zahn-Wellens/EMPA Test	96 % - 16 dagen	-	-

Conclusie/Samenvatting : Niet beschikbaar.

Product-/ingrediëntennaam	Halfwaardetijd in water	Fotolyse	Biologische afbreekbaarheid
ureum	-	-	Gemakkelijk

12.3 Bioaccumulatie

Product-/ingrediëntennaam	$LogP_{ow}$	BCF	Potentieel
ureum	-1.73	-	laag

12.4 Mobiliteit in de bodem

Scheidingscoëfficiënt aarde/water (K_{OC}) : Niet beschikbaar.

Mobiliteit : Niet beschikbaar.

12.5 Resultaten van PBT- en zPzB-beoordeling

PBT : Neen.

P: Niet beschikbaar. B: Niet beschikbaar. T: Neen.

zPzB : Niet beschikbaar.

zP: Niet beschikbaar. zB: Niet beschikbaar.

12.6 Andere schadelijke effecten : Significante effecten of kritische gevaren zijn niet bekend.

RUBRIEK 13: Instructies voor verwijdering

De informatie in deze rubriek bevat algemene adviezen en richtlijnen. De lijst van Aanbevolen toepassingen in Rubriek 1 moet worden geraadpleegd voor eventueel beschikbare gebruiksspecifieke informatie die gegeven wordt in de Blootstellingscenario('s).

13.1 Afvalverwerkingsmethoden

Product

Verwijderingsmethoden : Het produceren van afval dient altijd voor zover mogelijk te worden vermeden of tot een minimum te worden beperkt. Grote hoeveelheden productresten mogen niet via het riool worden afgevoerd, maar moeten worden verwerkt in een geschikte afvalwaterbehandelingsinstallatie. Laat overtollige en niet te recycleren producten afvoeren door een vergunninghoudend afvalverwerkingsbedrijf. Het afvoeren van dit product, oplossingen en alle bijproducten dient altijd te geschieden in overeenstemming met de geldende wetgeving op het gebied van milieubescherming en afvalverwerking en met alle andere regionaal of plaatselijk geldende reglementeringen.

Gevaarlijke Afvalstoffen : Naar huidige kennis van de leverancier wordt dit product niet beschouwd als gevaarlijke afvalstof zoals gedefinieerd in EG-richtlijn 91/689/EG

Verpakking

Verwijderingsmethoden : Het produceren van afval dient altijd voor zover mogelijk te worden vermeden of tot een minimum te worden beperkt. De lege verpakking moet worden gerecycleerd. Verbranding of storten moet alleen worden overwogen wanneer recycleren niet mogelijk is.

Speciale voorzorgsmaatregelen : Deze stof en de verpakking op veilige wijze afvoeren. Lege vaten of binnenzak kunnen enig restproduct bevatten. Vermijd verspreiding van gemorst materiaal en afvalmateriaal en voorkom dat dit in contact komt met bodem, waterwegen, afvoerleidingen en riool.

RUBRIEK 14: Informatie met betrekking tot het vervoer

	ADR/RID	ADN/ADNR	IMDG	IATA
14.1 VN-nummer	Niet gereglementeerd.	Niet gereglementeerd.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-
14.3 Transportgevarenklasse(n)	-	-	-	-
14.4 Verpakkingsgroep	-	-	-	-
14.5 Milieugevaren	Neen.	Neen.	No.	No.
14.6 Bijzondere voorzorgen voor de gebruiker	Niet beschikbaar.	Niet beschikbaar.	Niet beschikbaar.	Niet beschikbaar.
Extra informatie	-	-	-	-

14.7 Vervoer in bulk overeenkomstig bijlage II bij MARPOL 73/78 en de IBC-code : Niet beschikbaar.

RUBRIEK 15: Regelgeving

15.1 Specifieke veiligheids-, gezondheids- en milieureglementen en -wetgeving voor de stof of het mengsel

EU Verordening (EG) nr. 1907/2006 (REACH)

Bijlage XIV - Lijst van stoffen die aan toelating zijn onderworpen

Zeer zorgwekkende stoffen

Geen van de bestanddelen zijn gereguleerd.

Bijlage XVII - Beperkingen met betrekking tot de productie, het op de markt brengen en het gebruik van bepaalde gevaarlijke stoffen, mengsels en producten : Niet van toepassing.

Overige EU-regelgeving

Europese inventaris : Dit materiaal is opgenomen in een lijst geregistreerde chemische stoffen of vrijgesteld.

Internationale regelgeving

Chemische Wapens Conventie Bijlage I stoffen : Niet vermeld

Chemische Wapens Conventie Bijlage II stoffen : Niet vermeld

Chemische Wapens Conventie Bijlage III stoffen : Niet vermeld

15.2 Chemischeveiligheidsbeoordeling : Voltooid.

15.3 Registratiestatus : Van toepassing.

RUBRIEK 16: Overige informatie

Geeft informatie aan die gewijzigd is sinds de voorgaande uitgave.

Afkortingen en acroniemen : ATE = Acuut toxiciteitsschatting
CLP = Indeling, etikettering en verpakking van stoffen en mengsels [Verordening (EG) No. 1272/2008]
DNEL = De afgeleide dosis zonder effect
EUH zin = CLP-specifieke gevaarszin
PNEC = Voorspelde geen effect concentratie
RRN = REACH registratie nummer

Belangrijke literatuurreferenties en informatiebronnen : Literatuurgegevens en/of onderzoeksrapporten zijn beschikbaar via de fabrikant.

Procedure gebruikt voor het afleiden van de indeling in overeenstemming met Verordening (EG) nr.1272/2008 [CLP/GHS]

Classificatie	Rechtvaardiging
Niet geclassificeerd.	

Volledige tekst van afgekorte H-zinnen : Niet van toepassing.

Volledige tekst van indelingen [CLP/GHS] : Niet van toepassing.

RUBRIEK 16: Overige informatie

Volledige tekst van afgekorte R-zinnen	:	Niet van toepassing.
Volledige tekst van indelingen [Richtlijn gevaarlijke stoffen/Richtlijn gevaarlijke preparaten]	:	Niet van toepassing.
Opleidingsadviezen	:	Personeel dient voor het hanteren van deze stof/dit preparaat voldoende geïnformeerd te zijn door middel van dit veiligheidsinformatieblad.
Datum van uitgave/ Revisie datum	:	23 december 2011
Datum vorige uitgave	:	17 oktober 2011
Versie	:	1.1

Kennisgeving aan de lezer

Naar ons beste weten is de hierin ingesloten informatie juist. Noch bovengenoemde leverancier, noch enige dochtermaatschappij ervan, aanvaardt echter ook maar enige aansprakelijkheid voor de juistheid en volledigheid van de hierin besloten informatie. De gebruiker is als enige verantwoordelijk voor de uiteindelijke beslissing of een bepaald materiaal al dan niet geschikt is. Elk van de materialen kan onbekende risico's met zich meebrengen. In het gebruik ervan moet daarom grote zorgvuldigheid betracht worden. Ofschoon sommige risico's in dit gevarendocument worden beschreven, kunnen wij niet garanderen dat dit de enige bestaande risico's zijn.

SAFETY DATA SHEET

LNG

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

1.1 Product identifier

Product name : LNG

Viscosity or Type : Liquefied Natural Gas

EC number : Not available.

CAS number : Not available.

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

Material uses : Liquefied gas - Fuel.

1.3 Details of the supplier of the safety data sheet

Manufacturer / Distributor : Kuwait Petroleum (Belgium) N.V.
Brusselstraat 59 - Bus 1
2018, Antwerp, Belgium
Tel. +32 3 241 33 00, Fax +32 3 241 35 31

e-mail address of person responsible for this SDS : SDSinfo@Q8.com, communication preferably in English only.

1.4 Emergency telephone number

Netherlands : +31 10 713 8195

Europe : +44 (0) 1235 239 670

Global (English only) : +44 (0) 1865 407 333

National advisory body/Poison Center

Telephone number : Nationaal Vergiftigingen Informatie Centrum, Utrecht +31 (0)30 274 8888 (Only for the purpose of informing medical personnel in cases of acute intoxications.)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Multi-constituent substance

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

FLAMMABLE GASES	Category 1	H220
GASES UNDER PRESSURE	Compressed gas	H280

The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

Ingredients of unknown toxicity : None.

Ingredients of unknown ecotoxicity : None.

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

SECTION 2: Hazards identification

Hazard pictograms :

Signal word : Danger

Hazard statements : H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.

Precautionary statements

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

Response : P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - In case of leakage, eliminate all ignition sources.

Storage : P403 - Store in a well-ventilated place.

Disposal : Not applicable.

Hazardous ingredients : LNG

Supplemental label elements : Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Special packaging requirements

Containers to be fitted with child-resistant fastenings : Not applicable.

Tactile warning of danger : Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII :

PBT	P	B	T	vPvB	vP	vB
No	N/A	N/A	No	N/A	N/A	N/A

Other hazards which do not result in classification : None known.

SECTION 3: Composition/information on ingredients

3.1 Substances : Multi-constituent substance

Product/ingredient name	Identifiers	%	Regulation (EC) No. 1272/2008 [CLP]	Type	Notes
Methane	EC: 200-812-7 CAS: 74-82-8 Index: 601-001-00-4	80 - 95	Flam. Gas 1, H220 Press. Gas, H280	[A]	-
Ethane	EC: 200-814-8 CAS: 74-84-0 Index: 601-002-00-X	<6	Flam. Gas 1, H220 Press. Gas, H280	[A]	-
Propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	<1.5	Flam. Gas 1, H220 Press. Gas, H280	[A]	-

SECTION 3: Composition/information on ingredients

			See Section 16 for the full text of the H statements declared above.		

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type

[*] Substance
[A] Constituent
[B] Impurity
[C] Stabilizing additive

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : As this product is a gas, refer to the inhalation section.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4.2 Most important symptoms and effects, both acute and delayed

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Do not extinguish a leaking gas flame unless leak can be stopped. Use dry chemical, CO_2, alcohol-resistant foam or water spray (fog).

Unsuitable extinguishing media : Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.
The vapor/gas is heavier than air and will spread along the ground. Vapors can travel to a source of ignition and flashback.

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

5.3 Advice for firefighters

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

SECTION 6: Accidental release measures

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Contains refrigerated gas. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

Seveso Directive - Reporting thresholds

Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
P2	10 tonne	50 tonne

7.3 Specific end use(s)

Recommendations : Not available.

Industrial sector specific solutions : Not available.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

8.1 Control parameters

Occupational exposure limits

No exposure limit value known.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482

SECTION 8: Exposure controls/personal protection

(Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

No DNELs/DMELs available.

PNECs

No PNECs available.

8.2 Exposure controls

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.To reduce potential for static discharge, ensure that all equipment is properly grounded and bonded and meets appropriate electrical classification requirements.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Wear cold insulating gloves.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves. Refer to European Standard EN 1149 for further information on material and design requirements and test methods.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : The gas can cause asphyxiation without warning by replacing the oxygen in the air. Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. If operating conditions cause high gas concentrations to be produced or any recommended or statutory exposure limit is exceeded, use an air-fed respirator or self-contained breathing apparatus. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	:	Gas. [Cryogenic liquid]
Appearance	:	Not available.
Color	:	Colorless.
Odor	:	Odorless.
Odor threshold	:	Not available.
pH	:	Not applicable.
Melting point/freezing point	:	-182.5°C
Initial boiling point and boiling range	:	-161.5°C
Flash point	:	Open cup: <-150°C [ASTM D92.]
Evaporation rate	:	Not available.
Flammability (solid, gas)	:	Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge.
Upper/lower flammability or explosive limits	:	Lower: 5% Upper: 15%
Vapor pressure	:	Not available.
Vapor density	:	>1 [Air = 1]
Density	:	0.5 g/cm³ [15°C]
Solubility(ies)	:	Insoluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/water	:	2 to 3
Auto-ignition temperature	:	595°C
Decomposition temperature	:	Not available.
Viscosity (40°C)	:	Not available.
Explosive properties	:	Not applicable.
Oxidizing properties	:	Not applicable.

9.2 Other information

SECTION 10: Stability and reactivity

10.1 Reactivity	:	No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	:	The product is stable.
10.3 Possibility of hazardous reactions	:	Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	:	Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow gas to accumulate in low or confined areas.
10.5 Incompatible materials	:	Reactive or incompatible with the following materials: Strong oxidizing materials
10.6 Hazardous decomposition products	:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Conclusion/Summary : Not toxic.

Acute toxicity estimates

N/A

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitization

Conclusion/Summary

Skin : Not sensitizing

Respiratory : Not classified for respiratory sensitization.

Mutagenicity

Conclusion/Summary : No known significant effects or critical hazards.

Carcinogenicity

Conclusion/Summary : No known significant effects or critical hazards.

Reproductive toxicity

Conclusion/Summary : No known significant effects or critical hazards.

Teratogenicity

Conclusion/Summary : No known significant effects or critical hazards.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact : Extremely cold material. Contact with rapidly expanding gas may cause burns or frostbite.

Inhalation : At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen.Contains refrigerated gas; may cause cryogenic burns or injury.

Skin contact : Extremely cold material. Contact with rapidly expanding gas may cause burns or frostbite.

Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : frostbite

Potential delayed effects : Not available.

SECTION 11: Toxicological information

Long term exposure

Potential immediate effects : frostbite Suffocating.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

Conclusion/Summary : Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Other information : Not available.

SECTION 12: Ecological information

12.1 Toxicity

Conclusion/Summary : Not available.

12.2 Persistence and degradability

Conclusion/Summary : Not available.

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
LNG	2 to 3	-	low
methane	1.09	-	low
ethane	1.09	-	low
propane	1.09	-	low

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
LNG	No	N/A	N/A	No	N/A	N/A	N/A

12.6 Other adverse effects

: No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

SECTION 13: Disposal considerations

Methods of disposal : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste : Yes.

European waste catalogue (EWC)

Waste code	Waste designation
16 05 04*	gases in pressure containers (including halons) containing hazardous substances

Packaging

Methods of disposal : The generation of waste should be avoided or minimized wherever possible. Empty pressure vessels should be returned to the supplier. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	UN1972	UN1972	UN1972	UN1972
14.2 UN proper shipping name	METHANE, REFRIGERATED LIQUID	METHANE, REFRIGERATED LIQUID	METHANE, REFRIGERATED LIQUID	Methane, refrigerated liquid
14.3 Transport hazard class(es)	2 	2 	2.1 	2.1 
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.

Additional information

ADR/RID : **Hazard identification number** 223
Limited quantity 0
Tunnel code (B/D)

IMDG : **Emergency schedules** _F-D_, S-U

IATA : **Quantity limitation** Passenger and Cargo Aircraft: Forbidden. Packaging instructions: Forbidden. Cargo Aircraft Only: Forbidden. Packaging instructions: Forbidden. Limited Quantities - Passenger Aircraft: Forbidden. Packaging instructions: Forbidden.

14.6 Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to IMO instruments : Not available.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorization

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Other EU regulations

Industrial emissions (integrated pollution prevention and control) - Air : Listed

Industrial emissions (integrated pollution prevention and control) - Water : Not listed

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Seveso Directive

This product is controlled under the Seveso Directive.

Danger criteria

Category
P2

National regulations

Water Discharge Policy (ABM) : B(5) Low hazard for aquatic organisms. Decontamination effort: B

Hazard class for water (WGK) : 1

VOC content : Exempt.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

SECTION 15: Regulatory information

Inventory list

Australia	:	All components are listed or exempted.
Canada	:	All components are listed or exempted.
China	:	All components are listed or exempted.
Europe	:	All components are listed or exempted.
Japan	:	**Japan inventory (ENCS)**: Not determined. **Japan inventory (ISHL)**: Not determined.
New Zealand	:	All components are listed or exempted.
Philippines	:	All components are listed or exempted.
Republic of Korea	:	All components are listed or exempted.
Taiwan	:	All components are listed or exempted.
Thailand	:	Not determined.
Turkey	:	Not determined.
United States	:	All components are active or exempted.
Viet Nam	:	All components are listed or exempted.

15.2 Chemical Safety Assessment : Chemical Safety Assessments for all substances in this product are either Complete or Not applicable.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms :
ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
N/A = Not available
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
SGG = Segregation Group
vPvB = Very Persistent and Very Bioaccumulative

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Flam. Gas 1, H220	On basis of test data
Press. Gas (Comp.), H280	On basis of test data

Full text of abbreviated H statements

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.

Full text of classifications [CLP/GHS]

Flam. Gas 1	FLAMMABLE GASES - Category 1
Press. Gas (Comp.)	GASES UNDER PRESSURE - Compressed gas
Press. Gas (Liq.)	GASES UNDER PRESSURE - Liquefied gas

Training advice	:	Ensure operatives are trained to minimise exposures.
Date of printing	:	14-04-2020
Date of issue/ Date of revision	:	14-04-2020
Date of previous issue	:	28-04-2014
Version	:	1.02
Prepared by	:	Kuwait Petroleum Research & Technology B.V., The Netherlands

SECTION 16: Other information

Notice to reader

The information in this SDS is based on the present state of our knowledge and on current laws. The product is not to be used for purposes other than those specified under section 1 without first obtaining written handling instructions. It is always the responsibility of the user to take all necessary steps to fulfill the demands set out in the local rules and legislation. The information in this SDS is meant to be a description of the safety requirements for our product. It is not to be considered a guarantee of the product's properties.

Veiligheidsinformatieblad

volgens Verordening (EG) nr. 1907/2006 (REACH)

Datum herziening: 06.12.2022	*Versie: 7.2*	*Afdrukdatum: 06.12.2022*

RUBRIEK 1: Identificatie van de stof of het mengsel en van de vennootschap/onderneming

1.1 Productidentificatie

Productnaam/naam:	1,2-Propyleenglycol TECHNICAL
Product-nr.:	24414
CAS-nr.:	57-55-6
EU-Identificatienummer:	000-000-00-0
EU REACH-nr.:	01-2119456809-23-XXXX
Andere benamingen:	geen

1.2 Relevant geïdentificeerd gebruik van de stof of het mengsel en ontraden gebruik

Relevante identificeerbare toepassingen:	Chemische reagens

1.3 Details betreffende de verstrekker van het veiligheidsinformatieblad

Nederland

VWR International B.V.

Straat	Orlyplein 85
Postcode/Plaats	1043 DS Amsterdam
Telefoon	+31 20 480 8410
Telefax	+31 20 480 8411
E-mail (vakkundig persoon)	SDS@avantorsciences.com

1.4 Telefoonnummer voor noodgevallen

Telefoon	030 2748888 (Nationaal Vergiftigingen Informatie Centrum (NVIC), uitsluitend bestemd om professionele hulpverleners te informeren bij acute vergiftigingen).

RUBRIEK 2: Identificatie van de gevaren

2.1 Indeling van de stof of het mengsel

2.1.1 Classificatie conform Verordening (EG) Nr. 1272/2008 [CLP]

De stof is geklasseerd als niet gevaarlijk in de zin van de verordening (EG) Nr. 1272/2008 [CLP].

2.2 Etiketteringelementen

2.2.1 Labeling conform Verordening (EG) Nr. 1272/2008 [CLP]

Het product is volgens EG-richtlijnen of de overeenkomstige nationale wetten niet kenmerkingsplichtig.

2.3 Andere gevaren

Deze stof voldoet niet aan de PBT-/zPzB-criteria van de REACH-verordening, annex XIII.

RUBRIEK 3: Samenstelling en informatie over de bestanddelen

3.1 Stoffen

Stofnaam:	Propyleenglycol
Molecuulformule:	$CH_3CH(OH)CH_2OH$
Moleculair gewicht:	76,1 g/mol
CAS-nr.:	57-55-6
EU REACH registratienr.:	01-2119456809-23-XXXX
EG-nr.:	200-338-0
ATE, SCL en/of M-factor:	geen

RUBRIEK 4: Eerste hulp maatregelen

4.1 Beschrijving van de eerstehulpmaatregelen

Algemene informatie

In elk geval van twijfel of indien symptomen optreden, medische hulp inroepen. Verontreinigde of doordrenkte kleding uittrekken. Verontreinigde kleding wassen alvorens deze opnieuw te gebruiken. Slachtoffer niet onbewaakt laten.

Na inhalatie

Slachtoffer naar de frisse lucht brengen en warm en rustig houden. Medische hulp inroepen als symptomen optreden.

Bij huidcontact

Voorzichtig wassen met veel water en zeep. In geval van huidreacties arts consulteren.

Bij oogcontact:

Direct voorzichtig en grondig met oogdouche of met water spoelen. Medische hulp inroepen als symptomen optreden.

Na inslikken

Mond grondig met water spoelen. Bij onwel voelen een arts raadplegen.

Eigenbescherming van de eerste hulpverlener

Eerste hulp: let op zelfbescherming!

4.2 Belangrijkste acute en uitgestelde symptomen en effecten

Tot nu toe geen symptomen bekend.

4.3 Vermelding van de vereiste onmiddellijke medische verzorging en speciale behandeling

Geen speciale informatie over medische verzorging en speciale behandeling beschikbaar.

RUBRIEK 5: Brandbestrijdingsmaatregelen

5.1 Blusmiddelen

Geschikte blusmiddelen

Blusmaatregelen afstemmen op de omgeving.
Water.
Schuim.
Droog bluspoeder.

Ongeschikte blusmiddelen

Sterke waterstraal.

5.2 Speciale gevaren die door de stof of het mengsel worden veroorzaakt

In geval van brand kan ontstaan:
Koolstofmonoxide
Kooldioxide (CO_2).

5.3 Advies voor brandweerlieden

Brandbare stof.
Explosie- en brandgassen niet inademen.
De damp is zwaarder dan lucht en kan zich over de bodem verplaatsen; ontsteking op afstand mogelijk.
Bij onvoldoende ventilatie en/of door gebruik is vorming van ontplofbare/lichtontbrandbare mengsels mogelijk.

Aanvullende informatie

Ademhalingsapparatuur met perslucht en beschermingskleding dragen.
Met normale voorzorgen vanaf een redelijke afstand blussen.
Ter bescherming van personen en koeling van containers, in het gevarengebied watersproeistraal inzetten.
In geval van brand: evacueren.
Bluswater niet in de riolering of oppervlaktewater laten lopen.

RUBRIEK 6: Maatregelen bij het onopzettelijk vrijkomen van de stof of het mengsel

6.1 Persoonlijke voorzorgsmaatregelen, beschermde uitrusting en noodprocedures

Voor andere personen dan de hulpdiensten: Slachtoffers uit de gevarenzone weghalen. elementaire hulp, decontaminatie, symptomatische behandeling.

6.2 Milieuvoorzorgsmaatregelen

Er zijn geen speciale maatregelen noodzakelijk.

6.3 Insluitings- en reinigingsmethoden en -materiaal

Mechanisch opnemen en in geschikte containers verwijderen. Afvalverwijdering volgens overheidsbepalingen.

6.4 Aanvullende informatie

Persoonlijke bescherming: zie rubriek 8 Informatie over verwijdering: zie rubriek 13

RUBRIEK 7: Hantering en opslag

7.1 Voorzorgsmaatregelen voor het veilig hanteren van de stof of het mengsel

Maatregelen in verband met veilig hanteren
Er zijn geen speciale maatregelen noodzakelijk.
Maatregelen ter voorkoming van brand, aerosol- en stofontwikkeling
Er zijn geen speciale maatregelen noodzakelijk.
Maatregelen om het milieu te beschermen
Er zijn geen speciale maatregelen noodzakelijk.

Voor werkpauze en werkeinde handen wassen. Contact met ogen en huid vermijden. Niet eten, drinken of roken tijdens gebruik. Oogdouche klaargezet en de plaats duidelijk gekenmerkt worden.

7.2 Voorwaarden voor een veilige opslag, met inbegrip van incompatibele producten

Aanbevolen opslagtemperatuur: 15-25°C
Opslagklasse: 10-13
Opslag: Op een droge plaats bewaren. In gesloten verpakking bewaren. Verwijderd houden van warmte, hete oppervlakken, vonken, open vuur en andere ontstekingsbronnen. Niet roken. Verpakkingsmateriaal: Glas Hoge dichtheid polyethyleen (HDPE)
Ongeschikte materialen en coatings van containers/apparatuur: Geen verdere beschikbare relevante informatie.

7.3 Specifiek eindgebruik

Naast het gebruik dat is beschreven in paragraaf 1.2 zijn geen andere gebruikswijzen voorzien.

RUBRIEK 8: Maatregelen ter beheersing van blootstelling/persoonlijke bescherming

8.1 Controleparameters

Bevat geen stoffen in hoeveelheden boven de concentratiegrenzen waarvoor een werkplekgrenswaarde is vastgelegd.

8.2 Maatregelen ter beheersing van blootstelling

8.2.1 Passende technische maatregelen

Technische maatregelen en de toepassing van geschikte arbeidsmethoden hebben voorrang boven het gebruik van persoonlijke beschermingsuitrustingen. Bij open hanteren moeten installaties met plaatselijke afzuiging gebruikt worden.

8.2.2 Persoonlijke bescherming

Draag geschikte beschermende kleding. Bij het hanteren met chemische werkstoffen mag alleen beschermingskleding tegen chemicaliën met een CE-kermerk inclusief viercijferig controlenummer, gedragen worden.

Bescherming van de ogen/het gezicht
Bril met zijbescherming dragen DIN-/EN-normen EN 166
Aanbeveling: VWR 111-0432

Bescherming van de huid
Bij de omgang met chemische werkstoffen mogen handschoenen die tegen chemicaliën beschermen met CE-kenmerk inclusief het viercijferige controlenummer, gedragen worden. Aanbevolen handschoenenfabrikaten DIN-/EN-normen EN ISO 374 Bij gepland hergebruik handschoenen voor het uittrekken reinigen en goed geventileerd bewaren.

Bij kortdurig huidcontact

Geschikt materiaal:	NBR (Nitrilrubber)
Dikte van het handschoenenmateriaal:	0,12 mm
Doordringtijd:	30-60 min
Aanbevolen handschoenenfabrikaten:	VWR 112-0998

Bij herhaald handcontact

Geschikt materiaal:	NBR (Nitrilrubber)
Dikte van het handschoenenmateriaal:	0,38 mm
Doordringtijd:	> 480 min
Aanbevolen handschoenenfabrikaten:	VWR 112-3717 / 112-1381

Bescherming van de ademhalingswegen

Normaal gesproken is geen persoonlijke adembescherming noodzakelijk.

Aanvullende informatie

Voor werkpauze en werkeinde handen wassen. Contact met ogen en huid vermijden. Niet eten, drinken of roken tijdens gebruik. Oogdouche klaargezet en de plaats duidelijk gekenmerkt worden.

8.2.3 *Beheersing van milieublootstelling*

geen gegevens beschikbaar

RUBRIEK 9: Fysische en chemische eigenschappen

9.1 Informatie over fysische en chemische basiseigenschappen

a) Voorkomen	
Fysische toestand:	vloeibaar
Kleur:	kleurloos
b) Geur:	geen gegevens beschikbaar
c) Geurdrempelwaarde:	geen gegevens beschikbaar

Veiligheidstechnische gegevens

d) pH:	6-8 (100 g/l; H2O; 20 °C)
e) Smelt-/vriespunt:	-59 °C
f) Beginkookpunt en kooktraject:	187,6 °C (1013 hPa)
g) Vlampunt:	99 °C
h) Verdampingssnelheid:	geen gegevens beschikbaar
i) Ontvlambaarheid (vast, gas):	niet van toepassing
j) Ontvlambaarheids- of explosiegrenswaarden	
Onderste ontploffingsgrens:	2,4 % (v/v)
Bovenste ontploffingsgrens:	17,4 % (v/v)
k) Dampspanning:	0,11 hPa (20 °C)
l) Dampdichtheid:	~2,6 (20 °C)
m) Dichtheid:	1,04 g/cm³ (20 °C)
n) Oplosbaarheid	
Oplosbaarheid in water:	soluble (20 °C)
o) Verdelingscoëfficiënt n-octanol/water:	-0,92 (20 °C)
p) Zelfontbrandingstemperatuur:	371 °C
q) Ontledingstemperatuur:	niet van toepassing
r) Viscositeit	
Viscositeit, kinematisch:	geen gegevens beschikbaar
Viscositeit, dynamisch:	45 mPa*s (20 °C)
s) Ontploffingseigenschappen:	niet van toepassing
t) Oxiderende eigenschappen:	niet van toepassing
u) deeltjeskarakteristieken:	geldt niet voor vloeistoffen

9.2 Overige informatie

Bulkdichtheid:	geen gegevens beschikbaar
Brekingsindex:	1,4324 (589 nm; 20 °C)
Dissocatieconstante:	geen gegevens beschikbaar
Oppervlaktespanning:	geen gegevens beschikbaar
Henry-constante:	geen gegevens beschikbaar

RUBRIEK 10: Stabiliteit en reactiviteit

10.1 Reactiviteit

Dit materiaal is onder normale omstandigheden niet reactief.
Bij verhitting:
Risico op ontsteking.

Dampen kunnen met lucht een explosief mengsel vormen.

10.2 Chemische stabiliteit

Het product is chemisch stabiel onder standaard omgevingsvoorwaarden (kamertemperatuur).

10.3 Mogelijke gevaarlijke reacties

Heftige reactie met:
Oxidatiemiddelen
Reducerend middel
Peroxiden

10.4 Te vermijden omstandigheden

Dit materiaal is brandbaar en kan door hitte, vonken, vlammen of andere ontstekingsbronnen (bijv. statische electriciteit, ontstekingsvlammen, mechanische/elektrische uitrusting) ontvlammen.
Vermijd hoge temperaturen of direct zonlicht.

10.5 Chemisch op elkaar inwerkende materialen

Producten van rubber
Producten van kunststof

10.6 Gevaarlijke ontledingsproducten

Ontledingsproducten in geval van brand: zie sectie 5.

10.7 Aanvullende informatie

geen gegevens beschikbaar

RUBRIEK 11: Toxicologische informatie

11.1 Informatie over toxicologische effecten

Acute effecten
Acute orale toxiciteit:
LD50: < 19400 mg/kg - Rat - (Merck KGaA)

Acute dermale toxiciteit:
LD50: > 20800 mg/kg - Konijn - (Merck KGaA)

Acute inhalatieve toxiciteit:
geen gegevens beschikbaar

Irritatie en brandende werking:
Primaire irriterende werking op de huid:
niet van toepassing

Irritatie van de ogen:
niet van toepassing

Irritatie van de luchtwegen:
niet van toepassing

Sensibilisatie van de luchtwegen/de huid
Bij huidcontact: niet sensibiliserend
Na inhalatie: niet sensibiliserend

STOT bij eenmalige blootstelling
niet van toepassing

STOT bij herhaalde blootstelling
niet van toepassing

CMR-effecten (kankerverwekkende, erfgoedveranderende alsmede voortplantingsbedreigende effecten)
Kankerverwekkendheid
Geen aanwijzing tot kankerverwekking bij mensen.

Mutageniteit in geslachtscellen
Geen indicatie op mutageniteit van de kiemcellen van de mens.

Giftigheid voor de voortplanting
Geen indicatie op reproductietoxiciteit voor de mens.

Gevaar bij inademing
niet van toepassing

Andere schadelijke effecten
geen gegevens beschikbaar

Aanvullende informatie
geen gegevens beschikbaar

11.2 Hormoonontregelende eigenschappen:

Deze stof heeft geen hormoonontregelende eigenschappen met betrekking tot mensen.

RUBRIEK 12: Ecologische informatie

12.1 Ecotoxiciteit

Vistoxiciteit:
LC50: 39800 mg/l (96 h) - Cornell, J.S., D.A. Pillard, and M.T. Hernandez 2000. Comparative Measures of the Toxicity of Component Chemicals in Aircraft Deicing Fluid. Environ.Toxicol.Chem. 19(6):1465-1472

Daphnientoxiteit:
LC50: 5120 mg/l (48 h) - Cornell, J.S., D.A. Pillard, and M.T. Hernandez 2000. Comparative Measures of the Toxicity of Component Chemicals in Aircraft Deicing Fluid. Environ.Toxicol.Chem. 19(6):1465-1472

Algentoxiciteit:
geen gegevens beschikbaar

Bacteriëntoxiciteit:
geen gegevens beschikbaar

12.2 Persistentie en afbreekbaarheid
geen gegevens beschikbaar

12.3 Mogelijke bioaccumulatie
Verdelingscoëfficiënt n-octanol/water: -0,92 (20 °C)

12.4 Mobiliteit in de bodem:
geen gegevens beschikbaar

12.5 Resultaten van PTB/vPvB-beoordeling
Deze stof voldoet niet aan de PBT-/zPzB-criteria van de REACH-verordening, annex XIII.

12.6 Hormoonontregelende eigenschappen
Deze stof heeft geen hormoonontregelende eigenschappen voor het milieu.

12.7 Andere schadelijke effecten
geen gegevens beschikbaar

RUBRIEK 13: Instructies voor verwijdering

13.1 Afvalverwerkingsmethoden

Instructies voor verwijdering / Product
Afvalverwijdering volgens overheidsbepalingen. Voor vuilverwerking zich wenden tot de verantwoordelijke erkende vuilverwerker. Verwijderen naar een verbrandingsinstallatie voor gevaarlijke stoffen met in achteneming van de officiële voorschriften.

Afvalcode product: geen gegevens beschikbaar

Instructies voor verwijdering / Verpakking
Afvalverwijdering volgens overheidsbepalingen. Vervuilde verpakkingen moeten zoals de oorspronkelijke inhoud behandeld worden.

Aanvullende informatie
geen gegevens beschikbaar

RUBRIEK 14: Informatie met betrekking tot het vervoer

Landtransport (ADR/RID)

Niet geclassificeerd als gevaarlijk volgens de transportwetgeving.

Transport op open zee (IMDG)

Niet geclassificeerd als gevaarlijk volgens de transportwetgeving.

Vervoer in bulk overeenkomstig bijlage II bij MARPOL 73/78 en de IBC-code
niet van toepassing

Luchttransport (ICAO-TI / IATA-DGR)

Niet geclassificeerd als gevaarlijk volgens de transportwetgeving.

RUBRIEK 15: Regelgeving

15.1 Specifieke veiligheids-, gezondheids- en milieureglementen en -wetgeving voor de stof of het mengsel

EU-voorschriften

- Verordening (EG) nr. 1907/2006 van het Europees Parlement en de Raad van 18 december 2006 inzake de registratie en beoordeling van en de autorisatie en beperkingen ten aanzien van chemische stoffen (REACH), tot oprichting van een Europees Agentschap voor chemische stoffen, houdende wijziging van Richtlijn 1999/45/EG en houdende intrekking van Verordening (EEG) nr. 793/93 van de Raad en Verordening (EG) nr. 1488/94 van de Commissie alsmede Richtlijn 76/769/EEG van de Raad en de Richtlijnen 91/155/EEG, 93/67/EEG, 93/105/EG en 2000/21/EG van de Commissie
- Verordening (EG) nr. 1272/2008 van het Europees Parlement en de Raad van 16 december 2008 betreffende de indeling, etikettering en verpakking van stoffen en mengsels tot wijziging en intrekking van de Richtlijnen 67/548/EEG en 1999/45/EG en tot wijziging van Verordening (EG) nr. 1907/2006
- Verordening (EU) nr. 453/2010 van de Commissie van 20 mei 2010 tot wijziging van Verordening (EG) nr. 1907/2006 van het Europees Parlement en de Raad inzake de registratie en beoordeling van en de autorisatie en beperkingen ten aanzien van chemische stoffen (Reach)
- Verordening (EU) 2015/830 van de Commissie van 28 mei 2015 tot wijziging van Verordening (EG) nr. 1907/2006 van het Europees Parlement en de Raad inzake de registratie en beoordeling van en de autorisatie en beperkingen ten aanzien van chemische stoffen (REACH)

Nationale voorschriften

geen gegevens beschikbaar

Waterbedreigingsklasse (WGK): zwak waterbedreigend

15.2 Chemischeveiligheidsbeoordeling

Voor deze stof heeft geen chemische veiligheidsbeoordeling plaatsgevonden.

RUBRIEK 16: Overige informatie

Afkortingen en acroniemen

LTV - Grenswaarde
STV - Kortetijdswaarde
ACGIH - American Conference of Governmental Industrial Hygiensts
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road
AGS - Committee on Hazardous Substances (Ausschuss für Gefahrstoffe)
CLP - Regulation on Classification, Labelling and Packaging of Substances and Mixtures
DFG - German Research Foundation (Deutsche Forschungsgemeinschaft)
DNEL - Derived No Effect Level
Gestis - Information system on hazardous substances of the German Social Accident Insurance (Gefahrstoffinformationssystem der Deutschen Gesetzlichen Unfallversicherung)
IATA-DGR - International Air Transport Association-Dangerous Goods Regulations
ICAO-TI - International Civil Aviation Organization-Technical Instructions
IMDG - International Maritime Code for Dangerous Goods
KOSHA - Korea Occupational Safety and Health Agency
NIOSH - National Institute for Occupational Safety and Health
OSHA - Occupational Safety & Health Administration
PBT - Persistent, Bioaccumulative and Toxic
PNEC - Predicted No Effect Concentration
RID - Regulation concerning the International Carriage of Dangerous Goods by Rail
SVHC - Substances of Very High Concern
vPvB - very Persistent, very Bioaccumulative

Belangrijke literatuuropgaven en gegevensbronnen
Dit veiligheidsinformatieblad is opgesteld op basis van informatie die voor het publiek beschikbaar is als TOXNET-informatie, stoffendossier van het Europees Agentschap voor chemische stoffen (ECHA), documenten van internationale instituten voor kankeronderzoek (IARC-monografieën), gegevens van het Amerikaanse National Toxicology Program, het Amerikaanse Agentschap voor toxische stoffen en ziekten Controle (ATSDR), PubChem-websites en SDS van onze grondstoffenfabrikanten.

Aanvullende informatie

Indicatie van wijzigingen	Implementatie: Hormoonontregelende eigenschappen Neem contact op met de leverancier als u uitleg over de wijziging nodig heeft (SDS@avantorsciences.com).

Wij verklaren naar ons beste geweten dat de in dit veiligheidsinformatieblad opgenomen gegevens overeenkomen met onze kennisstand ten tijde van de druk. De informatie moet aanwijzingen voor de veilige omgang met het in dit veiligheidsblad genoemde product bij opslag, verwerking, transport en afvalverwerking bevatten. De gegevens zijn niet overdraagbaar op andere producten. Voor zover het product met ander materiaal vermengd of verwerkt wordt zijn de gegevens van dit veiligheidsbald niet zonder meer op het op die manier geproduceerde nieuwe materiaal overdraagbaar.

VEILIGHEIDSINFORMATIEBLAD

DOW BENELUX B.V.

Veiligheidsinformatieblad volgens Reg. (EU) 2020/878

Productbenaming: DOWTHERM™ A Heat Transfer Fluid

Herzieningsdatum: 07.04.2021
Versie: 9.0
Datum laatste uitgave: 19.09.2019
Printdatum: 08.04.2021

DOW BENELUX B.V. raadt u aan om het algehele VIB te lezen en begrijpen omdat deze belangrijke informatie bevat. Wij verwachten dat u de voorzorgsmaatregelen volgt die in dit document staan vermeld, tenzij uw gebruiksomstandigheden andere geschikte maatregelen vereisen.

RUBRIEK 1: IDENTIFICATIE VAN DE STOF OF HET MENGSEL EN VAN DE VENNOOTSCHAP/ONDERNEMING

1.1 Productidentificatie
Productbenaming: DOWTHERM™ A Heat Transfer Fluid
UFI: 9DA0-T0XJ-M00M-QAMD

1.2 Relevant geïdentificeerd gebruik van de stof of het mengsel en ontraden gebruik
Geïdentificeerd gebruik: Bedoeld als warmteoverdrachtvloeistof voor gesloten systemen. Alleen voor bedrijfsmatige toepassing. Wij raden u aan dit product te gebruiken volgensde gebruiksaanwijzingen. Als de gebruiksbestemming niet overeenkomt met het gebruiksdoel dat wordt omschreven in de gebruiksaanwijzing, neem dan contact op met uw verkoper of contactpersoon van de klantenservice.

1.3 Details betreffende de verstrekker van het veiligheidsinformatieblad
BEDRIJFSIDENTIFICATIE
DOW BENELUX B.V.
HERBERT H.DOWWEG 5
HOEK
4542 NM TERNEUZEN
NETHERLANDS

Klant Informatie Nummer: (31) 115 67 2626
SDSQuestion@dow.com

1.4 TELEFOONNUMMER VOOR NOODGEVALLEN
24- Uur Urgentie Contact: 31-(0)115 694982
Plaatselijk Urgentie Contact: 00 31 115 69 4982
Het telefoonnummer van het Nationaal Vergiftigingen Informatie Centrum (NVIC). Uitsluitend bedoeld om professionele hulpverleners te verwittigen in geval van acute vergiftiging: +31 30 – 2748888

RUBRIEK 2: IDENTIFICATIE VAN DE GEVAREN

2.1 Indeling van de stof of het mengsel

Classificatie volgens richtlijn (EC) nr. 1272/2008:
Huidcorrosie/-irritatie - Categorie 2 - H315

Oogirritatie - Categorie 2 - H319
Specifieke doelorgaantoxiciteit - eenmalige blootstelling - Categorie 3 - H335
(Acuut) Aquatisch gevaar op korte termijn - Categorie 1 - H400
(Chronisch) Aquatisch gevaar op lange termijn - Categorie 1 - H410
Voor de volledige text van H-zinnen zoals vermeld in deze paragraaf, zie paragraaf 16.

2.2 Etiketteringselementen

Etikettering volgens de verordening (EC) No 1272/2008 [CLP/GHS]:

Gevarenpictogrammen

Signaalwoord: WAARSCHUWING

Gevarenaanduidingen

H315	Veroorzaakt huidirritatie.
H319	Veroorzaakt ernstige oogirritatie.
H335	Kan irritatie van de luchtwegen veroorzaken.
H410	Zeer giftig voor in het water levende organismen, met langdurige gevolgen.

Veiligheidsaanbevelingen

P261	Inademing van stof/ rook/ gas/ nevel/ damp/ spuitnevel vermijden.
P264	Na het werken met dit product de huid grondig wassen.
P273	Voorkom lozing in het milieu.
P280	Draag beschermende handschoenen/ oogbescherming/ gelaatsbescherming.
P304 + P340 + P312	NA INADEMING: de persoon in de frisse lucht brengen en ervoor zorgen dat deze gemakkelijk kan ademen. Bij onwel voelen een ANTIGIFCENTRUM/ arts raadplegen.
P391	Gelekte/gemorste stof opruimen.

Bevat Bifenyl

2.3 Andere gevaren
Dit product bevat geen stoffen die als PBT of vPvB zijn beoordeeld in concentraties van 0.1% of hoger.

Hormoonontregelende eigenschappen

Milieu:	De substantie/het mengsel bevat geen componenten waarvan wordt aangenomen dat ze hormoonontregelende eigenschappen hebben, volgens REACH artikel 57(f) of de gedelegeerde verordening van de Commissie (EU) 2017/2100 of de verordening van de Commissie (EU) 2018/605 op niveau 0.1% of hoger.
Menselijke gezondheid:	De substantie/het mengsel bevat geen componenten waarvan wordt aangenomen dat ze hormoonontregelende eigenschappen hebben, volgens REACH artikel 57(f) of de gedelegeerde verordening van de Commissie (EU) 2017/2100 of de verordening van de Commissie (EU) 2018/605 op niveau 0.1% of hoger.

RUBRIEK 3: SAMENSTELLING EN INFORMATIE OVER DE BESTANDDELEN

3.2 Mengsels

Dit product is een mengsel.

CASRN / EG-Nr. / Indexnr.	REACH registratienummer	Concentratie	Component	Indeling: VERORDENING (EG) Nr. 1272/2008
CASRN 101-84-8 **EG-Nr.** 202-981-2 **Indexnr.** –	01-2119472545-33	73,0%	Difenyloxide	Eye Irrit. 2; H319 Aquatic Acute 1; H400 Aquatic Chronic 3; H412 M-factor (Acute aquatische toxiciteit): 1 Acute toxiciteitsschattingen Acute orale toxiciteit: 2 830 mg/kg Acute dermale toxiciteit: > 7 940 mg/kg
CASRN 92-52-4 **EG-Nr.** 202-163-5 **Indexnr.** 601-042-00-8	01-2119480408-33	27,0%	Bifenyl	Skin Irrit. 2; H315 Eye Irrit. 2; H319 STOT SE 3; H335 (Ademhalingsstelsel) Aquatic Acute 1; H400 Aquatic Chronic 1; H410 M-factor (Acute aquatische toxiciteit): 1 M-factor (Chronische aquatische toxiciteit): 1 Acute toxiciteitsschattingen Acute orale toxiciteit: 2 180 - 5 040 mg/kg Acute dermale toxiciteit: > 5 010 mg/kg

Voor de volledige text van H-zinnen zoals vermeld in deze paragraaf, zie paragraaf 16.

RUBRIEK 4: EERSTEHULPMAATREGELEN

4.1 Beschrijving van de eerstehulpmaatregelen
Algemeen advies:

EHBO'ers zouden zorg moeten besteden aan zelfbescherming en de aanbevolen beschermkledij gebruiken (handschoenen bestand tegen chemicaliën, bescherming tegen spatten). Indien er een blootstellingsrisico is, raadpleeg dan sectie 8 voor specifieke persoonlijke beschermingsuitrusting.

Inademing: Breng de persoon in de frisse lucht en laat hem comfortabel ademen; raadpleeg een arts.

Aanraking met de huid: Afwassen met veel water.

Aanraking met de ogen: De ogen grondig spoelen met water gedurende een aantal minuten. Contactlenzen na de eerste 1-2 minuten verwijderen en verder spoelen gedurende enkele minuten. Raadpleeg een arts indien er bijwerkingen optreden, bij voorkeur een oogarts

Inslikken: Braken niet opwekken. Waarschuw een arts en/of vervoer onmiddellijk naar het ziekenhuis.

4.2 Belangrijkste acute en uitgestelde symptomen en effecten:
Naast de informatie onder Beschrijving van eerste hulpmaatregelen (boven) en Indicatie van noodzakelijke dringende medische hulp en speciale behandelingen (beneden), worden alle bijkomdende belangrijke symptomen en effecten beschreven in Sectie 11: Toxicologische informatie.

4.3 Vermelding van de vereiste onmiddellijke medische verzorging en speciale behandeling
Opmerkingen voor de arts: Kan astmatische symptomen (reactieve luchtwegen) veroorzaken. Bronchoverwijdende, slijmoplossende, hoeststillende medicijnen en corticosteroïden kunnen misschien helpen. Omdat na aspiratie snelle opname door de longen kan voorkomen en derhalve lichamelijke effecten kan veroorzaken moet de beslissing om wel of niet braken op te wekken genomen worden door een arts. Als maagspoeling wordt uitgevoerd, wordt scopie van de ademhalingsorganen en/of de slokdarm aanbevolen. Het gevaar van aspiratie moet worden afgewogen tegen de toxiciteit bij het overwegen van maagspoeling. Geen specifiek antidotum. De behandeling van blootstelling zou rekening moeten houden met de symptomen en de klinische toestand van de patiënt. Een overmatige herhaalde blootstelling kan een bestaande longaandoening verergeren.

RUBRIEK 5: BRANDBESTRIJDINGSMAATREGELEN

5.1 Blusmiddelen

Geschikte blusmiddelen: Waternevel of dunne sproeistraal.. Bluspoeder.. CO2 brandblussers.. Schuim.. Synthetische schuimen voor algemene doeleinden (inclusief AFFF type) of proteïneschuimen zijn te verkiezen, indien beschikbaar. Alcoholbestendige schuimen (ATC type) kunnen ook doeltreffend zijn.. Waternevel, voorzichtig aangebracht, kan gebruikt worden als brandblusdeken..

Ongeschikte blusmiddelen: Gebruik geen directe waterstraal.. Kan het vuur verspreiden..

5.2 Speciale gevaren die door de stof of het mengsel worden veroorzaakt

Gevaarlijke verbrandingsproducten: Bij brand kan de rook het originele product bevatten alsmede verbrandingsproducten met variërende samenstelling die toxisch en/of irriterend kunnen zijn.. Tot de gevaarlijke nevenproducten bij verbranding kunnen o.a. behoren:. Koolmonoxide.. Kooldioxide..

Ongebruikelijke brand- en explosiegevaren: Hevige stoomontwikkeling of eruptie kan onstaan door water direct in hete vloeistof te laten stromen.. Een vloeistof nevel van dit

product is brandbaar.. Bij temperaturen boven het vlampunt kunnen ontvlambare dampconcentratieszich opstapelen; zie Sec. 9.. Dichte rook wordt ontwikkeld wanneer het productbrandt..

5.3 Advies voor brandweerlieden

Brandbestrijdingsmaatregelen: Houd mensen weg. Isoleer de zone waar het brandten sta geen onnodige entree toe.. Geen directe waterstraal gebruiken. Dit kan de brand verspreiden.. Brandende vloeistoffen mogen met stromend water verwijderd worden om personeel te beschermen en schade aan eigendommen te minimaliseren.. Waternevel, voorzichtig aangebracht, kan gebruikt worden als brandblusdeken.. Voorkom, indien mogelijk, het wegvloeien van bluswater. Bluswater, dat is weggevloeid, kan schade aan het milieu veroorzaken.. Raadpleeg de secties "Maatregelen bij accidenteel vrijkomen" en "Ecologische informatie" van dit Veiligheidsinformatieblad..

Speciale beschermende uitrusting voor brandweerlieden: Draag adembescherming m.b.v. draagbare perslucht(type: overdruk) en beschermende brandweerkleding, inclusief helm, jas, broek, laarzen en handschoenen.. Vermijd contact met het product gedurende de brandbestrijding. Draag, wanneer contact waarschijnlijk is, een chemicaliënpak voor brandbestrijding met een autonoom ademhalingstoestel. Indien niet beschikbaar, draag een chemicaliënpak met een autonoom ademhalingstoestel en bestrijd de brand vanop afstand.. Voor beschermingsmiddelen tijdens opruimwerkzaamheden na een brand wordt verwezen naar de relevante rubrieken in dit veiligheidsinformatieblad..

RUBRIEK 6: MAATREGELEN BIJ HET ACCIDENTEEL VRIJKOMEN VAN DE STOF OF HET MENGSEL

6.1 Persoonlijke voorzorgsmaatregelen, beschermingsmiddelen en noodprocedures: Blijf bovenwinds van de morsing. Ventileer de ruimte waar gelekt of gemorst is. Laat enkel het nodige en voldoende beschermd personeel in het gebied. Zie Sectie 7, Hantering, voor bijkomende voorzorgsmaatregelen. Gebruik de juiste beschermingsmiddelen. Voor additionele informatie, zie sectie 8: Maatregelen ter beheersing van blootstelling / persoonlijke bescherming.

6.2 Milieuvoorzorgsmaatregelen: Vermijd dat het product in de grond, in sloten, riolen, waterwegen en/of grondwater terechtkomt. Zie Sectie 12, Ecologische Informatie. Het is mogelijk dat het product gemorst of afgevoerd in naturlijken wateren de aquatische organismen zal doden.

6.3 Insluitings- en reinigingsmethoden en -materiaal: Gemorst product indammen indien mogelijk. Kleine lozingen: Onbrandbaar materiaal. Grote lozingen: Verzamel in geschikte vaten voorzien van goede etiketten. Voor bijkomende informatie, zie sectie 13, Instructies voor verwijdering.

6.4 Verwijzing naar andere rubrieken: Verwijzingen naar andere secties worden, indien van toepassing, in de voorgaande sub-secties verstrekt

RUBRIEK 7: HANTERING EN OPSLAG

7.1 Voorzorgsmaatregelen voor het veilig hanteren van de stof of het mengsel: Aanraking met huid en kleding vermijden. Vermijd inademing van de dampen. Niet inslikken. Was grondig na gebruik. De verpakking goed gesloten houden. Voor toereikende ventilatie zorgen Als deze organische stoffen over hete vezelachtige isolatiematerialen gemorst worden, kan de

zelfontbrandingstemperatuur verlagen en dit kan spontane ontbranding veroorzaken. Zie sectie 8: Maatregelen ter beheersing van blootstelling / Persoonlijke bescherming.

7.2 Voorwaarden voor een veilige opslag, met inbegrip van incompatibele producten: Niet opslaan in: Open of niet geëtiketteerde containers. In goed gesloten containers opslaan. Zie sectie 10 voor meer specifieke informatie. Opslaan buiten bereik van reactieve stoffen. Zie Sectie 10, STABILITEIT EN REACTIVITEIT. Bijkomende informatie over het opslaan van dit product kan bekomen worden door de verkoopskantoor of de klantendienst te contacteren.

7.3 Specifiek eindgebruik: Raadpleeg het technische gegevensblad van dit product voor meer informatie.

RUBRIEK 8: MAATREGELEN TER BEHEERSING VAN BLOOTSTELLING/PERSOONLIJKE BESCHERMING

8.1 Controleparameters
Als er blootstellingslimieten bestaan, staan deze hieronder vermeld. Als er geen blootstellingslimieten worden weergegeven, zijn ergeen waarden van toepassing.

Component	Verordening	Soort opgave	Waarde
Difenyloxide	ACGIH	TWA Damp	1 ppm
	ACGIH	STEL Damp	2 ppm
	2017/164/EU	STEL	14 mg/m3 2 ppm
	Nadere informatie: Indicatief		
	2017/164/EU	TWA	7 mg/m3 1 ppm
	Nadere informatie: Indicatief		
	NL WG	TGG-8 uur	7 mg/m3
	NL WG	TGG-15 min	14 mg/m3
Bifenyl	ACGIH	TWA	0,2 ppm

Aanbevolen waarnemingsprocedures
Monitoring van de concentratie van stoffen in de ademzone van de werknemers of in de algemene werkruimte kan nodig zijn om de naleving van de grenswaarden voor beroepsmatige blootstelling en de toereikendheid van de blootstelling te bevestigen. Voor sommige stoffen kan biologische monitoring ook geschikt zijn.
Gevalideerde blootstellingsmeetmethoden moeten worden toegepast door een competent persoon en monsters moeten worden geanalyseerd door een geaccrediteerd laboratorium.
Er moet worden verwezen naar het toezicht normen, zoals de volgende: Europese Norm EN 689 (Blootstelling op de werkplek - Meting van de inhalatieblootstelling aan chemische stoffen - Strategie om te voldoen aan de arbeidshygienische blootstellingsgrenswaarden). Europese Norm EN 14042 (Werkplekatmosfeer - Richtlijn voor de toepassing en het gebruik van procedures voor de beoordeling van blootstelling aan chemische en biologische stoffen). Europese Norm EN 482 (Werkplekatmosfeer - Algemene eisen voor de uitvoering van de procedures voor het meten van chemische stoffen).
Verwijzing naar nationale richtlijnen voor methoden voor de bepaling van gevaarlijke stoffen is ook vereist.
Voorbeelden van bronnen van aanbevolen blootstellingsmeetmethoden worden hieronder gegeven of neem contact op met de leverancier. Verdere nationale methoden zijn mogelijk beschikbaar.
National Institute of Occupational Safety and Health (NIOSH), VS: Manual of Analytical Methods.
Occupational Safety and Health Administration (OSHA), VS: bemonstering en analysemethoden.
Health and Safety Executive (HSE), Verenigd Koninkrijk: methoden voor het bepalen van gevaarlijke stoffen.
Institut für Arbeitsschutz Deutsche Gesetzlichen Unfallversicherung (IFA), Duitsland.

L'Institut National de Recherche et de Securité, (INRS), Frankrijk.

Afgeleide doses zonder effect
Difenyloxide
Werknemers

Acute - systemische effecten		***Acute - plaatselijke effecten***		***Lange termijn - systemische effecten***		***Lange termijn-plaatselijke effecten***	
Huid	Inademing	Huid	Inademing	Huid	Inademing	Huid	Inademing
n.a.	n.a.	n.a.	n.a.	58,3 mg/kg lg/dag	245,8 mg/m3	0,15 mg/cm2	9,68 mg/m3

Consumenten

Acute - systemische effecten			***Acute - plaatselijke effecten***		***Lange termijn - systemische effecten***			***Lange termijn-plaatselijke effecten***	
Huid	Inademing	Oraal	Huid	Inademing	Huid	Inademing	Oraal	Huid	Inademing
n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Bifenyl
Werknemers

Acute - systemische effecten		***Acute - plaatselijke effecten***		***Lange termijn - systemische effecten***		***Lange termijn-plaatselijke effecten***	
Huid	Inademing	Huid	Inademing	Huid	Inademing	Huid	Inademing
n.a.	n.a.	n.a.	n.a.	63 mg/kg lg/dag	11,17 mg/m3	n.a.	n.a.

Consumenten

Acute - systemische effecten			***Acute - plaatselijke effecten***		***Lange termijn - systemische effecten***			***Lange termijn-plaatselijke effecten***	
Huid	Inademing	Oraal	Huid	Inademing	Huid	Inademing	Oraal	Huid	Inademing
n.a.	n.a.	n.a.	n.a.	n.a.	38 mg/kg lg/dag	3,3 mg/m3	1,9 mg/kg lg/dag	n.a.	n.a.

Voorspelde concentratie zonder effect
Difenyloxide

Compartiment	**PNEC**
Zoetwater	0,0017 mg/l
Zeewater	0,00017 mg/l
Intermitterend gebruik/intermitterende emissie	0,017 mg/l
Rioolwaterbehandelingsinstallatie	10 mg/l
Sediment	0,345 mg/kg droog gewicht (d.g.)
Sediment	0,0345 mg/kg droog gewicht (d.g.)
Bodem	0,0681 mg/kg droog gewicht (d.g.)

Bifenyl

Compartiment	PNEC
Zoetwater	0,017 mg/l
Zeewater	0,0017 mg/l
Intermitterend gebruik/intermitterende emissie	0,17 mg/l
Rioolwaterbehandelingsinstallatie	10 mg/l
Grond	0,528 mg/kg droog gewicht (d.g.)
Zoetwater afzetting	2,69 mg/kg droog gewicht (d.g.)
Zeeafzetting	0,269 mg/kg droog gewicht (d.g.)
Oraal (Doorvergiftiging)	16,7 mg/kg voedsel

8.2 Maatregelen ter beheersing van blootstelling
Technische controlemiddelen: Technische maatregelen toepassen om de concentraties in de lucht beneden de blootstellinsglimieten/-richtlijnen te houden. Indien er geen blootstellingslimieten/-richtlijnen bestaan, gebruik enkel met voldoende ventilatie. Plaatselijke afzuiging kan nodig zijn voor sommige werkzaamheden.

Individuele beschermingsmaatregelen

Bescherming van de ogen / het gezicht: Gebruik veiligheidsbril met zijschermen. De veiligheidsbril met zijschermen moet overeen komen met de norm EN 166 of een vergelijkbare norm.

Bescherming van de huid

Bescherming van de handen: Gebruik voor deze stof niet doordringbare handschoenen, als aanhoudend of regelmatig herhalend contact kan voorkomen. Gebruik chemicaliënbestendige handschoenen, geclassificeerd onder EN374: handschoenen voor bescherming tegen chemicaliën en micro-organismen. Voorbeelden van te verkiezen handschoenmaterialen die een barrière vormen: Polyethyleen. Ethyl vinyl alcohol laminaat ("EVAL"). Polyvinylalcohol ("PVA"). Styreen/butadieen rubber Viton. Voorbeelden van aanvaardbare handschoenmaterialen die een barrière vormen omvatten: Butylrubber Gechloreerde polyethyleen Natuurrubber (latex). Neopreen. Nitril/butadieen rubber ("nitril" of "NBR"). Wanneer langdurig of vaak herhaald contact kan voorkomen, worden handschoenen met een beschermingsklasse 4 of hoger (doorbraaktijd groter dan 120 minuten volgens EN 374) aanbevolen. Wanneer enkel een kortstondig contact verwacht wordt, worden handschoenen met een beschermingsklasse 1 of hoger (doorbraaktijd groter dan 10 minuten volgens EN 374) aanbevolen. De handschoendikte is op zichzelf geen goede indicator van het beschermingsniveau die een handschoen geeft tegen een chmische stof, aangezien dit beschermingsniveau ook zeer afhankelijk is van de specifieke samenstelling van het materiaal waar de handschoen van gemaakt is. De dikte van de handschoen moet, afhankelijk van het materiaalmodel en –type, in het algemeen meer dan 0,35 mm. zijn om voldoende bescherming te bieden bij continu en regelmatig contact met de stof. Als uitzondering op deze algemene regel is het bekend dat handschoenen voor meerlaags laminaat verdergaande bescherming zou bieden bij diktes van minder dan 0,35 mm. Andere handschoenmaterialen met een dikte die minder is dan 0,35 mm. kunnen voldoende bescherming bieden wanneer enkel kort contact wordt verwacht. AANDACHT: De selectie van specifieke handschoenen voor een bepaalde toepassing en gebruikstijd in een arbeidsplaats zou ook rekening moeten houden met alle andere relevante

factoren op de arbeidsplaats, zoals (maar niet beperkt tot): andere chemicaliën die mogelijk gehanteerd worden, fysieke vereisten (bescherming tegen snijden/doorboren, handigheid, thermische bescherming), mogelijke lichamelijke reacties op de handschoenmateriaal, en de instructies/specificaties van de handschoenenleverancier.
Overige bescherming: Draag schone lichaamsbedekkende kleding met lange mouwen.

Bescherming van de ademhalingswegen: Een adembescherming zou moeten gedragen worden wanneer het risico bestaat dat de blootstellingslimieten worden overschreden. Indien er geen blootstellingslimieten of -richtlijnen bestaan, gebruik een goedgekeurd ademhalingstoestel indien nadelige effecten (zoalsirritatie van de luchtwegen) of onbehagen optreden, of wanneer aangewezen door uw risicobeoordelingsproces.
Volgend EG goedgekeurd ademhalingstoestel gebruiken: Filter voor organische dampen met een fijnstof-voorfilter, type AP2 (moet voldoen aan Norm EN 14387).

Beheersing van milieublootstelling
Zie SECTIE 7: Hantering en opslag en SECTIE 13:Instructies voor verwijdering maatregelen om overmatige blootstelling aan het milieu tijdens het gebruik en afvalverwijdering te voorkomen.

RUBRIEK 9: FYSISCHE EN CHEMISCHE EIGENSCHAPPEN

9.1 Informatie over fysische en chemische basiseigenschappen

Voorkomen	
Fysische staat	Vloeistof.
Kleur	Kleurloos tot geel
Geur	Aromatisch
Geurdrempel	Geen testgegevens beschikbaar
pH	Niet van toepassing, stof / mengsel niet-polair / aprotisch
Smelt-/vriespunt	
Smeltpunt/-traject	Niet van toepassing op vloeistoffen
Vriespunt	12,0 °C *Literatuur*
Kookpunt of beginkookpunt en kooktraject	
Kookpunt (760 mmHg)	257 °C *Literatuur*
Vlampunt	**gesloten beker** 113 °C *Gesloten vat*
Ontvlambaarheid (vast, gas)	Niet van toepassing op vloeistoffen
Ontvlambaarheid (vloeistoffen)	Wordt niet verwacht een statisch accumulerende ontvlambare vloeistof te zijn
Onderste explosiegrens	0,8 %(V) *Literatuur*
Bovenste explosiegrens	7,0 %(V) *Literatuur*
Dampdruk:	0,025 mmHg bij 25 °C *Literatuur*
Relatieve dampdichtheid (lucht = 1)	>1,0 *Literatuur*
Relatieve dichtheid (water = 1)	1,050 - 1,075 bij 25 °C / 25 °C *Literatuur*
Oplosbaarheid	
Oplosbaarheid in water	0,0138 g/l bij 15,6 °C *Literatuur*
Verdelingscoëfficiënt: n-octanol/water	Niet uitgevoerd

Zelfontbrandingstemperatuur	599 °C *Literatuur*
Ontledingstemperatuur	Geen testgegevens beschikbaar
Kinematische viscositeit	3,51 mm2/s bij 25 °C *Literatuur*
Deeltjeskenmerken	
Deeltjesgrootte	Niet van toepassing, vloeibaar

9.2 Overige informatie

Moleculair gewicht	166,0 g/mol *Literatuur*
Procent vluchtigheid	Geen gegevens beschikbaar
Ontploffingseigenschappen	Geen gegevens beschikbaar
Oxiderende eigenschappen	Geen gegevens beschikbaar
Verdampingssnelheid (Butylacetaat = 1)	< 0,1 geschat

NOTA :De fysische en chemische gegevens weergegeven in sectie 9 zijn typische waarden voor dit produkt en zijn niet bedoeld als produkt specificaties.

RUBRIEK 10: STABILITEIT EN REACTIVITEIT

10.1 Reactiviteit: Geen gegevens beschikbaar

10.2 Chemische stabiliteit: Thermisch stabiel bij normale gebruikstemperatuur

10.3 Mogelijke gevaarlijke reacties: Polymerisatie zal niet optreden.

10.4 Te vermijden omstandigheden: Door blootstelling aan hoge temperaturen kan ditproduct ontleden.

10.5 Chemisch op elkaar inwerkende materialen: Contact met oxiderende stoffen vermijden.

10.6 Gevaarlijke ontledingsproducten: De ontledingsproducten hangen af van de temperatuur, luchttoevoer en de aanwezigheid van andere stoffen.. Ontledingsproducten kunnen sporen van de volgende stoffen omvatten:. Benzeen.. Fenol..

RUBRIEK 11: TOXICOLOGISCHE INFORMATIE

Toxoligische informatie wordt weergegeven in dit gedeelte wanneer deze gegevens beschikbaar zijn.

11.1 Informatie over gevarenklassen als omschreven in Verordening (EG) nr. 1272/2008

Informatie over waarschijnlijke blootstellingsrouten
Inname, Inademing, Aanraking met de huid, Aanraking met de ogen.

Acute toxiciteit (vertegenwoordigt korte termijn blootstellingen met onmiddellijke effecten - geen chronische / vertraagde effecten bekend tenzij anders vermeld)

Acute orale toxiciteit

De orale toxiciteit is laag. Kleine hoeveelheden, ingeslikt samenhangend met het normale hanteren,zullen waarschijnlijk geen schade veroorzaken. Inslikken van grotere hoeveelheden kan schade tot gevolg hebben.

Gebaseerd op product testen:
LD50, Rat, > 2 000 mg/kg

Informatie voor componenten:

Difenyloxide
LD50, Rat, vrouwtje, 2 830 mg/kg

Bifenyl
LD50, Rat, 2 180 - 5 040 mg/kg

Acute dermale toxiciteit
Langdurig contact met de huid zal waarschijnlijk niet resulteren in de opname van schadelijke hoeveelheden.

Als product. De dermale LD50 is niet bepaald.

Gebaseerd op informatie voor component(en):
LD50, Konijn, > 5 000 mg/kg geschat

Informatie voor componenten:

Difenyloxide
LD50, Konijn, mannelijk en vrouwelijk, > 7 940 mg/kg

Bifenyl
LD50, Konijn, > 5 010 mg/kg

Acute toxiciteit bij inademing
Bij kamertemperatuur is de blootstelling aan dampen minimaal wegens de lage vluchtigheid. Bovenmatige blootstelling kan irritatie van de bovenste ademhalingsorganen (neus en keel) en de longen veroorzaken. Kan vanwege de geur hoofdpijn en misselijkheid veroorzaken.

De LC50 werd niet bepaald.

Informatie voor componenten:

Difenyloxide
Als product. De LC50 werd niet bepaald.

Bifenyl
De LC50 werd niet bepaald.

Huidcorrosie/-irritatie
Gebaseerd op product testen:
Herhaald contact kan een matige huidirritatie met lokale roodheid veroorzaken.

Informatie voor componenten:

Difenyloxide
Korte blootstelling (huidcontact) kan lichte huidirritatie met plaatselijke roodheid veroorzaken.
Langdurig contact kan een matige irritatie van de huid met plaatselijke roodheid veroorzaken.
Kan een ernstigere reactie veroorzaken op bedekte huid (onder kleding, handschoenen).
Herhaaldelijke blootstelling kan enige irritatie, zelfs brandwonden veroorzaken.

Bifenyl
Langdurig contact kan huidirritatie met lokale roodheid veroorzaken.
Het product kan worden gehanteerd bij verhoogde temperaturen. Contact met het verhitte product kan thermische brandwonden veroorzaken.

Ernstig oogletsel/oogirritatie
Gebaseerd op product testen:
Kan voorbijgaande lichte oogirritatie veroorzaken

Informatie voor componenten:

Difenyloxide
Kan matige oogirritatie veroorzaken.
Kan lichte hoornvliesbeschadiging veroorzaken.

Bifenyl
Kan lichte oogirritatie veroorzaken.
Hoornvliesbeschadiging is onwaarschijnlijk.
Dampen kunnen oogirritatie veroorzaken, met een licht onbehagen en roodheid.
Het product kan worden gehanteerd bij verhoogde temperaturen. Contact met het verhitte product kan thermische brandwonden veroorzaken.

Sensibilisatie
Bij overgevoeligheid van de huid:
Gebaseerd op informatie voor component(en):
Veroorzaakte geen allergische huidreacties bij testen met mensen.
Veroorzaakte geen allergische huidreacties bij testen met cavia's.

Sensibilisatie van de luchtwegen:
Geen specifieke, relevante data beschikbaar voor beoordeling.

Informatie voor componenten:

Difenyloxide
Veroorzaakte geen allergische huidreacties bij testen met mensen.
Veroorzaakte geen allergische huidreacties bij testen met cavia's.

Sensibilisatie van de luchtwegen:
Geen relevante data gevonden.

Bifenyl
Veroorzaakte geen allergische huidreacties bij testen met cavia's.

Sensibilisatie van de luchtwegen:
Geen relevante data gevonden.

Specifieke doel orgaan systeem toxiciteit (enkele blootstelling)

Kan irritatie van de luchtwegen veroorzaken.
Blootstellingsroute: Inademing

Informatie voor componenten:

Difenyloxide
De beschikbare gegevens zijn ontoereikend om eenblootstellingsspecifieke doelorgaantoxiciteit te bepalen.

Bifenyl
Kan irritatie van de luchtwegen veroorzaken.
Blootstellingsroute: Inademing
Doelorganen: Ademhalingsstelsel

Gevaar bij inademing
Kan schadelijk zijn bij inslikken en binnendringen van de luchtwegen.

Informatie voor componenten:

Difenyloxide
Op basis van de fysieke eigenschappen is het niet waarschijnlijk dat inademingsgevaar bestaat.

Bifenyl
Op basis van de fysieke eigenschappen is het niet waarschijnlijk dat inademingsgevaar bestaat.

Chronische toxiciteit (vertegenwoordigt langdurige blootstelling met herhaalde dosis resulterend in chronische / vertraagde effecten - geen onmiddellijke effecten bekend tenzij anders vermeld)

Specifieke doel orgaan systeem toxiciteit (herhaalde blootstelling)
Gebaseerd op informatie voor component(en):
Bij de mens werden effecten op de volgende organen beschreven:
Centrale zenuwstelsel.
Lever.
Ondergeschikt centraal zenuwstelsel.
Bij dieren zijn effecten aan de volgende organenwaargenomen:
Nier.
Kan misselijkheid of braken veroorzaken.
Kan een onbehaaglijk gevoel in de onderbuik of diarree veroorzaken.

Informatie voor componenten:

Difenyloxide
Gebaseerd op beschikbare gegevens, worden herhaaldelijke blootstellingen niet verwacht significante schadelijke effecten te veroorzaken.

Bifenyl
Bij de mens werden effecten op de volgende organen beschreven:
Centrale zenuwstelsel.
Lever.
Ondergeschikt centraal zenuwstelsel.

Bij dieren zijn effecten aan de volgende organenwaargenomen:
Nier.
Kan misselijkheid of braken veroorzaken.
Kan een onbehaaglijk gevoel in de onderbuik of diarree veroorzaken.

Kankerverwekkendheid
Bevat een of meerdere bestanddelen die kanker veroorzaakten bij proefdieren. Bifenyl is echter niet genotoxisch. De relevantie van het kankerverwekkend potentiëel bij de mens in niet gekend.

Informatie voor componenten:

Difenyloxide
Geen relevante data gevonden.

Bifenyl
Heeft kanker bij proefdieren veroorzaakt. Bifenyl is echter niet genotoxisch. De relevantie van het kankerverwekkend potentiëel bij de mens in niet gekend.

Teratogeniteit
Bevat bestanddelen die bij proefdieren toxisch voor de fetus waren, maar enkel bij doses toxisch voor het moederdier. Bevat een of meerdere bestanddelen die geen geboorteafwijkingen bij proefdieren veroorzaakten.

Informatie voor componenten:

Difenyloxide
Heeft geen geboorteafwijkingen of andere effecten aan de foetus veroorzaakt, zelfs niet bij doseringen die toxische effecten bij de moeder veroorzaakten.

Bifenyl
Veroorzaakte bij proefdieren geen aangeboren afwijkingen. Is bij proefdieren toxisch geweest voor de foetus bij doseringen die toxisch voor de moeder waren.

Giftigheid voor de voortplanting
In dierstudies met de bestanddelen werden effecten vastgesteld op de voortplanting enkel bij doses die ook belangrijke toxische effecten veroorzaakten bij de ouders.

Informatie voor componenten:

Difenyloxide
Geen relevante data gevonden.

Bifenyl
Bij dierproeven zijn effecten op de voortplanting alleen waargenomen bij doses die significante toxiciteit veroorzaakten bij de ouders.

Mutageniteit
Resultaten van genetische toxiciteitsstudies in vitro waren negatief. Genetische toxiciteitsstudies op dieren waren negatief.

Informatie voor componenten:

Difenyloxide

Resultaten van genetische toxiciteitsstudies in vitro waren negatief. Genetische toxiciteitsstudies op dieren waren negatief.

Bifenyl
In vitro studies van genetische toxiciteit waren in sommige gevallen negatief en in andere gevallen positief. Genetische toxiciteitsstudies op dieren waren negatief.

11.2 Informatie over andere gevaren

Hormoonontregelende eigenschappen

De substantie/het mengsel bevat geen componenten waarvan wordt aangenomen dat ze hormoonontregelende eigenschappen hebben, volgens REACH artikel 57(f) of de gedelegeerde verordening van de Commissie (EU) 2017/2100 of de verordening van de Commissie (EU) 2018/605 op niveau 0.1% of hoger.

Informatie voor componenten:

Difenyloxide
Deze stof wordt niet geacht hormoonontregelende eigenschappen te hebben volgens artikel 57(f) van REACH, Verordening (EU) 2018/605van de Commissie of Gedelegeerde Verordening (EU) 2017/2100 van de Commissie.

Bifenyl
Deze stof wordt niet geacht hormoonontregelende eigenschappen te hebben volgens artikel 57(f) van REACH, Verordening (EU) 2018/605van de Commissie of Gedelegeerde Verordening (EU) 2017/2100 van de Commissie.

RUBRIEK 12: ECOLOGISCHE INFORMATIE

Ecotoxicologische informatie verschijnt in deze sectie wanneer deze gegevens beschikbaar zijn.

12.1 Toxiciteit

Acute toxiciteit voor vissen
De stof is zeer toxisch voor waterorganismen (LC50/EC50/IC50 beneden 1 mg/L voor de meest gevoelige soorten).

LC50, Pimephales promelas (Amerikaanse dikkopling), 96 h, 9,6 mg/l

Acute toxiciteit voor in het water levende ongewervelden
EC50, Daphnia magna (grote watervlo), statische test, 48 h, 0,29 mg/l

12.2 Persistentie en afbreekbaarheid

Biologische afbreekbaarheid: Van het materiaal wordt verwacht dat het redelijk biologisch afbreekbaar is.

12.3 Bioaccumulatie

Bioaccumulatie: Voor de belangrijkste bestanddelen: Bioconcentratiepotentieel is matig (BCF tussen 100 en 3000 of log Pow tussen 3 en 5).

12.4 Mobiliteit in de bodem

Voor de belangrijkste bestanddelen:
Potentie tot verspreiding in de grond is laag (Koc tussen 500 en 2000).

12.5 Resultaten van PBT- en zPzB-beoordeling
Deze mengsel is niet beoordeeld voor persistentie, bioaccumulatie en toxiciteit (PBT).

12.6 Hormoonontregelende eigenschappen

De substantie/het mengsel bevat geen componenten waarvan wordt aangenomen dat ze hormoonontregelende eigenschappen hebben, volgens REACH artikel 57(f) of de gedelegeerde verordening van de Commissie (EU) 2017/2100 of de verordening van de Commissie (EU) 2018/605 op niveau 0.1% of hoger.

Difenyloxide
Deze stof wordt niet geacht hormoonontregelende eigenschappen te hebben volgens artikel 57(f) van REACH, Verordening (EU) 2018/605van de Commissie of Gedelegeerde Verordening (EU) 2017/2100 van de Commissie.

Bifenyl
Deze stof wordt niet geacht hormoonontregelende eigenschappen te hebben volgens artikel 57(f) van REACH, Verordening (EU) 2018/605van de Commissie of Gedelegeerde Verordening (EU) 2017/2100 van de Commissie.

12.7 Andere schadelijke effecten
Geen relevante data gevonden.

RUBRIEK 13: INSTRUCTIES VOOR VERWIJDERING

13.1 Afvalverwerkingsmethoden
Dit product moet, wanneer het wordt verwijderd in zijn ongebruikte en onvervuilde staat, worden behandeld als gevaarlijk afval volgens de EC-richtlijn 2008/98/EC. Verwijderingspraktijken moeten in overeenstemming zijn met alle nationale en provinciale wetten en enige gemeentelijke of lokale bijwetten over gevaarlijk afval. Er zijn mogelijk aanvullende evaluaties vereist voor gebruikt, vervuild en overblijvend materiaal. Niet in riolen, op bodem of op oppervlaktewater lozen.

De toewijzing van een geschikte EWC afvalgroep als ook een afvalcode EWC eigen aan dit produkt hangt af van de toepassing waarvoor dit produkt gebruikt is.Overleggen met de afvalverwerkende dienst.

RUBRIEK 14: INFORMATIE MET BETREKKING TOT HET VERVOER

Classificatie voor transport over WEG en SPOOR (ADR/RID)

14.1	**VN-nummer of ID-nummer**	UN 3082
14.2	**Juiste ladingnaam overeenkomstig de modelreglementen van de VN**	MILIEUGEVAARLIJKE VLOEISTOF, N.E.G.(Difenyloxide, bifenyl)
14.3	**Transportgevarenklasse(n)**	9
14.4	**Verpakkingsgroep**	III

14.5	**Milieugevaren**	Difenyloxide, bifenyl
14.6	**Bijzondere voorzorgen voor de gebruiker**	Gevarenidentificatienr.: 90

Classificatie voor BINNEN-wateren (ADNR/ADN):
Raadpleeg uw Dow-contactpersoon voordat u over de binnenlandse waterwegen vervoert

Classificatie voor ZEE transport (IMO/IMDG):

14.1	**VN-nummer of ID-nummer**	UN 3082
14.2	**Juiste ladingnaam overeenkomstig de modelreglementen van de VN**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(Diphenyl oxide, Biphenyl)
14.3	**Transportgevarenklasse(n)**	9
14.4	**Verpakkingsgroep**	III
14.5	**Milieugevaren**	Diphenyl oxide, Biphenyl
14.6	**Bijzondere voorzorgen voor de gebruiker**	EmS: F-A, S-F
14.7	**Zeevervoer in bulk overeenkomstig IMO-instrumenten**	Consult IMO regulations before transporting ocean bulk

Classificatie voor LUCHT transport (IATA/ICAO):

14.1	**VN-nummer of ID-nummer**	UN 3082
14.2	**Juiste ladingnaam overeenkomstig de modelreglementen van de VN**	Environmentally hazardous substance, liquid, n.o.s.(Diphenyl oxide, Biphenyl)
14.3	**Transportgevarenklasse(n)**	9
14.4	**Verpakkingsgroep**	III
14.5	**Milieugevaren**	Not applicable
14.6	**Bijzondere voorzorgen voor de gebruiker**	No data available.

Deze informatie is niet bedoeld om alle specifieke wetgeving, operationele vereisten/informatie over dit product bekend te maken. Bijkomende informatie over transport kan bekomen worden via een vertegenwoordiger van de verkoopsorganisatie, of van de klantendienst. Het is de verantwoordelijkheid van de transportonderneming om alle wettelijke bepalingen i.v.m. vervoer van goederen na te leven.

RUBRIEK 15: REGELGEVING

15.1 Specifieke veiligheids-, gezondheids- en milieureglementen en -wetgeving voor de stof of het mengsel

REACh Verordening (EG) Nr. 1907/2006
Dit product bevat componenten die zijn geregistreerd, zijn vrijgesteld van registratie, die als geregistreerd worden beschouwd of die niet zijn onderworpen aan registratie zoals geregeld in Verordening (EG) nr. 1907/2006 (REACH).,De hiervoorgenoemde aanwijzingen van de REACH-registratiestatus worden naar eer en geweten geleverd en er wordt vanuit gegaan dat deze nauwkeurig zijn vanaf de datum die hierboven wordt weergegeven. Er wordt echter expliciete of impliciete garantie gegeven. Het is de verantwoordelijk van de afnemer/gebruiker om te verzekeren dat zijn/haar begrip van de regelgevende status van dit product correct is.

REACH - Beperkingen op de vervaardiging, het in de handel brengen en het gebruik van bepaalde gevaarlijke stoffen, preparaten en voorwerpen (Bijlage XVII)	Beperkingsvoorwaarden voor de volgende data moeten in overweging worden genomen: Nummer op de lijst 3

Seveso III: Richtlijn 2012/18/EU van het Europees Parlement en de Raad betreffende de beheersing van de gevaren van zware ongevallen waarbij gevaarlijke stoffen zijn betrokken.
Vermeld in Verordening: MILIEUGEVAREN
Nummer in Verordening: E1
100 t
200 t

ABM (Algemene Beoordelingsmethodiek): Neem contact op met onze product stewardship specialist via de contactgegevens van onze klanteninformatie in sectie 1 voor informatie van de beoordeelde stoffen en preparaten in het kader van de uitvoering van het waterafvoerbeleid.

15.2 Chemische veiligheidsbeoordeling
Voor deze stof /dit mengsel is geen chemische veiligheidsbeoordeling uitgevoerd.

RUBRIEK 16: OVERIGE INFORMATIE

Volledige tekst van H-zinnen zoals vermeld in paragraaf 2 en 3.

H315	Veroorzaakt huidirritatie.
H319	Veroorzaakt ernstige oogirritatie.
H335	Kan irritatie van de luchtwegen veroorzaken.
H400	Zeer giftig voor in het water levende organismen.
H410	Zeer giftig voor in het water levende organismen, met langdurige gevolgen.
H412	Schadelijk voor in het water levende organismen, met langdurige gevolgen.

Classificatie en procedure worden gebruikt om de classificatie voor mengsels uit richtlijn (EC) nr. 1272/2008 af te leiden
Skin Irrit. - 2 - H315 - Gebaseerd op productgegevens of beoordeling
Eye Irrit. - 2 - H319 - Gebaseerd op productgegevens of beoordeling
STOT SE - 3 - H335 - Gebaseerd op productgegevens of beoordeling
Aquatic Acute - 1 - H400 - Gebaseerd op productgegevens of beoordeling

Aquatic Chronic - 1 - H410 - Calculatiemethode

Revisie
Identificatie Nummer: 11012315 / A281 / Aanmaakdatum:: 07.04.2021 / Versie: 9.0
De meest recente herzieningen worden aangeduid door de dubbele verticale lijn in vet gedrukt op de linkerkant van het document.

Randschrift

2017/164/EU	Europa. Commissie Richtlijn 2017/164/EU tot vaststelling van een vierde lijst van indicatieve grenswaarden voor beroepsmatige blootstelling
ACGIH	USA. ACGIH Threshold Limit Values (TLV - waarden grens drempel)
NL WG	Arbeidsomstandigheden - Wettelijke grenswaarden
STEL	Grenswaarden voor blootstelling gedurende kortere periode
TGG-15 min	Tijdgewogen gemiddelde - 15 min
TGG-8 uur	Tijdgewogen gemiddelde - 8 uur
TWA	8 uur, gemiddelde door de tijd gewogen
Aquatic Acute	(Acuut) Aquatisch gevaar op korte termijn
Aquatic Chronic	(Chronisch) Aquatisch gevaar op lange termijn
Eye Irrit.	Oogirritatie
Skin Irrit.	Huidcorrosie/-irritatie
STOT SE	Specifieke doelorgaantoxiciteit - eenmalige blootstelling

Volledige tekst van andere afkortingen
ADN - Europese overeenkomst betreffende het internationale vervoer van gevaarlijke goederen over de binnenwateren; ADR - Europese overeenkomst betreffende het internationale vervoer van gevaarlijke goederen over de weg (ADR-overeenkomst); AIIC - Australische inventarislijst van industriële chemische stoffen; ASTM - Amerikaanse Vereniging voor het testen van materialen; bw - Lichaamsgewicht; CLP - Verordening betreffende de indeling, etikettering en verpakking; Verordening (EG) nr 1272/2008; CMR - Carcinogeen, mutageen of giftig voor de voortplanting; DIN - Standaard of het Duitse instituut voor standaardisatie; DSL - Lijst met binnenshuis gebruikte stoffen (Canada); ECHA - Europees Agentschap voor Chemische Stoffen; EC-Number - EINECS nummer; ECx - Concentratie verbonden met x% respons; ELx - Laadcapaciteit verbonden met x% respons; EmS - Noodschema; ENCS - Bestaande en nieuwe chemische stoffen (Japan); ErCx - Concentratie verbonden met x% groei respons; GHS - Globaal geharmoniseerd systeem; GLP - Goede laboratoriumspraktijk; IARC - Internationaal agentschap voor onderzoek naar kanker; IATA - Vereniging voor internationaal luchtvervoer; IBC - Internationale IMO-code voor de bouw en de uitrusting van schepen die gevaarlijke chemicaliën in bulk vervoeren; IC50 - Halfmaximale remmende concentratie; ICAO - Internationale Burgerluchtvaartorganisatie; IECSC - Inventarislijst van bestaande chemische stoffen in China; IMDG - Internationale maritieme gevaarlijke goederen; IMO - Internationale maritieme organisatie; ISHL - Industriële Veiligheids- en Gezondheitswet (Japan); ISO - Internationale organisatie voor standaardisering; KECI - Koreaanse inventarislijst van bestaande chemicaliën; LC50 - Dodelijke concentratie voor 50% van een testpopulatie; LD50 - Dodelijke dosis voor 50% van een testpopulatie (letale-dosismediaan); MARPOL - Internationale conventie voor de preventie van vervuiling door schepen; n.o.s. - Niet op andere wijze gespecificeerd; NO(A)EC - Geen waarneembaar (negatief) effect op concentratie; NO(A)EL - Geen waarneembaar (negatief) effect op Level; NOELR - Geen waarneembaar effect op laadcapaciteit; NZIoC - Nieuw-Zeelandse inventarislijst van chemicaliën; OECD - Organisatie voor economische samenwerking en ontwikkeling OESO; OPPTS - Bureau voor chemische veiligheid en vervuilingspreventie; PBT - Moeilijk afbreekbare, bioaccumulatieve en toxische stof; PICCS - Philippijnse inventarislijst van chemicaliën en chemische stoffen; (Q)SAR - (Kwantitatieve) structuur-activiteitsrelaties; REACH - Verordening (EG) nr 1907/2006 van het Europese Parlement en de Raad inzake de registratie en beoordeling van en de autorisatie en

beperkingen ten aanzien van chemische stoffen (REACH); RID - Reglement betreffende het internationale spoorwegvervoer van gevaarlijke goederen (RID); SADT - Zelfversnellende ontledingstemperatuur; SDS - Veiligheidsinformatieblad; SVHC - zeer zorgwekkende stof; TCSI - Taiwanese inventarislijst van chemische stoffen; TRGS - Technisch voorschrift over gevaarlijke stoffen; TSCA - Wet inzake het beheersen van toxische stoffen (VS); UN - Verenigde Naties; vPvB - Zeer moeilijk afbreekbaar en zeer bioaccumulatief

Informatiebron en referenties
Dit veiligheidsinformatieblad is opgesteld door Product Regulatory Services en Hazard Communications Groups uit informatie door interne verwijzingen binnen ons bedrijf.

DOW BENELUX B.V. vraagt aan elke klant of ontvanger van dit Veiligheidsinformatieblad (VIB) het aandachtig te lezen en, indien nodig, de juiste deskundigen te raadplegen om de gegevens in dit VIB te begrijpen en om op de hoogte te zijn van de gevaren die het product met zich meebrengt. De informatie in dit document wordt te goeder trouw gegeven en wordt verondersteld juist te zijn op de aanmaakdatum van dit document. Er wordt echter geen expliciete of impliciete garantie gegeven. Wettelijke bepalingen kunnen veranderen en ze kunnen verschillend zijn afhankelijk van het land. Het is de verantwoordelijkheid van de koper/gebruiker om te verzekeren dat zijn activiteiten in overeenstemming zijn met alle plaatselijke wettelijke bepalingen. De informatie in dit document heeft enkel betrekking op het product zoals het verscheept wordt.Vermits de omstandigheden waarin het product gebruikt wordt niet door de producent kunnen gecontroleerd worden, moet de koper/gebruiker de omstandigheden bepalen, waarin het product in alle veiligheid kan gebruikt worden. Omwille van de proliferatie van informatiebronnen, zoals Veiligheidsinformatiebladen (VIBs) van verschillende producenten, zijn wij niet verantwoordelijk en kunnen wij niet verantwoordelijk zijn voor Veiligheidsinformatiebladen die via andere bronnen bekomen werden. Indien U een Veiligheidsinformatieblad via een andere bron heeft ontvangen, of indien U niet zeker bent dat U in bezit bent van de meest recente versie van een Veiligheidsinformatieblad, gelieve ons te contacteren. NL

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)

Calcium hydroxide ≥96 % powder

article number: **3529**
Version: **4.0 en**
Replaces version of: 2021-09-23
Version: (3)

date of compilation: 2015-12-10
Revision: 2022-04-26

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

1.1 Product identifier

Identification of the substance	**Calcium hydroxide** ≥96 % powder
Article number	3529
EC number	215-137-3
CAS number	1305-62-0

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

Relevant identified uses:	Laboratory chemical Laboratory and analytical use
Uses advised against:	Do not use for products which come into contact with foodstuffs. Do not use for private purposes (household).

1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone:+49 (0) 721 - 56 06 0
Telefax: +49 (0) 721 - 56 06 149
e-mail: sicherheit@carlroth.de
Website: www.carlroth.de

Competent person responsible for the safety data sheet:	:Department Health, Safety and Environment
e-mail (competent person):	**sicherheit@carlroth.de**

1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
National Poisons Information Service City Hospital	Dudley Rd	B187QH Birmingham	844 892 0111	

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
3.2	Skin corrosion/irritation	2	Skin Irrit. 2	H315
3.3	Serious eye damage/eye irritation	1	Eye Dam. 1	H318
3.8R	Specific target organ toxicity - single exposure (respiratory tract irritation)	3	STOT SE 3	H335

For full text of abbreviations: see SECTION 16

2.2 Label elements

Labelling

Signal word **Danger**

Pictograms

GHS05, GHS07

Hazard statements

H315	Causes skin irritation
H318	Causes serious eye damage
H335	May cause respiratory irritation

Precautionary statements

Precautionary statements - prevention

P260	Do not breathe dust
P280	Wear protective gloves/protective clothing/eye protection/face protection

Precautionary statements - response

P302+P352	IF ON SKIN: Wash with plenty of water
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310	Immediately call a POISON CENTER/doctor

2.3 Other hazards

Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance	Calcium hydroxide
Molecular formula	$Ca(OH)_2$
Molar mass	74,09 $^{g}/_{mol}$
CAS No	1305-62-0
EC No	215-137-3

SECTION 4: First aid measures

4.1 Description of first aid measures

General notes

Take off contaminated clothing.

Following inhalation

Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

Following skin contact

Rinse skin with water/shower. In case of skin irritation, consult a physician.

Following eye contact

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

Following ingestion

Rinse mouth. Call a doctor if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed

Risk of blindness, Risk of serious damage to eyes, Irritation, Cough, Dyspnoea

4.3 Indication of any immediate medical attention and special treatment needed

none

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

co-ordinate firefighting measures to the fire surroundings
water, foam, alcohol resistant foam, dry extinguishing powder, ABC-powder

Unsuitable extinguishing media

water jet

5.2 Special hazards arising from the substance or mixture

Non-combustible.

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Use personal protective equipment as required. Avoid contact with skin, eyes and clothes. Do not breathe dust.

6.2 Environmental precautions

Keep away from drains, surface and ground water.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains. Take up mechanically.

Advice on how to clean up a spill

Take up mechanically. Control of dust.

Other information relating to spills and releases

Place in appropriate containers for disposal.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Provision of sufficient ventilation. Avoid dust formation.

Measures to prevent fire as well as aerosol and dust generation

Removal of dust deposits.

Advice on general occupational hygiene

Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

Store in a dry place.

Incompatible substances or mixtures

Observe hints for combined storage.

Consideration of other advice:

Ventilation requirements

Use local and general ventilation.

Specific designs for storage rooms or vessels

Recommended storage temperature: 15 – 25 °C

7.3 Specific end use(s)

No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [mg/m³]	STEL [mg/m³]	Ceiling-C [mg/m³]	Notation	Source
EU	calcium dihydroxide	1305-62-0	IOELV	1	4		r	2017/164/EU
GB	dust		WEL	10			i	EH40/2005
GB	dust		WEL	4			r	EH40/2005
GB	calcium hydroxide	1305-62-0	WEL	5				EH40/2005
GB	calcium hydroxide	1305-62-0	WEL	1	4		r	EH40/2005

Notation

Ceiling-C	Ceiling value is a limit value above which exposure should not occur
i	Inhalable fraction
r	Respirable fraction
STEL	Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
TWA	Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

Human health values

Relevant DNELs and other threshold levels

Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	1 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
DNEL	4 mg/m³	human, inhalatory	worker (industry)	acute - local effects

Environmental values

Relevant PNECs and other threshold levels

End-point	Threshold level	Organism	Environmental compartment	Exposure time
PNEC	0,49 mg/l	aquatic organisms	freshwater	short-term (single instance)
PNEC	0,32 mg/l	aquatic organisms	marine water	short-term (single instance)
PNEC	3 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
PNEC	1.080 mg/kg	terrestrial organisms	soil	short-term (single instance)

8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection

Use safety goggle with side protection.

Skin protection

• hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 ° C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

• type of material

NBR (Nitrile rubber)

• material thickness

0,3 mm

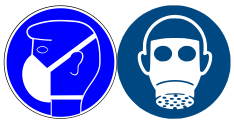
• breakthrough times of the glove material

>480 minutes (permeation: level 6)

• other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

Respiratory protection



Respiratory protection necessary at: Dust formation. Particulate filter device (EN 143). P2 (filters at least 94 % of airborne particles, colour code: White).

Environmental exposure controls

Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	solid
Colour	white - beige
Odour	odourless
Melting point/freezing point	>450 °C (ECHA)
Boiling point or initial boiling point and boiling range	not determined
Flammability	non-combustible
Lower and upper explosion limit	not determined
Flash point	not applicable
Auto-ignition temperature	>400 °C (ECHA)
Decomposition temperature	>550 °C
pH (value)	12,6 (in aqueous solution: 1,7 $^{g}/_{l}$, 20 °C)
Kinematic viscosity	not relevant
Solubility(ies)	
Water solubility	1,845 $^{g}/_{l}$ at 20 °C (ECHA)
Partition coefficient	
Partition coefficient n-octanol/water (log value):	not relevant (inorganic)
Vapour pressure	not determined
Density and/or relative density	
Density	2,24 $^{g}/_{cm^3}$ at 20 °C
Relative vapour density	information on this property is not available
Bulk density	~400 $^{kg}/_{m^3}$
Particle characteristics	No data available.
Other safety parameters	
Oxidising properties	none

9.2 Other information

Information with regard to physical hazard classes:	hazard classes acc. to GHS (physical hazards): not relevant
Other safety characteristics:	
Surface tension	72 $^{mN}/_{m}$ (20 °C) (ECHA)

SECTION 10: Stability and reactivity

10.1 Reactivity

This material is not reactive under normal ambient conditions.

10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions

Violent reaction with: Acids

10.4 Conditions to avoid

Keep away from heat. Decompostion takes place from temperatures above: >550 °C.

10.5 Incompatible materials

There is no additional information.

10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Classification acc. to GHS

Acute toxicity

Shall not be classified as acutely toxic.

Acute toxicity					
Exposure route	**Endpoint**	**Value**	**Species**	**Method**	**Source**
oral	LD50	>2.000 $^{mg}/_{kg}$	rat		ECHA
inhalation: dust/ mist	LC50	>6,04 $^{mg}/_{l}$/4h	rat		ECHA
dermal	LD50	>2.500 $^{mg}/_{kg}$	rabbit		ECHA

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Causes serious eye damage.

Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

Shall not be classified as carcinogenic.

Reproductive toxicity

Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure

May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics

• If swallowed

Data are not available.

• If in eyes

Causes serious eye damage, risk of blindness

• If inhaled

Irritation to respiratory tract, cough, Dyspnoea

• If on skin

causes skin irritation

• Other information

none

11.2 Endocrine disrupting properties

Not listed.

11.3 Information on other hazards

There is no additional information.

SECTION 12: Ecological information

12.1 Toxicity

Shall not be classified as hazardous to the aquatic environment.

Aquatic toxicity (acute)

Endpoint	Value	Species	Source	Exposure time
LC50	50,6 $^{mg}/_{l}$	fish	ECHA	96 h
EC50	49,1 $^{mg}/_{l}$	aquatic invertebrates	ECHA	48 h
ErC50	184,6 $^{mg}/_{l}$	algae	ECHA	72 h

Aquatic toxicity (chronic)

Endpoint	Value	Species	Source	Exposure time
LC50	53,1 $^{mg}/_{l}$	aquatic invertebrates	ECHA	14 d
EC50	300,4 $^{mg}/_{l}$	microorganisms	ECHA	3 h

Biodegradation

The methods for determining the biological degradability are not applicable to inorganic substances.

12.2 Process of degradability

Data are not available.

12.3 Bioaccumulative potential

Data are not available.

12.4 Mobility in soil

Data are not available.

12.5 Results of PBT and vPvB assessment

Data are not available.

12.6 Endocrine disrupting properties

Not listed.

12.7 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information

Do not empty into drains.

13.2 Relevant provisions relating to waste

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process. Waste catalogue ordinance (Germany).

13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

SECTION 14: Transport information

14.1	**UN number or ID number**	not subject to transport regulations
14.2	**UN proper shipping name**	not assigned
14.3	**Transport hazard class(es)**	none
14.4	**Packing group**	not assigned
14.5	**Environmental hazards**	non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user

There is no additional information.

14.7 Maritime transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN) - Additional information

Not subject to ADR, RID and ADN.

International Maritime Dangerous Goods Code (IMDG) - Additional information

Not subject to IMDG.

International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information

Not subject to ICAO-IATA.

SECTION 15: Regulatory information

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

Relevant provisions of the European Union (EU)

Seveso Directive

2012/18/EU (Seveso III)			
No	**Dangerous substance/hazard categories**	**Qualifying quantity (tonnes) for the application of lower and upper-tier requirements**	**Notes**
	not assigned		

Deco-Paint Directive

VOC content	0 % 0 $^{g}/_{l}$

Industrial Emissions Directive (IED)

VOC content	0 %
VOC content	0 $^{g}/_{l}$

Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

not listed

Regulation concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)

not listed

Water Framework Directive (WFD)

List of pollutants (WFD)				
Name of substance	**Name acc. to inventory**	**CAS No**	**Listed in**	**Remarks**
Calcium hydroxide	Metals and their compounds		a)	

Legend
A) Indicative list of the main pollutants

Regulation on the marketing and use of explosives precursors

not listed

Regulation on drug precursors

not listed

Regulation on substances that deplete the ozone layer (ODS)

not listed

Regulation concerning the export and import of hazardous chemicals (PIC)

not listed

Regulation on persistent organic pollutants (POP)

not listed

National regulations(GB)

List of substances subject to authorisation (GB REACH, Annex 14) / SVHC - candidate list

not listed

Restrictions according to GB REACH, Annex 17

not listed

Other information

Directive 94/33/EC on the protection of young people at work. Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

National inventories

Country	Inventory	Status
AU	AIIC	substance is listed
CA	DSL	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
EU	REACH Reg.	substance is listed
JP	CSCL-ENCS	substance is listed
KR	KECI	substance is listed
MX	INSQ	substance is listed
NZ	NZIoC	substance is listed
PH	PICCS	substance is listed
TR	CICR	substance is listed
TW	TCSI	substance is listed
US	TSCA	substance is listed

Legend

AIIC	Australian Inventory of Industrial Chemicals
CICR	Chemical Inventory and Control Regulation
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS)
DSL	Domestic Substances List (DSL)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
INSQ	National Inventory of Chemical Substances
KECI	Korea Existing Chemicals Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)

Legend
REACH Reg. REACH registered substances
TCSI Taiwan Chemical Substance Inventory
TSCA Toxic Substance Control Act

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Indication of changes (revised safety data sheet)

Alignment to regulation:
Restructuring: section 9, section 14

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.2	Labelling of packages where the contents do not exceed 125 ml: Signal word: Danger		yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
2017/164/EU	Commission Directive establishing a fourth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC, and amending Commission Directives 91/322/EEC, 2000/39/EC and 2009/161/EU
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
ADR	Accord relatif au transport international des marchandises dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
EC No	The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
EH40/2005	EH40/2005 Workplace exposure limits (http://www.nationalarchives.gov.uk/doc/open-government-licence/)
EINECS	European Inventory of Existing Commercial Chemical Substances

Abbr.	Descriptions of used abbreviations
ELINCS	European List of Notified Chemical Substances
ErC50	≡ EC50: in this method, that concentration of test substance which results in a 50 % reduction in either growth (EbC50) or growth rate (ErC50) relative to the control
GB REACH	The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019, SI 2019/758 (as amended)
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
IOELV	Indicative occupational exposure limit value
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
STEL	Short-term exposure limit
TWA	Time-weighted average
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative
WEL	Workplace exposure limit

Key literature references and sources for data

Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). Regulations concerning the International Carriage of Dangerous Goods by Rail (RID). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H315	Causes skin irritation.
H318	Causes serious eye damage.
H335	May cause respiratory irritation.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

SAFETY DATA SHEET

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

1.1. Product identifier

Name of the substance	Activated carbon
Trade name of the substance	COAL GN-UC-H
Identification number	7440-44-0
Registration number	01-2119488894-16-0012
Synonyms	None.
Issue date	17-July-2013
Version number	01
Revision date	-
Supersedes date	-

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

Identified uses	Adsorbent (pressure swing adsorption).
Uses advised against	None known.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

Classification according to Directive 67/548/EEC or 1999/45/EC as amended

This substance does not meet the criteria for classification according to Directive 67/548/EEC as amended.

Classification according to Regulation (EC) No 1272/2008 as amended

This substance does not meet the criteria for classification according to Regulation (EC) 1272/2008 as amended.

Hazard summary

Physical hazards	Not classified for physical hazards.
Health hazards	Not classified for health hazards. However, occupational exposure to the mixture or substance(s) may cause adverse health effects.
Environmental hazards	Not classified for hazards to the environment.
Specific hazards	Dust may irritate the eyes. Dust may irritate skin. Prolonged skin contact may cause redness, irritation and dry skin. Ingestion of dusts generated during working operations may cause nausea and vomiting. Dust and fumes generated from the material can enter the body by inhalation. High concentrations of dust may irritate throat and respiratory system and cause coughing. Frequent inhalation of fume/dust over a long period of time increases the risk of developing lung diseases. Prolonged and repeated overexposure to dust can lead to pneumoconiosis. Pre-existing pulmonary disorders, such as emphysema, may possibly be aggravated by prolonged exposure to high concentrations of carbon and/or crystalline silica dust.
Main symptoms	Exposed may experience eye tearing, redness, and discomfort. Prolonged skin contact may cause temporary irritation.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains:	Activated carbon (HDS)
Identification number	7440-44-0
Hazard pictograms	None.

Signal word	None.
Hazard statements	The substance does not meet the criteria for classification.

Precautionary statements

Prevention	Observe good industrial hygiene practices.
Response	Wash hands after handling.
Storage	Store away from incompatible materials.
Disposal	Dispose of waste and residues in accordance with local authority requirements.

Supplemental label information Not applicable.

2.3. Other hazards May present dust explosion hazard. This material does not ignite easily; however, feasible precautions against dust explosion are recommended. Contact with strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc., may result in fire. Wet activated carbon depletes oxygen from air and, therefore, dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessel's oxygen content should be determined and work procedures for potentially low oxygen areas should be followed. Spent (or used) activated carbons may exhibit properties pertaining to the adsorbed components.

SECTION 3: Composition/information on ingredients

3.1. Substances

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
Activated carbon (HDS)	≥ 90	7440-44-0 231-153-3	01-2119488894-16-0012	-	
Classification: **DSD:** -					
CLP: -					
Water (impurity)	≤ 3	7732-18-5 231-791-2	-	-	
Classification: **DSD:** -					
CLP: -					
Potassium carbonate (impurity)	≤ 1,7	584-08-7 209-529-3	-	-	
Classification: **DSD:** Xi;R36/37/38					
CLP: Skin Irrit. 2;H315, Eye Irrit. 2;H319, STOT SE 3;H335					
Calcium sulfate (impurity)	≤ 0,9	7778-18-9 231-900-3	-	-	
Classification: **DSD:** -					
CLP: -					
Calcium oxide (impurity)	≤ 0,3	1305-78-8 215-138-9	-	-	
Classification: **DSD:** Xi;R37-38-41					
CLP: Skin Irrit. 2;H315, Eye Dam. 1;H318, STOT SE 3;H335					
Magnesium oxide (impurity)	≤ 0,3	1309-48-4 215-171-9	-	-	
Classification: **DSD:** -					
CLP: -					
Iron oxide (impurity)	≤ 0,2	1345-25-1 215-721-8	-	-	
Classification: **DSD:** -					
CLP: -					

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
Silicon oxide (impurity) **Classification:** **DSD:** - **CLP:** -	≤ 0,2	11126-22-0 234-368-0	-	-	
Aluminium oxide (impurity) **Classification:** **DSD:** - **CLP:** -	≤ 0,1	1344-28-1 215-691-6	-	-	

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. Oxides may also be present as mixed oxides.

SECTION 4: First aid measures

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

4.1. Description of first aid measures

Inhalation Move injured person into fresh air and keep person calm under observation. For breathing difficulties, oxygen may be necessary. Get medical attention.

Skin contact Wash contact areas with soap and water. Get medical attention if irritation develops or persists.

Eye contact Flush thoroughly with water for at least 15 minutes. Do not rub eye. Remove any contact lenses and open eyelids wide apart. If irritation occurs, get medical assistance.

Ingestion Rinse mouth thoroughly if dust is ingested. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed Exposed may experience eye tearing, redness, and discomfort.

4.3. Indication of any immediate medical attention and special treatment needed Treat symptomatically.

SECTION 5: Firefighting measures

General fire hazards The product is not flammable. Bulk material is non-combustible. The material may form dust and can accumulate electrostatic charges, which may cause an electrical spark (ignition source). Care should be taken to seal electrical circuits and switches that may be affected. Dusts should not be emitted to the atmosphere where they may settle on and cause shorting of outside electrical equipment.

5.1. Extinguishing media

Suitable extinguishing media Dust: Extinguish with foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture Avoid stirring up dust clouds. Under certain conditions, carbon dust / air mixtures can produce an explosive atmosphere. Wetted activated carbon may cause oxygen depletion in enclosed spaces. Dangerous decomposition products: carbon oxides. Used activated carbon may produce other combustion products. After a fire, smoldering hotspots within the activated carbon may be present for a long time. Activated carbon which has been allowed to smolder for a long time in a confined space may accumulate carbon monoxide above its lower explosion limit.

5.3. Advice for firefighters

Special protective equipment for firefighters Use standard firefighting procedures and consider the hazards of other involved materials. If possible move smoldering activated carbon to a safe area (preferably outside).

Special fire fighting procedures Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Avoid generation and spreading of dust. Avoid inhalation of dust and contact with skin and eyes. Wear suitable protective clothing and gloves. Wet activated carbon depletes oxygen from air and, therefore, dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessel's oxygen content should be determined and work procedures for potentially low oxygen areas should be followed. For personal protection, see Section 8 of the SDS.
For emergency responders	Use personal protection recommended in section 8 of the SDS.
6.2. Environmental precautions	Do not allow material to enter storm or sanitary sewers, groundwater or soil. Used or spent activated carbon may contain pollutants which require the material to be treated according to national law or local permits and which require the use of risk management measures when handling the materials.
6.3. Methods and material for containment and cleaning up	Collect in approved containers and seal securely. If not possible, gently moisten dust with water fog before it is collected with shovel, broom or the like. Collect dust using a vacuum cleaner equipped with HEPA filter. Containers must be labeled. For waste disposal, see section 13 of the SDS.
6.4. Reference to other sections	For personal protection, see Section 8 of the SDS. For waste disposal, see Section 13 of the SDS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling	Use work methods which minimise dust production. Avoid inhalation of dust and contact with skin and eyes. Wear appropriate personal protective equipment. Carbon dust is electrically conductive. Wet activated carbon depletes oxygen from air and, therefore, dangerously low levels of oxygen may be encountered. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. Keep away from heat, spark, open flames and other sources of ignition. Keep the workplace clean. Observe good industrial hygiene practices.
7.2. Conditions for safe storage, including any incompatibilities	Keep away from heat, spark, open flames and other sources of ignition. Protect from direct sunlight. Keep only in the original container in a cool, well-ventilated place. Store away from incompatible materials. Access to storage of wet activated carbon should be restricted. Oxygen level alarms are advisable in enclosed storage rooms containing wet activated carbon.
7.3. Specific end use(s)	Adsorbent (pressure swing adsorption).

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

UK. EH40 Workplace Exposure Limits (WELs)

Material	Type	Value	Form
Activated carbon (HDS) (CAS 7440-44-0)	TWA	4 mg/m3	Respirable dust.
		10 mg/m3	Inhalable dust.

Components	Type	Value	Form
Aluminium oxide (impurity) (CAS 1344-28-1)	TWA	4 mg/m3	Respirable dust.
		10 mg/m3	Inhalable dust.
Calcium oxide (impurity) (CAS 1305-78-8)	TWA	2 mg/m3	
Magnesium oxide (impurity) (CAS 1309-48-4)	TWA	4 mg/m3	Respirable dust and/or fume.
		10 mg/m3	Inhalable dust.

Biological limit values	No biological exposure limits noted for the ingredient(s).
Recommended monitoring procedures	Follow standard monitoring procedures.

Derived no-effect level (DNEL)

Material	Type	Route	Value	Form
Activated carbon (HDS) (CAS 7440-44-0)	Consumer	Inhalation	0.5 mg/m3	Long-term - local effects
	Workers	Inhalation	3 mg/m3	Long-term - local effects

Predicted no effect concentrations (PNECs)	Not available.

8.2. Exposure controls

Appropriate engineering controls	Provide adequate ventilation. Mechanical ventilation or local exhaust ventilation is required. Provide explosion-proof ventilation for high dust concentrations. Low oxygen work procedures should be in place – Wet activated carbon depletes oxygen from air and, therefore, dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessels oxygen content should be determined and work procedures for potentially low oxygen areas should be followed. Alternatively the room may be fitted with oxygen level sensors having an alarm setting at 18 vol.%. Observe occupational exposure limits and minimise the risk of inhalation of dust and fumes. Provide access to washing facilities including soap, skin cleanser and fatty cream.

Individual protection measures, such as personal protective equipment

General information	Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment. Make sure to provide adequate control by applying the "COSHH Essentials" procedure.
Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin protection	
- Hand protection	No specific hand protection noted, but gloves may still be advisable. Suitable gloves can be recommended by the glove supplier.
- Other	Wear appropriate clothing to prevent repeated or prolonged skin contact.
Respiratory protection	In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter (type P2).
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
Hygiene measures	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.
Environmental exposure controls	Environmental manager must be informed of all significant spillages.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	
Physical state	Solid.
Form	Black solid in granulate or pellet form.
Colour	Black.
Odour	Odourless.
Odour threshold	Not available.
pH	Not applicable.
Melting point/freezing point	> 1000 °C (> 1832 °F)
Initial boiling point and boiling range	Not available.
Flash point	Not applicable.
Evaporation rate	Not applicable.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Vapour density	Not applicable.
Relative density	2.1 (20°C)
Solubility(ies)	Insoluble
Partition coefficient (n-octanol/water)	Not applicable. Not applicable.
Auto-ignition temperature	430 °C (806 °F) (1013 hPa)
Decomposition temperature	Not available.
Viscosity	Not available.
Explosive properties	Not applicable.
Oxidizing properties	Not applicable.

9.2. Other information

Density	2.10 g/cm³ (20°C)
Explosive limit	Not applicable.
Molecular formula	C
Molecular weight	12.01 g/mol

SECTION 10: Stability and reactivity

10.1. Reactivity	Stable at normal conditions.
10.2. Chemical stability	Material is stable under normal conditions.
10.3. Possibility of hazardous reactions	Will not occur.
10.4. Conditions to avoid	Dust is combustible, avoid sources of ignition and strong oxidizing agents.
10.5. Incompatible materials	Strong oxidising agents.
10.6. Hazardous decomposition products	Carbon oxides.

SECTION 11: Toxicological information

General information Processing may generate carbon dusts with potential for the health effects listed below.

Information on likely routes of exposure

Ingestion	Ingestion of dusts generated during working operations may cause nausea and vomiting.
Inhalation	Dust and fumes generated from the material can enter the body by inhalation. High concentrations of dust may irritate throat and respiratory system and cause coughing. Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases.
Skin contact	Dust may irritate skin. May dry the skin leading to discomfort and dermatitis.
Eye contact	Dust may irritate the eyes.

Symptoms Exposed may experience eye tearing, redness, and discomfort.

11.1. Information on toxicological effects

Acute toxicity Product is not classified as hazard material.

Product	Species	Test results
Activated carbon (HDS) (CAS 7440-44-0)		
Acute		
Inhalation		
LC50	Rat	> 8500 mg/m³, Air
Oral		
LD50	Rat	> 2000 mg/kg, (Female)

Components	Species	Test results
Iron oxide (impurity) (CAS 1345-25-1)		
Acute		
Oral		
LD50	Rat	> 15 g/kg

Skin corrosion/irritation	Dust may irritate skin.
Serious eye damage/eye irritation	Dust may irritate the eyes.
Respiratory sensitisation	No data available.
Skin sensitisation	Not a skin sensitiser.
Germ cell mutagenicity	No data available.
Carcinogenicity	No data available.
Reproductive toxicity	No data available.
Specific target organ toxicity - single exposure	Not available.
Specific target organ toxicity - repeated exposure	Not available.
Aspiration hazard	Not an aspiration hazard.
Mixture versus substance information	Not available.

Other information Prolonged and repeated overexposure to dust can lead to pneumoconiosis. Pre-existing pulmonary disorders, such as emphysema, may possibly be aggravated by prolonged exposure to high concentrations of carbon dusts.

SECTION 12: Ecological information

12.1. Toxicity The product is not expected to be hazardous to the environment.

Components		Species	Test results
Iron oxide (impurity) (CAS 1345-25-1)			
Aquatic			
Fish	LC50	Western mosquitofish (Gambusia affinis)	> 10000 mg/l, 96 hours

12.2. Persistence and degradability The product solely consists of inorganic compounds which are not biodegradable.

12.3. Bioaccumulative potential Bioaccumulation is unlikely to be significant because of the low water solubility of this product.

Partition coefficient n-octanol/water (log Kow) Not applicable.

Bioconcentration factor (BCF) Not available.

12.4. Mobility in soil No data available.

Mobility in general The product is insoluble in water and will sediment in water systems.

12.5. Results of PBT and vPvB assessment Not a PBT or vPvB substance or mixture.

12.6. Other adverse effects The product is not expected to be hazardous to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste Dispose of in accordance with local regulations.

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal.

EU waste code 10 02 99
Waste codes should be assigned by the user based on the application for which the product was used.

Disposal methods/information Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal. Recover and reclaim or recycle, if practical.

SECTION 14: Transport information

ADR

Not regulated as dangerous goods.

RID

Not regulated as dangerous goods.

ADN

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not available.

SECTION 15: Regulatory information

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

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I

Not listed.

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex II

Not listed.

Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(1) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorisation, as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

Not listed.

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work

Not regulated.

Directive 92/85/EEC: on the safety and health of pregnant workers and workers who have recently given birth or are breastfeeding

Not regulated.

Other EU regulations

Directive 96/82/EC (Seveso II) on the control of major-accident hazards involving dangerous substances

Not regulated.

Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Not listed.

Directive 94/33/EC on the protection of young people at work

Not listed.

National regulations	The product has not been classified as dangerous according to the legislation in force. Safety data sheet available for professional user on request.
15.2. Chemical safety assessment	For this substance a chemical safety assessment has been carried out.

SECTION 16: Other information

List of abbreviations	DSD: Directive 67/548/EEC. CLP: Regulation No. 1272/2008. DNEL: Derived No-Effect Level. PNEC: Predicted No-Effect Concentration. HDS: High Density Skeleton
References	Not available.
Information on evaluation method leading to the classification of mixture	The substance is classified based on test data for physical hazards. The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available. For details, refer to Sections 9, 11 and 12.
Full text of any statements or R-phrases and H-statements under Sections 2 to 15	R36/37/38 Irritating to eyes, respiratory system and skin. R37 Irritating to respiratory system. R38 Irritating to skin. R41 Risk of serious damage to eyes. H315 Causes skin irritation. H318 Causes serious eye damage. H319 Causes serious eye irritation. H335 May cause respiratory irritation.
Training information	Follow training instructions when handling this material.
Further information	Exposure Scenarios in national languages will be published as soon as they are available.
Disclaimer	This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.

ACTIVATED CARBON:
ANNEX TO THE SAFETY DATA SHEET

List of exposure scenarios:

1. ES 1: Manufacturing stage; Manufacture of non-powdered activated carbon (NPAC)
2. ES 2: Manufacturing stage; Manufacture of powdered activated carbon (PAC)
3. ES 3: Formulation (SU 3); Formulation of non-powdered activated carbon (NPAC)
4. ES 4: Industrial end-use (SU 3); Industrial use of non-powdered activated carbon (NPAC)
5. ES 5: Professional end-use (SU 22); Professional use of non-powdered activated carbon (NPAC)
6. ES 6: Consumer end-use (SU 21); Consumer use of non-powdered activated carbon (NPAC)
7. ES 7: Formulation (SU 3); Formulation of powdered activated carbon (PAC)
8. ES 8: Industrial end-use (SU 3); Industrial use of powdered activated carbon (PAC)
9. ES 9: Professional end-use (SU 22); Professional use of powdered activated carbon (PAC)
10. ES 10: Consumer end-use (SU 21); Consumer use of powdered activated carbon (PAC)

Please note that in this annex to the safety data sheet, identifiers like for example “NPAC.C1”, “NPAC.C1w” and similar are used. These identifiers originate from the chemical safety report (CSR) of the substance and were retained in this annex only in order to maintain data relationship between this annex and the CSR.

1. ES 1: Manufacturing stage; Manufacture of non-powdered activated carbon (NPAC)

1. Title of Exposure scenario	
Environment: Manufacture of non-powdered activated carbon (NPAC)	ERC 1
Worker	
NPAC.C1 and NPAC.C1w : PROC 1 : Handling in closed system, no sampling required.	PROC 1
NPAC.C2 and NPAC.C2w : PROC 2 : Handling in closed continuous system, sampling required.	PROC 2
NPAC.C3 and NPAC.C3w : PROC 3 : Handling in closed batch system, sampling required	PROC 3
NPAC.C10 and NPAC.C4w : PROC 4 : Maintenance, working in or at opened installations or installation components (emptied before start of work) and handling in system with opportunity for exposure.	PROC 4
NPAC.C11 : PROC 4 : Cleaning of equipment.	PROC 4
NPAC.C4 and NPAC.C9 : PROC 8a : Coupling and uncoupling of flexible hose and sampling of dry activated carbon in non-dedicated facilities.	PROC 8a
NPAC.C6 : PROC 8a : Charging / discharging bags/containers of non-powdered materials in non-dedicated facilities without dust removal system in place.	PROC 8a
NPAC.C5 : PROC 8b : Sampling or charging / discharging bags/containers of non-powdered materials in dedicated facilities with appropriate RMM's in place.	PROC 8b
NPAC.C12 : PROC 22 : Potentially closed processing operations with minerals/metals at elevated temperatures.	PROC 3

2. Conditions of use affecting exposure
2.0 Control of environmental exposure: Manufacture of non-powdered activated carbon (NPAC) **(ERC 1)**
There are no hazards potentially requiring control of risk related to environmental endpoints. This also supports the conclusion that there is no need to assess the indirect exposure of man via the environment through the oral route.
2.1 Control of workers exposure applicable to all worker scenarios
Product characteristics
Dustiness of product Low Covers percentage of substance in the product up to 100% (unless stated differently)
Amount used, frequency and duration of use/exposure
Uses covered ranging from ml up to m^3/s Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Assumes a good basis standard of occupational hygiene is implemented.
2.2 Control of workers exposure for NPAC.C1 and NPAC.C1w : PROC 1 : Handling in closed system, no sampling required. **(PROC 1)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.3 Control of workers exposure for NPAC.C2 and NPAC.C2w : PROC 2 : Handling in closed continuous system, sampling required. **(PROC 2)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.4 Control of workers exposure for NPAC.C3 and NPAC.C3w : PROC 3 : Handling in closed batch system, sampling required **(PROC 3)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.5 Control of workers exposure for NPAC.C10 and NPAC.C4w : PROC 4 : Maintenance, working in or at opened installations or installation components (emptied before start of work) and handling in system with opportunity for exposure. **(PROC 4)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.6 Control of workers exposure for NPAC.C11 : PROC 4 : Cleaning of equipment. **(PROC 4)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.7 Control of workers exposure for NPAC.C4 and NPAC.C9 : PROC 8a : Coupling and uncoupling of flexible hose and sampling of dry activated carbon in non-dedicated facilities. **(PROC 8a)**

2. Conditions of use affecting exposure
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands (960 cm2)
2.8 Control of workers exposure for NPAC.C6 : PROC 8a : Charging / discharging bags/containers of non-powdered materials in non-dedicated facilities without dust removal system in place. **(PROC 8a)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands (960 cm2)
2.9 Control of workers exposure for NPAC.C5 : PROC 8b : Sampling or charging / discharging bags/containers of non-powdered materials in dedicated facilities with appropriate RMM's in place. **(PROC 8b)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.10 Control of workers exposure for NPAC.C12 : PROC 22 : Potentially closed processing operations with minerals/metals at elevated temperatures. **(PROC 3)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)

3 Exposure estimation and risk characterization		
Contributing scenario	**Long term**	**Exposure estimation Method**
NPAC.C1 and NPAC.C1w : PROC 1 : Handling in closed system, no sampling required. (PROC 1)	Exposure: 0.01 mg/m³ RCR: 0.003	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.C2 and NPAC.C2w : PROC 2 : Handling in closed continuous system, sampling required. (PROC 2)	Exposure: 0.01 mg/m³ RCR: 0.003	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.C3 and NPAC.C3w : PROC 3 : Handling in closed batch system, sampling required (PROC 3)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.C10 and NPAC.C4w : PROC 4 : Maintenance, working in or at opened installations or installation components (emptied before start of work) and handling in system with opportunity for exposure. (PROC 4)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.C11 : PROC 4 : Cleaning of equipment. (PROC 4)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.C4 and NPAC.C9 : PROC 8a : Coupling and uncoupling of flexible hose and sampling of dry activated carbon in non-dedicated facilities. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.C6 : PROC 8a : Charging / discharging bags/containers of non-powdered materials in non-dedicated facilities without dust removal system in place. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.C5 : PROC 8b : Sampling or charging / discharging bags/containers of non-powdered materials in dedicated facilities with appropriate RMM's in place. (PROC 8b)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.C12 : PROC 22 : Potentially closed processing operations with minerals/metals at elevated temperatures. (PROC 3)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

A DU works within the boundaries of this ES if he fulfills the conditions of use set in section 2. The table on the effectiveness on workplace RMM as listed in the ECETOC-TRA documentation TR 107 - Addendum to ECETOC Targeted Risk Assessment Technical Report No. 93, provides an overview of the assumed effectiveness for the different RMM. The DU can use these effectiveness estimation in order to assess if any deviating RMM will also provide safe use. This is done by multiplying the relevant RCR with the effectiveness of the RMM in place and divide it by the effectiveness of the RMM listed in section 2.

Risk management measure		**Assumed effectiveness**[1]		**Source of effectiveness**
		Inhalatory	Dermal	
Technical Risk management measures				
General ventilation (mechanical)		50%	-	Advanced REACH tool (www.advancedreachtool.com).
Local exhaust ventilation	PROC 2, 3, 4, 5, 6, 8a, 9, 10, 13, 15, 15, 16, 19. 21, 23, 25	90%	30%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
	PROC 7	95%		
	PROC 8b	95%		
	PROC 11, 20	n.a.		
	PROC 17, 18	90%		
	PROC 22	90%		
	PROC 24	90%		
Laminar flow booth		90%	90%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
Organizational risk management measure, Reduction of duration of exposure				
> 60 and <= 240 minutes per shift		40%	40%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 15 and <= 60 minutes per shift		80%	80%	
<= 15 minutes per shift		90%	80%	
Operational risk management measure, Concentration of substance in mixture				
> 5% and <= 25%		40%	75%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 1% and <= 5%		80%	95%	
<= 1%		90%	99%	
Personal protective equipment				
Respirator (Wear a full face respirator conforming to EN140 with Type A / P2 filter or better. APF >20))		95%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)
Respirator (Wear a respirator (half face mask) conforming to EN140 with Type A filter / P2 filter or better. APF >10)		90%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)

If the shift duration is greater than 8 hours per day, the long term systemic DNELs have to be adapted with the using the following equation,:

DNEL Reduction Factor = (8 / hours worked in shift)

This equation can not be used to adapt a DNEL for a shift duration smaller than 8 hours.
With the adapted DNEL, the DU can recalculate the RCR by dividing the exposure estimation in section 3 with the adapted DNEL. If the RCR is smaller than 1, the downstreamuser works within the boundaries set by the ES.

[1] All effectiveness's listed are only valid if the RMM is properly designed, installed (if applicable), used and maintained.

2. ES 2: Manufacturing stage; Manufacture of powdered activated carbon (PAC)

1. Title of Exposure scenario	
Environment: Manufacture of powdered activated carbon (PAC)	ERC 1
Worker	
PAC.C1 and PAC.C1w : PROC 1: Handling in closed system, no sampling required.	PROC 1
PAC.C2 and PAC.C2w : PROC 2 : Handling in closed continuous system, sampling required.	PROC 2
PAC.C3 and PAC.C3w : PROC 3 : Handling in closed batch system, sampling required.	PROC 3
PAC.C4w and PAC.C9 : PROC 4 : Handling in system with opportunity for exposure and maintenance, working in or at opened installations or installation components (emptied before start of work).	PROC 4
PAC.C10 : PROC 4 : Cleaning of equipment	PROC 4
PAC.C5 and PAC.C8 : PROC 8a : Coupling and uncoupling of flexible hose and sampling bags/containers of powdered materials in non-dedicated facilities without dust removal system in place.	PROC 8a
PAC.C7 : PROC 8a : Charging / discharging bags/containers of powdered materials in non-dedicated facilities without dust removal system in place.	PROC 8a
PAC.C6 : PROC 8b : Sampling and charging / discharging bags/containers of powdered materials in dedicated facilities with appropriate RMM's in place.	PROC 8b
PAC.C11 : PROC 22 : Potentially closed processing operations with minerals/metals at elevated temperatures.	PROC 22

2. Conditions of use affecting exposure
2.0 Control of environmental exposure: Manufacture of powdered activated carbon (PAC) **(ERC 1)**
There are no hazards potentially requiring control of risk related to environmental endpoints. This also supports the conclusion that there is no need to assess the indirect exposure of man via the environment through the oral route.
2.1 Control of workers exposure applicable to all worker scenarios
Product characteristics
Dustiness of product High (unless stated differently) Covers percentage of substance in the product up to 100% (unless stated differently)
Amount used, frequency and duration of use/exposure
Uses covered ranging from ml up to m^3/s (unless stated differently) Operation carried out for <= 8 hours (unless stated differently)
Other operational conditions affecting workers exposure
Indoor use assumed (unless stated differently) Assumes a good basis standard of occupational hygiene is implemented.
2.2 Control of workers exposure for PAC.C1 and PAC.C1w : PROC 1: Handling in closed system, no sampling required. **(PROC 1)**
Product characteristics
Dustiness of wetted product Low
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.3 Control of workers exposure for PAC.C2 and PAC.C2w : PROC 2 : Handling in closed continuous system, sampling required. **(PROC 2)**
Product characteristics
Dustiness of wetted product Low
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.4 Control of workers exposure for PAC.C3 and PAC.C3w : PROC 3 : Handling in closed batch system, sampling required. **(PROC 3)**
Product characteristics
Dustiness of wetted product Low
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.5 Control of workers exposure for PAC.C4 and PAC.C9 : PROC 4 : Handling in system with opportunity for exposure and maintenance, working in or at opened installations or installation components (emptied before start of work). **(PROC 4)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures

2. Conditions of use affecting exposure
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]
Conditions and measures related to personal protection, hygiene and health evaluation
If above technical control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better with an assigned protection factor of at least 10.
2.5.1 Control of workers exposure for PAC.C4w: PROC 4 : Handling in system with opportunity for exposure and maintenance, working in or at opened installations or installation components (emptied before start of work). **(PROC 4)**
Product characteristics
Dustiness of product Low
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.6 Control of workers exposure for PAC.C10 : PROC 4 : Cleaning of equipment **(PROC 4)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]
Conditions and measures related to personal protection, hygiene and health evaluation
If above technical control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better with an assigned protection factor of at least 10.
2.7 Control of workers exposure for PAC.C8 : PROC 8a : Sampling bags/containers of powdered materials in non-dedicated facilities without dust removal system in place. **(PROC 8a)**
Amount used, frequency and duration of use/exposure
Sampling rate 10-100 gram/minute Operation carried out for 15 min – 1 hour per shift
Other operational conditions affecting workers exposure
Drop height < 0.5 m Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures
None
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better with an assigned protection factor of at least 10 if task is performed for more than 1 hour per shift.
2.7.1 Control of workers exposure for PAC.C5: PROC 8a : Coupling and uncoupling of flexible hose and sampling bags/containers of powdered materials in non-dedicated facilities without dust removal system in place. **(PROC 8a)**
Amount used, frequency and duration of use/exposure
Operation carried out for 15 min – 1 hour
Other operational conditions affecting workers exposure
Use outdoors for coupling and uncoupling of hoses Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures
None
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better with an assigned protection factor of at least 10 if task is performed for more than 1 hour per shift.
2.8 Control of workers exposure for PAC.C7 : PROC 8a : Charging / discharging bags/containers of powdered materials in non-dedicated facilities without dust removal system in place. **(PROC 8a)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands (960 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 99%]
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better with an assigned protection factor of at least 10.
2.9 Control of workers exposure for PAC.C6 : PROC 8b : Sampling and charging / discharging bags/containers of powdered materials in dedicated facilities with appropriate RMM's in place. **(PROC 8b)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)

2. Conditions of use affecting exposure
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%] If above technical control measures are not feasible, then adopt following PPE: Wear a respirator conforming to EN140 with Type A/P2 filter or better with an assigned protection factor of at least 10.
2.10 Control of workers exposure for PAC.C11 : PROC 22 : Potentially closed processing operations with minerals/metals at elevated temperatures. **(PROC 3)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)

3 Exposure estimation and risk characterization		
Contributing scenario	**Long term**	**Exposure estimation Method**
PAC.C1 and PAC.C1w : PROC 1: Handling in closed system, no sampling required. (PROC 1)	Exposure: 0.01 mg/m³ RCR: 0.003	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.C2 and PAC.C2w : PROC 2 : Handling in closed continuous system, sampling required. (PROC 2)	Exposure: 1 mg/m³ RCR: 0.333	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.C3 and PAC.C3w : PROC 3 : Handling in closed batch system, sampling required. (PROC 3)	Exposure: 1 mg/m³ RCR: 0.333	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.C4 and PAC.C9 : PROC 4 : Handling in system with opportunity for exposure and maintenance, working in or at opened installations or installation components (emptied before start of work). (PROC 4)	Exposure: 2.5 mg/m³ RCR: 0.833	DNEL = 3 mg/m3 Long term: TRA workers
PAC.C4w: PROC 4 : Handling in system with opportunity for exposure and maintenance, working in or at opened installations or installation components (emptied before start of work). (PROC 4)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: TRA workers
PAC.C10 : PROC 4 : Cleaning of equipment (PROC 4)	Exposure: 2.5 mg/m³ RCR: 0.833	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.C8 : PROC 8a : Sampling bags/containers of powdered materials in non-dedicated facilities without dust removal system in place. (PROC 8a)	Exposure: 0.54 mg/m³ RCR: 0.18	DNEL = 3 mg/m3 Long term: External exposure estimation tool (Advanced REACH Tool. OC: Dry form, high dustiness, outdoor, time restriction. No RMM.)
PAC.C5: PROC 8a : Coupling and uncoupling of flexible hose in non-dedicated facilities without dust removal system in place. (PROC 8a)	Exposure: 0.63 mg/m³ RCR: 0.21	DNEL = 3 mg/m3 Long term: External exposure estimation tool (Advanced REACH Tool. OC: Dry form, density density dustiness, outdoor, time restriction. No RMM.)
PAC.C7 : PROC 8a : Charging / discharging bags/containers of powdered materials in non-dedicated facilities without dust removal system in place. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.C6 : PROC 8b : Sampling and charging / discharging bags/containers of powdered materials in dedicated facilities with appropriate RMM's in place. (PROC 8b)	Exposure: 1.25 mg/m³ RCR: 0.417	DNEL = 3 mg/m3 Long term: TRA workers
PAC.C11 : PROC 22 : Potentially closed processing operations with minerals/metals at elevated temperatures. (PROC 3)	Exposure: 1 mg/m³ RCR: 0.333	DNEL = 3 mg/m3 Long term: Extended TRA workers

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

A DU works within the boundaries of this ES if he fulfills the conditions of use set in section 2. The table on the effectiveness on workplace RMM as listed in the ECETOC-TRA documentation TR 107 - Addendum to ECETOC Targeted Risk Assessment Technical Report No. 93, provides an overview of the assumed effectiveness for the different RMM. The DU can use these effectiveness estimation in order to assess if any deviating RMM will also provide safe use. This is done by multiplying the relevant RCR with the effectiveness of the RMM in place and divide it by the effectiveness of the RMM listed in section 2.

Risk management measure		**Assumed effectiveness**[2]		**Source of effectiveness**
		Inhalatory	Dermal	
Technical Risk management measures				
General ventilation (mechanical)		50%	-	Advanced REACH tool (www.advancedreachtool.com).
Local exhaust ventilation	PROC 2, 3, 4, 5, 6, 8a, 9, 10, 13, 15, 15, 16, 19. 21, 23, 25	90%	30%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
	PROC 7	95%		
	PROC 8b	95%		
	PROC 11, 20	n.a.		
	PROC 17, 18	90%		
	PROC 22	90%		
	PROC 24	90%		
Laminar flow booth		90%	90%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
Organizational risk management measure, Reduction of duration of exposure				
> 60 and <= 240 minutes per shift		40%	40%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 15 and <= 60 minutes per shift		80%	80%	
<= 15 minutes per shift		90%	80%	
Operational risk management measure, Concentration of substance in mixture				
> 5% and <= 25%		40%	75%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 1% and <= 5%		80%	95%	
<= 1%		90%	99%	
Personal protective equipment				
Respirator (Wear a full face respirator conforming to EN140 with Type A / P2 filter or better. APF >20))		95%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)
Respirator (Wear a respirator (half face mask) conforming to EN140 with Type A filter / P2 filter or better. APF >10)		90%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)

If the shift duration is greater than 8 hours per day, the long term systemic DNELs have to be adapted with the using the following equation,:

DNEL Reduction Factor = (8 / hours worked in shift)

This equation can not be used to adapt a DNEL for a shift duration smaller than 8 hours.
With the adapted DNEL, the DU can recalculate the RCR by dividing the exposure estimation in section 3 with the adapted DNEL. If the RCR is smaller than 1, the downstreamuser works within the boundaries set by the ES.

[2] All effectiveness's listed are only valid if the RMM is properly designed, installed (if applicable), used and maintained.

3. ES 3: Formulation (SU 3); Formulation of non-powdered activated carbon (NPAC)

1. Title of Exposure scenario	
Non-powdered activated carbon (NPAC)	
Environment: Formulation of non-powdered activated carbon (NPAC)	ERC 2
Worker	
NPAC.B1 and NPAC.B1m : PROC 1 : Handling/use in closed systems, no likelihood of exposure.	PROC 1
NPAC.B2 and NPAC.B2m : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling).	PROC 2
NPAC.B3 and NPAC.B3m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling).	PROC 3
NPAC.B4 and NPAC.B4m : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust).	PROC 4
NPAC.B5 and NPAC.B5m : PROC 5 : Mixing of carbon with little or no liquid in open system, continuous significant dust release.	PROC 5
NPAC.B6 and NPAC.B6m : PROC 8b : Sampling or discharging bags/containers, dust released but contained with removal system.	PROC 8b
NPAC.B7 and NPAC.B7m : PROC 8a : Discharging bags/containers, dust released, no dust removal system.	PROC 8a
NPAC.B8, NPAC.B8m, NPAC.Bx and NPAC.Bxm : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of flexible hose.	PROC 8a
NPAC.B9 and NPAC.B9m : PROC 9 : Filling of jars or bags with activated carbon, filling of gas mask canisters, POU filters, ELCD filters.	PROC 9
NPAC.B10m : PROC 14 : Mixed with other substance(s): production of blocks / plates / tablets / from AC and binder.	PROC 14

2. Conditions of use affecting exposure
2.0 Control of environmental exposure: Manufacture of non-powdered activated carbon (NPAC) **(ERC 1)**
There are no hazards potentially requiring control of risk related to environmental endpoints. This also supports the conclusion that there is no need to assess the indirect exposure of man via the environment through the oral route.
2.1 Control of workers exposure applicable to all worker scenarios
Product characteristics
Dustiness of product Low Covers percentage of substance in the product up to 100% (unless stated differently)
Amount used, frequency and duration of use/exposure
Uses covered ranging from ml up to m^3/s Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed (unless stated differently) Assumes activities are at ambient temperature (unless stated differently). Assumes a good basis standard of occupational hygiene is implemented.
2.2 Control of workers exposure for NPAC.B1 and NPAC.B1m : PROC 1 : Handling/use in closed systems, no likelihood of exposure. **(PROC 1)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.3 Control of workers exposure for NPAC.B2 and NPAC.B2m : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling). **(PROC 2)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.4 Control of workers exposure for NPAC.B3 and NPAC.B3m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling). **(PROC 3)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.5 Control of workers exposure for NPAC.B4 and NPAC.B4m : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust). **(PROC 4)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.6 Control of workers exposure for NPAC.B5 and NPAC.B5m : PROC 5 : Mixing of carbon with little or no liquid in open system, continuous significant dust release. **(PROC 5)**

2. Conditions of use affecting exposure
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.7 Control of workers exposure for NPAC.B6 and NPAC.B6m : PROC 8b : Sampling or discharging bags/containers, dust released but contained with removal system. **(PROC 8b)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.8 Control of workers exposure for NPAC.B7 and NPAC.B7m : PROC 8a : Discharging bags/containers, dust released, no dust removal system. **(PROC 8a)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands (960 cm2)
2.9 Control of workers exposure for NPAC.B8, NPAC.B8m, NPAC.Bx and NPAC.Bxm : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of flexible hose. **(PROC 8a)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands (960 cm2)
2.10 Control of workers exposure for NPAC.B9 and NPAC.B9m : PROC 9 : Filling of jars or bags with activated carbon, filling of gas mask canisters, POU filters, ELCD filters. **(PROC 9)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.11 Control of workers exposure for NPAC.B10m : PROC 14 : Mixed with other substance(s): production of blocks / plates / tablets / from AC and binder. **(PROC 14)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)

3 Exposure estimation and risk characterization		
Contributing scenario	**Long term**	**Exposure estimation Method**
NPAC.B1 and NPAC.B1m : PROC 1 : Handling/use in closed systems, no likelihood of exposure. (PROC 1)	Exposure: 0.01 mg/m³ RCR: 0.003	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.B2 and NPAC.B2m : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling). (PROC 2)	Exposure: 0.01 mg/m³ RCR: 0.003	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.B3 and NPAC.B3m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling). (PROC 3)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.B4 and NPAC.B4m : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust). (PROC 4)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.B5 and NPAC.B5m : PROC 5 : Mixing of carbon with little or no liquid in open system, continuous significant dust release. (PROC 5)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.B6 and NPAC.B6m : PROC 8b : Sampling or discharging bags/containers, dust released but contained with removal system. (PROC 8b)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.B7 and NPAC.B7m : PROC 8a : Discharging bags/containers, dust released, no dust removal system. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.B8, NPAC.B8m, NPAC.Bx and NPAC.Bxm : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of flexible hose. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.B9 and NPAC.B9m : PROC 9 : Filling of jars or bags with activated carbon, filling of gas mask canisters, POU filters, ELCD filters. (PROC 9)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.B10m : PROC 14 : Mixed with other substance(s): production of blocks / plates / tablets / from AC and binder. (PROC 14)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

A DU works within the boundaries of this ES if he fulfills the conditions of use set in section 2. The table on the effectiveness on workplace RMM as listed in the ECETOC-TRA documentation TR 107 - Addendum to ECETOC Targeted Risk Assessment Technical Report No. 93, provides an overview of the assumed effectiveness for the different RMM. The DU can use these effectiveness estimation in order to assess if any deviating RMM will also provide safe use. This is done by multiplying the relevant RCR with the effectiveness of the RMM in place and divide it by the effectiveness of the RMM listed in section 2.

Risk management measure		**Assumed effectiveness**[3]		**Source of effectiveness**
		Inhalatory	Dermal	
Technical Risk management measures				
General ventilation (mechanical)		50%	-	Advanced REACH tool (www.advancedreachtool.com).
Local exhaust ventilation	PROC 2, 3, 4, 5, 6, 8a, 9, 10, 13, 15, 15, 16, 19. 21, 23, 25	90%	30%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
	PROC 7	95%		
	PROC 8b	95%		
	PROC 11, 20	n.a.		
	PROC 17, 18	90%		
	PROC 22	90%		
	PROC 24	90%		
Laminar flow booth		90%	90%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
Organizational risk management measure, Reduction of duration of exposure				
> 60 and <= 240 minutes per shift		40%	40%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 15 and <= 60 minutes per shift		80%	80%	
<= 15 minutes per shift		90%	80%	
Operational risk management measure, Concentration of substance in mixture				
> 5% and <= 25%		40%	75%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 1% and <= 5%		80%	95%	
<= 1%		90%	99%	
Personal protective equipment				
Respirator (Wear a full face respirator conforming to EN140 with Type A / P2 filter or better. APF >20))		95%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)
Respirator (Wear a respirator (half face mask) conforming to EN140 with Type A filter / P2 filter or better. APF >10)		90%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)

If the shift duration is greater than 8 hours per day, the long term systemic DNELs have to be adapted with the using the following equation,:

DNEL Reduction Factor = (8 / hours worked in shift)

This equation can not be used to adapt a DNEL for a shift duration smaller than 8 hours.
With the adapted DNEL, the DU can recalculate the RCR by dividing the exposure estimation in section 3 with the adapted DNEL. If the RCR is smaller than 1, the downstreamuser works within the boundaries set by the ES.

[3] All effectiveness's listed are only valid if the RMM is properly designed, installed (if applicable), used and maintained.

4. ES 4: Industrial end-use (SU 3); Industrial use of non-powdered activated carbon (NPAC)

1. Title of Exposure scenario	
Non-powdered activated carbon (NPAC)	
Environment: Industrial use of non-powdered activated carbon (NPAC)	ERC 4
Worker	
NPAC.A1, NPAC.A1m, NPAC.A10/7m, NPAC.A10/8m and NPAC.A15m : PROC 1 : Handling/use in closed systems, no likelihood of exposure and use of articles without release (INDOOR).	PROC 1
NPAC.A2 and NPAC.A2m : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling).	PROC 2
NPAC.A3, NPAC.A3m and NPAC.A16m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car.	PROC 3
NPAC.A11m and NPAC.A12m : PROC 8a/3 : Mixed with other substances (dry/wet/slurry): depositing activated carbon in the soil and (surface) water.	PROC 3
NPAC.A4 and NPAC.A4m : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust).	PROC 4
NPAC.A6 and NPAC.A6m : PROC 8a : Discharging bags/containers, dust released, no dust removal system.	PROC 8a
NPAC.A9, NPAC.A9m, NPAC.Ax and NPAC.Axm : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of flexible hose.	PROC 8a
NPAC.A5 and NPAC.A5m : PROC 8b: Sampling or discharging bags/containers, dust release contained with removal system.	PROC 8b
NPAC.A14 : PROC 15 : Laboratory use of non-powdered activated carbon with dust removal.	PROC 15
NPAC.A10m : PROC 16 : Mixed with other substances (dry/wet/slurry): waste incineration with energy recovery.	PROC 16

2. Conditions of use affecting exposure
2.0 Control of environmental exposure: Manufacture of non-powdered activated carbon (NPAC) **(ERC 1)**
There are no hazards potentially requiring control of risk related to environmental endpoints. This also supports the conclusion that there is no need to assess the indirect exposure of man via the environment through the oral route.
2.1 Control of workers exposure applicable to all worker scenarios
Product characteristics
Dustiness of product Low Covers percentage of substance in the product up to 100% (unless stated differently)
Amount used, frequency and duration of use/exposure
Uses covered ranging from ml up to m^3/s Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Assumes a good basis standard of occupational hygiene is implemented.
2.2 Control of workers exposure for NPAC.A1, NPAC.A1m, NPAC.A10/7m, NPAC.A10/8m and NPAC.A15m : PROC 1 : Handling/use in closed systems, no likelihood of exposure and use of articles without release (INDOOR). **(PROC 1)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.3 Control of workers exposure for NPAC.A2 and NPAC.A2m : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling). **(PROC 2)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.4 Control of workers exposure for NPAC.A3, NPAC.A3m and NPAC.A16m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car. **(PROC 3)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.5 Control of workers exposure for NPAC.A11m and NPAC.A12m : PROC 8a/3 : Mixed with other substances (dry/wet/slurry): depositing activated carbon in the soil and (surface) water. **(PROC 3)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.6 Control of workers exposure for NPAC.A4 and NPAC.A4m : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust). **(PROC 4)**
Other operational conditions affecting workers exposure

2. Conditions of use affecting exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.7 Control of workers exposure for NPAC.A6 and NPAC.A6m : PROC 8a : Discharging bags/containers, dust released, no dust removal system. **(PROC 8a)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands (960 cm2)
2.8 Control of workers exposure for NPAC.A9, NPAC.A9m, NPAC.Ax and NPAC.Axm : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of flexible hose. **(PROC 8a)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands (960 cm2)
2.9 Control of workers exposure for NPAC.A5 and NPAC.A5m : PROC 8b: Sampling or discharging bags/containers, dust release contained with removal system. **(PROC 8b)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.10 Control of workers exposure for NPAC.A14 : PROC 15 : Laboratory use of non-powdered activated carbon with dust removal. **(PROC 15)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.11 Control of workers exposure for NPAC.A10m : PROC 16 : Mixed with other substances (dry/wet/slurry): waste incineration with energy recovery. **(PROC 16)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)

3 Exposure estimation and risk characterization		
Contributing scenario	**Long term**	**Exposure estimation Method**
NPAC.A1, NPAC.A1m, NPAC.A10/7m, NPAC.A10/8m and NPAC.A15m : PROC 1 : Handling/use in closed systems, no likelihood of exposure and use of articles without release (INDOOR). (PROC 1)	Exposure: 0.01 mg/m³ RCR: 0.003	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.A2 and NPAC.A2m : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling). (PROC 2)	Exposure: 0.01 mg/m³ RCR: 0.003	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.A3, NPAC.A3m and NPAC.A16m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car. (PROC 3)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.A11m and NPAC.A12m : PROC 8a/3 : Mixed with other substances (dry/wet/slurry): depositing activated carbon in the soil and (surface) water. (PROC 3)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.A4 and NPAC.A4m : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust). (PROC 4)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.A6 and NPAC.A6m : PROC 8a : Discharging bags/containers, dust released, no dust removal system. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.A9, NPAC.A9m, NPAC.Ax and NPAC.Axm : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of flexible hose. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.A5 and NPAC.A5m : PROC 8b: Sampling or discharging bags/containers, dust release contained with removal system. (PROC 8b)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.A14 : PROC 15 : Laboratory use of non-powdered activated carbon with dust removal. (PROC 15)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.A10m : PROC 16 : Mixed with other substances (dry/wet/slurry): waste incineration with energy recovery. (PROC 16)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

A DU works within the boundaries of this ES if he fulfills the conditions of use set in section 2. The table on the effectiveness on workplace RMM as listed in the ECETOC-TRA documentation TR 107 - Addendum to ECETOC Targeted Risk Assessment Technical Report No. 93, provides an overview of the assumed effectiveness for the different RMM. The DU can use these effectiveness estimation in order to assess if any deviating RMM will also provide safe use. This is done by multiplying the relevant RCR with the effectiveness of the RMM in place and divide it by the effectiveness of the RMM listed in section 2.

Risk management measure		**Assumed effectiveness**[4]		**Source of effectiveness**
		Inhalatory	Dermal	
Technical Risk management measures				
General ventilation (mechanical)		50%	-	Advanced REACH tool (www.advancedreachtool.com).
Local exhaust ventilation	PROC 2, 3, 4, 5, 6, 8a, 9, 10, 13, 15, 15, 16, 19. 21, 23, 25	90%	30%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
	PROC 7	95%		
	PROC 8b	95%		
	PROC 11, 20	n.a.		
	PROC 17, 18	90%		
	PROC 22	90%		
	PROC 24	90%		
Laminar flow booth		90%	90%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
Organizational risk management measure, Reduction of duration of exposure				
> 60 and <= 240 minutes per shift		40%	40%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 15 and <= 60 minutes per shift		80%	80%	
<= 15 minutes per shift		90%	80%	
Operational risk management measure, Concentration of substance in mixture				
> 5% and <= 25%		40%	75%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 1% and <= 5%		80%	95%	
<= 1%		90%	99%	
Personal protective equipment				
Respirator (Wear a full face respirator conforming to EN140 with Type A / P2 filter or better. APF >20))		95%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)
Respirator (Wear a respirator (half face mask) conforming to EN140 with Type A filter / P2 filter or better. APF >10)		90%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)

If the shift duration is greater than 8 hours per day, the long term systemic DNELs have to be adapted with the using the following equation,:

DNEL Reduction Factor = (8 / hours worked in shift)

This equation can not be used to adapt a DNEL for a shift duration smaller than 8 hours.
With the adapted DNEL, the DU can recalculate the RCR by dividing the exposure estimation in section 3 with the adapted DNEL. If the RCR is smaller than 1, the downstreamuser works within the boundaries set by the ES.

[4] All effectiveness's listed are only valid if the RMM is properly designed, installed (if applicable), used and maintained.

5. ES 5: Professional end-use (SU 22); Professional use of non-powdered activated carbon (NPAC)

1. Title of Exposure scenario	
Non-powdered activated carbon (NPAC)	
Environment: Professional use of non-powdered activated carbon (NPAC)	ERC 8a
Worker	
NPAC.D3, NPAC.D3m, NPAC.D5m and NPAC.D6m : PROC 1 : Handling/use in closed systems, no likelihood of exposure use of articles without release (INDOOR/OUTDOOR).	PROC 1
NPAC.D10, NPAC.D10m, NPAC.D8m/a and NPAC.D8m/d : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling) and use in municipal swimming pools or aquaria.	PROC 2
NPAC.D10, NPAC.D10m and NPAC.D4m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car.	PROC 3
NPAC.D8w, NPAC.D11 and NPAC.D11m : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge.	PROC 4
NPAC.D13, NPAC.D13m, NPAC.D7m/a and NPAC.D7m/d : PROC 8a : Discharging bags/containers, dust released, no dust removal system and use in municipal swimming pools or aquaria.	PROC 8a
NPAC.D14, NPAC.D14m, NPAC.D16 and NPAC.D16m : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of flexible hose.	PROC 8a
NPAC.D2m : PROC 5: Mixed with other substance(s): activated carbon in the soil.	PROC 8a
NPAC.D9, NPAC.D9, NPAC.D12 and NPAC.D12m : PROC 8b : Sampling or discharging bags/containers, dust release but contained with removal system sampling, discharge.	PROC 8b
NPAC.D9m : PROC 9 : Use by medical / health professional in medical equipment.	PROC 9
NPAC.D1 : PROC 15 : Laboratory use of non-powdered activated carbon with dust removal.	PROC 15
NPAC.D15m : PROC 16 : Mixed with other substances: waste incineration with energy recovery.	PROC 16

2. Conditions of use affecting exposure
2.0 Control of environmental exposure: Manufacture of non-powdered activated carbon (NPAC) **(ERC 1)**
There are no hazards potentially requiring control of risk related to environmental endpoints. This also supports the conclusion that there is no need to assess the indirect exposure of man via the environment through the oral route.
2.1 Control of workers exposure applicable to all worker scenarios
Product characteristics
Dustiness of product Low Covers percentage of substance in the product up to 100% (unless stated differently)
Amount used, frequency and duration of use/exposure
Uses covered ranging from ml up to m^3/s Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed (unless stated differently) Assumes activities are at ambient temperature (unless stated differently). Assumes a good basis standard of occupational hygiene is implemented.
2.2 Control of workers exposure for NPAC.D3, NPAC.D3m, NPAC.D5m and NPAC.D6m : PROC 1 : Handling/use in closed systems, no likelihood of exposure use of articles without release (INDOOR/OUTDOOR). **(PROC 1)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.3 Control of workers exposure for NPAC.D10, NPAC.D10m, NPAC.D8m/a and NPAC.D8m/d : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling) and use in municipal swimming pools or aquaria. **(PROC 2)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.4 Control of workers exposure for NPAC.D10, NPAC.D10m and NPAC.D4m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car. **(PROC 3)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.5 Control of workers exposure for NPAC.D8w, NPAC.D11 and NPAC.D11m : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. **(PROC 4)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)

2. Conditions of use affecting exposure
2.6 Control of workers exposure for NPAC.D13, NPAC.D13m, NPAC.D7m/a and NPAC.D7m/d : PROC 8a : Discharging bags/containers, dust released, no dust removal system and use in municipal swimming pools or aquaria. **(PROC 8a)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands (960 cm2)
2.7 Control of workers exposure for NPAC.D14, NPAC.D14m, NPAC.D16 and NPAC.D16m : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of flexible hose. **(PROC 8a)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands (960 cm2)
2.8 Control of workers exposure for NPAC.D2m : PROC 5: Mixed with other substance(s): activated carbon in the soil. **(PROC 8a)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands (960 cm2)
2.9 Control of workers exposure for NPAC.D9, NPAC.D9, NPAC.D12 and NPAC.D12m : PROC 8b : Sampling or discharging bags/containers, dust release but contained with removal system sampling, discharge. **(PROC 8b)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.10 Control of workers exposure for NPAC.D9m : PROC 9 : Use by medical / health professional in medical equipment. **(PROC 9)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: Two hands face (480 cm2)
2.11 Control of workers exposure for NPAC.D1 : PROC 15 : Laboratory use of non-powdered activated carbon with dust removal. **(PROC 15)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
2.12 Control of workers exposure for NPAC.D15m : PROC 16 : Mixed with other substances: waste incineration with energy recovery. **(PROC 16)**
Other operational conditions affecting workers exposure
Exposed skin surface assumed: One hand face only (240 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness ≥ 90%

3 Exposure estimation and risk characterization		
Contributing scenario	**Long term**	**Exposure estimation Method**
NPAC.D3, NPAC.D3m, NPAC.D5m and NPAC.D6m : PROC 1 : Handling/use in closed systems, no likelihood of exposure use of articles without release (INDOOR/OUTDOOR). (PROC 1)	Exposure: 0.01 mg/m³ RCR: 0.003	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.D10, NPAC.D10m, NPAC.D8m/a and NPAC.D8m/d : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling) and use in municipal swimming pools or aquaria. (PROC 2)	Exposure: 0.01 mg/m³ RCR: 0.003	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.D10, NPAC.D10m and NPAC.D4m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car. (PROC 3)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.D8w, NPAC.D11 and NPAC.D11m : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. (PROC 4)	Exposure: 1 mg/m³ RCR: 0.333	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.D13, NPAC.D13m, NPAC.D7m/a and NPAC.D7m/d : PROC 8a : Discharging bags/containers, dust released, no dust removal system and use in municipal swimming pools or aquaria. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.D14, NPAC.D14m, NPAC.D16 and NPAC.D16m : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of flexible hose. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.D2m : PROC 5: Mixed with other substance(s): activated carbon in the soil. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers

3 Exposure estimation and risk characterization		
NPAC.D9, NPAC.D9, NPAC.D12 and NPAC.D12m : PROC 8b : Sampling or discharging bags/containers, dust release but contained with removal system sampling, discharge. (PROC 8b)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.D9m : PROC 9 : Use by medical / health professional in medical equipment. (PROC 9)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.D1 : PROC 15 : Laboratory use of non-powdered activated carbon with dust removal. (PROC 15)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
NPAC.D15m : PROC 16 : Mixed with other substances: waste incineration with energy recovery. (PROC 16)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES					
Risk management measure		**Assumed effectiveness**[5]			**Source of effectiveness**
		Inhalatory		Dermal	
Technical Risk management measures					
General ventilation (mechanical)		50%		-	Advanced REACH tool (www.advancedreachtool.com).
		Industrial	Professional		
Local exhaust ventilation	PROC 2, 3, 4, 5, 6, 8a, 9, 10, 13, 15, 15, 16, 19. 21, 23, 25	90%	80%	30%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
	PROC 7	95%	n.a.		
	PROC 8b	95%	80%		
	PROC 11, 20	n.a.	80%		
	PROC 17, 18	90%	90%		
	PROC 22	90%	n.a.		
	PROC 24	90%	75%		
Laminar flow booth		90%	90%	30%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
Organizational risk management measure, Reduction of duration of exposure					
> 60 and <= 240 minutes per shift		40%		40%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 15 and <= 60 minutes per shift		80%		80%	
<= 15 minutes per shift		90%		80%	
Operational risk management measure, Concentration of substance in mixture					
> 5% and <= 25%		40%		75%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 1% and <= 5%		80%		95%	
<= 1%		90%		99%	
Personal protective equipment					
Respirator (Wear a full face respirator conforming to EN140 with Type A / P2 filter or better. APF >20))		95%		n.a.	ECETOC TRA (http://www.ecetoc.org/tra)
Respirator (Wear a respirator (half face mask) conforming to EN140 with Type A filter / P2 filter or better. APF >10)		90%		n.a.	ECETOC TRA (http://www.ecetoc.org/tra)
If the shift duration is greater than 8 hours per day, the long term systemic DNELs have to be adapted with the using the following equation,: DNEL Reduction Factor = (8 / hours worked in shift) This equation can not be used to adapt a DNEL for a shift duration smaller than 8 hours. With the adapted DNEL, the DU can recalculate the RCR by dividing the exposure estimation in section 3 with the adapted DNEL. If the RCR is smaller than 1, the downstreamuser works within the boundaries set by the ES.					

[5] All effectiveness's listed are only valid if the RMM is properly designed, installed (if applicable), used and maintained.

6. ES 6: Consumer end-use (SU 21); Consumer use of non-powdered activated carbon (NPAC)

1. Title of Exposure scenario	
Non-powdered activated carbon (NPAC)	
Environment: Consumer use of non-powdered activated carbon (NPAC)	ERC 9a
Consumer	
NPAC : Dry handling or wet handling when mixed with other substances.	PC 2
NPAC : Mixed with other substances, wet handling.	PC 2
NPAC : Mixed with other substance(s): handling and use of articles without release (INDOOR/OUTDOOR).	PC 2
NPAC : Mixed with other substance(s): handling and use of preparations or articles with release (INDOOR/OUTDOOR).	PC 2

2. Conditions of use affecting exposure
2.1 Control of environmental exposure: Consumer use of non-powdered activated carbon (NPAC) **(ERC 9a)**
2.2 Control of consumers exposure for NPAC : Dry handling or wet handling when mixed with other substances. **(PC 2)**
2.3 Control of consumers exposure for NPAC : Mixed with other substances, wet handling. **(PC 2)**
2.4 Control of consumers exposure for NPAC : Mixed with other substance(s): handling and use of articles without release (INDOOR/OUTDOOR). **(PC 2)**
2.5 Control of consumers exposure for NPAC : Mixed with other substance(s): handling and use of preparations or articles with release (INDOOR/OUTDOOR). **(PC 2)**

3. Exposure estimation and reference to its source		
Environment		
Not required as no hazard identified		
Consumer exposure		
Long-term, systemic		
Not required as no hazard identified		
Risk characterisation for acute systemic		
Not required as no hazard identified		
Local effects via inhalation route		
Contributing scenario	**Long term**	**Exposure estimation Method**
NPAC : Dry handling or wet handling when mixed with other substances. (PC 2)	Exposure: 0 mg/m³ RCR: 0	DNEL = 3 mg/m3 Long term: External exposure estimation tool (Consumer exposure to non-powdered activated carbon)
NPAC : Mixed with other substances, wet handling. (PC 2)	Exposure: 0 mg/m³ RCR: 0	DNEL = 3 mg/m3 Long term: External exposure estimation tool (Consumer exposure to non-powdered activated carbon)
NPAC : Mixed with other substance(s): handling and use of articles without release (INDOOR/OUTDOOR). (PC 2)	Exposure: 0 mg/m³ RCR: 0	DNEL = 3 mg/m3 Long term: External exposure estimation tool (Consumer exposure to non-powdered activated carbon)
NPAC : Mixed with other substance(s): handling and use of preparations or articles with release (INDOOR/OUTDOOR). (PC 2)	Exposure: 0 mg/m³ RCR: 0	DNEL = 3 mg/m3 Long term: External exposure estimation tool (Consumer exposure to non-powdered activated carbon)
Local effects via dermal route		
Not required as no hazard identified		

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

A DU works within the boundaries of this ES if he fulfills the conditions of use set in section 2. The table on the effectiveness on workplace RMM as listed in the ECETOC-TRA documentation TR 107 - Addendum to ECETOC Targeted Risk Assessment Technical Report No. 93, provides an overview of the assumed effectiveness for the different RMM. The DU can use these effectiveness estimation in order to assess if any deviating RMM will also provide safe use. This is done by multiplying the relevant RCR with the effectiveness of the RMM in place and divide it by the effectiveness of the RMM listed in section 2.

Risk management measure		**Assumed effectiveness**[6]		**Source of effectiveness**
		Inhalatory	Dermal	
Technical Risk management measures				
General ventilation (mechanical)		50%	-	Advanced REACH tool (www.advancedreachtool.com).
Local exhaust ventilation	PROC 2, 3, 4, 5, 6, 8a, 9, 10, 13, 15, 15, 16, 19. 21, 23, 25	90%	30%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
	PROC 7	95%		
	PROC 8b	95%		
	PROC 11, 20	n.a.		
	PROC 17, 18	90%		
	PROC 22	90%		
	PROC 24	90%		
Laminar flow booth		90%	90%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
Organizational risk management measure, Reduction of duration of exposure				
> 60 and <= 240 minutes per shift		40%	40%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 15 and <= 60 minutes per shift		80%	80%	
<= 15 minutes per shift		90%	80%	
Operational risk management measure, Concentration of substance in mixture				
> 5% and <= 25%		40%	75%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 1% and <= 5%		80%	95%	
<= 1%		90%	99%	
Personal protective equipment				
Respirator (Wear a full face respirator conforming to EN140 with Type A / P2 filter or better. APF >20))		95%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)
Respirator (Wear a respirator (half face mask) conforming to EN140 with Type A filter / P2 filter or better. APF >10)		90%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)

If the shift duration is greater than 8 hours per day, the long term systemic DNELs have to be adapted with the using the following equation,:

DNEL Reduction Factor = (8 / hours worked in shift)

This equation can not be used to adapt a DNEL for a shift duration smaller than 8 hours.
With the adapted DNEL, the DU can recalculate the RCR by dividing the exposure estimation in section 3 with the adapted DNEL. If the RCR is smaller than 1, the downstreamuser works within the boundaries set by the ES.

[6] All effectiveness's listed are only valid if the RMM is properly designed, installed (if applicable), used and maintained.

7. ES 7: Formulation (SU 3); Formulation of powdered activated carbon (PAC)

1. Title of Exposure scenario	
Powdered activated carbon (PAC)	
Environment: Formulation of powdered activated carbon (PAC)	ERC 2
Worker	
PAC.B1, PAC.B1m and PAC.B1w : PROC 1 : Handling/use in closed systems, no likelihood of exposure.	PROC 1
PAC.B2, PAC.B2m and PAC.B2w : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling).	PROC 2
PAC.B3, PAC.B3m and PAC.B3w : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling).	PROC 3
PAC.B4, PAC.B4m and PAC.B4w : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge.	PROC 4
PAC.B5, PAC.B5m and PAC.B5w : PROC 5 : Mixing of carbon with little or no liquid in open system, continuous significant dust release.	PROC 5
PAC.B7, PAC.B7m and PAC.B7w : PROC 8a : Discharging bags/containers, dust released, no dust removal system.	PROC 8a
PAC.B8, PAC.B8m, PAC.B8w, PAC.B15 and PAC.B15m : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of flexible hose.	PROC 8a
PAC.B6, PAC.B6m and PAC.B6w : PROC 8b : Sampling or discharging bags/containers, dust released but contained with removal system.	PROC 8b
PAC.B9, PAC.B9m and PAC.B9w : PROC 9 : Filling of jars or bags with activated carbon.	PROC 9
PAC.B10m : PROC 14 : Mixed with other substance(s): production of blocks/plates/tablets from AC and a binder.	PROC 14

2. Conditions of use affecting exposure
2.1 Control of environmental exposure: Formulation of powdered activated carbon (PAC) **(ERC 2)**
2.2 Control of workers exposure for PAC.B1, PAC.B1m and PAC.B1w : PROC 1 : Handling/use in closed systems, no likelihood of exposure. **(PROC 1)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: One hand face only (240 cm2)
2.3 Control of workers exposure for PAC.B2, PAC.B2m and PAC.B2w : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling). **(PROC 2)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
2.4 Control of workers exposure for PAC.B3, PAC.B3m and PAC.B3w : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling). **(PROC 3)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: One hand face only (240 cm2)
2.5 Control of workers exposure for PAC.B4 and PAC.B4m: PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. **(PROC 4)**
Product characteristics
Dustiness of product High

2. Conditions of use affecting exposure
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 99%]
2.5.1 Control of workers exposure for PAC.B4w : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. **(PROC 4)**
Product characteristics
Dustiness of product Low
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
2.6 Control of workers exposure for PAC.B5 and PAC.B5m: PROC 5 : Mixing of carbon with little or no liquid in open system, continuous significant dust release. **(PROC 5)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 99%]
2.6.1 Control of workers exposure for PAC.B5w : PROC 5 : Mixing of carbon with little or no liquid in open system, continuous significant dust release. **(PROC 5)**
Product characteristics
Dustiness of product Low
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
2.7 Control of workers exposure for PAC.B7 and PAC.B7m: PROC 8a : Discharging bags/containers, dust released, no dust removal system. **(PROC 8a)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands (960 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 99%]
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness ≥ 90%
2.7.1 Control of workers exposure for PAC.B7w : PROC 8a : Discharging bags/containers, dust released, no dust removal system. **(PROC 8a)**
Product characteristics
Dustiness of product Low
Amount used, frequency and duration of use/exposure

2. Conditions of use affecting exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands (960 cm2)
2.8 Control of workers exposure for PAC.B8, PAC.B8m, PAC.B8w, PAC.B15 and PAC.B15m : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of flexible hose. **(PROC 8a)**
Amount used, frequency and duration of use/exposure
Operation carried out for 15 min – 1 hour
Other operational conditions affecting workers exposure
Use outdoors Exposed skin surface assumed: Two hands face (480 cm2)
2.9 Control of workers exposure for PAC.B6 and PAC.B6m: PROC 8b : Sampling or discharging bags/containers, dust released but contained with removal system. **(PROC 8b)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]
2.9.1 Control of workers exposure for PAC.B6w : PROC 8b : Sampling or discharging bags/containers, dust released but contained with removal system. **(PROC 8b)**
Product characteristics
Dustiness of product Low
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
2.10 Control of workers exposure for PAC.B9 and PAC.B9m: PROC 9 : Filling of jars or bags with activated carbon. **(PROC 9)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]
2.10.1 Control of workers exposure for PAC.B9w : PROC 9 : Filling of jars or bags with activated carbon. **(PROC 9)**
Product characteristics
Dustiness of product Low
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
2.11 Control of workers exposure for PAC.B10m : PROC 14 : Mixed with other substance(s): production of blocks/plates/tablets from AC and a binder. **(PROC 14)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure

2. Conditions of use affecting exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]

3. Exposure estimation and reference to its source		
Environment		
Not required as no hazard identified		
Worker exposure		
Long-term, systemic		
Not required as no hazard identified		
Acute systemic		
Not required as no hazard identified		
Local effects via inhalation route		
Contributing scenario	**Long term**	**Exposure estimation Method**
PAC.B1, PAC.B1m and PAC.B1w : PROC 1 : Handling/use in closed systems, no likelihood of exposure. (PROC 1)	Exposure: 0.01 mg/m³ RCR: 0.003	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.B2, PAC.B2m and PAC.B2w : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling). (PROC 2)	Exposure: 1 mg/m³ RCR: 0.333	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.B3, PAC.B3m and PAC.B3w : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling). (PROC 3)	Exposure: 1 mg/m³ RCR: 0.333	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.B4 and PAC.B4m: PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. (PROC 4)	Exposure: 2.5 mg/m³ RCR: 0.833	DNEL = 3 mg/m3 Long term: TRA workers
PAC.B4w : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. (PROC 4)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: TRA workers
PAC.B5 and PAC.B5m: PROC 5 : Mixing of carbon with little or no liquid in open system, continuous significant dust release. (PROC 5)	Exposure: 2.5 mg/m³ RCR: 0.833	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.B5w : PROC 5 : Mixing of carbon with little or no liquid in open system, continuous significant dust release. (PROC 5)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.B7, PAC.B7m and PAC.B7w : PROC 8a : Discharging bags/containers, dust released, no dust removal system. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.B8, PAC.B8m, PAC.B8w, PAC.B15 and PAC.B15m : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of flexible hose. (PROC 8a)	Exposure: 0.63 mg/m³ RCR: 0.21	DNEL = 3 mg/m3 Long term: External exposure estimation tool (Advanced REACH Tool. OC: Dry form, high dustiness, outdoor, time restriction. No RMM.)
PAC.B6, PAC.B6m: PROC 8b : Sampling or discharging bags/containers, dust released but contained with removal system. (PROC 8b)	Exposure: 1.25 mg/m³ RCR: 0.417	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.B6w : PROC 8b : Sampling or discharging bags/containers, dust released but contained with removal system. (PROC 8b)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.B9 and PAC.B9m: PROC 9 : Filling of jars or bags with activated carbon. (PROC 9)	Exposure: 2 mg/m³ RCR: 0.667	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.B9w : PROC 9 : Filling of jars or bags with activated carbon. (PROC 9)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.B10m : PROC 14 : Mixed with other substance(s): production of blocks/plates/tablets from AC and a binder. (PROC 14)	Exposure: 1 mg/m³	DNEL = 3 mg/m3 Long term: Extended TRA workers

3. Exposure estimation and reference to its source		
	RCR: 0.333	
Local effects via dermal route		
Not required as no hazard identified		

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

A DU works within the boundaries of this ES if he fulfills the conditions of use set in section 2. The table on the effectiveness on workplace RMM as listed in the ECETOC-TRA documentation TR 107 - Addendum to ECETOC Targeted Risk Assessment Technical Report No. 93, provides an overview of the assumed effectiveness for the different RMM. The DU can use these effectiveness estimation in order to assess if any deviating RMM will also provide safe use. This is done by multiplying the relevant RCR with the effectiveness of the RMM in place and divide it by the effectiveness of the RMM listed in section 2.

Risk management measure		**Assumed effectiveness**[7]		**Source of effectiveness**
		Inhalatory	Dermal	
Technical Risk management measures				
General ventilation (mechanical)		50%	-	Advanced REACH tool (www.advancedreachtool.com).
Local exhaust ventilation	PROC 2, 3, 4, 5, 6, 8a, 9, 10, 13, 15, 15, 16, 19. 21, 23, 25	90%	30%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
	PROC 7	95%		
	PROC 8b	95%		
	PROC 11, 20	n.a.		
	PROC 17, 18	90%		
	PROC 22	90%		
	PROC 24	90%		
Laminar flow booth		90%	90%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
Organizational risk management measure, Reduction of duration of exposure				
> 60 and <= 240 minutes per shift		40%	40%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 15 and <= 60 minutes per shift		80%	80%	
<= 15 minutes per shift		90%	80%	
Operational risk management measure, Concentration of substance in mixture				
> 5% and <= 25%		40%	75%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 1% and <= 5%		80%	95%	
<= 1%		90%	99%	
Personal protective equipment				
Respirator (Wear a full face respirator conforming to EN140 with Type A / P2 filter or better. APF >20))		95%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)
Respirator (Wear a respirator (half face mask) conforming to EN140 with Type A filter / P2 filter or better. APF >10)		90%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)

If the shift duration is greater than 8 hours per day, the long term systemic DNELs have to be adapted with the using the following equation,:

DNEL Reduction Factor = (8 / hours worked in shift)

This equation can not be used to adapt a DNEL for a shift duration smaller than 8 hours.
With the adapted DNEL, the DU can recalculate the RCR by dividing the exposure estimation in section 3 with the adapted DNEL. If the RCR is smaller than 1, the downstreamuser works within the boundaries set by the ES.

[7] All effectiveness's listed are only valid if the RMM is properly designed, installed (if applicable), used and maintained.

8. ES 8: Industrial end-use (SU 3); Industrial use of powdered activated carbon (PAC)

1. Title of Exposure scenario	
Powdered activated carbon (PAC)	
Environment: Industrial use of powdered activated carbon (PAC)	ERC 4
Worker	
PAC.A1, PAC.A1m, PAC.A1w and PAC.A15m : PROC 1 : Handling/use in closed systems, no likelihood of exposure and use of articles without release (INDOOR/OUTDOOR).	PROC 1
PAC.A2, PAC.A2m, PAC.A2w, PAC.A10m and PAC.A18m : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling) and use in municipal swimming pools or aquaria.	PROC 2
PAC.A3, PAC.A3m, PAC.A3w and PAC.A16m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car.	PROC 3
PAC.A4, PAC.A4m and PAC.A4w : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge.	PROC 4
PAC.A9m : PROC 4/5 : Mixed with other substances: activated carbon in soil.	PROC 4
PAC.A6, PAC.A6m, PAC.A6w and PAC.A17m : PROC 8a : Discharging bags/containers, dust released, no dust removal system and use in municipal swimming pools or aquaria.	PROC 8a
PAC.A7, PAC.A7m, PAC.A7w and PAC.Ax : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of hose.	PROC 8a
PAC.A5, PAC.A5m and PAC.A5w : PROC 8b : Sampling or discharging bags/containers, dust contained with removal system or at dedicated plants (no exposure).	PROC 8b
PAC.A11m : PROC 9 : Filling of small containers in dedicated facilities.	PROC 9
PAC.A12m : PROC 14 : Pellitizing or extrusion.	PROC 14
PAC.A14 : PROC 15 : Laboratory use of powdered AC with dust removal.	PROC 15
PAC.A8m : PROC 16 : Mixed with other substances: waste incineration with energy recovery.	PROC 16
PAC.A13m : PROC 19 : Hand mixing.	PROC 19

2. Conditions of use affecting exposure
2.1 Control of environmental exposure: Industrial use of powdered activated carbon (PAC) **(ERC 4)**
2.2 Control of workers exposure for PAC.A1, PAC.A1m, PAC.A1w and PAC.A15m : PROC 1 : Handling/use in closed systems, no likelihood of exposure and use of articles without release (INDOOR/OUTDOOR). **(PROC 1)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: One hand face only (240 cm2)
2.3 Control of workers exposure for PAC.A2, PAC.A2m, PAC.A2w, PAC.A10m and PAC.A18m : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling) and use in municipal swimming pools or aquaria. **(PROC 2)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
2.4 Control of workers exposure for PAC.A3, PAC.A3m, PAC.A3w and PAC.A16m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car. **(PROC 3)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: One hand face only (240 cm2)

2. Conditions of use affecting exposure
2.5 Control of workers exposure for PAC.A4 and PAC.A4m: PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. **(PROC 4)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 99%]
2.5.1 Control of workers exposure for PAC.A4w : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. **(PROC 4)**
Product characteristics
Dustiness of product Low
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
2.6 Control of workers exposure for PAC.A9m : PROC 4/5 : Mixed with other substances: activated carbon in soil. **(PROC 4)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Use outdoors Exposed skin surface assumed: Two hands face (480 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness ≥ 90%
2.7 Control of workers exposure for PAC.A6, PAC.A6m, PAC.A6w and PAC.A17m : PROC 8a : Discharging bags/containers, dust released, no dust removal system and use in municipal swimming pools or aquaria. **(PROC 8a)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands (960 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 99%]
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness ≥ 90%
2.8 Control of workers exposure for PAC.A7, PAC.A7m, PAC.A7w and PAC.Ax : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of hose. **(PROC 8a)**
Amount used, frequency and duration of use/exposure
Operation carried out for 15 min – 1 hour
Other operational conditions affecting workers exposure
Use outdoors Exposed skin surface assumed: Two hands face (480 cm2)
2.9 Control of workers exposure for PAC.A5 and PAC.A5m: PROC 8b : Sampling or discharging bags/containers, dust contained with removal system or at dedicated plants (no exposure). **(PROC 8b)**
Product characteristics
Dustiness of product High

2. Conditions of use affecting exposure
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]
2.9.1 Control of workers exposure for PAC.A5w : PROC 8b : Sampling or discharging bags/containers, dust contained with removal system or at dedicated plants (no exposure). **(PROC 8b)**
Product characteristics
Dustiness of product Low
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
2.10 Control of workers exposure for PAC.A11m : PROC 9 : Filling of small containers in dedicated facilities. **(PROC 9)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]
2.11 Control of workers exposure for PAC.A12m : PROC 14 : Pellitizing or extrusion. **(PROC 14)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]
2.12 Control of workers exposure for PAC.A14 : PROC 15 : Laboratory use of powdered AC with dust removal. **(PROC 15)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: One hand face only (240 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]
2.13 Control of workers exposure for PAC.A8m : PROC 16 : Mixed with other substances: waste incineration with energy recovery. **(PROC 16)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure

2. Conditions of use affecting exposure
Indoor use assumed Exposed skin surface assumed: One hand face only (240 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]
2.14 Control of workers exposure for PAC.A13m : PROC 19 : Hand mixing. **(PROC 19)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands and forearms (1980 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]

3. Exposure estimation and reference to its source		
Environment		
Not required as no hazard identified		
Worker exposure		
Long-term, systemic		
Not required as no hazard identified		
Acute systemic		
Not required as no hazard identified		
Contributing scenario	**Long term**	**Exposure estimation Method**
PAC.A1, PAC.A1m, PAC.A1w and PAC.A15m : PROC 1 : Handling/use in closed systems, no likelihood of exposure and use of articles without release (INDOOR/OUTDOOR). (PROC 1)	Exposure: 0.01 mg/m³ RCR: 0.003	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.A2, PAC.A2m, PAC.A2w, PAC.A10m and PAC.A18m : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling) and use in municipal swimming pools or aquaria. (PROC 2)	Exposure: 1 mg/m³ RCR: 0.333	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.A3, PAC.A3m, PAC.A3w and PAC.A16m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car. (PROC 3)	Exposure: 1 mg/m³ RCR: 0.333	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.A4 and PAC.A4m: PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. (PROC 4)	Exposure: 2.5 mg/m³ RCR: 0.833	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.A4w : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. (PROC 4)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.A9m : PROC 4/5 : Mixed with other substances: activated carbon in soil. (PROC 4)	Exposure: 1.75 mg/m³ RCR: 0.583	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.A6, PAC.A6m, PAC.A6w and PAC.A17m : PROC 8a : Discharging bags/containers, dust released, no dust removal system and use in municipal swimming pools or aquaria. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.A7, PAC.A7m, PAC.A7w and PAC.Ax : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of hose. (PROC 8a)	Exposure: 0.63 mg/m³ RCR: 0.21	DNEL = 3 mg/m3 Long term: External exposure estimation tool (Advanced REACH Tool. OC: Dry form, high dustiness, outdoor, time restriction. No RMM.)
PAC.A5 and PAC.A5m: PROC 8b : Sampling or discharging bags/containers, dust contained with removal system or at dedicated plants (no exposure). (PROC 8b)	Exposure: 1.25 mg/m³ RCR: 0.417	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.A5w : PROC 8b : Sampling or discharging bags/containers, dust contained with removal system or at dedicated plants (no exposure). (PROC 8b)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.A11m : PROC 9 : Filling of small containers in dedicated facilities. (PROC 9)	Exposure: 2 mg/m³	DNEL = 3 mg/m3 Long term: Extended TRA workers

3. Exposure estimation and reference to its source		
	RCR: 0.667	
PAC.A12m : PROC 14 : Pellitizing or extrusion. (PROC 14)	Exposure: 1 mg/m³ RCR: 0.333	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.A14 : PROC 15 : Laboratory use of powdered AC with dust removal. (PROC 15)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.A8m : PROC 16 : Mixed with other substances: waste incineration with energy recovery. (PROC 16)	Exposure: 1 mg/m³ RCR: 0.333	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.A13m : PROC 19 : Hand mixing. (PROC 19)	Exposure: 2.5 mg/m³ RCR: 0.833	DNEL = 3 mg/m3 Long term: Extended TRA workers

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

A DU works within the boundaries of this ES if he fulfills the conditions of use set in section 2. The table on the effectiveness on workplace RMM as listed in the ECETOC-TRA documentation TR 107 - Addendum to ECETOC Targeted Risk Assessment Technical Report No. 93, provides an overview of the assumed effectiveness for the different RMM. The DU can use these effectiveness estimation in order to assess if any deviating RMM will also provide safe use. This is done by multiplying the relevant RCR with the effectiveness of the RMM in place and divide it by the effectiveness of the RMM listed in section 2.

Risk management measure		Assumed effectiveness[8]		Source of effectiveness
		Inhalatory	Dermal	
Technical Risk management measures				
General ventilation (mechanical)		50%	-	Advanced REACH tool (www.advancedreachtool.com).
Local exhaust ventilation	PROC 2, 3, 4, 5, 6, 8a, 9, 10, 13, 15, 15, 16, 19. 21, 23, 25	90%	30%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
	PROC 7	95%		
	PROC 8b	95%		
	PROC 11, 20	n.a.		
	PROC 17, 18	90%		
	PROC 22	90%		
	PROC 24	90%		
Laminar flow booth		90%	90%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
Organizational risk management measure, Reduction of duration of exposure				
> 60 and <= 240 minutes per shift		40%	40%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 15 and <= 60 minutes per shift		80%	80%	
<= 15 minutes per shift		90%	80%	
Operational risk management measure, Concentration of substance in mixture				
> 5% and <= 25%		40%	75%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 1% and <= 5%		80%	95%	
<= 1%		90%	99%	
Personal protective equipment				
Respirator (Wear a full face respirator conforming to EN140 with Type A / P2 filter or better. APF >20))		95%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)
Respirator (Wear a respirator (half face mask) conforming to EN140 with Type A filter / P2 filter or better. APF >10)		90%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)

If the shift duration is greater than 8 hours per day, the long term systemic DNELs have to be adapted with the using the following equation,:

DNEL Reduction Factor = (8 / hours worked in shift)

This equation can not be used to adapt a DNEL for a shift duration smaller than 8 hours.
With the adapted DNEL, the DU can recalculate the RCR by dividing the exposure estimation in section 3 with the adapted DNEL. If the RCR is smaller than 1, the downstreamuser works within the boundaries set by the ES.

[8] All effectiveness's listed are only valid if the RMM is properly designed, installed (if applicable), used and maintained.

9. ES 9: Professional end-use (SU 22); Professional use of powdered activated carbon (PAC)

1. Title of Exposure scenario	
Powdered activated carbon (PAC)	
Environment: Professional use of powdered activated carbon (PAC)	ERC 8a
Worker	
PAC.D3m, PAC.D4m, PAC.D5, PAC.D5m and PAC.D5w : PROC 1 : Handling/use in closed systems, no likelihood of exposure and use of articles without release (INDOOR/OUTDOOR).	PROC 1
PAC.D6, PAC.D6m, PAC.D6w, PAC.D15m/a and PAC.D15m/d : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling) and use in municipal swimming pools or aquaria.	PROC 2
PAC.D7, PAC.D7m, PAC.D7w and PAC.13m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car.	PROC 3
PAC.D2m : PROC 4/5 : Mixed with other substance(s): activated carbon in the soil.	PROC 4/5
PAC.D8 and PAC.D8m, PAC.D8W : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge.	PROC 4
PAC.D10, PAC.D10m, PAC.D10w, PAC.D14m and PAC.D14m/d : PROC 8a : Discharging bags/containers, dust released, no dust removal system or exposure due to spillages and use in municipal swimming pools or aquaria.	PROC 8a
PAC.D11, PAC.D11m, PAC.D11w, PAC.D17, PAC.D17m, PAC.D17w and PAC.Axm : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of hose.	PROC 8a
PAC.D9w : PROC 8b : Moist or slurry(no dust) : sampling or discharging bags/containers, dedicated plants(no exposure) sampling, discharge.	PROC 8b
PAC.D16m : PROC 9 : Use by medical / health professional in medical equipment.	PROC 9
PAC.D1 : PROC 15 : Laboratory use of powdered AC with dust removal.	PROC 15
PAC.D12m : PROC 16 : Mixed with other substances: waste incineration with energy recovery.	PROC 16

2. Conditions of use affecting exposure
2.1 Control of environmental exposure: Professional use of powdered activated carbon (PAC) **(ERC 8a)**
2.2 Control of workers exposure for PAC.D3m, PAC.D4m, PAC.D5, PAC.D5m and PAC.D5w : PROC 1 : Handling/use in closed systems, no likelihood of exposure and use of articles without release (INDOOR/OUTDOOR). **(PROC 1)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: One hand face only (240 cm2)
2.3 Control of workers exposure for PAC.D6, PAC.D6m, PAC.D15m/a and PAC.D15m/d : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling) and use in municipal swimming pools or aquaria. **(PROC 2)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness ≥ 90%
2.3.1 Control of workers exposure for PAC.D6w: PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling) and use in municipal swimming pools or aquaria. **(PROC 2)**
Product characteristics
Dustiness of product Low
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)

2. Conditions of use affecting exposure
2.4 Control of workers exposure for PAC.D7, PAC.D7m, and PAC.13m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car. **(PROC 3)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: One hand face only (240 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness ≥ 90%
2.4.1 Control of workers exposure for PAC.D7w: PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car. **(PROC 3)**
Product characteristics
Dustiness of product Low
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: One hand face only (240 cm2)
2.5 Control of workers exposure for PAC.D2m : PROC 4/5 : Mixed with other substance(s): activated carbon in the soil. **(PROC 4)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a full face respirator conforming to EN136 with Type A/P2 filter or better. Effectiveness ≥95%
2.6 Control of workers exposure for PAC.D8 and PAC.D8m : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. **(PROC 4)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a full face respirator conforming to EN136 with Type A/P2 filter or better. Effectiveness ≥95%
2.4.1 Control of workers exposure for PAC.Dw : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. **(PROC 4)**
Product characteristics
Dustiness of product Low
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: One hand face only (240 cm2)
2.7 Control of workers exposure for PAC.D10, PAC.D10m, PAC.D14m and PAC.D14m/d : PROC 8a : Discharging bags/containers, dust released, no dust removal system or exposure due to spillages and use in municipal swimming pools or aquaria. **(PROC 8a)**
Product characteristics

2. Conditions of use affecting exposure
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands (960 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a full face respirator conforming to EN136 with Type A/P2 filter or better. Effectiveness ≥95%
2.7.1 Control of workers exposure for PAC.D10w: PROC 8a : Discharging bags/containers, dust released, no dust removal system or exposure due to spillages and use in municipal swimming pools or aquaria. **(PROC 8a)**
Product characteristics
Dustiness of product Low
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands (960 cm2)
2.8 Control of workers exposure for PAC.D11, PAC.D11m, PAC.D11w, PAC.D17, PAC.D17m, PAC.D17w and PAC.Axm : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of hose. **(PROC 8a)**
Amount used, frequency and duration of use/exposure
Operation carried out for 15 min – 1 hour
Other operational conditions affecting workers exposure
Use outdoors Exposed skin surface assumed: Two hands face (480 cm2)
2.9 Control of workers exposure for PAC.D9 : PROC 8b : Moist or slurry(no dust) : sampling or discharging bags/containers, dedicated plants(no exposure) sampling, discharge. **(PROC 8b)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a full face respirator conforming to EN136 with Type A/P2 filter or better. Effectiveness ≥95%
2.9.1 Control of workers exposure for PAC.D9w : PROC 8b : Moist or slurry(no dust) : sampling or discharging bags/containers, dedicated plants(no exposure) sampling, discharge. **(PROC 8b)**
Product characteristics
Dustiness of product Low
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
2.10 Control of workers exposure for PAC.D16m : PROC 9 : Use by medical / health professional in medical equipment. **(PROC 9)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: Two hands face (480 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness ≥ 90%

2. Conditions of use affecting exposure
2.11 Control of workers exposure for PAC.D1 : PROC 15 : Laboratory use of powdered AC with dust removal. **(PROC 15)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: One hand face only (240 cm2)
Technical and organizational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 80% ; Dermal: 90%]
2.12 Control of workers exposure for PAC.D12m : PROC 16 : Mixed with other substances: waste incineration with energy recovery. **(PROC 16)**
Product characteristics
Dustiness of product High
Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours
Other operational conditions affecting workers exposure
Indoor use assumed Exposed skin surface assumed: One hand face only (240 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a full face respirator conforming to EN136 with Type A/P2 filter or better. Effectiveness ≥95%

3. Exposure estimation and reference to its source		
Contributing scenario	**Long term**	**Exposure estimation Method**
PAC.D3m, PAC.D4m, PAC.D5, PAC.D5m and PAC.D5w : PROC 1 : Handling/use in closed systems, no likelihood of exposure and use of articles without release (INDOOR/OUTDOOR). (PROC 1)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.D6, PAC.D6m, PAC.D15m/a and PAC.D15m/d : PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling) and use in municipal swimming pools or aquaria. (PROC 2)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: TRA workers
PAC.D6w: PROC 2 : Handling/use in closed continuous system, occasional controlled exposure (sampling) and use in municipal swimming pools or aquaria. (PROC 2)	Exposure: 0.01 mg/m³ RCR: 0.003	DNEL = 3 mg/m3 Long term: TRA workers
PAC.D7, PAC.D7m, and PAC.13m : PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car. (PROC 3)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.D7w: PROC 3 : Handling/use in closed batch system, occasional controlled exposure (sampling) and transfer by suction of AC from filter into dedicated tank car. (PROC 3) PAC.D8w: PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. (PROC 4)	Exposure: 0.1 mg/m³ RCR: 0.033	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.D2m : PROC 4/5 : Mixed with other substance(s): activated carbon in the soil. (PROC 4)	Exposure: 2.5 mg/m³ RCR: 0.833	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.D8 and PAC.D8m : PROC 4 : Handling/use in closed batch system, occasional controlled exposure (emitted dust) during charging, sampling, discharge. (PROC 4)	Exposure: 2.5 mg/m³ RCR: 0.833	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.D10, PAC.D10m, PAC.D14m and PAC.D14m/d : PROC 8a : Discharging bags/containers, dust released, no dust removal system or exposure due to spillages and use in municipal swimming pools or aquaria. (PROC 8a)	Exposure: 2.5 mg/m³ RCR: 0.833	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.D10w: PROC 8a : Discharging bags/containers, dust released, no dust removal system or exposure due to spillages and use in municipal swimming pools or aquaria. (PROC 8a)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers

3. Exposure estimation and reference to its source		
PAC.D11, PAC.D11m, PAC.D11w, PAC.D17, PAC.D17m, PAC.D17w and PAC.Axm : PROC 8a : Sampling of material, non-dedicated facilities and coupling and uncoupling of hose. (PROC 8a)	Exposure: 0.63 mg/m³ RCR: 0.21	DNEL = 3 mg/m3 Long term: External exposure estimation tool (Advanced REACH Tool. OC: Dry form, high dustiness, outdoor, time restriction. No RMM.)
PAC.D9 : PROC 8b : Moist or slurry(no dust) : sampling or discharging bags/containers, dedicated plants(no exposure) sampling, discharge. (PROC 8b)	Exposure: 2.5 mg/m³ RCR: 0.833	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.D9w : PROC 8b : Moist or slurry(no dust) : sampling or discharging bags/containers, dedicated plants(no exposure) sampling, discharge. (PROC 8b)	Exposure: 0.5 mg/m³ RCR: 0.167	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.D16m : PROC 9 : Use by medical / health professional in medical equipment. (PROC 9)	Exposure: 2 mg/m³ RCR: 0.667	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.D1 : PROC 15 : Laboratory use of powdered AC with dust removal. (PROC 15)	Exposure: 1 mg/m³ RCR: 0.333	DNEL = 3 mg/m3 Long term: Extended TRA workers
PAC.D12m : PROC 16 : Mixed with other substances: waste incineration with energy recovery. (PROC 16)	Exposure: 2.5 mg/m³ RCR: 0.833	DNEL = 3 mg/m3 Long term: Extended TRA workers

Local effects via dermal route
Not required as no hazard identified

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

A DU works within the boundaries of this ES if he fulfills the conditions of use set in section 2. The table on the effectiveness on workplace RMM as listed in the ECETOC-TRA documentation TR 107 - Addendum to ECETOC Targeted Risk Assessment Technical Report No. 93, provides an overview of the assumed effectiveness for the different RMM. The DU can use these effectiveness estimation in order to assess if any deviating RMM will also provide safe use. This is done by multiplying the relevant RCR with the effectiveness of the RMM in place and divide it by the effectiveness of the RMM listed in section 2.

Risk management measure		Assumed effectiveness[9]		Source of effectiveness
		Inhalatory	Dermal	
Technical Risk management measures				
General ventilation (mechanical)		50%	-	Advanced REACH tool (www.advancedreachtool.com).
Local exhaust ventilation	PROC 2, 3, 4, 5, 6, 8a, 9, 10, 13, 15, 15, 16, 19. 21, 23, 25	80%	30%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
	PROC 7	n.a.		
	PROC 8b	80%		
	PROC 11, 20	80%		
	PROC 17, 18	90%		
	PROC 22	n.a.		
	PROC 24	75%		
Laminar flow booth		90%	30%	Advanced REACH tool (www.advancedreachtool.com) for the inhalatory effectiveness, the dermal effectiveness is assumed to be 1/3 of the inhalatory effectiveness.
Organizational risk management measure, Reduction of duration of exposure				
> 60 and <= 240 minutes per shift		40%	40%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 15 and <= 60 minutes per shift		80%	80%	
<= 15 minutes per shift		90%	80%	
Operational risk management measure, Concentration of substance in mixture				
> 5% and <= 25%		40%	75%	ECETOC TRA (http://www.ecetoc.org/tra) for the inhalatory effectiveness, expert judgment for dermal effectiveness.
> 1% and <= 5%		80%	95%	
<= 1%		90%	99%	
Personal protective equipment				
Respirator (Wear a full face respirator conforming to EN140 with Type A / P2 filter or better. APF >20))		95%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)
Respirator (Wear a respirator (half face mask) conforming to EN140 with Type A filter / P2 filter or better. APF >10)		90%	n.a.	ECETOC TRA (http://www.ecetoc.org/tra)

If the shift duration is greater than 8 hours per day, the long term systemic DNELs have to be adapted with the using the following equation,:

DNEL Reduction Factor = (8 / hours worked in shift)

This equation can not be used to adapt a DNEL for a shift duration smaller than 8 hours.
With the adapted DNEL, the DU can recalculate the RCR by dividing the exposure estimation in section 3 with the adapted DNEL. If the RCR is smaller than 1, the downstreamuser works within the boundaries set by the ES.

[9] All effectiveness's listed are only valid if the RMM is properly designed, installed (if applicable), used and maintained.

10. ES 10: Consumer end-use (SU 21); Consumer use of powdered activated carbon (PAC)

1. Title of Exposure scenario	
Powdered activated carbon (PAC)	
Environment: Consumer use of powdered activated carbon (PAC)	ERC 8a
Consumer	
PAC : Mixed with other substance(s): handling and use of articles without release (INDOOR/OUTDOOR).	PC 2
PAC : Mixed with other substance(s): handling and use of preparations or articles with release (INDOOR/OUTDOOR).	PC 2

2. Conditions of use affecting exposure
2.1 Control of environmental exposure: Consumer use of powdered activated carbon (PAC) **(ERC 8a)**
2.2 Control of consumers exposure for PAC : Mixed with other substance(s): handling and use of articles without release (INDOOR/OUTDOOR). **(PC 2)**
2.3 Control of consumers exposure for PAC : Mixed with other substance(s): handling and use of preparations or articles with release (INDOOR/OUTDOOR). **(PC 2)**

3. Exposure estimation and reference to its source
Environment
Not required as no hazard identified

Consumer exposure

Long-term, systemic

Contributing scenario	Inhalation	Dermal	Oral	Combined routes	Exposure estimation Method
PAC : Mixed with other substance(s): handling and use of articles without release (INDOOR/OUTDOOR). (PC 2)	Exposure:0 RCR:0	Exposure:0 RCR:0	Exposure:0 RCR:	RCR:0	Inhal: DNEL = 3 mg/m3 Derm: DNEL = 3 mg/m3 Oral: DNEL = 3 mg/m3
PAC : Mixed with other substance(s): handling and use of preparations or articles with release (INDOOR/OUTDOOR). (PC 2)	Exposure:0 RCR:0	Exposure:0 RCR:0	Exposure:0 RCR:0	RCR:0	Inhal: DNEL = 3 mg/m3 Derm: DNEL = 3 mg/m3 Oral: DNEL = 3 mg/m3

Risk characterisation for acute systemic

Not required as no hazard identified

Local effects via inhalation route

Not required as no hazard identified

Contributing scenario	Acute	Long term	Exposure estimation Method
PAC : Mixed with other substance(s): handling and use of articles without release (INDOOR/OUTDOOR). (PC 2)	Not required as no hazard identified	Exposure: 0 mg/m³ RCR: 0	DNEL = 3 mg/m3 Long term: External exposure estimation tool (Consumer exposure to powdered activated carbon)
PAC : Mixed with other substance(s): handling and use of preparations or articles with release (INDOOR/OUTDOOR). (PC 2)	Not required as no hazard identified	Exposure: 0 mg/m³ RCR: 0	DNEL = 3 mg/m3 Long term: External exposure estimation tool (Consumer exposure to powdered activated carbon)

Local effects via dermal route

Not required as no hazard identified

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
Substance has to be in closed container or packaging.

SAFETY DATA SHEET

Version 8.0
Revision Date 09/16/2021
Print Date 12/14/2022

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

1.1 Product identifiers

Product name : Diesel

Product Number : CRMMPGO
Brand : Sigma-Aldrich
Index-No. : 649-224-00-6
CAS-No. : 68334-30-5

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

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 3), H226
Acute toxicity, Inhalation (Category 4), H332
Skin irritation (Category 2), H315
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure (Category 2), H373
Aspiration hazard (Category 1), H304
Short-term (acute) aquatic hazard (Category 2), H401
Long-term (chronic) aquatic hazard (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram	
Signal word	Danger

Hazard statement(s)	
H226	Flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H332	Harmful if inhaled.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 **Hazards not otherwise classified (HNOC) or not covered by GHS** - none

SECTION 3: Composition/information on ingredients

3.1 Substances

CAS-No. : 68334-30-5
EC-No. : 269-822-7
Index-No. : 649-224-00-6

Component	Classification	Concentration
Diesel fuel		
	Flam. Liq. 3; Acute Tox. 4; Skin Irrit. 2; Carc. 2; STOT RE 2; Asp. Tox. 1; Aquatic Acute 2; Aquatic Chronic 2; H226, H332, H315, H351, H373, H304, H401, H411	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Consult a physician. Show this material safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Dry powder Dry sand

Unsuitable extinguishing media
Do NOT use water jet.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapor or mist.

Advice on protection against fire and explosion
Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Storage class
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Diesel fuel	68334-30-5	TWA	100 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	No data available
f)	Initial boiling point and boiling range	141 - 462 °C 286 - 864 °F at 1,013 hPa
g)	Flash point	>= 56 °C (>= 133 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	400 hPa at 40 °C (104 °F)
l)	Vapor density	No data available
m)	Density	0.8 - 0.91 g/cm3 at 15 °C (59 °F)
	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	>= 1.5 mm2/s at 40 °C (104 °F) -
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 17,900 mg/kg
(OECD Test Guideline 401)
Inhalation: No data available
LD50 Dermal - Rabbit - > 4,300 mg/kg
(OECD Test Guideline 402)
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Irritating to skin. - 24 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation - 24 h
(OECD Test Guideline 405)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: Did not cause sensitization on laboratory animals.
(OECD Test Guideline 406)

Germ cell mutagenicity
No data available

Carcinogenicity
Limited evidence of carcinogenicity in animal studies

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.**Aspiration hazard**
May be fatal if swallowed and enters airways.

11.2 Additional Information

Cough, Difficulty in breathing, chest congestion, Shortness of breath, Fever, defatting, Dermatitis, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	static test LC50 - Oncorhynchus mykiss (rainbow trout) - 21 mg/l - 96 h (OECD Test Guideline 203)
Toxicity to algae	Growth inhibition EC50 - Pseudokirchneriella subcapitata (green algae) - 10 mg/l - 72 h (OECD Test Guideline 201)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 28 d Result: 57.5 % - According to the results of tests of biodegradability this product is not readily biodegradable. (OECD Test Guideline 301)

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
UN number: 1202 Class: 3 Packing group: III
Proper shipping name: Diesel fuel
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG
UN number: 1202 Class: 3 Packing group: III EMS-No: F-E, S-E
Proper shipping name: DIESEL FUEL

IATA
UN number: 1202 Class: 3 Packing group: III
Proper shipping name: Diesel fuel

SECTION 15: Regulatory information

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Diesel fuel	68334-30-5	1989-08-11

Diesel fuel	CAS-No. 68334-30-5	Revision Date 1989-08-11

New Jersey Right To Know Components

Diesel fuel	CAS-No. 68334-30-5	Revision Date 1989-08-11

SECTION 16: Other information

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

Version: 8.0 Revision Date: 09/16/2021 Print Date: 12/14/2022

SAFETY DATA SHEET
According to EC No 1907/2006 as amended as at the date of this SDS

Shell Omala Oil F 320

Version	Revision Date:	SDS Number:	Date of last issue: 07.02.2023
3.4	11.04.2023	800001005282	Print Date 12.04.2023

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

1.1 Product identifier

Trade name : Shell Omala Oil F 320
Product code : 001A0930

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

Use of the Sub-stance/Mixture : Gear oil
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 supplier.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier : **Shell Nederland Verkoopmaatschappij B.V.**
Weena 505
3013 AL Rotterdam
Netherlands
Telephone : (+31) 0900 202 2710
Telefax :
Contact for Safety Data Sheet : If you have any enquiries about the content of this SDS please email lubricantSDS@shell.com

1.4 Emergency telephone number
: National Poison Information Centre (NVIC): Tel. nr. +31(0)88 755 8000 (24 hrs a day and 7 days a week). Only for the purpose of informing medical personnel in cases of accidental intoxications.
+31 (0)10 4313233

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)
Based on available data this substance / mixture does not meet the classification criteria.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)
Hazard pictograms : No Hazard Symbol required
Signal word : No signal word

Hazard statements : PHYSICAL HAZARDS:
Not classified as a physical hazard according to CLP criteria.
HEALTH HAZARDS:
Not classified as a health hazard under CLP criteria.
ENVIRONMENTAL HAZARDS:
Not classified as environmental hazard according to CLP criteria.

Precautionary statements : **Prevention:**
No precautionary phrases.

Response:
No precautionary phrases.

Storage:
No precautionary phrases.

Disposal:
No precautionary phrases.

Safety data sheet available on request.

Sensitising components : Contains amine phosphate.
May produce an allergic reaction.

2.3 Other hazards

This mixture does not contain any REACH registered substances that are assessed to be a PBT or a vPvB.

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.

Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Used oil may contain harmful impurities.
Not classified as flammable but will burn.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : Highly refined mineral oils and additives.
The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.
Classification based on DMSO extract content < 3% (Regulation (EC) 1272/2008, Annex VI, Part 3, Note L).

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
Amine phosphate	Not Assigned 931-384-6 01-2119493620-38	Acute Tox. 4; H302 Skin Sens. 1; H317 Aquatic Chronic 2; H411 Eye Irrit. 2; H319	0,1 - 0,9
Long chain alkenylamine	7173-62-8 230-528-9	Acute Tox. 4; H302 Skin Corr. 1B; H314 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 M-Factor (Acute aquatic toxicity): 10 M-Factor (Chronic aquatic toxicity): 1	0,01 - 0,1

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

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 : No treatment necessary under normal conditions of use.
If symptoms persist, obtain medical advice.

In case of skin contact : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.
If persistent irritation occurs, obtain medical attention.

In case of eye contact : Flush eye with copious quantities of water.
Remove contact lenses, if present and easy to do. Continue rinsing.
If persistent irritation occurs, obtain medical attention.

If swallowed : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Notes to doctor/physician:
Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

Unsuitable extinguishing media : Do not use water in a jet.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting : Hazardous combustion products may include:
A complex mixture of airborne solid and liquid particulates and gases (smoke).
Carbon monoxide may be evolved if incomplete combustion occurs.
Unidentified organic and inorganic compounds.

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 methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : 6.1.1 For non emergency personnel:
Avoid contact with skin and eyes.
6.1.2 For emergency responders:
Avoid contact with skin and eyes.

6.2 Environmental precautions

Environmental precautions : Use appropriate containment to avoid environmental contami-

nation. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.

Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Slippery when spilt. Avoid accidents, clean up immediately.
Prevent from spreading by making a barrier with sand, earth or other containment material.
Reclaim liquid directly or in an absorbent.
Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.

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 : Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.
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.

Advice on safe handling : Avoid prolonged or repeated contact with skin.
Avoid inhaling vapour and/or mists.
When handling product in drums, safety footwear should be worn and proper handling equipment should be used.
Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.

Product Transfer : Proper grounding and bonding procedures should be used during all bulk transfer operations to avoid static accumulation.

7.2 Conditions for safe storage, including any incompatibilities

Further information on storage stability : Keep container tightly closed and in a cool, well-ventilated place.
Use properly labeled and closable containers.
Store at ambient temperature.

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 or high density polyethylene.
Unsuitable material: PVC.

Container Advice : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

7.3 Specific end use(s)

Specific use(s) : Not applicable

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Oil mist, mineral	Not Assigned	TLV-8hr (Mist)	5 mg/m3	NL WG
Oil mist, mineral		TWA (inhalable fraction)	5 mg/m3	US. ACGIH Threshold Limit Values
Oil mist, mineral		TWA (Mist)	5 mg/m3	NL WG

Biological occupational exposure limits

8.2 Exposure controls

Engineering measures

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:
Adequate ventilation to control airborne concentrations.

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

General Information:
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.
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.

Personal protective equipment

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

PPE suppliers.

Eye protection : If material is handled such that it could be splashed into eyes, protective eyewear is recommended.
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. PVC, neoprene or nitrile rubber gloves 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.
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.

Skin and body protection : Skin protection is not ordinarily required beyond standard work clothes.
It is good practice to wear chemical resistant gloves.

Respiratory protection : No respiratory protection is ordinarily required under normal conditions of use.
In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material.
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 suitable, select an appropriate combination of mask and filter.
Select a filter suitable for combined particulate/organic gases and vapours [Type A/Type P boiling point > 65°C (149°F)] meeting EN14387 and EN143.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	Liquid at room temperature.
Colour	:	brown
Odour	:	Data not available
Odour Threshold	:	Data not available
pour point	:	-18 °C Method: IP 15
Melting / freezing point		Data not available
Initial boiling point and boiling range	:	> 280 °Cestimated value(s)
Flammability		
Flammability (solid, gas)	:	Not applicable
Flammability (liquids)	:	Not classified as flammable but will burn.
Lower explosion limit and upper explosion limit / flammability limit		
Upper explosion limit / upper flammability limit	:	Typical 10 %(V)
Lower explosion limit / Lower flammability limit	:	Typical 1 %(V)
Flash point	:	202 °C Method: IP 34
Auto-ignition temperature	:	> 320 °C
Decomposition temperature		
Decomposition temperature	:	Data not available
pH	:	Not applicable
Viscosity		
Viscosity, dynamic	:	Data not available
Viscosity, kinematic	:	320 mm2/s (40,0 °C) Method: IP 71
		25 mm2/s (100 °C)

Method: IP 71

Solubility(ies)

Water solubility	:	negligible
Solubility in other solvents	:	Data not available
Partition coefficient: n-octanol/water	:	log Pow: > 6 (based on information on similar products)
Vapour pressure	:	< 0,5 Pa (20 °C) estimated value(s)
Relative density	:	0,903 (15 °C)
Density	:	903 kg/m3 (15,0 °C) Method: IP 365
Relative vapour density	:	> 5

9.2 Other information

Explosives	:	Classification Code: Not classified
Oxidizing properties	:	Data not available
Flammability (liquids)	:	Not classified as flammable but will burn.
Evaporation rate	:	Data not available
Conductivity	:	This material is not expected to be a static accumulator.

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.

10.2 Chemical stability

Stable.
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	:	Extremes of temperature and direct sunlight.

10.5 Incompatible materials

Materials to avoid : Strong oxidising agents.

10.6 Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

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

Information on likely routes of exposure : Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity : LD50 (rat): > 5.000 mg/kg
Remarks: Low toxicity
Based on available data, the classification criteria are not met.

Acute inhalation toxicity : Remarks: Based on available data, the classification criteria are not met.

Acute dermal toxicity : LD50 (Rabbit): > 5.000 mg/kg
Remarks: Low toxicity
Based on available data, the classification criteria are not met.

Skin corrosion/irritation

Product:

Remarks : Slightly irritating to skin.
Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation

Product:

Remarks : Slightly irritating to the eye.
Based on available data, the classification criteria are not met.

Components:

Amine phosphate:

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

Respiratory or skin sensitisation

Product:

Remarks : For respiratory and skin sensitisation:
Not a sensitiser.
Based on available data, the classification criteria are not met.

Components:

Amine phosphate:

Remarks : Experimental data has shown that the concentration of potentially sensitising components present in this product does not induce skin sensitisation.
May cause an allergic skin reaction in sensitive individuals.

Germ cell mutagenicity

Product:

Genotoxicity in vivo : Remarks: Non mutagenic
Based on available data, the classification criteria are not met.

Germ cell mutagenicity- Assessment : 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.

Remarks : Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies.
Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC).

Carcinogenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Material	GHS/CLP Carcinogenicity Classification
Highly refined mineral oil	No carcinogenicity classification.

Reproductive toxicity

Product:

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

not met.

Reproductive toxicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

STOT - single exposure

Product:

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

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 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.

Further information

Product:

Remarks : Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal.
ALL used oil should be handled with caution and skin contact avoided as far as possible.

Remarks : Slightly irritating to respiratory system.

Remarks : Classifications by other authorities under varying regulatory frameworks may exist.

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

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish	:	Remarks: Based on available data, the classification criteria are not met. Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: Based on available data, the classification criteria are not met. Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to algae/aquatic plants	:	Remarks: Based on available data, the classification criteria are not met. Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to fish (Chronic toxicity)	:	Remarks: Based on available data, the classification criteria are not met.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: Based on available data, the classification criteria are not met.
Toxicity to microorganisms	:	Remarks: Based on available data, the classification criteria are not met.

Components:

Long chain alkenylamine:

M-Factor (Acute aquatic toxicity)	:	10
M-Factor (Chronic aquatic toxicity)	:	1

12.2 Persistence and degradability

Product:

Biodegradability	:	Remarks: Not readily biodegradable. Major constituents are inherently biodegradable, but contains components that may persist in the environment. Persistent per IMO criteria. International Oil Pollution Compensation (IOPC) Fund definition: "A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340ºC (645ºF) and (b) at least 95% of

which, by volume, distils at a temperature of 370ºC (700ºF) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

12.3 Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Contains components with the potential to bioaccumulate.

12.4 Mobility in soil

Product:

Mobility : Remarks: Liquid under most environmental conditions., If it enters soil, it will adsorb to soil particles and will not be mobile.

Remarks: Floats on water.

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This mixture does not contain any REACH registered substances that are assessed to be a PBT or a 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 information : Does not have ozone depletion potential, photochemical ozone creation potential or global warming potential.
Product is a mixture of non-volatile components, which will not be released to air in any significant quantities under normal conditions of use.

Poorly soluble mixture.
Causes physical fouling of aquatic organisms.

Mineral oil does not cause chronic toxicity to aquatic organisms at concentrations less than 1 mg/l.

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 toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment. Do not dispose into the environment, in drains or in water courses. Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination. Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand. 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	:	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.
Local legislation		
Waste catalogue	:	EU Waste Disposal Code (EWC):
Waste Code	:	13 02 05*
Remarks	:	Classification of waste is always the responsibility of the end user. Disposal should be in accordance with applicable regional, national, and local laws and regulations.

SECTION 14: Transport information

14.1 UN number or ID number

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.2 UN proper shipping name

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.3 Transport hazard class(es)

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.4 Packing group

ADN	:	Not regulated as a dangerous good
CDNI Inland Water Waste Agreement	:	NST 3411 Mineral Lubricating Oils
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.5 Environmental hazards

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good

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 needs to comply with in connection with transport.

14.7 Maritime transport in bulk according to IMO instruments

MARPOL Annex 1 rules apply for bulk shipments by sea.

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) : Not applicable

REACH - List of substances subject to authorisation (Annex XIV) : Product is not subject to Authorisation under REACH.

Volatile organic compounds : Volatile organic compounds (VOC) content: 0 %

Other regulations:

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

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

EINECS : All components listed or polymer exempt.

TSCA : All components listed.

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

SECTION 16: Other information

Full text of H-Statements

H302	:	Harmful if swallowed.
H314	:	Causes severe skin burns and eye damage.
H317	:	May cause an allergic skin reaction.
H319	:	Causes serious eye irritation.
H400	:	Very toxic to aquatic life.
H410	:	Very toxic to aquatic life with long lasting effects.
H411	:	Toxic to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	:	Acute toxicity
Aquatic Acute	:	Short-term (acute) aquatic hazard
Aquatic Chronic	:	Long-term (chronic) aquatic hazard
Eye Irrit.	:	Eye irritation
Skin Corr.	:	Skin corrosion
Skin Sens.	:	Skin sensitisation
NL WG	:	Netherlands. Law on Labour conditions - Occupational Exposure Limits
NL WG / TWA	:	Time weighted average
NL WG / TLV-8hr	:	Time Weighted Average

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 - 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 operators.
Other information	:	No Exposure Scenario annex is attached to this safety data sheet. It is a non-classified mixture containing hazardous substances as detailed in Section 3; relevant information from Exposure Scenarios for the hazardous substances contained have been integrated into the core sections 1-16 of this SDS. 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).

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.

NL / EN

SAFETY DATA SHEET
According to EC No 1907/2006 as amended as at the date of this SDS

Shell Omala Oil F 220

Version	Revision Date:	SDS Number:	Date of last issue: 04.02.2016
3.3	11.04.2023	800001003473	Print Date 12.04.2023

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

1.1 Product identifier

Trade name : Shell Omala Oil F 220
Product code : 001A0929

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

Use of the Sub-stance/Mixture : Gear oil
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 supplier.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier : **Shell Nederland Verkoopmaatschappij B.V.**
Weena 505
3013 AL Rotterdam
Netherlands
Telephone : (+31) 0900 202 2710
Telefax :
Contact for Safety Data Sheet : If you have any enquiries about the content of this SDS please email lubricantSDS@shell.com

1.4 Emergency telephone number
: National Poison Information Centre (NVIC): Tel. nr. +31(0)88 755 8000 (24 hrs a day and 7 days a week). Only for the purpose of informing medical personnel in cases of accidental intoxications.
+31 (0)10 4313233

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)
Based on available data this substance / mixture does not meet the classification criteria.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)
Hazard pictograms : No Hazard Symbol required
Signal word : No signal word

Hazard statements : PHYSICAL HAZARDS:
Not classified as a physical hazard according to CLP criteria.
HEALTH HAZARDS:
Not classified as a health hazard under CLP criteria.
ENVIRONMENTAL HAZARDS:
Not classified as environmental hazard according to CLP criteria.

Precautionary statements : **Prevention:**
No precautionary phrases.

Response:
No precautionary phrases.

Storage:
No precautionary phrases.

Disposal:
No precautionary phrases.

Safety data sheet available on request.

Sensitising components : Contains amine phosphate.
May produce an allergic reaction.

2.3 Other hazards

This mixture does not contain any REACH registered substances that are assessed to be a PBT or a vPvB.

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.

Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Used oil may contain harmful impurities.
Not classified as flammable but will burn.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : Highly refined mineral oils and additives.
The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.
Classification based on DMSO extract content < 3% (Regulation (EC) 1272/2008, Annex VI, Part 3, Note L).

Components

SECTION 4: First aid measures

4.1 Description of first aid measures

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	:	No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.
In case of skin contact	:	Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention.
In case of eye contact	:	Flush eye with copious quantities of water. Remove contact lenses, if present and easy to do. Continue rinsing. If persistent irritation occurs, obtain medical attention.
If swallowed	:	In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms	:	Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment	:	Notes to doctor/physician: Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable extinguishing media	:	Do not use water in a jet.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting	:	Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke).

Carbon monoxide may be evolved if incomplete combustion occurs.
Unidentified organic and inorganic compounds.

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 methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	6.1.1 For non emergency personnel: Avoid contact with skin and eyes. 6.1.2 For emergency responders: Avoid contact with skin and eyes.

6.2 Environmental precautions

Environmental precautions	:	Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	:	Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.

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	:	Use local exhaust ventilation if there is risk of inhalation of

vapours, mists or aerosols.
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.

Advice on safe handling : Avoid prolonged or repeated contact with skin.
Avoid inhaling vapour and/or mists.
When handling product in drums, safety footwear should be worn and proper handling equipment should be used.
Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.

Product Transfer : Proper grounding and bonding procedures should be used during all bulk transfer operations to avoid static accumulation.

7.2 Conditions for safe storage, including any incompatibilities

Further information on storage stability : Keep container tightly closed and in a cool, well-ventilated place.
Use properly labeled and closable containers.
Store at ambient temperature.

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 or high density polyethylene.
Unsuitable material: PVC.

Container Advice : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

7.3 Specific end use(s)

Specific use(s) : Not applicable

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Oil mist, mineral	Not Assigned	TLV-8hr (Mist)	5 mg/m3	NL WG
Oil mist, mineral		TWA (inhalable fraction)	5 mg/m3	US. ACGIH Threshold Limit Values
Oil mist, mineral		TWA (Mist)	5 mg/m3	NL WG

Biological occupational exposure limits

8.2 Exposure controls

Engineering measures

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:
Adequate ventilation to control airborne concentrations.

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

General Information:
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.
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.

Personal protective equipment

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 PPE suppliers.

Eye protection : If material is handled such that it could be splashed into eyes, protective eyewear is recommended.
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. PVC, neoprene or nitrile rubber gloves 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.
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.

Skin and body protection : Skin protection is not ordinarily required beyond standard work clothes.
It is good practice to wear chemical resistant gloves.

Respiratory protection : No respiratory protection is ordinarily required under normal conditions of use.
In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material.
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 suitable, select an appropriate combination of mask and filter.
Select a filter suitable for combined particulate/organic gases and vapours [Type A/Type P boiling point > 65°C (149°F)] meeting EN14387 and EN143.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	Liquid at room temperature.
Colour	:	brown
Odour	:	Data not available
Odour Threshold	:	Data not available
pour point	:	-18 °C Method: IP 15
Initial boiling point and boiling range	:	> 280 °Cestimated value(s)
Flammability		
Flammability (solid, gas)	:	Not applicable
Flammability (liquids)	:	Not classified as flammable but will burn.

Lower explosion limit and upper explosion limit / flammability limit

Upper explosion limit / upper flammability limit	:	Typical 10 %(V)
Lower explosion limit / Lower flammability limit	:	Typical 1 %(V)
Flash point	:	199 °C Method: IP 34
Auto-ignition temperature	:	> 320 °C
Decomposition temperature		
Decomposition temperature	:	Data not available
pH	:	Not applicable
Viscosity		
Viscosity, dynamic	:	Data not available
Viscosity, kinematic	:	220 mm2/s (40,0 °C) Method: IP 71 19,4 mm2/s (100 °C) Method: IP 71
Solubility(ies)		
Water solubility	:	negligible
Solubility in other solvents	:	Data not available
Partition coefficient: n-octanol/water	:	log Pow: > 6 (based on information on similar products)
Vapour pressure	:	< 0,5 Pa (20 °C) estimated value(s)
Relative density	:	0,899 (15 °C)
Density	:	899 kg/m3 (15,0 °C) Method: IP 365
Relative vapour density	:	> 5

9.2 Other information

Explosives	:	Classification Code: Not classified
Oxidizing properties	:	Data not available

Flammability (liquids)	:	Not classified as flammable but will burn.
Evaporation rate	:	Data not available
Conductivity	:	This material is not expected to be a static accumulator.

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.

10.2 Chemical stability

Stable.
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	:	Extremes of temperature and direct sunlight.

10.5 Incompatible materials

Materials to avoid	:	Strong oxidising agents.

10.6 Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

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

Information on likely routes of exposure	:	Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (rat): > 5.000 mg/kg Remarks: Low toxicity Based on available data, the classification criteria are not met.
Acute inhalation toxicity	:	Remarks: Based on available data, the classification criteria are not met.
Acute dermal toxicity	:	LD50 (Rabbit): > 5.000 mg/kg

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

Skin corrosion/irritation

Product:

Remarks : Slightly irritating to skin.
Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation

Product:

Remarks : Slightly irritating to the eye.
Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation

Product:

Remarks : For respiratory and skin sensitisation:
Not a sensitiser.
Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Product:

Genotoxicity in vivo : Remarks: Non mutagenic
Based on available data, the classification criteria are not met.

Germ cell mutagenicity- Assessment : 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.

Remarks : Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies.
Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC).

Carcinogenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Material	GHS/CLP Carcinogenicity Classification
Highly refined mineral oil	No carcinogenicity classification.

Reproductive toxicity

Product:

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

Reproductive toxicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

STOT - single exposure

Product:

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

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 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.

Further information

Product:

Remarks : Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal.

ALL used oil should be handled with caution and skin contact avoided as far as possible.

Remarks : Slightly irritating to respiratory system.

Remarks : Classifications by other authorities under varying regulatory frameworks may exist.

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

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish : Remarks: Based on available data, the classification criteria are not met.
Practically non toxic:
LL/EL/IL50 > 100 mg/l

Toxicity to daphnia and other aquatic invertebrates : Remarks: Based on available data, the classification criteria are not met.
Practically non toxic:
LL/EL/IL50 > 100 mg/l

Toxicity to algae/aquatic plants : Remarks: Based on available data, the classification criteria are not met.
Practically non toxic:
LL/EL/IL50 > 100 mg/l

Toxicity to fish (Chronic toxicity) : Remarks: Based on available data, the classification criteria are not met.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Remarks: Based on available data, the classification criteria are not met.

Toxicity to microorganisms :

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

12.2 Persistence and degradability

Product:

Biodegradability : Remarks: Not readily biodegradable.
Major constituents are inherently biodegradable, but contains components that may persist in the environment.
Persistent per IMO criteria.
International Oil Pollution Compensation (IOPC) Fund definition:

"A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340ºC (645ºF) and (b) at least 95% of which, by volume, distils at a temperature of 370ºC (700ºF) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

12.3 Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Contains components with the potential to bioaccumulate.

12.4 Mobility in soil

Product:

Mobility : Remarks: Liquid under most environmental conditions., If it enters soil, it will adsorb to soil particles and will not be mobile.

Remarks: Floats on water.

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This mixture does not contain any REACH registered substances that are assessed to be a PBT or a 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 information : Does not have ozone depletion potential, photochemical ozone creation potential or global warming potential.
Product is a mixture of non-volatile components, which will not be released to air in any significant quantities under normal conditions of use.

Poorly soluble mixture.
Causes physical fouling of aquatic organisms.

Mineral oil does not cause chronic toxicity to aquatic organisms at concentrations less than 1 mg/l.

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 toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment. Do not dispose into the environment, in drains or in water courses. Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination. Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand. 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	:	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.
Local legislation		
Waste catalogue	:	EU Waste Disposal Code (EWC):
Waste Code	:	13 02 05*
Remarks	:	Classification of waste is always the responsibility of the end user. Disposal should be in accordance with applicable regional, national, and local laws and regulations.

SECTION 14: Transport information

14.1 UN number or ID number

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.2 UN proper shipping name

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.3 Transport hazard class(es)

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.4 Packing group

ADN	:	Not regulated as a dangerous good
CDNI Inland Water Waste Agreement	:	NST 3411 Mineral Lubricating Oils
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA	:	Not regulated as a dangerous good

14.5 Environmental hazards

ADN	:	Not regulated as a dangerous good
ADR	:	Not regulated as a dangerous good
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good

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 needs to comply with in connection with transport.

14.7 Maritime transport in bulk according to IMO instruments

MARPOL Annex 1 rules apply for bulk shipments by sea.

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Not applicable
REACH - List of substances subject to authorisation (Annex XIV)	:	Product is not subject to Authorisation under REACH.
Volatile organic compounds	:	Volatile organic compounds (VOC) content: 0 %

Other regulations:

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

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

EINECS	:	All components listed or polymer exempt.
TSCA	:	All components listed.

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

SECTION 16: Other information

Full text of other abbreviations

NL WG	:	Netherlands. Law on Labour conditions - Occupational Exposure Limits
NL WG / TWA	:	Time weighted average
NL WG / TLV-8hr	:	Time Weighted Average

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 - Emergen-

cy 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 - 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 operators.
Other information	:	No Exposure Scenario annex is attached to this safety data sheet. It is a non-classified mixture containing hazardous substances as detailed in Section 3; relevant information from Exposure Scenarios for the hazardous substances contained have been integrated into the core sections 1-16 of this SDS. 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).

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.

NL / EN

Oxygen, compressed

Safety Data Sheet P-4638

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Issue date: 01/01/1979 Revision date: 02/03/2022 Supersedes: 01/27/2021 Version: 2.2

SECTION: 1. Product and company identification

1.1. Product identifier

Product form	:	Substance
Trade name	:	Oxygen, MediPure Oxygen
CAS-No.	:	7782-44-7
Formula	:	O2
Other means of identification	:	Oxygen, Compressed; MediPure Oxygen; Aviator's Breathing Oxygen; USP Oxygen; Oxygen - Diving Grade

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

Use of the substance/mixture	:	Medical applications. Industrial use Diving Gas (Underwater Breathing)

1.3. Details of the supplier of the safety data sheet

Linde Inc.
10 Riverview Drive
Danbury, CT 06810-6268, USA
www.lindeus.com

Linde Inc. 1-844-44LINDE (1-844-445-4633)

1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS US classification

Ox. Gas 1 H270
Press. Gas (Comp.) H280

2.2. Label elements

GHS US labeling

Hazard pictograms (GHS US) :

GHS03 GHS04

Signal word (GHS US) : Danger

Hazard statements (GHS US) : H270 - MAY CAUSE OR INTENSIFY FIRE; OXIDIZER
H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED

Precautionary statements (GHS US) : P202 - Do not handle until all safety precautions have been read and understood.
P220 - Keep/Store away from combustible materials, clothing
P244 - Keep reduction valves/valves and fittings free from oil and grease.
P271+P403 - Use and store only outdoors or in a well-ventilated place.
P370+P376 - IN CASE OF FIRE: Stop leak if safe to do so
CGA-PG05 - Use a back flow preventive device in the piping.
CGA-PG20+CGA-PG10 - Use only with equipment of compatible materials of construction and rated for cylinder pressure.
CGA-PG22 - Use only with equipment cleaned for oxygen service.

CGA-PG12 - Do not open valve until connected to equipment prepared for use.
CGA-PG21 - Open valve slowly.
CGA-PG06 - Close valve after each use and when empty.
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F).

2.3. Other hazards

Other hazards which do not result in classification : Breathing 80 percent or more oxygen at atmospheric pressure for more than a few hours may cause nasal stuffiness, cough, sore throat, chest pain, and breathing difficulty. Breathing oxygen at higher pressure increases the likelihood of adverse effects within a shorter time period. Breathing pure oxygen under pressure may cause lung damage and central nervous system (CNS) effects, resulting in dizziness, poor coordination, tingling sensation, visual and hearing disturbances, muscular twitching, unconsciousness, and convulsions. Breathing oxygen under pressure may cause prolongation of adaptation to darkness and reduced peripheral vision.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name : Oxygen, compressed

CAS-No. : 7782-44-7

Name	Product identifier	%
Oxygen	(CAS-No.) 7782-44-7	99.5 – 100

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Move to fresh air. Get medical advice/attention.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Adverse effects not expected from this product. In case of eye irritation: Rinse immediately with plenty of water. Consult an ophthalmologist if irritation persists.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Vigorously accelerates combustion. Use media appropriate for surrounding fire. Water (e.g, safety shower) is the preferred extinguishing media for clothing fires.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Oxidizing agent; vigorously accelerates combustion. Contact with flammable materials may cause fire or explosion.

5.3. Advice for firefighters

Firefighting instructions : High-pressure, oxidizing gas.

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Special protective equipment for fire fighters	:	Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	:	Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. Stop flow of product if safe to do so. Use water spray or fog to knock down fire fumes if possible.
Other information	:	Heat of fire can build pressure in container and cause it to rupture. Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.) No part of the container should be subjected to a temperature higher than 125°F (52°C). Smoking, flames, and electric sparks in the presence of enriched oxygen atmospheres are potential explosion hazards.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Ensure adequate air ventilation. Eliminate ignition sources. Evacuate area. Try to stop release. Monitor concentration of released product. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Stop leak if safe to do so.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	:	Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.
Safe use of the product	:	**The suitability of this product as a component in underwater breathing gas mixtures** is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the physiological effects, methods employed, frequency and duration of use, hazards, side effects, and precautions to be taken.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post “No Smoking/No Open Flames” signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g, NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Oxygen, compressed (7782-44-7)	
ACGIH	Not established
USA OSHA	Not established

Oxygen (7782-44-7)	
ACGIH	Not established
USA OSHA	Not established

8.2. Exposure controls

Appropriate engineering controls : Avoid oxygen rich (>23.5%) atmospheres. Use a local exhaust system with sufficient flow velocity to maintain an adequate supply of air in the worker's breathing zone. Mechanical (general): General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

Eye protection : Wear safety glasses with side shields.

Skin and body protection : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138. As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder’s gloves and protective goggles, and may include arm protectors, aprons, hats, and shoulder protection as well as substantial clothing.

Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Colorless gas.

Molecular mass : 32 g/mol

Color : Colorless.

Odor	:	No odor warning properties.
Odor threshold	:	No data available
pH	:	Not applicable.
Relative evaporation rate (butyl acetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	-219 °C (-362°F)
Freezing point	:	No data available
Boiling point	:	-183 °C (-297°F)
Flash point	:	Not applicable.
Critical temperature	:	-118.6 °C (-181.48°F)
Auto-ignition temperature	:	Not applicable.
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapor pressure	:	Not applicable.
Critical pressure	:	50.4 bar (731.4 psia)
Relative vapor density at 20 °C	:	0.0827 lb/ft3 (1.325 kg/m3) absolute vapor density at 70°F/21.1°C, 1 atm
Relative density	:	1.1
Density	:	1.4289 kg/m³ (at 21.1 °C)
Relative gas density	:	1.1
Solubility	:	Water: 39 mg/l
Partition coefficient n-octanol/water (Log Pow)	:	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	Oxidizer.
Explosion limits	:	No data available

9.2. Other information

Gas group	:	Compressed gas
Additional information	:	Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Violently oxidizes organic material.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

Keep equipment free from oil and grease. Consider the potential toxicity hazard due to the presence of chlorinated or fluorinated polymers in high pressure (> 30 bar) oxygen lines in case of combustion. May react violently with combustible materials. May react violently with reducing agents.

10.6. Hazardous decomposition products

None.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Skin corrosion/irritation : Not classified

pH: Not applicable.

Serious eye damage/irritation : Not classified

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

STOT-single exposure : Not classified

STOT-repeated exposure : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

12.2. Persistence and degradability

Oxygen, compressed (7782-44-7)	
Persistence and degradability	No ecological damage caused by this product.

Oxygen (7782-44-7)	
Persistence and degradability	No ecological damage caused by this product.

12.3. Bioaccumulative potential

Oxygen, compressed (7782-44-7)	
Partition coefficient n-octanol/water (Log Pow)	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

Oxygen (7782-44-7)	
Partition coefficient n-octanol/water (Log Pow)	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

Oxygen, compressed (7782-44-7)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

Oxygen (7782-44-7)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects

Effect on ozone layer : None.

Effect on the global warming : No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

SECTION 14: Transport information

In accordance with DOT

Transport document description (DOT) : UN1072 Oxygen, compressed, 2.2

UN-No.(DOT) : UN1072

Proper Shipping Name (DOT) : Oxygen, compressed

Class (DOT) : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115

Hazard labels (DOT) : 2.2 - Non-flammable gas
5.1 - Oxidizer

DOT Special Provisions (49 CFR 172.102) : 110 - Fire extinguishers transported under UN1044 may include installed actuating cartridges (cartridges, power device of Division 1.4C or 1.4S), without changing the classification of Division 2.2, provided the aggregate quantity of deflagrating (propellant) explosives does not exceed 3.2 grams per extinguishing unit.
A14 - This material is not authorized to be transported as a limited quantity or consumer commodity in accordance with 173.306 of this subchapter when transported aboard an aircraft.

Additional information

Emergency Response Guide (ERG) Number : 122 (UN1072)

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG) : 1072

Proper Shipping Name (IMDG) : OXYGEN, COMPRESSED

Class (IMDG) : 2 - Gases

Division (IMDG) : 2.2 - Non-flammable, non-toxic gases

MFAG-No : 122

Air transport

UN-No. (IATA) : 1072

Proper Shipping Name (IATA) : Oxygen, compressed

Class (IATA) : 2 - Gases

Civil Aeronautics Law : Gases under pressure/Gases nonflammable nontoxic under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

Oxygen, compressed (7782-44-7)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

15.2. International regulations

CANADA

Oxygen, compressed (7782-44-7)
Listed on the Canadian DSL (Domestic Substances List)

Oxygen (7782-44-7)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Oxygen, compressed (7782-44-7)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Oxygen, compressed (7782-44-7)
Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on KECL/KECI (Korean Existing Chemicals Inventory) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on the TCSI (Taiwan Chemical Substance Inventory)

15.3. US State regulations

Oxygen, compressed(7782-44-7)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

Oxygen (7782-44-7)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significant risk level (NSRL)
No	No	No	No	

Oxygen (7782-44-7)
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Other information : When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Linde asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Linde Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Linde Inc, it is the user's obligation to determine the conditions of safe use of the product.

Linde SDSs are furnished on sale or delivery by Linde or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your sales representative, local distributor, or supplier, or download from www.lindeus.com. If you have questions regarding Linde SDSs, would like the document number and date of the latest SDS, or would like the names of the Linde suppliers in your area, phone or write the Linde Call Center (Phone: 1-844-44-Linde (1-844-445-4633); Address: Linde Call Center, Linde Inc, P.O. Box 44, Tonawanda, NY 14151-0044).

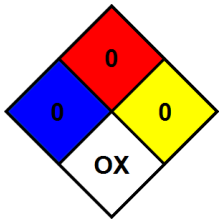
Revision date : 02/03/2022

NFPA health hazard : 0 - Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA instability : 0 - Material that in themselves are normally stable, even under fire conditions.

NFPA specific hazard : OX - Materials that posses oxidizing properties.



SDS US (GHS HazCom 2012) - Linde 2022

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

A Member of The Linde Group

SAFETY DATA SHEET
Carbon dioxide

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

1.1 Product identifier

Product name: Carbon dioxide

Trade name: Carbon Dioxide Food Grade, R744, Laserpure, CP Grade

Other Name: Carbon Dioxide (Special Gases)

Additional identification

Chemical name:	Carbon dioxide
Chemical formula:	CO2
INDEX No.	-
CAS-No.	124-38-9
EC No.	204-696-9
REACH Registration No.	Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.

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

Identified uses: Industrial and professional. Perform risk assessment prior to use. Aerosol propellant. Balance gas for mixtures. Beverage applications. Biocidal uses. Blanketing gas. Blast cleaning. Calibration gas. Carrier gas. Chemical synthesis. Combustion, melting and cutting processes. Cooling applications. Fire suppressant gas. Food freezing. Food packaging gas. Freezing, Cooling and heat transfer. Inerting gas. Inflation systems. Laboratory use. Laser gas. Plant growth promoter. Pressure head gas, operational assist gas in pressure systems. Process gas. Purge gas. Refrigerant. Solvent for extraction. Special effects (entertainment). Test gas.
Consumer use. Propellant gas. Shielding gas in gas welding.
It is the responsibility of the end user to ensure that the product as supplied is suitable for its intended use.

Uses advised against Industrial or technical grade is unsuitable for medical and/or food applications or inhalation.

1.3 Details of the supplier of the safety data sheet

Supplier

BOC
Priestley Road, Worsley
M28 2UT Manchester

Telephone: 0800 111 333

E-mail: ReachSDS@boc.com

1.4 Emergency telephone number: 0800 111 333

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 as amended.

Physical Hazards

Gases under pressure	Liquefied gas	H280: Contains gas under pressure; may explode if heated.

2.2 Label Elements

Signal Word: Warning

Hazard Statement(s): H280: Contains gas under pressure; may explode if heated.

Precautionary Statements

General None.

Prevention: None.

Response: None.

Storage: P403: Store in a well-ventilated place.

Disposal None.

Supplemental information

EIGA-As: Asphyxiant in high concentrations.

2.3 Other hazards

Contact with evaporating liquid may cause frostbite or freezing of skin.

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name Carbon dioxide
INDEX No.: -
CAS-No.: 124-38-9
EC No.: 204-696-9
REACH Registration No.: Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.
Purity: 100%
The purity of the substance in this section is used for classification only, and does not represent the actual purity of the substance as supplied, for which other documentation should be consulted.
Trade name: Carbon Dioxide Food Grade, R744, Laserpure, CP Grade

Chemical name	Chemical formula	Concentration	CAS-No.	REACH Registration No.	M-Factor:	Notes
Carbon dioxide	CO2	100%	124-38-9	Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.	-	#

The concentrations of the components in the SDS header, product name on page one and in section 3.2 are in mol due to regulatory requirements. All concentrations are nominal.
This substance has workplace exposure limit(s).
PBT: persistent, bioaccumulative and toxic substance.
vPvB: very persistent and very bioaccumulative substance.

SECTION 4: First Aid Measures

General: In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

4.1 Description of first aid measures

Inhalation: In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped. Low concentrations of CO2 cause increased respiration and headache.

Eye contact: Rinse the eye with water immediately. Remove contact lenses, if present and easy to do. Continue rinsing. Flush thoroughly with water for at least 15 minutes. Get immediate medical assistance. If medical assistance is not immediately available, flush an additional 15 minutes.

Skin Contact: Contact with evaporating liquid may cause frostbite or freezing of skin.

Ingestion: Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects, both acute and delayed: Respiratory arrest. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.

4.3 Indication of any immediate medical attention and special treatment needed

Hazards: Respiratory arrest. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.

Treatment: Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

SECTION 5: Firefighting Measures

General Fire Hazards: Heat may cause the containers to explode.

5.1 Extinguishing media

Suitable extinguishing media: Material will not burn. In case of fire in the surroundings: use appropriate extinguishing agent.

Unsuitable extinguishing media: None.

5.2 Special hazards arising from the substance or mixture: None.

Hazardous Combustion Products: None.

5.3 Advice for firefighters

Special fire fighting procedures: In case of fire: Stop leak if safe to do so. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate the source of the fire or let it burn out.

Special protective equipment for firefighters: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Guideline: EN 469 Protective clothing for firefighters. Performance requirements for protective clothing for firefighting. EN 15090 Footwear for firefighters. EN 659 Protective gloves for firefighters. EN 443 Helmets for fire fighting in buildings and other structures. EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures: Evacuate area. Provide adequate ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

6.2 Environmental Precautions: Prevent further leakage or spillage if safe to do so.

6.3 Methods and material for containment and cleaning up: Provide adequate ventilation.

6.4 Reference to other sections: Refer to sections 8 and 13.

SECTION 7: Handling and Storage:

7.1 Precautions for safe handling: Only experienced and properly instructed persons should handle gases under pressure. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Secure cylinders in an upright position at all times, close all valves when not in use. Provide adequate ventilation. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Avoid suckback of water, acid and alkalis. Keep container below 50°C in a well ventilated place. Observe all regulations and local requirements regarding storage of containers. When using do not eat, drink or smoke. Store in accordance with local/regional/national/international regulations. Never use direct flame or electrical heating devices to raise the pressure of a container. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Damaged valves should be reported immediately to the supplier Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Keep container valve outlets clean and free from contaminates particularly oil and water. If user experiences any difficulty operating container valve discontinue use and contact supplier. Never attempt to transfer gases from one container to another. Container valve guards or caps should be in place. Depressurisation of liquid CO2 below approximately 5 bar can create solid CO2 which may block protective devices, pipework and create dry-ice within containers. Containers, which contain or have contained flammable or explosive substances, must not be inerted with liquid carbon dioxide.

7.2 Conditions for safe storage, including any incompatibilities: Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible material.

7.3 Specific end use(s): None.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control Parameters

Occupational Exposure Limits

Chemical name	Type	Exposure Limit Values	Source
Carbon dioxide	TWA	5,000 ppm 9,150 mg/m3	UK. EH40 Workplace Exposure Limits (WELs) (12 2011)
	STEL	15,000 ppm 27,400 mg/m3	UK. EH40 Workplace Exposure Limits (WELs) (12 2011)
	TWA	5,000 ppm 9,000 mg/m3	EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU (12 2009)

8.2 Exposure controls

Appropriate engineering controls: Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Oxygen detectors should be used when asphyxiating gases may be released. Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Systems under pressure should be regularly checked for leakages. Preferably use permanent leak tight connections (eg. welded pipes). Do not eat, drink or smoke when using the product. CO2 detectors should be used when CO2 may be released.

Individual protection measures, such as personal protective equipment

General information: A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Keep self contained breathing apparatus readily available for emergency use. Personal protective equipment for the body should be selected based on the task being performed and the risks involved.

Eye/face protection: Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases. Guideline: EN 166 Personal Eye Protection.

Skin protection
Hand Protection: Guideline: EN 388 Protective gloves against mechanical risks.
Additional Information: Wear working gloves while handling containers

Body protection:	No special precautions.
Other:	Wear safety shoes while handling containers Guideline: ISO 20345 Personal protective equipment - Safety footwear.
Respiratory Protection:	When allowed by a risk assessment Respiratory Protective Equipment (RPE) may be used The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD. Self-contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres. Guideline: EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.
Thermal hazards:	No precautionary measures are necessary.
Hygiene measures:	Specific risk management measures are not required beyond good industrial hygiene and safety procedures. Do not eat, drink or smoke when using the product.
Environmental exposure controls:	For waste disposal, see section 13.

SECTION 9: Physical And Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance	
Physical state:	Gas
Form:	Liquefied gas
Colour:	Colourless
Odour:	Odourless
Odour Threshold:	Odour threshold is subjective and is inadequate to warn of over exposure.
pH:	3.2 - 3.7 The pH of saturated CO2 solutions varies from 3.7 at 101 kPa (1 atm) to 3.2 at 2370 kPa (23.4 atm)
Melting Point:	-56.6 °C
Boiling Point:	-78.5 °C
Sublimation Point:	-78.5 °C
Critical Temp. (°C):	31.0 °C
Flash Point:	Not applicable to gases and gas mixtures.
Evaporation Rate:	Not applicable to gases and gas mixtures.
Flammability (solid, gas):	This product is not flammable.
Flammability limit - upper (%):	Not applicable.
Flammability limit - lower(%):	Not applicable.
Vapour pressure:	45.1 bar (10 °C)
Vapour density (air=1):	1.522 (21 °C)

Relative density:	1.512 (-56.6 °C)
Solubility(ies)	
Solubility in Water:	2.900 mg/l (25 °C)
Partition coefficient (n-octanol/water):	0.83
Autoignition Temperature:	Not applicable.
Decomposition Temperature:	Not known.
Viscosity	
Kinematic viscosity:	No data available.
Dynamic viscosity:	0.07 mPa.s (20 °C)
Explosive properties:	Not applicable.
Oxidising Properties:	Not applicable.

9.2 Other information: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

Molecular weight: 44.01 g/mol (CO_2)

SECTION 10: Stability and Reactivity

10.1 Reactivity: No reactivity hazard other than the effects described in sub-section below.

10.2 Chemical Stability: Stable under normal conditions.

10.3 Possibility of Hazardous Reactions: None.

10.4 Conditions to Avoid: None.

10.5 Incompatible Materials: No reaction with any common materials in dry or wet conditions.

10.6 Hazardous Decomposition Products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological Information

General information: In high concentrations may cause rapid circulatory deterioration even at normal levels of oxygen concentration. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness and even death.

11.1 Information on toxicological effects

Acute toxicity - Oral
Product: Based on available data, the classification criteria are not met.

Acute toxicity - Dermal
Product Based on available data, the classification criteria are not met.

Acute toxicity - Inhalation
Product Based on available data, the classification criteria are not met.

Skin Corrosion/Irritation
Product Based on available data, the classification criteria are not met.

Serious Eye Damage/Eye Irritation
Product Based on available data, the classification criteria are not met.

Respiratory or Skin Sensitisation
Product Based on available data, the classification criteria are not met.

Germ Cell Mutagenicity
Product Based on available data, the classification criteria are not met.

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

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

Specific Target Organ Toxicity - Single Exposure
Product Based on available data, the classification criteria are not met.

Specific Target Organ Toxicity - Repeated Exposure
Product Based on available data, the classification criteria are not met.

Aspiration Hazard
Product Not applicable to gases and gas mixtures..

SECTION 12: Ecological Information

12.1 Toxicity

Acute toxicity
Product No ecological damage caused by this product.

12.2 Persistence and Degradability
Product Not applicable to gases and gas mixtures..

12.3 Bioaccumulative Potential
Product The subject product is expected to biodegrade and is not expected to persist for long periods in an aquatic environment.

12.4 Mobility in Soil

Product: Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5 Results of PBT and vPvB assessment

Product: Not classified as PBT or vPvB.

12.6 Other Adverse Effects: No ecological damage caused by this product.

SECTION 13: Disposal Considerations

13.1 Waste treatment methods

General information: Do not discharge into any place where its accumulation could be dangerous. Vent to atmosphere in a well ventilated place.

Disposal methods: Refer to the EIGA code of practice (Doc.30 "Disposal of Gases", downloadable at http://www.eiga.org) for more guidance on suitable disposal methods. Dispose of container via supplier only. Discharge, treatment, or disposal may be subject to national, state, or local laws.

European Waste Codes

Container: 16 05 05: Gases in pressure containers other than those mentioned in 16 05 04.

SECTION 14: Transport Information

ADR

14.1 UN Number:	UN 1013
14.2 UN Proper Shipping Name:	CARBON DIOXIDE
14.3 Transport Hazard Class(es)	
Class:	2
Label(s):	2.2
Hazard No. (ADR):	20
Tunnel restriction code:	(C/E)
Emergency Action Code:	2T
14.4 Packing Group:	–
14.5 Environmental hazards:	Not applicable
14.6 Special precautions for user:	–

RID

14.1 UN Number:	UN 1013
14.2 UN Proper Shipping Name	CARBON DIOXIDE
14.3 Transport Hazard Class(es)	
Class:	2
Label(s):	2.2
14.4 Packing Group:	–
14.5 Environmental hazards:	Not applicable
14.6 Special precautions for user:	–

IMDG

14.1 UN Number:	UN 1013
14.2 UN Proper Shipping Name:	CARBON DIOXIDE
14.3 Transport Hazard Class(es)	
Class:	2.2
Label(s):	2.2
EmS No.:	F-C, S-V
14.4 Packing Group:	–
14.5 Environmental hazards:	Not applicable
14.6 Special precautions for user:	–

IATA

14.1 UN Number:	UN 1013
14.2 Proper Shipping Name:	Carbon dioxide
14.3 Transport Hazard Class(es):	
Class:	2.2
Label(s):	2.2
14.4 Packing Group:	–
14.5 Environmental hazards:	Not applicable
14.6 Special precautions for user:	–
Other information	
Passenger and cargo aircraft:	Allowed.
Cargo aircraft only:	Allowed.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code: Not applicable

Additional identification: Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured. Ensure that the container valve is closed and not leaking. Container valve guards or caps should be in place. Ensure adequate air ventilation.

SECTION 15: Regulatory information

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

EU Regulations

EU. Directive 2012/18/EU (SEVESO III) on major accident hazards involving dangerous substances, as amended.:
Not applicable

National Regulations

Management of Health and Safety at Work Regulations (1999 No. 3242). The Regulatory Reform (Fire Safety) Order 2005 (2005 No. 1541). Control of Substances Hazardous to Health Regulations (COSHH, 2002 No. 2677). Provision and Use of Work Equipment Regulations (PUWER, 1998 No. 2306). Personal Protective Equipment Regulations (1992 No. 2966). Control of Major Accident Hazards Regulations (COMAH, 2015 No. 483). Pressure Systems Safety Regulations (PSSR, 2000 No. 128). Only products that comply with the food regulations (EC) No. 1333/2008 and (EU) No. 231/2012 and are labelled as such may be used as food additives.
This Safety Data Sheet has been produced to comply with Regulation (EU) 2015/830.

15.2 Chemical safety assessment: Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration. A CSA does not need to be carried out for this product.

SECTION 16: Other Information

Revision Information: Not relevant.

Key literature references and sources for data:

Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to:
Agency for Toxic Substances and Diseases Registry (ATSDR) (http://www.atsdr.cdc.gov/).
European Chemical Agency: Guidance on the Compilation of Safety Data Sheets.
European Chemical Agency: Information on Registered Substances http://apps.echa.europa.eu/registered/registered-sub.aspx#search
European Industrial Gases Association (EIGA) Doc. 169 "Classification and Labelling guide", as amended.
International Programme on Chemical Safety (http://www.inchem.org/)
ISO 10156:2010 Gases and gas mixtures - Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets.
Matheson Gas Data Book, 7th Edition.
National Institute for Standards and Technology (NIST) Standard Reference Database Number 69.
The ESIS (European chemical Substances 5 Information System) platform of the former European Chemicals Bureau (ECB) ESIS (http://ecb.jrc.ec.europa.eu/esis/).
The European Chemical Industry Council (CEFIC) ERICards.
United States of America's National Library of Medicine's toxicology data network TOXNET (http://toxnet.nlm.nih.gov/index.html)
Threshold Limit Values (TLV) from the American Conference of Governmental Industrial Hygienists (ACGIH).
Substance specific information from suppliers.
Details given in this document are believed to be correct at the time of publication.
EH40 (as amended) Workplace exposure limits.

Wording of the H-statements in sections 2 and 3

H280	Contains gas under pressure; may explode if heated.

Training information:

Users of breathing apparatus must be trained. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Ensure operators understand the hazards.

Classification according to Regulation (EC) No 1272/2008 as amended.

Press. Gas Liq. Gas, H280

Other information:

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Ensure adequate air ventilation. Ensure all national/local regulations are observed. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Note: When the Product Name appears in the SDS header the decimal sign and its position comply with rules for the structure and drafting of international standards, and is a comma on the line. As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).

Last revised date: 28.04.2021

Disclaimer: This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.

Nitrogen, compressed

Safety Data Sheet P-4631

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Issue date: 01/01/1980 Revision date: 11/10/2022 Supersedes: 02/03/2022 Version: 2.3

SECTION: 1. Product and company identification

1.1. Product identifier

Product form	:	Substance
Trade name	:	Nitrogen, Medipure Nitrogen, Extendapak Nitrogen
Chemical name	:	Nitrogen
CAS-No.	:	7727-37-9
Formula	:	N2
Other means of identification	:	Dinitrogen, Refrigerant R728, Nitrogen, Medipure Nitrogen, Extendapak Nitrogen, Nitrogen - Diving Grade

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

Use of the substance/mixture	:	Industrial use Medical applications. Food applications. Diving Gas (Underwater Breathing)

1.3. Details of the supplier of the safety data sheet

Linde Inc.
10 Riverview Drive
Danbury, CT 06810-6268, USA
www.lindeus.com

Linde Inc. 1-844-44LINDE (1-844-445-4633)

1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24 hr/day 7 days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-US classification

Simple asphyxiant SIAS
Press. Gas (Comp.) H280

2.2. Label elements

GHS US labelling

Hazard pictograms (GHS US) :

GHS04

Signal word (GHS US) : Warning

Hazard statements (GHS US) : H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION

Precautionary statements (GHS US) : P202 - Do not handle until all safety precautions have been read and understood.
P271+P403 - Use and store only outdoors or in a well-ventilated place.
CGA-PG05 - Use a back flow preventive device in the piping.
CGA-PG10 - Use only with equipment rated for cylinder pressure.
CGA-PG12 - Do not open valve until connected to equipment prepared for use.
CGA-PG06 - Close valve after each use and when empty.
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F).

P304, P340, P313 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention.

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substances

Name : Nitrogen, compressed

CAS-No. : 7727-37-9

Name	Product identifier	%
Nitrogen	(CAS-No.) 7727-37-9	99.5 – 100

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Adverse effects not expected from this product. In case of eye irritation: Rinse immediately with plenty of water. Consult an ophthalmologist if irritation persists.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

5.2. Special hazards arising from the substance or mixture

Reactivity : Under certain conditions, nitrogen can react violently with lithium, neodymium, titanium (above 1472°F/800°C), or magnesium to form nitrides. At high temperature, it can also combine with oxygen and hydrogen.

5.3. Advice for firefighters

Firefighting instructions : Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Protection during firefighting : Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.

Stop flow of product if safe to do so.

Use water spray or fog to knock down fire fumes if possible.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Evacuate area. Ensure adequate air ventilation. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Stop leak if safe to do so.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

No additional information available

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wear leather safety gloves and safety shoes when handling cylinders. Protect containers from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

Safe use of the product : **The suitability of this product as a component in underwater breathing gas mixtures** is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the physiological effects, methods employed, frequency and duration of use, hazards, side effects, and precautions to be taken.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Nitrogen, compressed (7727-37-9)	
ACGIH	Not established
USA OSHA	Not established

Nitrogen (7727-37-9)	
ACGIH	Not established
USA OSHA	Not established

8.2. Exposure controls

Appropriate engineering controls : Use a local exhaust system with sufficient flow velocity to maintain an adequate supply of air in the worker's breathing zone. Mechanical (general): General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

Eye protection : Wear safety glasses with side shields.

Skin and body protection : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible.

Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets or exceeds the requirements of the appropriate Health and Safety Regulations. Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Colourless gas.

Molecular mass : 28 g/mol

Colour : Colourless.

Odour : No odour warning properties.

Odour threshold : No data available

pH : Not applicable.

Relative evaporation rate (butylacetate=1) : No data available

Relative evaporation rate (ether=1) : Not applicable.

Melting point : -210 °C

Freezing point : No data available

Boiling point : -195.8 °C

Flash point : No data available

Critical temperature : -149.9 °C

Auto-ignition temperature : Not applicable.

Decomposition temperature : No data available

Flammability (solid, gas) : No data available

Vapour pressure : Not applicable.

Critical pressure : 3390 kPa

Relative vapour density at 20 °C : No data available

Relative density : No data available

Density : 1.16 kg/m³

Relative gas density	:	0.97
Solubility	:	Water: 20 mg/l
Partition coefficient n-octanol/water (Log Pow)	:	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Explosive limits	:	No data available

9.2. Other information

Gas group	:	Compressed gas
Additional information	:	None.

SECTION 10: Stability and reactivity

10.1. Reactivity

Under certain conditions, nitrogen can react violently with lithium, neodymium, titanium (above 1472°F/800°C), or magnesium to form nitrides. At high temperature, it can also combine with oxygen and hydrogen.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

May occur.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

None.

10.6. Hazardous decomposition products

None.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Not classified
Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Not classified

Skin corrosion/irritation	:	Not classified pH: Not applicable.
Serious eye damage/irritation	:	Not classified pH: Not applicable.
Respiratory or skin sensitisation	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
STOT-single exposure	:	Not classified

STOT-repeated exposure : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

12.2. Persistence and degradability

Nitrogen, compressed (7727-37-9)	
Persistence and degradability	No ecological damage caused by this product.

Nitrogen (7727-37-9)	
Persistence and degradability	No ecological damage caused by this product.

12.3. Bioaccumulative potential

Nitrogen, compressed (7727-37-9)	
Partition coefficient n-octanol/water (Log Pow)	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

Nitrogen (7727-37-9)	
Partition coefficient n-octanol/water (Log Pow)	Not applicable for inorganic products.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

Nitrogen, compressed (7727-37-9)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

Nitrogen (7727-37-9)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects

Effect on the ozone layer : None.

Effect on global warming : None.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

SECTION 14: Transport information

In accordance with DOT

Transport document description (DOT) : UN1066 Nitrogen, compressed, 2.2

UN-No.(DOT) : UN1066

Proper Shipping Name (DOT) : Nitrogen, compressed

Class (DOT) : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115

Hazard labels (DOT) : 2.2 - Non-flammable gas

Additional information

Emergency Response Guide (ERG) Number : 121

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG) : 1066

Proper Shipping Name (IMDG) : NITROGEN, COMPRESSED

Class (IMDG) : 2 - Gases

Division (IMDG) : 2.2 - Non-flammable, non-toxic gases

MFAG-No : 121

Air transport

UN-No. (IATA) : 1066

Proper Shipping Name (IATA) : Nitrogen, compressed

Class (IATA) : 2.2 - Gases : Non-flammable, non-toxic

Civil Aeronautics Law : Gases under pressure/Gases nonflammable nontoxic under pressure(Hazardous materials notice Appended Table 1 Article 194 of the Enforcement Regulations)

SECTION 15: Regulatory information

15.1. US Federal regulations

Nitrogen, compressed (7727-37-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory.

15.2. International regulations

CANADA

Nitrogen, compressed (7727-37-9)
Listed on the Canadian DSL (Domestic Substances List)

Nitrogen (7727-37-9)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Nitrogen, compressed (7727-37-9)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Nitrogen, compressed (7727-37-9)
Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

15.3. US State regulations

Nitrogen, compressed(7727-37-9)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

Nitrogen (7727-37-9)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significant risk level (NSRL)
No	No	No	No	

Nitrogen (7727-37-9)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Other information : When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Linde asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Linde Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Linde Inc, it is the user's obligation to determine the conditions of safe use of the product.

Linde SDSs are furnished on sale or delivery by Linde or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your sales representative, local distributor, or supplier, or download from www.lindeus.com. If you have questions regarding Linde SDSs, would like the document number and date of the latest SDS, or would like the names of the Linde suppliers in your area, phone or write the Linde Call Center (Phone: 1-844-44-Linde (1-844-445-4633); Address: Linde Call Center, Linde Inc, P.O. Box 44, Tonawanda, NY 14151-0044).

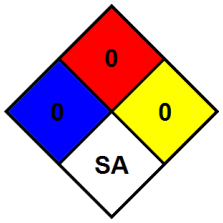
Revision date : 11/10/2022

NFPA health hazard : 0 - Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA instability : 0 - Material that in themselves are normally stable, even under fire conditions.

NFPA specific hazard : SA - Materials that are simple asphyxiants.



SDS US (GHS HazCom 2012) - Linde 2022

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Argon, refrigerated liquid

Safety Data Sheet P-4564

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Issue date: 01/01/1979 Revision date: 01/24/2022 Supersedes: 01/28/2021 Version: 2.1

SECTION: 1. Product and company identification

1.1. Product identifier

Product form : Substance

Trade name : Liquid Argon

CAS-No. : 7440-37-1

Formula : Ar

Other means of identification : Argon, refrigerated liquid

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

Use of the substance/mixture : Industrial use; Use as directed.

1.3. Details of the supplier of the safety data sheet

Linde Inc.
10 Riverview Drive
Danbury, CT 06810-6268, USA
www.lindeus.com

Linde Inc. 1-844-44LINDE (1-844-445-4633)

1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS US classification

Simple asphyxiant SIAS
Press. Gas (Ref. Liq.) H281

2.2. Label elements

GHS US labeling

Hazard pictograms (GHS US) :

GHS04

Signal word (GHS US) : Warning

Hazard statements (GHS US) : H281 - CONTAINS REFRIGERATED GAS; MAY CAUSE CRYOGENIC BURNS OR INJURY
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.

Precautionary statements (GHS US) : P202 - Do not handle until all safety precautions have been read and understood.
P271+P403 - Use and store only outdoors or in a well-ventilated place.
P282 - Wear cold insulating gloves/face shield/eye protection. cold insulating gloves, face shield, eye protection
P304, P340, P313 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention.
P302, P336, P315 - IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area.. Get immediate medical advice/attention.
CGA-PG05 - Use a back flow preventive device in the piping.
CGA-PG20+CGA-PG10 - Use only with equipment of compatible materials of construction and rated for cylinder pressure.
CGA-PG24 - DO NOT change or force fit connections.

CGA-PG12 - Do not open valve until connected to equipment prepared for use.
CGA-PG06 - Close valve after each use and when empty.
CGA-PG23 - Always keep container in upright position.

2.3. Other hazards

Other hazards which do not result in classification : Asphyxiant in high concentrations.

Contact with liquid may cause cold burns/frostbite.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name	Product identifier	%
Argon, refrigerated liquid (Main constituent)	(CAS-No.) 7440-37-1	100

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First-aid measures after skin contact : The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately. Get immediate medical attention.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

5.2. Special hazards arising from the substance or mixture

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

5.3. Advice for firefighters

Firefighting instructions : DANGER! Extremely cold liquid and gas under pressure. Take care not to direct spray onto vents on top of container. Do not discharge sprays directly into liquid; cryogenic liquid can freeze water rapidly.

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Protection during firefighting : Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.

Special protective equipment for fire fighters	:	Use self-contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	:	Stop flow of product if safe to do so. Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. Use water spray or fog to knock down fire fumes if possible. If leaking do not spray water onto container. Water surrounding area (from protected position) to contain fire. Exposure to fire may cause containers to rupture/explode.
Other information	:	Cryogenic liquid causes severe frostbite, a burn-like injury. Heat of fire can build pressure in a closed container and cause it to rupture. Venting vapors may obscure visibility. Air will condense on surfaces such as vaporizers or piping exposed to liquid or cold gas. Nitrogen, which has a lower boiling point than oxygen, evaporates first, leaving an oxygen-enriched condensate.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Evacuate area. Ensure adequate air ventilation. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Stop leak if safe to do so.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Argon, refrigerated liquid (7440-37-1)	
ACGIH	Not established
USA OSHA	Not established

8.2. Exposure controls

Appropriate engineering controls : Oxygen detectors should be used when asphyxiating gases may be released. Systems under pressure should be regularly checked for leakages. Provide adequate general and local exhaust ventilation. Consider work permit system e.g. for maintenance activities.

Hand protection : Wear working gloves when handling gas containers.

Eye protection : Wear safety glasses with side shields. Wear goggles and a face shield when transfilling or breaking transfer connections.

Respiratory protection : Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres.

Thermal hazard protection : Wear cold insulating gloves. Wear cold insulating gloves when transfilling or breaking transfer connections.

Environmental exposure controls : None necessary.

Other information : Wear safety shoes while handling containers.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Colorless gas.

Molecular mass : 40 g/mol

Color : Colorless.

Odor : Odorless.

Odor threshold : No data available

pH : Not applicable.

Relative evaporation rate (butyl acetate=1) : No data available

Relative evaporation rate (ether=1) : Not applicable.

Melting point : -189 °C

Freezing point : No data available

Boiling point : -185.9 °C

Flash point : No data available

Critical temperature : -122.4 °C

Auto-ignition temperature	:	Not applicable.
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapor pressure	:	Not applicable.
Critical pressure	:	4898 kPa
Relative vapor density at 20 °C	:	No data available
Relative density	:	1.4
Density	:	1.654 kg/m³ Vapor density, 70°F (21.1°C), 1 atm
Relative gas density	:	1.38
Solubility	:	Water: 67 mg/l
Partition coefficient n-octanol/water (Log Pow)	:	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Explosion limits	:	No data available

9.2. Other information

Gas group	:	Press. Gas (Ref. Liq.)
Additional information	:	Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

None.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

None.

10.6. Hazardous decomposition products

None.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Skin corrosion/irritation : Not classified

pH: Not applicable.

Serious eye damage/irritation : Not classified

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified
STOT-single exposure : Not classified
STOT-repeated exposure : Not classified
Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

12.2. Persistence and degradability

Argon, refrigerated liquid (7440-37-1)	
Persistence and degradability	No ecological damage caused by this product.

12.3. Bioaccumulative potential

Argon, refrigerated liquid (7440-37-1)	
Partition coefficient n-octanol/water (Log Pow)	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

Argon, refrigerated liquid (7440-37-1)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects

Other adverse effects : Can cause frost damage to vegetation.
Effect on ozone layer : None.
Effect on the global warming : No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : May be vented to atmosphere in a well ventilated place. Consult supplier for specific recommendations.
Product/Packaging disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

SECTION 14: Transport information

In accordance with DOT
Transport document description (DOT) : UN1951 Argon, refrigerated liquid, 2.2
UN-No.(DOT) : UN1951
Proper Shipping Name (DOT) : Argon, refrigerated liquid
Class (DOT) : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115
Hazard labels (DOT) : 2.2 - Non-flammable gas

DOT Special Provisions (49 CFR 172.102)	:	T75 - When portable tank instruction T75 is referenced in Column (7) of the 172.101 Table, the applicable refrigerated liquefied gases are authorized to be transported in portable tanks in accordance with the requirements of 178.277 of this subchapter. TP5 - For a portable tank used for the transport of flammable refrigerated liquefied gases or refrigerated liquefied oxygen, the maximum rate at which the portable tank may be filled must not exceed the liquid flow capacity of the primary pressure relief system rated at a pressure not exceeding 120 percent of the portable tank's design pressure. For portable tanks used for the transport of refrigerated liquefied helium and refrigerated liquefied atmospheric gas (except oxygen), the maximum rate at which the tank is filled must not exceed the liquid flow capacity of the pressure relief device rated at 130 percent of the portable tank's design pressure. Except for a portable tank containing refrigerated liquefied helium, a portable tank shall have an outage of at least two percent below the inlet of the pressure relief device or pressure control valve, under conditions of incipient opening, with the portable tank in a level attitude. No outage is required for helium.

Additional information

Emergency Response Guide (ERG) Number	:	121 (UN1006);120 (UN1951)
Other information	:	No supplementary information available.
Special transport precautions	:	Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG)	:	1951
Proper Shipping Name (IMDG)	:	ARGON, REFRIGERATED LIQUID
Class (IMDG)	:	2 - Gases
Division (IMDG)	:	2.2 - Non-flammable, non-toxic gases
MFAG-No	:	120

Air transport

UN-No. (IATA)	:	1951
Proper Shipping Name (IATA)	:	Argon, refrigerated liquid
Class (IATA)	:	2 - Gases
Civil Aeronautics Law	:	Gases under pressure/Gases nonflammable nontoxic under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

Argon, refrigerated liquid (7440-37-1)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

15.2. International regulations

CANADA

Argon, refrigerated liquid (7440-37-1)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Argon, refrigerated liquid (7440-37-1)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Argon, refrigerated liquid (7440-37-1)
Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on KECL/KECI (Korean Existing Chemicals Inventory) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on the TCSI (Taiwan Chemical Substance Inventory)

15.3. US State regulations

Argon, refrigerated liquid(7440-37-1)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

Other information : When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Linde asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Linde Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Linde Inc, it is the user's obligation to determine the conditions of safe use of the product.

Linde SDSs are furnished on sale or delivery by Linde or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your sales representative, local distributor, or supplier, or download from www.lindeus.com. If you have questions regarding Linde SDSs, would like the document number and date of the latest SDS, or would like the names of the Linde suppliers in your area, phone or write the Linde Call Center (Phone: 1-844-44-Linde (1-844-445-4633); Address: Linde Call Center, Linde Inc, P.O. Box 44, Tonawanda, NY 14151-0044).

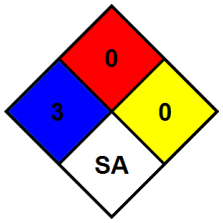
Revision date : 01/24/2022

NFPA health hazard : 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

NFPA fire hazard : 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA instability : 0 - Material that in themselves are normally stable, even under fire conditions.

NFPA specific hazard : SA - This denotes gases which are simple asphyxiants.



SDS US (GHS HazCom 2012) - Linde 2022

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Acetylene, dissolved in DMF

Safety Data Sheet P-6201

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Issue date: 01/01/1987 Revision date: 04/05/2022 Supersedes: 10/26/2016 Version: 1.0

SECTION: 1. Product and company identification

1.1. Product identifier

Product form	:	Substance
Trade name	:	Acetylene Trailer Acetylene
CAS-No.	:	74-86-2
Formula	:	C2H2
Other means of identification	:	Acetylen, ethine, ethyne, narcylene

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

Use of the substance/mixture	:	Industrial use; Use as directed.

1.3. Details of the supplier of the safety data sheet

Linde Inc.
10 Riverview Drive
Danbury, CT 06810-6268, USA
www.lindeus.com

Linde Inc. 1-844-44LINDE (1-844-445-4633)

1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24 hr/day 7 days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-US classification

Flam. Gas 1	H220
Press. Gas (Diss.)	H280
Simple asphyxiant	SIAS

2.2. Label elements

GHS US labelling

Hazard pictograms (GHS US) :

GHS02 GHS04

Signal word (GHS US) : Danger

Hazard statements (GHS US) : H220 - EXTREMELY FLAMMABLE GAS
H231 - MAY REACT EXPLOSIVELY EVEN IN THE ABSENCE OF AIR AT ELEVATED PRESSURE AND/OR TEMPERATURE
H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.
CGA-HG04 - MAY FORM EXPLOSIVE MIXTURES WITH AIR

Precautionary statements (GHS US) : P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P271+P403 - Use and store only outdoors or in a well-ventilated place.
P377 - LEAKING GAS FIRE: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.
P304, P340, P313 - IF INHALED: Remove person to fresh air and keep comfortable for

breathing. Get medical advice/attention.
P501 - Dispose of contents/container in accordance with container Supplier/owner instructions
CGA-PG05 - Use a back flow preventive device in the piping.
CGA-PG06 - Close valve after each use and when empty.
CGA-PG10 - Use only with equipment rated for cylinder pressure.
CGA-PG12 - Do not open valve until connected to equipment prepared for use.
CGA-PG20 - Use only with equipment of compatible materials of construction and rated for cylinder pressure.
CGA-PG13 - Fusible plugs in the top, bottom, or valve melt at 98°C to 107°C (208°F to 224°F). Do not discharge at pressures above 15 psig (103 kPa).
CGA-PG11 - Never put cylinders into unventilated areas of passenger vehicles.
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F).

2.3. Other hazards

Other hazards which do not result in classification : For safety reasons, the acetylene is dissolved in dimethylformamide (CAS no. 68-12-2; Repr. 1B, Acute Tox. 4, Eye Irrit. 2) in the gas container. Vapour of the solvent is carried away as impurity when the acetylene is extracted from the gas container. The concentration of the solvent vapour in the gas is lower than the concentration limits to change the classification of the acetylene.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Product identifier	%
Acetylene, dissolved in DMF (Main constituent)	(CAS-No.) 74-86-2	100

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

First-aid measures after skin contact : Adverse effects not expected from this product. If skin irritation occurs: Wash with plenty of soap and water. If irritation persists, consult a doctor.

First-aid measures after eye contact : Adverse effects not expected from this product. In case of eye irritation: Rinse eyes with water as a precaution. Consult an ophthalmologist if irritation persists.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : See below. See CGA Pamphlet SB-4, *Handling Acetylene Cylinders in Fire Situations*, for further information.

5.2. Special hazards arising from the substance or mixture

Fire hazard : EXTREMELY FLAMMABLE GAS. If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device.

Explosion hazard	:	EXTREMELY FLAMMABLE GAS. Forms explosive mixtures with air and oxidizing agents.
Reactivity	:	No reactivity hazard other than the effects described in sub-sections below.

5.3. Advice for firefighters

Firefighting instructions	:	Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.
Protection during firefighting	:	Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.
Special protective equipment for fire fighters	:	Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	:	Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. Stop flow of product if safe to do so. Use water spray or fog to knock down fire fumes if possible. Continue water spray from protected position until container stays cool.
Other information	:	Acetylene containers are provided with pressure relief devices designed to vent contents when exposed to elevated temperature.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	:	Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Evacuate area. Ensure adequate ventilation. Stop leak if safe to do so.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with container supplier/owner instructions.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment.

Wear leather safety gloves and safety shoes when handling cylinders. Protect containers from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post “No Smoking/No Open Flames” signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g, NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

Storage area : Acetylene trailers are designed and intended for outdoor use. Acetylene storage in excess of 2.500 cu ft (70.79 cubic meters) is prohibited in buildings and other occupancies.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Acetylene, dissolved in DMF (74-86-2)	
ACGIH	Not established
USA OSHA	Not established

8.2. Exposure controls

Appropriate engineering controls : An explosion-proof local exhaust system or a mechanical system is acceptable if it can prevent oxygen deficiency and keep hazardous fumes and gases below all applicable exposure limits in the worker's breathing area. During welding, ensure that there is adequate ventilation to keep worker exposure below applicable limits for fumes, gases, and other by-products of welding. Do not breathe fumes or gases. Short-term overexposure to fumes may cause dizziness, nausea, and dryness or irritation of the nose, throat, and eyes, or may cause other similar discomfort.

Eye protection : Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.

Skin and body protection	:	As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder's gloves and protective goggles, and may include arm protectors, aprons, hats, and shoulder protection as well as substantial clothing.
Respiratory protection	:	When workplace conditions warrant respirator use, follow a respiratory protection program that meets or exceeds the requirements of the appropriate Health and Safety Regulations. Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).
Other information	:	Consider the use of flame resistant anti-static safety clothing. Wear leather safety gloves and safety shoes when handling cylinders.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Gas
Appearance	:	Colorless, odorless gas.
Molecular mass	:	26 g/mol
Colour	:	Colourless.
Odour	:	Garlic like. Poor warning properties at low concentrations.
Odour threshold	:	No data available
pH	:	Not applicable.
Relative evaporation rate (butylacetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	-80.8 °C
Freezing point	:	No data available
Boiling point	:	-84 °C
Flash point	:	-17 °C
Critical temperature	:	36 °C
Auto-ignition temperature	:	305 °C
Decomposition temperature	:	635 °C
Flammability (solid, gas)	:	2.5 – 100 vol %
Vapour pressure	:	4400 kPa
Critical pressure	:	6138 kPa
Relative vapour density at 20 °C	:	No data available
Relative density	:	Not applicable.
Density	:	0.0012 g/cm³ (at 0 °C)
Relative gas density	:	0.9
Solubility	:	Water: 1185 mg/l
Partition coefficient n-octanol/water (Log Pow)	:	0.37
Partition coefficient n-octanol/water (Log Kow)	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Explosive limits	:	No data available

9.2. Other information

Sublimation point	:	-83.3 °C
Gas group	:	Press. Gas (Diss.)

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Dissolved in a solvent supported in a porous mass. Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of hazardous reactions

May react explosively even in the absence of air. May decompose violently at high temperature and/or pressure or in the presence of a catalyst. Can form explosive mixture with air. May react violently with oxidants.

10.4. Conditions to avoid

High temperature. High pressure. Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

10.5. Incompatible materials

Forms explosive acetylides with copper, silver and mercury. Do not use alloys containing more than 65% copper. Air, Oxidizer. Do not use alloys containing more than 43% silver.

10.6. Hazardous decomposition products

Thermal decomposition or burning may produce carbon monoxide, carbon dioxide, and hydrogen. The welding and cutting process may form reaction products such as carbon monoxide and carbon dioxide. Other decomposition products of normal operation originate from the volatilization, reaction, or oxidation of the material being worked.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Not classified

Acute toxicity (dermal) : Not classified

Acute toxicity (inhalation) : Not classified

Skin corrosion/irritation : Not classified

pH: Not applicable.

Serious eye damage/irritation : Not classified

pH: Not applicable.

Respiratory or skin sensitisation : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

STOT-single exposure : Not classified

STOT-repeated exposure : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No known ecological damage caused by this product.

12.2. Persistence and degradability

Acetylene, dissolved in DMF (74-86-2)	
Persistence and degradability	Will rapidly degrade by indirect photolysis in air. Will not undergo hydrolysis.

12.3. Bioaccumulative potential

Acetylene, dissolved in DMF (74-86-2)	
Partition coefficient n-octanol/water (Log Pow)	0.37
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). See section 9.

12.4. Mobility in soil

Acetylene, dissolved in DMF (74-86-2)	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Effect on the ozone layer : No known effects from this product.

Effect on global warming : No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations : Dispose of contents/container in accordance with container supplier/owner instructions.

SECTION 14: Transport information

In accordance with DOT

Transport document description (DOT) : UN1001 Acetylene, dissolved, 2.1

UN-No.(DOT) : UN1001

Proper Shipping Name (DOT) : Acetylene, dissolved

Hazard labels (DOT) : 2.1 - Flammable gas

DOT Special Provisions (49 CFR 172.102) : N86 - UN pressure receptacles made of aluminum alloy are not authorized.
N88 - Any metal part of a UN pressure receptacle in contact with the contents may not contain more than 65% copper, with a tolerance of 1%.

Additional information

Emergency Response Guide (ERG) Number : 116 (UN1001)

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG) : 1001

Proper Shipping Name (IMDG) : Acetylene, dissolved

Class (IMDG) : 2 - Gases

MFAG-No : 116

Air transport

UN-No. (IATA)	:	1001
Proper Shipping Name (IATA)	:	Acetylene, dissolved
Class (IATA)	:	2 - Gases
Civil Aeronautics Law	:	Gases under pressure/Gases flammable under pressure(Hazardous materials notice Appended Table 1 Article 194 of the Enforcement Regulations)

SECTION 15: Regulatory information

15.1. US Federal regulations

Acetylene, dissolved in DMF (74-86-2)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Sudden release of pressure hazard Reactive hazard Fire hazard

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory.

15.2. International regulations

CANADA

Acetylene, dissolved in DMF (74-86-2)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Acetylene, dissolved in DMF (74-86-2)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Acetylene, dissolved in DMF (74-86-2)
Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing New Chemical Substances) inventory Listed on the Japanese ISHL (Industrial Safety and Health Law) Listed on KECL/KECI (Korean Existing Chemicals Inventory) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on the TCSI (Taiwan Chemical Substance Inventory)

15.3. US State regulations

Acetylene, dissolved in DMF(74-86-2)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List

Acetylene, dissolved in DMF(74-86-2)	
	U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

Other information : When using this product in welding and cutting, read and understand the manufacturer's instructions and the precautionary label on the product. Ask your welding products supplier for a copy of Linde's free safety booklet, P-2035, Precautions and Safe Practices for Gas Welding, Cutting, and Heating, and for other manufacturers' safety publications. For a detailed treatment, get ANSI Z49.1, Safety in Welding, Cutting, and Allied Processes, published by the American Welding Society (AWS), www.aws.org. Order AWS documents from Global Engineering Documents, global.ihs.com. Arcs and sparks can ignite combustible materials. Prevent fires. Refer to NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hotwork. Do not strike an arc on the container. The defect produced by an arc burn may lead to container rupture.

Fumes and gases produced during welding and cutting processes can be dangerous to your health and may cause serious lung disease. KEEP YOUR HEAD OUT OF FUMES. DO NOT BREATHE FUMES AND GASES. Use enough ventilation, local exhaust, or both to keep fumes and gases from your breathing zone and the general area. Short-term overexposure to fumes may cause dizziness, nausea, and dryness or irritation of the nose, throat, and eyes; or may cause other similar discomfort. Contaminants in the air may add to the hazard of fumes and gases.

When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Linde asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Linde Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Linde Inc, it is the user's obligation to determine the conditions of safe use of the product.

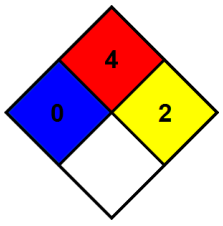
Linde SDSs are furnished on sale or delivery by Linde or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your sales representative, local distributor, or supplier, or download from www.lindeus.com. If you have questions regarding Linde SDSs, would like the document number and date of the latest SDS, or would like the names of the Linde suppliers in your area, phone or write the Linde Call Center (Phone: 1-844-44-Linde (1-844-445-4633); Address: Linde Call Center, Linde Inc, P.O. Box 44, Tonawanda, NY 14151-0044).

Revision date : 04/05/2022

NFPA health hazard : 0 - Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 4 - Materials that rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and burn readily.

NFPA instability : 2 - Materials that readily undergo violent chemical change at elevated temperatures and pressures.



SDS US (GHS HazCom 2012) - Linde 2022

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

METHANE, COMPRESSED

Safety Data Sheet P-4618

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Issue date: 01/01/1978 Revision date: 12/17/2021 Supersedes: 01/29/2021 Version: 1.1

SECTION: 1. Product and company identification

1.1. Product identifier

Product form : Substance

Trade name : Methane

Chemical name : Methane

CAS-No. : 74-82-8

Formula : CH4

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

Use of the substance/mixture : Industrial use; Use as directed.

1.3. Details of the supplier of the safety data sheet

Linde Inc.
10 Riverview Drive
Danbury, CT 06810-6268, USA
www.lindeus.com

Linde Inc. 1-844-44LINDE (1-844-445-4633)

1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS US classification

Flam. Gas 1 H220
Press. Gas (Comp.) H280
Simple asphyxiant SIAS

2.2. Label elements

GHS US labeling

Hazard pictograms (GHS US) :

GHS02 GHS04

Signal word (GHS US) : Danger

Hazard statements (GHS US) : H220 - EXTREMELY FLAMMABLE GAS
H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.
CGA-HG04 - MAY FORM EXPLOSIVE MIXTURES WITH AIR

Precautionary statements (GHS US) : P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P271+P403 - Use and store only outdoors or in a well-ventilated place.
P377 - LEAKING GAS FIRE: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.
P304, P340, P313 - IF INHALED: Remove person to fresh air and keep comfortable for

breathing. Get medical advice/attention.
CGA-PG05 - Use a back flow preventive device in the piping.
CGA-PG10 - Use only with equipment rated for cylinder pressure.
CGA-PG12 - Do not open valve until connected to equipment prepared for use.
CGA-PG06 - Close valve after each use and when empty.
CGA-PG11 - Never put cylinders into unventilated areas of passenger vehicles.
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F).

2.3. Other hazards

Other hazards which do not result in classification : None.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name : METHANE, COMPRESSED

CAS-No. : 74-82-8

Name	Product identifier	%
Methane	(CAS-No.) 74-82-8	100

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

First-aid measures after skin contact : If skin irritation occurs: Wash with plenty of soap and water.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide, Dry chemical, Water spray or fog.

5.2. Special hazards arising from the substance or mixture

Fire hazard : EXTREMELY FLAMMABLE GAS. If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device.

Explosion hazard : EXTREMELY FLAMMABLE GAS. Forms explosive mixtures with air and oxidizing agents.

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

5.3. Advice for firefighters

Firefighting instructions : **Danger! FLAMMABLE, HIGH PRESSURE GAS.**

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

Other information : Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : **Danger:** EXTREMELY FLAMMABLE GAS. Forms explosive mixtures with air and oxidizing agents. See section 5. Evacuate personnel to a safe area. Appropriate self-contained breathing apparatus may be required. Approach suspected leak area with caution. Remove all sources of ignition. if safe to do so. Reduce gas with fog or fine water spray. Stop flow of product if safe to do so. Ventilate area or move container to a well-ventilated area. Flammable gas may spread from leak. Before entering the area, especially a confined area, check the atmosphere with an appropriate device.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment.

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post “No Smoking/No Open Flames” signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g, NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

METHANE, COMPRESSED (74-82-8)	
ACGIH	Not established
USA OSHA	Not established

Methane (74-82-8)	
ACGIH	Not established
USA OSHA	Not established

8.2. Exposure controls

Appropriate engineering controls : Use an explosion-proof local exhaust system with sufficient flow velocity to maintain an adequate supply of air in the worker's breathing zone. Mechanical/General measures: Use in a closed system.

Eye protection : Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.

Skin and body protection : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.

Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Colorless gas.

Molecular mass : 16.04 g/mol

Color : Colorless

Odor : odorless

Odor threshold	:	No data available
pH	:	Not applicable.
Relative evaporation rate (butyl acetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	-182 °C
Freezing point	:	No data available
Boiling point	:	-161.5 °C
Flash point	:	No data available
Critical temperature	:	-82.5 °C
Auto-ignition temperature	:	600 °C
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	5 – 15 vol %
Vapor pressure	:	Not applicable.
Critical pressure	:	45.99 bar
Relative vapor density at 20 °C	:	No data available
Relative density	:	0.56
Density	:	0.66 kg/m³ Vapor density @15.6°C, 1 atm
Relative gas density	:	0.7 @15.6°C, 1 atm
Solubility	:	Water: No data available
Partition coefficient n-octanol/water (Log Pow)	:	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Explosion limits	:	No data available

9.2. Other information

Gas group	:	Compressed gas
Additional information	:	None.

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

May occur.

10.4. Conditions to avoid

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

10.5. Incompatible materials

Oxidizing agents. May explode: Bromine pentafluoride. Chlorine. Mercury oxide. Nitrogen trifluoride. Liquid Oxygen. Oxygen difluoride.

10.6. Hazardous decomposition products

Thermal decomposition may produce : Carbon dioxide. Carbon monoxide. Hydrogen.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Skin corrosion/irritation : Not classified

pH: Not applicable.

Serious eye damage/irritation : Not classified

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

STOT-single exposure : Not classified

STOT-repeated exposure : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No known ecological damage caused by this product.

12.2. Persistence and degradability

METHANE, COMPRESSED (74-82-8)	
Persistence and degradability	The substance is biodegradable. Unlikely to persist.

Methane (74-82-8)	
Persistence and degradability	The substance is biodegradable. Unlikely to persist.

12.3. Bioaccumulative potential

METHANE, COMPRESSED (74-82-8)	
Partition coefficient n-octanol/water (Log Pow)	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

Methane (74-82-8)	
Partition coefficient n-octanol/water (Log Pow)	1.09
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

12.4. Mobility in soil

METHANE, COMPRESSED (74-82-8)	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

Methane (74-82-8)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Effect on ozone layer : None.

Global warming potential [CO2=1] : 21

Effect on the global warming : When discharged in large quantities may contribute to the greenhouse effect.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

SECTION 14: Transport information

In accordance with DOT

Transport document description (DOT)	:	UN1971 Methane, compressed, 2.1
UN-No.(DOT)	:	UN1971
Proper Shipping Name (DOT)	:	Methane, compressed
Class (DOT)	:	2.1 - Class 2.1 - Flammable gas 49 CFR 173.115
Hazard labels (DOT)	:	2.1 - Flammable gas

Additional information

Emergency Response Guide (ERG) Number	:	115 (UN1971)
Other information	:	No supplementary information available.
Special transport precautions	:	Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG)	:	1971
Proper Shipping Name (IMDG)	:	METHANE, COMPRESSED
Class (IMDG)	:	2 - Gases
Division (IMDG)	:	2.1 - Flammable gases
MFAG-No	:	115

Air transport

UN-No. (IATA)	:	1971
Proper Shipping Name (IATA)	:	Methane, compressed
Class (IATA)	:	2 - Gases
Civil Aeronautics Law	:	Gases under pressure/Gases flammable under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

METHANE, COMPRESSED (74-82-8)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

15.2. International regulations

CANADA

METHANE, COMPRESSED (74-82-8)
Listed on the Canadian DSL (Domestic Substances List)

Methane (74-82-8)
Listed on the Canadian DSL (Domestic Substances List)

Methane (74-82-8)

EU-Regulations

METHANE, COMPRESSED (74-82-8)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

METHANE, COMPRESSED (74-82-8)
Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on KECL/KECI (Korean Existing Chemicals Inventory) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on CICR (Turkish Inventory and Control of Chemicals)

15.3. US State regulations

METHANE, COMPRESSED(74-82-8)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

Methane (74-82-8)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significant risk level (NSRL)
No	No	No	No	

Methane (74-82-8)
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Other information : When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Linde asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Linde Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Linde Inc, it is the user's obligation to determine the conditions of safe use of the product.

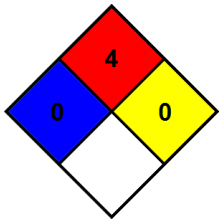
Linde SDSs are furnished on sale or delivery by Linde or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your sales representative, local distributor, or supplier, or download from www.lindeus.com. If you have questions regarding Linde SDSs, would like the document number and date of the latest SDS, or would like the names of the Linde suppliers in your area, phone or write the Linde Call Center (Phone: 1-800-772-9247; Address: Linde Call Center, Linde Inc, P.O. Box 44, Tonawanda, NY 14151-0044).

Revision date : 12/17/2021

NFPA health hazard : 0 - Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 4 - Materials that rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and burn readily.

NFPA instability : 0 - Material that in themselves are normally stable, even under fire conditions.



SDS US (GHS HazCom 2012) - Praxair OR Linde

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Heavy Pyrolysis Oil Distillate

Veiligheidsinformatieblad

volgens de REACH-verordening (EC) 1907/2006 zoals gewijzigd bij Verordening (EU) 2020/878

Datum van uitgave: 20-4-2023 Datum herziening: 10-5-2023 Vervangt versie van: 10-5-2023 Versie: 1.2

RUBRIEK 1: Identificatie van de stof of het mengsel en van de vennootschap/onderneming

1.1. Productidentificatie

Productvorm	:	De stof is een samenstelling van UVCB
Handelsnaam	:	Heavy Pyrolysis Oil Distillate
Scheikundige naam	:	Hydrocarbons from pyrolysis of waste plastic, condensed, syngas sparged, heavy oil fraction
IUPAC-naam	:	Hydrocarbons from pyrolysis of waste plastic, condensed, syngas sparged, heavy oil fraction
EG-Nr	:	954-431-2

1.2. Relevant geïdentificeerd gebruik van de stof of het mengsel en ontraden gebruik

1.2.1. Relevant geïdentificeerd gebruik

Hoofdgebruikscategorie	:	Gebruik als tussenproduct,Raffinaderij Grondstof
Spec. industrieel/professioneel gebruik	:	Industrieel gebruik Professioneel gebruik Industrieel Enkel voor professioneel gebruik
Gebruik van de stof of het mengsel	:	Tussenproducten Grondstof Chemische productie of raffinage in een gesloten proces, waarbij blootstelling niet waarschijnlijk is of processen met vergelijkbare beperkingsomstandighed en. Chemische productie of raffinage in een gesloten, continu proces met incidentele beheerste blootstelling of processen met vergelijkbare beperkingsomstandighed en.

1.2.2. Ontraden gebruik

Gebruiksbeperkingen	:	Gebruiken door de consument

1.3. Details betreffende de verstrekker van het veiligheidsinformatieblad

Fabrikant
Itero Development Ltd
SL0 9HW
T +447500147891
Alexis.Delich@itero-tech.com

Leverancier
Itero Technologies B.V.
Brightlands Chemelot Camous Urmonderbaan 22
6167 RD Sittard-Geleen
Netherlands

1.4. Telefoonnummer voor noodgevallen

Noodnummer	:	+44 7500147891 Maandag - vrijdag van 9.00 - 17.00 uur GMT

Land	Organisatie/Bedrijf	Adres	Noodnummer	Opmerking
Nederland	Nationaal Vergiftigingen Informatie Centrum (NVIC)	Huispostnummer Q03.2.315 Postbus 85500 3508 GA Utrecht	+31 88 755 80 00	Uitsluitend bestemd om professionele hulpverleners te informeren bij acute vergiftigingen (24 uur per dag en 7 dagen in de week)

RUBRIEK 2: Identificatie van de gevaren

2.1. Indeling van de stof of het mengsel

Indeling conform Verordening (EG) Nr. 1272/2008 [CLP]

Acute toxiciteit (inhalatie:stof,nevel) Categorie 4	H332
Huidsensibilisatie, Categorie 1B	H317

Mutageniteit in geslachtscellen, Categorie 1B	H340
Kankerverwekkendheid, Categorie 1B	H350
Specifieke doelorgaantoxiciteit bij herhaalde blootstelling, Categorie 1	H372
Aspiratiegevaar, Categorie 1	H304

Volledige tekst van H- en EUH-zinnen: zie sectie 16

Nadelige fysisch-chemische, gezondheids- en milieueffecten

Geen aanvullende informatie beschikbaar

2.2. Etiketteringselementen

Etikettering conform Verordening (EG) Nr. 1272/2008 [CLP]

Gevarenpictogrammen (CLP) :

GHS07 GHS08

CLP Signaalwoord : Gevaar

Gevarenaanduidingen (CLP) : H304 - Kan dodelijk zijn als de stof bij inslikken in de luchtwegen terechtkomt.
H317 - Kan een allergische huidreactie veroorzaken.
H332 - Schadelijk bij inademing.
H340 - Kan genetische schade veroorzaken.
H350 - Kan kanker veroorzaken.
H372 - Veroorzaakt schade aan organen bij langdurige of herhaalde blootstelling.

Veiligheidsaanbevelingen (CLP) : P201 - Alvorens te gebruiken de speciale aanwijzingen raadplegen.
P202 - Pas gebruiken nadat u alle veiligheidsvoorschriften gelezen en begrepen heeft.
P260 - Damp, nevel niet inademen.
P264 - Na het werken met dit product handen grondig wassen.
P270 - Niet eten, drinken of roken tijdens het gebruik van dit product.
P271 - Alleen buiten of in een goed geventileerde ruimte gebruiken.

2.3. Andere gevaren

Bevat geen PBT- of zPzB stoffen ≥ 0.1% beoordeeld overeenkomstig REACH Bijlage XIII

RUBRIEK 3: Samenstelling en informatie over de bestanddelen

3.1. Stoffen

Naam	Productidentificatie	%	Indeling conform Verordening (EG) Nr. 1272/2008 [CLP]
Hydrocarbons from pyrolysis of waste plastic, condensed, syngas sparged, heavy oil fraction	EG-Nr: 954-431-2	100	Acute Tox. 4 (Inhalatie:stof,nevel), H332 (ATE=1,5 mg/l/4u) Skin Sens. 1B, H317 Muta. 1B, H340 Carc. 1B, H350 STOT RE 1, H372 Asp. Tox. 1, H304

Volledige tekst van H- en EUH-zinnen: zie sectie 16

3.2. Mengsels

Niet van toepassing

RUBRIEK 4: Eerstehulpmaatregelen

4.1. Beschrijving van de eerstehulpmaatregelen

EHBO algemeen : Nooit bij een bewusteloze persoon iets toedienen via de mond. Bij onwel voelen een arts raadplegen (deze indien mogelijk dit etiket tonen).

EHBO na inademing	:	Laat de getroffen persoon frisse lucht inademen. Laat het slachtoffer rusten. De persoon in de frisse lucht brengen en ervoor zorgen dat deze gemakkelijk kan ademen. Als het slachtoffer bewusteloos is en niet ademt, zorg dan dat de ademhaling niet wordt belemmerd en pas kunstmatige beademing toe door getraind personeel. Geef zo nodig externe hartmassage en roep medische hulp in. Als het slachtoffer bewusteloos is en ademt, plaats hem dan in de zijligging en houd het hoofd onder het niveau van de romp. Dien indien nodig zuurstof toe. Bij onwel voelen een ANTIGIFCENTRUM/arts raadplegen.
EHBO na contact met de huid	:	De besmette kleding uittrekken, de blootgestelde huid wassen met milde zeep en water en vervolgens afspoelen met warm water. Bij huidirritatie: een arts raadplegen.
EHBO na contact met de ogen	:	Voorzichtig afspoelen met water gedurende een aantal minuten. Contactlenzen verwijderen, indien mogelijk. Blijven spoelen. Medische hulp inroepen, indien pijn of roodheid aanhoudt.
EHBO na opname door de mond	:	De mond spoelen. GEEN braken opwekken. Onmiddellijk een ANTIGIFCENTRUM/arts raadplegen.

4.2. Belangrijkste acute en uitgestelde symptomen en effecten

Symptomen/effecten	:	Kan genetische schade veroorzaken. Kan kanker veroorzaken. Veroorzaakt schade aan organen (bloed, Oog, Andere) bij langdurige of herhaalde blootstelling.
Symptomen/effecten na inademing	:	Gevaar voor ernstige schade aan de gezondheid bij langdurige blootstelling door inademing. Schadelijk bij inademing. Inademing van dampen kan hoofdpijn, misselijkheid, braken en een verandering van de bewustzijnsstaat veroorzaken.
Symptomen/effecten na contact met de huid	:	Symptomen zijn roodheid, jeuk, en verbranding van de huid.
Symptomen/effecten na contact met de ogen	:	Kan een matige irritatie veroorzaken.
Symptomen/effecten na opname door de mond	:	Kan dodelijk zijn als de stof bij inslikken in de luchtwegen terechtkomt. Bij inslikken moet altijd worden aangenomen dat er aspiratie ontstaat. Onmiddellijk naar een ziekenhuis vervoeren. Wacht niet totdat de symptomen zich kunnen ontwikkelen.

4.3. Vermelding van eventueel noodzakelijke onmiddellijke medische verzorging en speciale behandeling

Geen aanvullende informatie beschikbaar

RUBRIEK 5: Brandbestrijdingsmaatregelen

5.1. Blusmiddelen

Geschikte blusmiddelen	:	Schuim. Droog poeder. Koolstofdioxide. Zand.
Ongeschikte blusmiddelen	:	Gebruik geen sterke waterstraal.

5.2. Speciale gevaren die door de stof of het mengsel worden veroorzaakt

Brandgevaar	:	Niet ingedeeld als ontvlambaar, maar is brandbaar.
Explosiegevaar	:	Kan een ontvlambaar/ontplofbaar damp-lucht mengsel vormen. In goed gesloten verpakking bewaren. Explosieveilige elektrische /ventilatie-/verlichtings- apparatuur gebruiken.

5.3. Advies voor brandweerlieden

Blusinstructies	:	Koel de blootgestelde vaten af met een waternevel of mist. Wees uiterst voorzichtig bij het bestrijden van een chemische brand. Vermijd dat het bluswater in het milieu terechtkomt.
Bescherming tijdens brandbestrijding	:	Brandzone niet betreden zonder geschikte veiligheidsuitrusting, inclusief ademhalingsbescherming.

RUBRIEK 6: Maatregelen bij het accidenteel vrijkomen van de stof of het mengsel

6.1. Persoonlijke voorzorgsmaatregelen, beschermingsmiddelen en noodprocedures

6.1.1. Voor andere personen dan de hulpdiensten

Noodprocedures	:	Overbodig personeel weg laten gaan. Alleen getraind personeel mag eerste hulp verlenen. Voordat u eerste hulp probeert te verlenen, dient u het gebied te isoleren van alle mogelijke ontstekingsbronnen, inclusief het loskoppelen van de elektrische voeding.

6.1.2. Voor de hulpdiensten

Beschermingsmiddelen	:	Schoonmaakpersoneel uitrusten met aangepaste bescherming. Zie sectie 8 van het veiligheids informatieblad.
Noodprocedures	:	De ruimte ventileren.

6.2. Milieuvoorzorgsmaatregelen

Niet in de riolering of openbare wateren laten wegstromen. Waarschuw de betreffende autoriteiten als de vloeistof een riolering of open water binnendringt. Gooi het spoelwater weg in overeenstemming met de plaatselijke en nationale voorschriften.

6.3. Insluitings- en reinigingsmethoden en -materiaal

Voor insluiting	:	Bevochtig indien nodig verontreinigde kleding met water voordat u deze uittrekt om het risico op vonken door statische elektriciteit te voorkomen.
Reinigingsmethodes	:	Het gemorste product zo snel mogelijk opzuigen met inerte vaste stoffen zoals klei of kiezelaarde. Gelekte/gemorste stof opruimen. Gescheiden van ander materiaal bewaren.

6.4. Verwijzing naar andere rubrieken

Zie Rubriek 8. Maatregelen ter beheersing van blootstelling en persoonlijke bescherming.

RUBRIEK 7: Hantering en opslag

7.1. Voorzorgsmaatregelen voor het veilig hanteren van de stof of het mengsel

Extra gevaren bij verwerking	:	Lege houders/verpakkingen voorzichtig hanteren, aangezien de achtergebleven dampen ontvlambaar zijn. Vat voorzichtig openen aangezien de inhoud onder druk kan staan.
Voorzorgsmaatregelen voor het veilig hanteren van de stof of het mengsel	:	Alvorens te gebruiken de speciale aanwijzingen raadplegen. Pas gebruiken nadat u alle veiligheidsvoorschriften gelezen en begrepen heeft. De handen en andere blootgestelde delen wassen met zachte zeep en water, alvorens te eten, drinken, roken of het werk te verlaten. Zorg voor een goede ventilatie in de verwerkingsruimte, om de vorming van dampen te vermijden. Alleen buiten of in een goed geventileerde ruimte gebruiken. In geval van lekkage alle ontstekingsbronnen wegnemen. Inademing van Damp vermijden.
Hygiënische maatregelen	:	Niet eten, drinken of roken tijdens het gebruik van dit product. Na het werken met dit product gezicht, handen grondig wassen.

7.2. Voorwaarden voor een veilige opslag, met inbegrip van incompatibele producten

Technische maatregelen	:	Om statische elektriciteit te vermijden moeten de juiste aardingsprocedures worden gevolgd. Opslag- en opvangreservoir aarden. Explosieveilige elektrische, verlichtings-, ventilatie- apparatuur gebruiken. Voorzorgsmaatregelen treffen tegen ontladingen van statische elektriciteit.
Opslagvoorwaarden	:	Uitsluitend in de oorspronkelijke verpakking opslaan op een koele, goed geventileerde plaats verwijderd van : Ontstekingsbronnen. De vaten gesloten houden als ze niet worden gebruikt.
Niet combineerbare stoffen	:	Sterke basen. Sterke zuren.
Onverenigbare materialen	:	Ontstekingsbronnen. Rechtstreeks zonlicht. Warmtebronnen.

7.3. Specifiek eindgebruik

Geen aanvullende informatie beschikbaar

RUBRIEK 8: Maatregelen ter beheersing van blootstelling/persoonlijke bescherming

8.1. Controleparameters

8.1.1 Nationale beroepsmatige blootstellingswaarden en biologische grenswaarden

Geen aanvullende informatie beschikbaar

8.1.2. Aanbevolen monitoringprocedures

Geen aanvullende informatie beschikbaar

8.1.3. Gevormde Luchtvervuilende stoffen

Geen aanvullende informatie beschikbaar

8.1.4. DNEL en PNEC

Geen aanvullende informatie beschikbaar

8.1.5. Control banding

Geen aanvullende informatie beschikbaar

8.2. Maatregelen ter beheersing van blootstelling

8.2.1. Passende technische maatregelen

Passende technische maatregelen:
In de onmiddellijke nabijheid van elke mogelijke bron van blootstelling moeten veiligheidsdouches aanwezig zijn.

8.2.2. Persoonlijke beschermingsmiddelen

Persoonlijke beschermingsuitrusting:
Vermijd onnodige blootstelling. Chemisch beschermingspak dragen.

8.2.2.1. Bescherming van de ogen en het gezicht

Bescherming van de ogen:
Chemische stofbril of veiligheidsbril

8.2.2.2. Bescherming van de huid

Huid en lichaam bescherming:
Chemisch beschermingspak dragen. chemicaliënbestending schort dragen.

Bescherming van de handen:
Beschermende handschoenen dragen. Draag geschikte handschoenen die getest zijn volgens EN374

8.2.2.3. Bescherming van de ademhalingswegen

Bescherming van de ademhalingswegen:
[Bij ontoereikende ventilatie] adembescherming dragen.

8.2.2.4. Thermische gevaren

Geen aanvullende informatie beschikbaar

8.2.3. Beperking en controle van de blootstelling van het milieu

Beperking en controle van de blootstelling van het milieu:
Voer afval af naar een erkende afvalverwerkingslocatie in overeenstemming met de vereisten van de lokale afvalverwerkingsautoriteit. Voor vuilverwerking zich wenden tot de verantwoordelijke erkende vuilverwerker. Niet in de riolering of openbare wateren laten wegstromen.

Overige informatie:
Niet eten, drinken of roken tijdens het gebruik.

RUBRIEK 9: Fysische en chemische eigenschappen

9.1. Informatie over fysische en chemische basiseigenschappen

Fysische toestand	:	Vloeibaar
Kleur	:	donkerbruin.
Voorkomen	:	Viskeuze vloeistof.
Geur	:	Sterk.
Geurdrempelwaarde	:	Niet beschikbaar
Smeltpunt	:	> 30 – ≤ 40 °C
Vriespunt	:	Niet beschikbaar
Kookpunt	:	≥ 150 – ≤ 600 °C
Ontvlambaarheid	:	Niet beschikbaar
Oxiderende eigenschappen	:	Niet oxiderend.
Explosiegrenzen	:	Niet beschikbaar
Laagste explosiegrenswaarde	:	Niet beschikbaar
Bovenste explosiegrenswaarde	:	Niet beschikbaar
Vlampunt	:	105 °C
Zelfontbrandingstemperatuur	:	Niet beschikbaar
Ontledingstemperatuur	:	Niet beschikbaar
pH	:	Niet beschikbaar

Viscositeit, kinematisch	:	Niet beschikbaar
Oplosbaarheid	:	Niet oplosbaar in water.
Verdelingscoëfficiënt n-octanol/water (Log Kow)	:	Niet beschikbaar
Dampspanning	:	Niet beschikbaar
Dampdruk bij 50°C	:	Niet beschikbaar
Dichtheid	:	> 0,801 – ≤ 0,933
Relatieve dichtheid	:	Niet beschikbaar
Relatieve dampdichtheid bij 20°C	:	Niet beschikbaar
Deeltjeskenmerken	:	Niet van toepassing

9.2. Overige informatie

9.2.1. Informatie inzake fysische gevarenklassen

Geen aanvullende informatie beschikbaar

9.2.2. Andere veiligheidskenmerken

Geen aanvullende informatie beschikbaar

RUBRIEK 10: Stabiliteit en reactiviteit

10.1. Reactiviteit

Geen aanvullende informatie beschikbaar

10.2. Chemische stabiliteit

Niet vastgesteld.

10.3. Mogelijke gevaarlijke reacties

Niet vastgesteld.

10.4. Te vermijden omstandigheden

Rechtstreeks zonlicht. Zeer hoge temperaturen.

10.5. Chemisch op elkaar inwerkende materialen

Sterke zuren. Sterke basen.

10.6. Gevaarlijke ontledingsproducten

damp. Koolstofmonoxide. Koolstofdioxide.

RUBRIEK 11: Toxicologische informatie

11.1. Informatie over gevarenklassen als omschreven in Verordening (EG) nr. 1272/2008

Acute toxiciteit (oraal)	:	Niet ingedeeld
Acute toxiciteit (dermaal)	:	Niet ingedeeld
Acute toxiciteit (inhalatie)	:	Schadelijk bij inademing.

Hydrocarbons from pyrolysis of waste plastic, condensed, syngas sparged, heavy oil fraction	
ATE CLP (stof, nevel)	1,5 mg/l/4u

Huidcorrosie/-irritatie	:	Niet ingedeeld
Aanvullende informatie	:	Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan
Ernstig oogletsel/oogirritatie	:	Niet ingedeeld
Aanvullende informatie	:	Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan
Sensibilisatie van de luchtwegen/de huid	:	Kan een allergische huidreactie veroorzaken.
Mutageniteit in geslachtscellen	:	Kan genetische schade veroorzaken.
Carcinogeniteit	:	Kan kanker veroorzaken.
Giftigheid voor de voortplanting	:	Niet ingedeeld
Aanvullende informatie	:	Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan

STOT bij eenmalige blootstelling : Niet ingedeeld

Aanvullende informatie : Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan

STOT bij herhaalde blootstelling : Veroorzaakt schade aan organen bij langdurige of herhaalde blootstelling.

Hydrocarbons from pyrolysis of waste plastic, condensed, syngas sparged, heavy oil fraction	
STOT bij herhaalde blootstelling	Veroorzaakt schade aan organen bij langdurige of herhaalde blootstelling.

Gevaar bij inademing : Kan dodelijk zijn als de stof bij inslikken in de luchtwegen terechtkomt.

11.2. Informatie over andere gevaren

11.2.1. Hormoonontregelende eigenschappen

Geen aanvullende informatie beschikbaar

11.2.2. Overige informatie

Potentiële schadelijke effecten op de mens en mogelijke symptomen : Schadelijk bij inademing.

RUBRIEK 12: Ecologische informatie

12.1. Toxiciteit

Gevaar voor het aquatisch milieu, (acuut) op korte termijn : Niet ingedeeld

Gevaar voor het aquatisch milieu, (chronisch) op lange termijn : Niet ingedeeld

12.2. Persistentie en afbreekbaarheid

Hydrocarbons from pyrolysis of waste plastic, condensed, syngas sparged, heavy oil fraction	
Persistentie en afbreekbaarheid	Niet vastgesteld.

12.3. Bioaccumulatie

Hydrocarbons from pyrolysis of waste plastic, condensed, syngas sparged, heavy oil fraction	
Bioaccumulatie	Niet vastgesteld.

12.4. Mobiliteit in de bodem

Geen aanvullende informatie beschikbaar

12.5. Resultaten van PBT- en zPzB-beoordeling

Geen aanvullende informatie beschikbaar

12.6. Hormoonontregelende eigenschappen

Geen aanvullende informatie beschikbaar

12.7. Andere schadelijke effecten

Aanvullende informatie : Voorkom lozing in het milieu.

RUBRIEK 13: Instructies voor verwijdering

13.1. Afvalverwerkingsmethoden

Aanbevelingen voor afvoer van producten/verpakkingen : Op een veilige manier opruimen in overeenstemming met lokale/nationale voorschriften. Inhoud/verpakking afvoeren naar ...

Ecologie - afvalstoffen : Voorkom lozing in het milieu. Gevaarlijk afval, toxisch.

RUBRIEK 14: Informatie met betrekking tot het vervoer

Overeenkomstig met ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
14.1. VN-nummer of ID-nummer				
Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd
14.2. Juiste ladingnaam overeenkomstig de modelreglementen van de VN				
Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd
14.3. Transportgevarenklasse(n)				
Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd
14.4. Verpakkingsgroep				
Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd
14.5. Milieugevaren				
Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd
Geen aanvullende informatie beschikbaar				

14.6. Bijzondere voorzorgen voor de gebruiker

Wegtransport
Niet gereglementeerd

Transport op open zee
Niet gereglementeerd

Luchttransport
Niet gereglementeerd

Transport op binnenlandse wateren
Niet gereglementeerd

Spoorwegvervoer
Niet gereglementeerd

14.7. Zeevervoer in bulk overeenkomstig IMO-instrumenten

Niet van toepassing

RUBRIEK 15: Regelgeving

15.1. Specifieke veiligheids-, gezondheids- en milieureglementen en -wetgeving voor de stof of het mengsel

15.1.1. EU-voorschriften

REACH bijlage XVII (stoffen met beperkt gebruik)

Niet opgenomen in REACH bijlage XVII

REACH bijlage XIV (lijst autorisatieplichtige stoffen)

Niet van toepassing

REACH kandidaatlijst (SVHC)

Niet opgenomen in de REACH kandidatenlijst

PIC-verordening (voorafgaande geïnformeerde toestemming)

Niet opgenomen in de PIC-lijst (Verordening EU 649/2012)

POP-verordening (persistente organische verontreinigende stoffen)

Niet opgenomen in de POP (Verordening EU 2019/1021)

Ozon-verordening (1005/2009)

Niet opgenomen in de lijst ozonaantastende stoffen (Verordening EU 1005/2009):

Verordening precursoren voor explosieven (2019/1148)

Bevat geen stoffen opgenomen in de Lijst precursoren voor explosieven (Verordening EU 2019/1148 inzake de marketing en het gebruik van precursoren van explosieven)

Verordening precursoren voor geneesmiddelen (273/2004)

Bevat geen stoffen die zijn opgenomen in de lijst precursoren voor geneesmiddelen (Verordening EG 273/2004 inzake de productie en het in de handel brengen van bepaalde stoffen gebruikt bij de onwettige productie van verdovende middelen en psychotrope stoffen)

15.1.2. Nationale voorschriften

Duitsland

Beperkingen m.b.t. beroepswerkzaamheden	:	Houd u aan de beperkingen ten aanzien van Wet op de bescherming van werkende moeders (MuSchG). Houd u aan de beperkingen ten aanzien van Wet op de bescherming van jonge mensen in dienstverband (JArbSchG).
Waterbedreigingsklasse (WGK)	:	Niet ingedeeld volgens Verordening inzake het beheer van systemen voor de behandeling van waterverontreinigende stoffen (AwSV).
Resolutie verbieden van chemische stoffen (ChemVerbotsV)	:	Dit product valt onder ChemVerbotsV bijlage 2, lemma 1. De volgende voorschriften moeten worden gevolgd: toestemmingsvoorschrift (volgens § 6 paragraaf 1 zin 1), basisvoorschriften voor het uitvoeren van de levering (volgens § 8 paragraaf 1, 3 en 4), identificatie en documentatie (volgens § 9 paragraaf 1 t/m 3) en uitsluiting van de verzendroute (volgens § 10).
Resolutie gevaarlijke incidenten (12. BImSchV)	:	Valt niet onder de Resolutie gevaarlijke incidenten (12. BImSchV)

Nederland

SZW-lijst van kankerverwekkende stoffen	:	De stof is niet aanwezig
SZW-lijst van mutagene stoffen	:	De stof is niet aanwezig
SZW-lijst van reprotoxische stoffen – Borstvoeding	:	De stof is niet aanwezig
SZW-lijst van reprotoxische stoffen – Vruchtbaarheid	:	De stof is niet aanwezig
SZW-lijst van reprotoxische stoffen – Ontwikkeling	:	De stof is niet aanwezig

Denemarken

Deense nationale voorschriften	:	Jongeren onder de 18 jaar zijn niet toegestaan om het product te gebruiken Zwangere / zogende vrouwen werken met het product mag niet in direct contact met haar

Zwitserland

Opslagklasse (LK)	:	LK 6.1 - Toxische materialen
Resolutie chemische stoffen (SR 813.11)	:	Groep 1

15.2. Chemischeveiligheidsbeoordeling

Geen chemische veiligheidsbeoordeling is uitgevoerd

RUBRIEK 16: Overige informatie

Gegevensbronnen	:	Verordening (EG) Nr. 1272/2008 van het Europees Parlement en de Raad van 16 december 2008 betreffende de indeling, etikettering en verpakking van stoffen en mengsels tot wijziging en intrekking van de Richtlijnen 67/548/EEG en 1999/45/EG en tot wijziging van Verordening (EG) nr. 1907/2006 (et sequens).
Overige informatie	:	Geen.

Integrale tekst van de zinnen H en EUH:	
Acute Tox. 4 (Inhalatie:stof,nevel)	Acute toxiciteit (inhalatie:stof,nevel) Categorie 4
Asp. Tox. 1	Aspiratiegevaar, Categorie 1

Integrale tekst van de zinnen H en EUH:	
Carc. 1B	Kankerverwekkendheid, Categorie 1B
H304	Kan dodelijk zijn als de stof bij inslikken in de luchtwegen terechtkomt.
H317	Kan een allergische huidreactie veroorzaken.
H332	Schadelijk bij inademing.
H340	Kan genetische schade veroorzaken.
H350	Kan kanker veroorzaken.
H372	Veroorzaakt schade aan organen bij langdurige of herhaalde blootstelling.
Muta. 1B	Mutageniteit in geslachtscellen, Categorie 1B
Skin Sens. 1B	Huidsensibilisatie, Categorie 1B
STOT RE 1	Specifieke doelorgaantoxiciteit bij herhaalde blootstelling, Categorie 1

Veiligheidsinformatieblad (VIB), EU

Deze informatie is gebaseerd op onze huidige kennis en is bedoeld om het product te beschrijven voor de toepassing van gezondheids-, veiligheids-en milieu-aspecten. Het mag dus niet worden opgevat als garantie voor gelijk welke specifieke eigenschap van het product.

Circular Cracker Feedstock

Veiligheidsinformatieblad

volgens de REACH-verordening (EC) 1907/2006 zoals gewijzigd bij Verordening (EU) 2020/878
Datum van uitgave: 14-4-2023 Datum herziening: 10-5-2023 Vervangt versie van: 10-5-2023 Versie: 1.2

RUBRIEK 1: Identificatie van de stof of het mengsel en van de vennootschap/onderneming

1.1. Productidentificatie

Productvorm	:	De stof is een samenstelling van UVCB
Handelsnaam	:	Circular Cracker Feedstock
Scheikundige naam	:	Plastic, waste, pyrolized, fractionation bottoms
IUPAC-naam	:	Plastic, waste, pyrolized, fractionation bottoms
EG-Nr	:	942-177-5
CAS-Nr	:	100801-72-7

1.2. Relevant geïdentificeerd gebruik van de stof of het mengsel en ontraden gebruik

1.2.1. Relevant geïdentificeerd gebruik

Hoofdgebruikscategorie	:	Gebruik als tussenproduct,Raffinaderij Grondstof,Laboratoriumgebruik
Spec. industrieel/professioneel gebruik	:	Industrieel Professioneel
Gebruik van de stof of het mengsel	:	Industrieel gebruik Grondstof Tussenproduct Chemische productie of raffinage in een gesloten proces, waarbij blootstelling niet waarschijnlijk is of processen met vergelijkbare beperkingsomstandighed en. Chemische productie of raffinage in een gesloten, continu proces met incidentele beheerste blootstelling of processen met vergelijkbare beperkingsomstandighed en. Laboratoriumgebruik

1.2.2. Ontraden gebruik

Gebruiksbeperkingen	:	Gebruiken door de consument

1.3. Details betreffende de verstrekker van het veiligheidsinformatieblad

Fabrikant
Itero Development Ltd
SL0 9HW
T +447500147891
Alexis.Delich@itero-tech.com

Leverancier
Itero Technologies B.V.
Brightlands Chemelot Camous Urmonderbaan 22
6167 RD Sittard-Geleen
Netherlands

1.4. Telefoonnummer voor noodgevallen

Noodnummer	:	+44 7500147891 Maandag - vrijdag van 9.00 - 17.00 uur GMT

Land	Organisatie/Bedrijf	Adres	Noodnummer	Opmerking
Nederland	Nationaal Vergiftigingen Informatie Centrum (NVIC)	Huispostnummer Q03.2.315 Postbus 85500 3508 GA Utrecht	+31 88 755 80 00	Uitsluitend bestemd om professionele hulpverleners te informeren bij acute vergiftigingen (24 uur per dag en 7 dagen in de week)

RUBRIEK 2: Identificatie van de gevaren

2.1. Indeling van de stof of het mengsel

Indeling conform Verordening (EG) Nr. 1272/2008 [CLP]

Ontvlambare vloeistoffen, Categorie 2	H225
Huidsensibilisatie, Categorie 1	H317
Mutageniteit in geslachtscellen, Categorie 2	H341

Kankerverwekkendheid, Categorie 1A	H350
Aspiratiegevaar, Categorie 1	H304
Chronisch gevaar voor het aquatisch milieu, Categorie 2	H411

Volledige tekst van H- en EUH-zinnen: zie sectie 16

Nadelige fysisch-chemische, gezondheids- en milieueffecten

Geen aanvullende informatie beschikbaar

2.2. Etiketteringselementen

Etikettering conform Verordening (EG) Nr. 1272/2008 [CLP]

Gevarenpictogrammen (CLP) :

GHS02 GHS07 GHS08 GHS09

CLP Signaalwoord : Gevaar

Gevarenaanduidingen (CLP) : H225 - Licht ontvlambare vloeistof en damp.
H304 - Kan dodelijk zijn als de stof bij inslikken in de luchtwegen terechtkomt.
H317 - Kan een allergische huidreactie veroorzaken.
H341 - Verdacht van het veroorzaken van genetische schade.
H350 - Kan kanker veroorzaken.
H411 - Giftig voor in het water levende organismen, met langdurige gevolgen.

Veiligheidsaanbevelingen (CLP) : P201 - Alvorens te gebruiken de speciale aanwijzingen raadplegen.
P202 - Pas gebruiken nadat u alle veiligheidsvoorschriften gelezen en begrepen heeft.
P210 - Verwijderd houden van warmte, hete oppervlakken, vonken, open vuur en andere ontstekingsbronnen. Niet roken.
P233 - In goed gesloten verpakking bewaren.
P240 - Opslag- en opvangreservoir aarden.
P241 - Explosieveilige elektrische apparatuur, verlichtingsapparatuur, ventilatieapparatuur gebruiken.

2.3. Andere gevaren

Bevat geen PBT- of zPzB stoffen ≥ 0.1% beoordeeld overeenkomstig REACH Bijlage XIII

Component 1	
Circular Pyrolysis Oil / HHC	Deze stof/dit mengsel voldoet niet aan de PBT-criteria van de REACH-verordening, annex XIII Deze stof/dit mengsel voldoet niet aan de zPzB-criteria van de REACH-verordening, annex XIII

RUBRIEK 3: Samenstelling en informatie over de bestanddelen

3.1. Stoffen

Stoftype	:	UVCB
Naam	:	Plastic, waste, pyrolized, fractionation bottoms
CAS-Nr	:	100801-72-7
EG-Nr	:	942-177-5

Naam	Productidentificatie	%
Circular Pyrolysis Oil / HHC	EG-Nr: 942-177-5	100

Volledige tekst van H- en EUH-zinnen: zie sectie 16

3.2. Mengsels

Niet van toepassing

RUBRIEK 4: Eerstehulpmaatregelen

4.1. Beschrijving van de eerstehulpmaatregelen

EHBO algemeen : Nooit bij een bewusteloze persoon iets toedienen via de mond. Bij onwel voelen een arts raadplegen (deze indien mogelijk dit etiket tonen).

EHBO na inademing : Laat de getroffen persoon frisse lucht inademen. Laat het slachtoffer rusten.

EHBO na contact met de huid : Huid met water afspoelen/afdouchen. Verontreinigde kleding onmiddellijk uittrekken. Met veel water/… wassen. Bij huidirritatie of uitslag: Een arts raadplegen. Specifieke behandeling vereist (zie aanvullende eerstehulpmaatregel op dit etiket). Verontreinigde kleding wassen alvorens deze opnieuw te gebruiken.

EHBO na contact met de ogen : Onmiddellijk en overvloedig spoelen met water. Medische hulp inroepen, indien pijn of roodheid aanhoudt.

EHBO na opname door de mond : De mond spoelen. GEEN braken opwekken. Onmiddellijk een ANTIGIFCENTRUM/arts raadplegen.

4.2. Belangrijkste acute en uitgestelde symptomen en effecten

Symptomen/effecten : Verdacht van het veroorzaken van genetische schade.

Symptomen/effecten na inademing : Kan een allergische huidreactie veroorzaken. Kan kanker veroorzaken bij inademing.

Symptomen/effecten na opname door de mond : Kan dodelijk zijn als de stof bij inslikken in de luchtwegen terechtkomt.

4.3. Vermelding van eventueel noodzakelijke onmiddellijke medische verzorging en speciale behandeling

Geen aanvullende informatie beschikbaar

RUBRIEK 5: Brandbestrijdingsmaatregelen

5.1. Blusmiddelen

Geschikte blusmiddelen : Schuim. Droog poeder. Kooldioxide. Zand.

Ongeschikte blusmiddelen : Gebruik geen sterke waterstraal.

5.2. Speciale gevaren die door de stof of het mengsel worden veroorzaakt

Brandgevaar : Licht ontvlambare vloeistof en damp. Vuurbestendige of vlamvertragende kleding dragen. Verwijderd houden van warmte, hete oppervlakken, vonken, open vuur en andere ontstekingsbronnen. Niet roken. Vonkvrij gereedschap gebruiken. Opslag- en opvangreservoir aarden.

Explosiegevaar : Kan een ontvlambaar/ontplofbaar damp-lucht mengsel vormen. In goed gesloten verpakking bewaren. Explosieveilige elektrische /ventilatie-/verlichtings- apparatuur gebruiken.

5.3. Advies voor brandweerlieden

Blusinstructies : Koel de blootgestelde vaten af met een waternevel of mist. Wees uiterst voorzichtig bij het bestrijden van een chemische brand. Vermijd dat het bluswater in het milieu terechtkomt.

Bescherming tijdens brandbestrijding : Brandzone niet betreden zonder geschikte veiligheidsuitrusting, inclusief ademhalingsbescherming.

RUBRIEK 6: Maatregelen bij het accidenteel vrijkomen van de stof of het mengsel

6.1. Persoonlijke voorzorgsmaatregelen, beschermingsmiddelen en noodprocedures

Algemene maatregelen : Ontstekingsbronnen verwijderen. Neem speciale voorzorgsmaatregelen om statische elektriciteitsladingen te vermijden. Niet blootstellen aan open vuur. Verboden te roken.

6.1.1. Voor andere personen dan de hulpdiensten

Noodprocedures : Overbodig personeel weg laten gaan.

6.1.2. Voor de hulpdiensten

Beschermingsmiddelen : Schoonmaakpersoneel uitrusten met aangepaste bescherming. Zie sectie 8 van het veiligheids informatieblad.

Noodprocedures : De ruimte ventileren.

6.2. Milieuvoorzorgsmaatregelen

Niet in de riolering of openbare wateren laten wegstromen. Waarschuw de betreffende autoriteiten als de vloeistof een riolering of open water binnendringt. Voorkom lozing in het milieu. Gooi het spoelwater weg in overeenstemming met de plaatselijke en nationale voorschriften.

6.3. Insluitings- en reinigingsmethoden en -materiaal

Reinigingsmethodes	:	Het gemorste product zo snel mogelijk opzuigen met inerte vaste stoffen zoals klei of kiezelaarde. Gelekte/gemorste stof opruimen. Gescheiden van ander materiaal bewaren.

6.4. Verwijzing naar andere rubrieken

Zie Rubriek 8. Maatregelen ter beheersing van blootstelling en persoonlijke bescherming.

RUBRIEK 7: Hantering en opslag

7.1. Voorzorgsmaatregelen voor het veilig hanteren van de stof of het mengsel

Extra gevaren bij verwerking	:	Lege houders/verpakkingen voorzichtig hanteren, aangezien de achtergebleven dampen ontvlambaar zijn. Vat voorzichtig openen aangezien de inhoud onder druk kan staan.
Voorzorgsmaatregelen voor het veilig hanteren van de stof of het mengsel	:	Roken, eten en drinken moet verboden worden in de ruimtes waar het product gebruikt wordt. De handen en andere blootgestelde delen wassen met zachte zeep en water, alvorens te eten, drinken, roken of het werk te verlaten. Zorg voor een goede ventilatie in de verwerkingsruimte, om de vorming van dampen te vermijden. Niet blootstellen aan open vuur. Verboden te roken. Uitsluitend vonkvrij gereedschap gebruiken. Inademing van Damp vermijden. Alvorens te gebruiken de speciale aanwijzingen raadplegen. De nodige persoonlijke beschermingsuitrusting gebruiken. Zie sectie 8 van het veiligheids informatieblad. Pas gebruiken nadat u alle veiligheidsvoorschriften gelezen en begrepen heeft. Aanraking met de ogen en de huid vermijden. Maatregelen treffen tegen ontladingen van statische elektriciteit.
Hygiënische maatregelen	:	Verontreinigde werkkleding mag de werkruimte niet verlaten. Verontreinigde kleding wassen alvorens deze opnieuw te gebruiken.

7.2. Voorwaarden voor een veilige opslag, met inbegrip van incompatibele producten

Technische maatregelen	:	Om statische elektriciteit te vermijden moeten de juiste aardingsprocedures worden gevolgd. Opslag- en opvangreservoir aarden. Explosieveilige elektrische, verlichtings-, ventilatie- apparatuur gebruiken. Elektrische installaties of werkmaterialen moeten voldoen aan de technologische veiligheidsnormen.
Opslagvoorwaarden	:	Uitsluitend in de oorspronkelijke verpakking opslaan op een koele, goed geventileerde plaats verwijderd van : Ontstekingsbronnen, Warmtebronnen. Opslaan op een brandveilige plaats. In goed gesloten verpakking bewaren.
Niet combineerbare stoffen	:	Sterke basen. Sterke zuren.
Onverenigbare materialen	:	Ontstekingsbronnen. Rechtstreeks zonlicht. Warmtebronnen.

7.3. Specifiek eindgebruik

Geen aanvullende informatie beschikbaar

RUBRIEK 8: Maatregelen ter beheersing van blootstelling/persoonlijke bescherming

8.1. Controleparameters

8.1.1 Nationale beroepsmatige blootstellingswaarden en biologische grenswaarden

Geen aanvullende informatie beschikbaar

8.1.2. Aanbevolen monitoringprocedures

Geen aanvullende informatie beschikbaar

8.1.3. Gevormde Luchtvervuilende stoffen

Geen aanvullende informatie beschikbaar

8.1.4. DNEL en PNEC

Circular Cracker Feedstock (100801-72-7)	
DNEL/DMEL (Werknemers)	
Langdurig - systemische effecten, dermaal	14,71 mg/kg lichaamsgewicht/dag
Langdurig - systemische effecten, inhalatie	25,93 mg/m³
PNEC (Water)	
PNEC aqua (zacht water)	0,166 mg/l
PNEC aqua (zeewater)	16,6 mg/l
PNEC (Sedimenten)	
PNEC sediment (zoet water)	0,635 mg/kg droog gewicht
PNEC sediment (zeewater)	63,5 mg/kg droog gewicht
PNEC (Bodem)	
PNEC bodem	29,6 µg/kg dg
PNEC (STP)	
PNEC waterzuiveringsinstallatie	35 mg/l

8.1.5. Control banding

Geen aanvullende informatie beschikbaar

8.2. Maatregelen ter beheersing van blootstelling

8.2.1. Passende technische maatregelen

Passende technische maatregelen:
Zorg voor een plaatselijke luchtafvoer of algemene ventilatie van de ruimte, om dampconcentraties tot een minimum te beperken. Explosieveilige ventilatieapparatuur gebruiken. In de onmiddellijke nabijheid van elke mogelijke bron van blootstelling moeten veiligheidsdouches aanwezig zijn.

8.2.2. Persoonlijke beschermingsmiddelen

Persoonlijke beschermingsuitrusting:
Vermijd onnodige blootstelling. Chemisch beschermingspak dragen.

8.2.2.1. Bescherming van de ogen en het gezicht

Bescherming van de ogen:
Chemische stofbril of veiligheidsbril

8.2.2.2. Bescherming van de huid

Huid en lichaam bescherming:
Chemisch beschermingspak dragen. Antistatische kledij, waaronder antistatische schoenen, wordt aanbevolen. Schort bestand tegen chemicaliën

Bescherming van de handen:
Chemicaliënbestendige veiligheidshandschoenen (EN 374) geschikt bij langer direkt contact dragen

8.2.2.3. Bescherming van de ademhalingswegen

Bescherming van de ademhalingswegen:
[Bij ontoereikende ventilatie] adembescherming dragen. Draag een ademhalingsbescherming volgens EN 140 met filtertype A of beter

8.2.2.4. Thermische gevaren

Bescherming tegen thermische gevaren:
Verwijderd houden van ontstekingsbronnen. Beschermende onbrandbare kleding.

8.2.3. Beperking en controle van de blootstelling van het milieu

Beperking en controle van de blootstelling van het milieu:
Voer afval af naar een erkende afvalverwerkingslocatie in overeenstemming met de vereisten van de lokale afvalverwerkingsautoriteit. Voor vuilverwerking zich wenden tot de verantwoordelijke erkende vuilverwerker. Niet in de riolering of openbare wateren laten wegstromen.

Overige informatie:

Niet eten, drinken of roken tijdens het gebruik.

RUBRIEK 9: Fysische en chemische eigenschappen

9.1. Informatie over fysische en chemische basiseigenschappen

Fysische toestand	:	Vloeibaar
Kleur	:	Licht geelbruin.
Voorkomen	:	Licht geelbruine vloeistof met lage viscositeit.
Geur	:	sterk.
Geurdrempelwaarde	:	Niet beschikbaar
Smeltpunt	:	< -80 °C Atm. press.: 1 atm Decomposition: 'no' Sublimation: 'no'
Vriespunt	:	Niet beschikbaar
Kookpunt	:	> 37 (≥ 30,6 – ≤ 415,9) °C
Ontvlambaarheid	:	Licht ontvlambare vloeistof en damp.
Explosiegrenzen	:	Niet beschikbaar
Laagste explosiegrenswaarde	:	Niet beschikbaar
Bovenste explosiegrenswaarde	:	Niet beschikbaar
Vlampunt	:	Niet beschikbaar
Zelfontbrandingstemperatuur	:	Niet beschikbaar
Ontledingstemperatuur	:	Niet beschikbaar
pH	:	Niet beschikbaar
Viscositeit, kinematisch	:	Niet beschikbaar
Oplosbaarheid	:	Niet oplosbaar in water.
Verdelingscoëfficiënt n-octanol/water (Log Kow)	:	Niet beschikbaar
Dampspanning	:	≈ 29,2 kPa Temp.: 37,8 °C
Dampdruk bij 50°C	:	Niet beschikbaar
Dichtheid	:	> 0,88 – < 0,9 g/cm³
Relatieve dichtheid	:	Niet beschikbaar
Relatieve dampdichtheid bij 20°C	:	Niet beschikbaar
Deeltjeskenmerken	:	Niet van toepassing

9.2. Overige informatie

9.2.1. Informatie inzake fysische gevarenklassen

Geen aanvullende informatie beschikbaar

9.2.2. Andere veiligheidskenmerken

Geen aanvullende informatie beschikbaar

RUBRIEK 10: Stabiliteit en reactiviteit

10.1. Reactiviteit

Geen aanvullende informatie beschikbaar

10.2. Chemische stabiliteit

Licht ontvlambare vloeistof en damp. Kan een ontvlambaar/ontplofbaar damp-lucht mengsel vormen.

10.3. Mogelijke gevaarlijke reacties

Niet vastgesteld.

10.4. Te vermijden omstandigheden

Rechtstreeks zonlicht. Extreem hoge of lage temperaturen. Open vuur.

10.5. Chemisch op elkaar inwerkende materialen

Sterke zuren. Sterke basen.

10.6. Gevaarlijke ontledingsproducten

damp. Koolstofmonoxide. Koolstofdioxide. Kan ontvlambare gassen vrijgeven.

RUBRIEK 11: Toxicologische informatie

11.1. Informatie over gevarenklassen als omschreven in Verordening (EG) nr. 1272/2008

Acute toxiciteit (oraal) : Niet ingedeeld
Acute toxiciteit (dermaal) : Niet ingedeeld
Acute toxiciteit (inhalatie) : Niet ingedeeld

Circular Cracker Feedstock (100801-72-7)	
LD50 oraal rat	> 2000 mg/kg lichaamsgewicht Animal: rat, Animal sex: female, Guideline: OECD Guideline 423 (Acute Oral toxicity - Acute Toxic Class Method)

Circular Pyrolysis Oil / HHC	
LD50 oraal rat	> 2000 mg/kg lichaamsgewicht Animal: rat, Animal sex: female, Guideline: OECD Guideline 423 (Acute Oral toxicity - Acute Toxic Class Method)
LD50 dermaal konijn	> 2000 mg/kg
LC50 Inhalatie - Rat	> 5 mg/l/4u

Huidcorrosie/-irritatie : Niet ingedeeld
Aanvullende informatie : Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan
Ernstig oogletsel/oogirritatie : Niet ingedeeld
Aanvullende informatie : Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan
Sensibilisatie van de luchtwegen/de huid : Kan een allergische huidreactie veroorzaken.
Mutageniteit in geslachtscellen : Verdacht van het veroorzaken van genetische schade.
Carcinogeniteit : Kan kanker veroorzaken.
Giftigheid voor de voortplanting : Niet ingedeeld
Aanvullende informatie : Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan
STOT bij eenmalige blootstelling : Niet ingedeeld
Aanvullende informatie : Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan
STOT bij herhaalde blootstelling : Niet ingedeeld
Aanvullende informatie : Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan
Gevaar bij inademing : Kan dodelijk zijn als de stof bij inslikken in de luchtwegen terechtkomt.

Circular Pyrolysis Oil / HHC	
Viscositeit, kinematisch	3 – 6 mm²/s @20 °C

11.2. Informatie over andere gevaren

11.2.1. Hormoonontregelende eigenschappen

Geen aanvullende informatie beschikbaar

11.2.2. Overige informatie

Potentiële schadelijke effecten op de mens en mogelijke symptomen : Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan

RUBRIEK 12: Ecologische informatie

12.1. Toxiciteit

Ecologie - water : Giftig voor in het water levende organismen, met langdurige gevolgen.
Gevaar voor het aquatisch milieu, (acuut) op korte termijn : Niet ingedeeld
Gevaar voor het aquatisch milieu, (chronisch) op lange termijn : Giftig voor in het water levende organismen, met langdurige gevolgen.

Circular Cracker Feedstock (100801-72-7)	
EC50 - Schaaldieren [1]	5,41 – 7,81 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algen [1]	≈ 4,52 mg/l Test organisms (species): Desmodesmus subspicatus (previous name: Scenedesmus subspicatus)

Circular Pyrolysis Oil / HHC	
LC50 - Vissen [1]	> 7,9 mg/l
EC50 - Schaaldieren [1]	5,41 – 7,81 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algen [1]	≈ 4,52 mg/l Test organisms (species): Desmodesmus subspicatus (previous name: Scenedesmus subspicatus)
NOEC chronisch vis	1,97 mg/l
NOEC chronisch schaaldieren	0,1 – 1 mg/l

12.2. Persistentie en afbreekbaarheid

Circular Cracker Feedstock (100801-72-7)	
Persistentie en afbreekbaarheid	Kan in het milieu op lange termijn schadelijke effecten veroorzaken.

Circular Pyrolysis Oil / HHC	
Persistentie en afbreekbaarheid	Kan in het milieu op lange termijn schadelijke effecten veroorzaken. persistent. Niet gemakkelijk bioafbreekbaar.

12.3. Bioaccumulatie

Circular Cracker Feedstock (100801-72-7)	
Bioaccumulatie	Niet vastgesteld.

Circular Pyrolysis Oil / HHC	
Verdelingscoëfficiënt n-octanol/water (Log Kow)	3 – 6
Bioaccumulatie	Bioaccumulatiepotentieel. Niet vastgesteld.

12.4. Mobiliteit in de bodem

Circular Pyrolysis Oil / HHC	
Ecologie - bodem	Drijft en kan op het wateroppervlak herontbranden. Vermijd dat het product het grondwater verontreinigd. Absorbeert in de bodem.

12.5. Resultaten van PBT- en zPzB-beoordeling

Component	
Circular Pyrolysis Oil / HHC	Deze stof/dit mengsel voldoet niet aan de PBT-criteria van de REACH-verordening, annex XIII Deze stof/dit mengsel voldoet niet aan de zPzB-criteria van de REACH-verordening, annex XIII

12.6. Hormoonontregelende eigenschappen

Geen aanvullende informatie beschikbaar

12.7. Andere schadelijke effecten

Aanvullende informatie : Voorkom lozing in het milieu.

RUBRIEK 13: Instructies voor verwijdering

13.1. Afvalverwerkingsmethoden

Aanbevelingen voor afvoer van producten/verpakkingen : Op een veilige manier opruimen in overeenstemming met lokale/nationale voorschriften. Inhoud/verpakking afvoeren naar een goedgekeurde afvalverwijderingsinstallatie.

Aanvullende informatie : Lege houders/verpakkingen voorzichtig hanteren, aangezien de achtergebleven dampen ontvlambaar zijn.

Ecologie - afvalstoffen : Voorkom lozing in het milieu. Gevaarlijk afval, toxisch.

RUBRIEK 14: Informatie met betrekking tot het vervoer

Overeenkomstig met ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
14.1. VN-nummer of ID-nummer				
UN 1993	UN 1993	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd
14.2. Juiste ladingnaam overeenkomstig de modelreglementen van de VN				
BRANDBARE VLOEISTOF, N.E.G.	FLAMMABLE LIQUID, N.O.S.	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd
Omschrijving vervoerdocument				
UN 1993 BRANDBARE VLOEISTOF, N.E.G., 3, II, (D/E), MILIEUGEVAARLIJK	UN 1993 FLAMMABLE LIQUID, N.O.S., 3, II, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd
14.3. Transportgevarenklasse(n)				
3	3	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd
		Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd
14.4. Verpakkingsgroep				
II	II	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd
14.5. Milieugevaren				
Milieugevaarlijk: Ja	Milieugevaarlijk: Ja Mariene verontreiniging: Ja	Niet gereglementeerd	Niet gereglementeerd	Niet gereglementeerd
Geen aanvullende informatie beschikbaar				

14.6. Bijzondere voorzorgen voor de gebruiker

Wegtransport

Classificatiecode (ADR) : F1

Bijzondere bepalingen (ADR) : 274, 601, 640D

Gelimiteerde hoeveelheden (ADR) : 1l

Vrijgestelde hoeveelheden (ADR) : E2

Verpakkingsinstructies (ADR) : P001, IBC02, R001

Voorschriften voor gezamenlijke verpakking (ADR) : MP19

Instructies voor transporttanks en bulkcontainers (ADR) : T7

Bijzondere bepalingen voor transporttanks en bulkcontainers (ADR) : TP1, TP8, TP28

Tankcode (ADR) : LGBF

Voertuig voor tankvervoer : FL

Vervoerscategorie (ADR)	:	2
Bijzondere bepalingen voor het vervoer - Bedrijf (ADR)	:	S2, S20
Gevaarsidentificatienummer (Kemler-nr.)	:	33
Oranje identificatiebord	:	
Code voor beperkingen in tunnels (ADR)	:	D/E
EAC code	:	•3YE

Transport op open zee

Bijzondere bepaling (IMDG)	:	274
Beperkte hoeveelheden (IMDG)	:	1 L
Uitgezonderde hoeveelheden (IMDG)	:	E2
Verpakkingsinstructies (IMDG)	:	P001
Verpakkingsinstructies IBC (IMDG)	:	IBC02
Instructies voor tanks (IMDG)	:	T7
Bijzondere bepalingen voor tanks (IMDG)	:	TP1, TP28, TP8
Nr. NS (Brand)	:	F-E
Nr. NS (Verspilling)	:	S-E
Stuwagecategorie (IMDG)	:	B

Luchttransport

Niet gereglementeerd

Transport op binnenlandse wateren

Niet gereglementeerd

Spoorwegvervoer

Niet gereglementeerd

14.7. Zeevervoer in bulk overeenkomstig IMO-instrumenten

Niet van toepassing

RUBRIEK 15: Regelgeving

15.1. Specifieke veiligheids-, gezondheids- en milieureglementen en -wetgeving voor de stof of het mengsel

15.1.1. EU-voorschriften

REACH bijlage XVII (stoffen met beperkt gebruik)

Niet opgenomen in REACH bijlage XVII

REACH bijlage XIV (lijst autorisatieplichtige stoffen)

Niet van toepassing

REACH kandidaatlijst (SVHC)

Niet opgenomen in de REACH kandidatenlijst

PIC-verordening (voorafgaande geïnformeerde toestemming)

Niet opgenomen in de PIC-lijst (Verordening EU 649/2012)

POP-verordening (persistente organische verontreinigende stoffen)

Niet opgenomen in de POP (Verordening EU 2019/1021)

Ozon-verordening (1005/2009)

Niet opgenomen in de lijst ozonaantastende stoffen (Verordening EU 1005/2009):

Verordening precursoren voor explosieven (2019/1148)

Bevat geen stoffen opgenomen in de Lijst precursoren voor explosieven (Verordening EU 2019/1148 inzake de marketing en het gebruik van precursoren van explosieven)

Verordening precursoren voor geneesmiddelen (273/2004)

Bevat geen stoffen die zijn opgenomen in de lijst precursoren voor geneesmiddelen (Verordening EG 273/2004 inzake de productie en het in de handel brengen van bepaalde stoffen gebruikt bij de onwettige productie van verdovende middelen en psychotrope stoffen)

15.1.2. Nationale voorschriften

Duitsland

Beperkingen m.b.t. beroepswerkzaamheden	:	Houd u aan de beperkingen ten aanzien van Wet op de bescherming van werkende moeders (MuSchG). Houd u aan de beperkingen ten aanzien van Wet op de bescherming van jonge mensen in dienstverband (JArbSchG).
Waterbedreigingsklasse (WGK)	:	Niet ingedeeld volgens Verordening inzake het beheer van systemen voor de behandeling van waterverontreinigende stoffen (AwSV).
Resolutie gevaarlijke incidenten (12. BImSchV)	:	Valt niet onder de Resolutie gevaarlijke incidenten (12. BImSchV)

Nederland

SZW-lijst van kankerverwekkende stoffen	:	De stof is niet aanwezig
SZW-lijst van mutagene stoffen	:	De stof is niet aanwezig
SZW-lijst van reprotoxische stoffen – Borstvoeding	:	De stof is niet aanwezig
SZW-lijst van reprotoxische stoffen – Vruchtbaarheid	:	De stof is niet aanwezig
SZW-lijst van reprotoxische stoffen – Ontwikkeling	:	De stof is niet aanwezig

Denemarken

Deense nationale voorschriften	:	Jongeren onder de 18 jaar zijn niet toegestaan om het product te gebruiken Zwangere / zogende vrouwen werken met het product mag niet in direct contact met haar De voorschriften van de Deense autoriteit voor de arbeidsomgeving met betrekking tot het werken met carcinogenen moeten tijdens gebruik en afvoer worden gevolgd

Zwitserland

Opslagklasse (LK)	:	LK 3 - Ontvlambare vloeistoffen
Resolutie chemische stoffen (SR 813.11)	:	Groep 1

15.2. Chemischeveiligheidsbeoordeling

Geen chemische veiligheidsbeoordeling is uitgevoerd

RUBRIEK 16: Overige informatie

Gegevensbronnen	:	Verordening (EG) Nr. 1272/2008 van het Europees Parlement en de Raad van 16 december 2008 betreffende de indeling, etikettering en verpakking van stoffen en mengsels tot wijziging en intrekking van de Richtlijnen 67/548/EEG en 1999/45/EG en tot wijziging van Verordening (EG) nr. 1907/2006 (et sequens).
Overige informatie	:	Geen.

Integrale tekst van de zinnen H en EUH:	
Aquatic Chronic 2	Chronisch gevaar voor het aquatisch milieu, Categorie 2
Asp. Tox. 1	Aspiratiegevaar, Categorie 1
Carc. 1A	Kankerverwekkendheid, Categorie 1A
Flam. Liq. 2	Ontvlambare vloeistoffen, Categorie 2
H225	Licht ontvlambare vloeistof en damp.
H304	Kan dodelijk zijn als de stof bij inslikken in de luchtwegen terechtkomt.
H317	Kan een allergische huidreactie veroorzaken.
H341	Verdacht van het veroorzaken van genetische schade.
H350	Kan kanker veroorzaken.
H411	Giftig voor in het water levende organismen, met langdurige gevolgen.

Integrale tekst van de zinnen H en EUH:	
Muta. 2	Mutageniteit in geslachtscellen, Categorie 2
Skin Sens. 1	Huidsensibilisatie, Categorie 1

Veiligheidsinformatieblad (VIB), EU

Deze informatie is gebaseerd op onze huidige kennis en is bedoeld om het product te beschrijven voor de toepassing van gezondheids-, veiligheids-en milieu-aspecten. Het mag dus niet worden opgevat als garantie voor gelijk welke specifieke eigenschap van het product.