SAFETY DATA SHEET

Version 2.0
Revision Date 23.05.2024
Supercedes Version: 1.3

SDS Number 300000015573
Print Date 24.05.2024

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

1.1. Product identifier : Mixture of Gases 015573

Refer to Section 3 for REACH information

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

Use of the Substance/Mixture	:	Industrial and professional use for chemical analysis, calibration, (routine) quality control, laboratory use, under controlled conditions. Perform risk assessment prior to use.
Restrictions on Use	:	Not for consumer use.

1.3. Details of the supplier of the safety data sheet : Air Products Plc
2 Millennium Gate
Westmere Drive
Crewe

Email Address – Technical Information	:	GASTECH@airproducts.com
Telephone	:	+44(0)3457 020202

1.4. Emergency telephone number : +44(0)8085 020202
Poison Information Centre +47 22 59 13 00

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Gases under pressure - Compressed gas. H280:Contains gas under pressure; may explode if heated.

2.2. Label elements

Hazard pictograms/symbols

Signal Word: Warning

Hazard Statements:

H280:Contains gas under pressure; may explode if heated.

Precautionary Statements:

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

2.3. Other hazards

Use a back flow preventative device in the piping.
Use equipment rated for cylinder pressure.
Close valve after each use and when empty.
Read and follow the Safety Data Sheet (SDS) before use.
Distinctive rotten egg odor.
Olfactory fatigue may lead to loss of this warning property.
Extended exposure to gas reduces the ability to smell sulfides.
High pressure gas.
Can cause rapid suffocation.
The product 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.
Mixture does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

Environmental Effects

Not harmful.

SECTION 3: Composition/information on ingredients

3.1. Substances : Not applicable.

3.2. Mixtures

Components	EC number	CAS Number	Concentration (Volume)
Hydrogen sulphide	231-977-3	7783-06-4	25 PPM
Carbon monoxide	211-128-3	630-08-0	100 PPM
Methane	200-812-7	74-82-8	2.2 %
Oxygen	231-956-9	7782-44-7	18 %
Nitrogen	231-783-9	7727-37-9	> 79.78%

Components	Classification (CLP)	REACH Reg. No.
Hydrogen sulphide	Flam. gas 1A ;H220 Press. Gas (Liq.) ;H280 Acute Tox. Inha 2 ;H330 Eye Irrit. 2 ;H319 STOT SE 3 ;H335 Aquatic Acute 1 ;H400	01-2119445737-29
Carbon monoxide	Flam. gas 1B ;H221 Press. Gas (Comp.) ;H280 Repr. 1A ;H360D Acute Tox. Inha 3 ;H331 STOT RE 1 ;H372	01-2119480165-39
Methane	Flam. gas 1A ;H220 Press. Gas (Comp.) ;H280	*1
Oxygen	Ox. Gas 1 ;H270	*1

	Press. Gas (Comp.) ;H280	
Nitrogen	Press. Gas (Comp.) ;H280	*1

*1:Listed in Annex IV / V REACH, exempted from registration.
*2:Registration not required: substance manufactured or imported < 1 t/y.
*3:Registration not required: substance manufactured or imported < 1 t/y for non-intermediate uses.

Components	Specific concentration limit	M-factor	ATE
Hydrogen sulphide	STOT SE3 ;H335; C >= 1 %	Acute M = 10	Inhalation ATE : 356 ppm (gas) Dermal - Oral -
Carbon monoxide	STOT RE1 ;H372; C >= 10 % STOT RE2 ;H373; C >= 1 % Repr.1A ;H360D; C >= 0.3 %	-	Inhalation ATE : 1300 ppm (gas) Dermal - Oral -

Refer to section 16 for full text of each relevant hazard statement (H).

Concentration is nominal. For the exact product composition, please refer to technical specifications.

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice : Remove victim to uncontaminated area wearing self-contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

Eye contact : In case of direct contact with eyes, seek medical advice.

Skin contact : Adverse effects not expected from this product.

Ingestion : Ingestion is not considered a potential route of exposure.

Inhalation : Remove to fresh air. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. In case of shortness of breath, give oxygen.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms : Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness.

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

Treatment : Hyperbaric oxygen is the most efficient treatment of carbon monoxide and dramatically reduces the biological half-life of carboxyhemoglobin. Although less effective, 100% oxygen by mask is useful if hyperbaric facilities are not available. Stimulant drugs are not indicated. Central nervous system toxicity may cause respiratory paralysis requiring assisted ventilation. Irritation of the deep lung may cause chemical pneumonitis and pulmonary edema. If exposed or concerned: Get medical attention/advice.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : The product itself does not burn.
Use extinguishing media appropriate for surrounding fire.

Extinguishing media which must not be used for safety reasons. : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

: Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Product is nonflammable and does not support combustion. Move away from container and cool with water from a protected position. Keep containers and surroundings cool with water spray.

5.3. Advice for firefighters

: Wear self contained breathing apparatus for fire fighting if necessary. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

: Evacuate personnel to safe areas. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Monitor oxygen level. Ventilate the area.

6.2. Environmental precautions

: Do not discharge into any place where its accumulation could be dangerous. Prevent further leakage or spillage if safe to do so.

6.3. Methods and material for containment and cleaning up

: Ventilate the area.

Additional advice : If possible, stop flow of product. Increase ventilation to the release area and monitor oxygen level. If leak is from cylinder or cylinder valve, call the emergency telephone number. If the leak is in the user's system, close the cylinder valve and safely vent the pressure before attempting repairs.

6.4. Reference to other sections

: For more information refer to Sections 8 & 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 50°C (122°F). Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Before using the product, determine its identity by reading the label. Know and understand the properties and hazards of the product before use. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. 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. Use an adjustable strap wrench to remove over-tight or rusted caps. Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials. Before connecting the container for use, ensure that back feed from the system into the container is prevented. Ensure the complete gas system is compatible for pressure rating and materials of construction. Ensure the complete gas system has been checked for leaks before use. Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with lower pressure rating than that of the container. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Open valve slowly. If user experiences any difficulty operating cylinder valve discontinue use and contact 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. Damaged valves should be reported immediately to the supplier. Close valve after each use and when empty. Replace outlet caps or plugs and container caps as soon as container is disconnected from equipment. Do not subject containers to abnormal mechanical shock. Never attempt to lift a cylinder by its valve protection cap or guard. Do not use containers as rollers or supports or for any other purpose than to contain the gas as supplied. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Do not smoke while handling product or cylinders. Never re-compress a gas or a gas mixture without first consulting the supplier. Never attempt to transfer gases from one cylinder/container to another. Always use backflow protective device in piping. When returning cylinder install valve outlet cap or plug leak tight. Never use direct flame or electrical heating devices to raise the pressure of a container. Containers should not be subjected to temperatures above 50°C (122°F).

7.2. Conditions for safe storage, including any incompatibilities

Full containers should be stored so that oldest stock is used first. Containers should be stored in a purpose build compound which should be well ventilated, preferably in the open air. Stored containers should be periodically checked for general condition and leakage. Observe all regulations and local requirements regarding storage of containers. Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Containers should be stored in the vertical position and properly secured to prevent toppling. The container valves should be tightly closed and where appropriate valve outlets should be capped or plugged. Container valve guards or caps should be in place. Keep containers tightly closed in a cool, well-ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Full and empty cylinders should be segregated. Do not allow storage temperature to exceed 50°C (122°F). Return empty containers in a timely manner.

Technical measures/Precautions

Containers should be segregated in the storage area according to the various categories (e.g. flammable, toxic, etc.) and in accordance whit local regulations. Keep away from combustible material.

7.3. Specific end use(s)

Refer to section 1 or the extended SDS if applicable.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limit(s)

Hydrogen sulphide	Ceiling Limit Value	10 ppm	14 mg/m3	Norway. Regulation No. 1358 on Measures and Limit Values for Physical and Chemical Factors in Work Environment and Infection Groups for Biological Factors, as amended

Hydrogen sulphide	Threshold Limit Value	5 ppm	7 mg/m3	Norway. Regulation No. 1358 on Measures and Limit Values for Physical and Chemical Factors in Work Environment and Infection Groups for Biological Factors, as amended
Hydrogen sulphide	Time Weighted Average (TWA)	5 ppm	7 mg/m3	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended
Hydrogen sulphide	Short Term Exposure Limit (STEL)	10 ppm	14 mg/m3	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended
Carbon monoxide	Ceiling Limit Value	100 ppm	-	Norway. Regulation No. 1358 on Measures and Limit Values for Physical and Chemical Factors in Work Environment and Infection Groups for Biological Factors, as amended
Carbon monoxide	Short Term Exposure Limit (STEL)	100 ppm	117 mg/m3	Norway. Regulation No. 1358 on Measures and Limit Values for Physical and Chemical Factors in Work Environment and Infection Groups for Biological Factors, as amended
Carbon monoxide	Threshold Limit Value	20 ppm	23 mg/m3	Norway. Regulation No. 1358 on Measures and Limit Values for Physical and Chemical Factors in Work Environment and Infection Groups for Biological Factors, as amended
Carbon monoxide	Short Term Exposure Limit (STEL)	100 ppm	117 mg/m3	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended
Carbon monoxide	Time Weighted Average (TWA)	20 ppm	23 mg/m3	EU. OELs for Certain Carcinogens, Mutagens, Reprotoxins: Annex III, Directive 2004/37/EC (CMRD), as amended

If applicable, refer to the extended section of the SDS for further information on CSA.

DNEL: Derived no effect level (Workers)
No applicable value for mixture components.

PNEC: predicted no effect concentration
No applicable value for mixture components.

8.2. Exposure controls

Engineering measures

Provide natural or mechanical ventilation to prevent oxygen deficient atmospheres below 19.5% oxygen.

Personal protective equipment

Respiratory protection	:	Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmosphere. Air purifying respirators will not provide protection. Users of breathing apparatus must be trained.
Hand protection	:	Wear work gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk.
Eye/face Protection	:	Safety glasses recommended when handling cylinders. Standard EN 166 - Personal eye-protection.
Skin and body protection	:	Safety shoes are recommended when handling cylinders. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
Special instructions for protection and hygiene	:	Ensure adequate ventilation, especially in confined areas.
Environmental Exposure Controls	:	If applicable, refer to the extended section of the SDS for further information on CSA.
Remarks	:	Simple asphyxiant.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

(a) Physical state	:	Gaseous. Compressed gas.
(b) Colour	:	Colorless.
(c) Odour	:	Not determined.
	:	Mixture contains one or more component(s) which have the following odor: No odor warning properties. Rotten eggs. Odour threshold is subjective and inadequate to warn of overexposure.
(d) Melting point/freezing point	:	Not applicable for gases and gas mixtures.
(e) Boiling point/range	:	It is technically not possible to determine the boiling point or range of this mixture.
(f) Flammability	:	Non flammable.
(g) Lower and upper explosion limit	:	Lower explosion limit : Not applicable. Upper explosion limit : Not applicable.
(h) Flash point	:	Not applicable for gases and gas mixtures.
(i) Auto-ignition temperature	:	Not applicable.
(j) Decomposition temperature	:	Not applicable.

(k) pH	:	Not applicable for gases and gas mixtures.
(l) Kinematic viscosity	:	Not applicable for gases and gas mixtures.
(m) Water solubility [20°C]	:	Not known, but considered to have low solubility.
(n) Partition coefficient n-octanol/water (log value)	:	Not applicable for gas mixtures.
(o) Vapour pressure	:	Not applicable for compressed gases and gas mixtures.
(p) Density and/or relative density	:	Not applicable for gases and gas mixtures.
(q) Relative vapour density	:	0.9826 (air = 1) Lighter or similar to air.
(r) Particle characteristics	:	Not applicable for gases and gas mixtures. Nanoforms are not relevant for gases and gas mixtures.

9.2. Other information

Oxidising properties	:	No oxidising properties.
Molar mass	:	28.46 g/mol

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	:	No data available.
10.4. Conditions to avoid	:	None under recommended storage and handling conditions (see section 7).
10.5. Incompatible materials	:	No data available.
10.6. Hazardous decomposition products	:	Sulphur compounds. Hydrogen. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

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

Likely routes of exposure

Effects on Eye	:	In case of direct contact with eyes, seek medical advice.

Effects on Skin	:	Adverse effects not expected from this product.
Inhalation Effects	:	In high concentrations may cause asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themselves.
Ingestion Effects	:	Ingestion is not considered a potential route of exposure.
Symptoms	:	Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness.

Acute toxicity

Acute Oral Toxicity	:	No data is available on the product itself.
Acute Inhalation Toxicity	:	No data is available on the product itself.

Components

Hydrogen sulphide	LC50 (1 h) : 712 ppm	Species : Rat.
Hydrogen sulphide	LC50 (4 h) : 356 ppm	Species : Rat.
Carbon monoxide	LC50 (1 h) : 3760 ppm	Species : Rat.
Carbon monoxide	LC50 (4 h) : 1300 ppm	Species : Rat.

Acute Dermal Toxicity	:	No data is available on the product itself.
Skin corrosion/irritation	:	No data available.
Serious eye damage/eye irritation	:	No data available.
Sensitization.	:	No data available.

Chronic toxicity or effects from long term exposures

Carcinogenicity	:	No data available.
Reproductive toxicity	:	No data is available on the product itself.
Germ cell mutagenicity	:	No data is available on the product itself.
Specific target organ systemic toxicity (single exposure)	:	No data available.
Specific target organ systemic toxicity (repeated exposure)	:	No data available.
Aspiration hazard	:	No data available.

11.2. Information on other hazards

The substance/mixture has no endocrine disrupting properties.

SECTION 12: Ecological information

12.1. Toxicity

Aquatic toxicity : No data is available on the product itself.

Toxicity to fish - Components

Hydrogen sulphide	LC50 (96 h) : 0.0198 mg/l	Species : Fish.
Methane	LC50 (96 h) : 147.5 mg/l	Species : Fish.

Toxicity to daphnia - Components

Hydrogen sulphide	EC50 (48 h) : 0.12 mg/l	Species : Daphnia magna.
Methane	EC50 (48 h) : 69.4 mg/l	Species : Daphnia magna.

Toxicity to algae - Components

Hydrogen sulphide	EC50 (72 h) : 1.87 mg/l	Species : Algae.
Methane	EC50 (72 h) : 19.4 mg/l	Species : Algae.

Toxicity to other organisms : No data is available on the product itself.

12.2. Persistence and degradability

No data available.

12.3. Bioaccumulative potential

Refer to Section 9 "Partition Coefficient (n-octanol/water)".

Bioaccumulation - Components

Carbon monoxide	Does not bioaccumulate.

12.4. Mobility in soil

Because of its high volatility, the product is unlikely to cause ground pollution.

12.5. Results of PBT and vPvB assessment

If applicable, refer to the extended section of the SDS for further information on CSA.

12.6. Endocrine disrupting properties

The substance/mixture has no endocrine disrupting properties.

12.7. Other adverse effects

This product has no known eco-toxicological effects.

Effect on the ozone layer	:	No known effects from this product.
Ozone Depleting Potential	:	None

Effect on global warming	:	When discharged in large quantities may contribute to the greenhouse effect.
Global Warming Potential	:	
Components		
Methane	:	25

SECTION 13: Disposal considerations

13.1. Waste treatment methods : Contact supplier if guidance is required. Return unused product in original cylinder to supplier. 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. List of hazardous waste codes: 16 05 05: Gases in pressure containers other than those mentioned in 16 05 04.

Contaminated packaging : Return cylinder to supplier.

SECTION 14: Transport information

14.1. UN number or ID number

UN/ID No. : UN1956

14.2. UN proper shipping name

Transport by road/rail/inland waterways (ADR/RID/ADN)	:	COMPRESSED GAS, N.O.S., (Nitrogen, Oxygen)
Transport by air (ICAO-TI / IATA-DGR)	:	Compressed gas, n.o.s., (Nitrogen, Oxygen)
Transport by sea (IMDG)	:	COMPRESSED GAS, N.O.S., (Nitrogen, Oxygen)

14.3. Transport hazard class(es)

Label(s) : 2.2

Transport by road/rail/inland waterways (ADR/RID/ADN)

Class or Division	:	2
ADR/RID/ADN Hazard ID no.	:	20
Tunnel Code	:	(E)

Transport by air (ICAO-TI / IATA-DGR)

Class or Division : 2.2

Transport by sea (IMDG)

Class or Division : 2.2

14.4. Packing group

Transport by road/rail/inland waterways (ADR/RID/ADN)	:	Not applicable.
Transport by air (ICAO-TI / IATA-DGR)	:	Not applicable.
Transport by sea (IMDG)	:	Not applicable.

14.5. Environmental hazards

Transport by road/rail/inland waterways (ADR/RID/ADN)

Marine Pollutant : No

Transport by air (ICAO-TI / IATA-DGR)
Marine Pollutant : No

Transport by sea (IMDG)
Marine Pollutant : No
Segregation Group : None

14.6. Special precautions for user

Transport by air (ICAO-TI / IATA-DGR)
Passenger and Cargo Aircraft : Transport allowed
Cargo Aircraft only : Transport allowed

Further Information
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. The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact customer service.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15: Regulatory information

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

Country/Region	Regulatory list	Notification
USA	TSCA	Included on Inventory
Australia	AU AIICL	Included on Inventory
Canada	DSL	Included on Inventory
Japan	ENCS (JP)	Included on Inventory
Korea	KECI (KR)	Included on Inventory
China	IECSC	Included on Inventory
Switzerland	CH INV	Included on Inventory
Taiwan	TCSI	Included on Inventory

Other Regulations
REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, as amended.

COMMISSION REGULATION (EU) 2020/878 of 18 June 2020 amending Annex II to Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). OJ L 203, 26.06.2020, as amended.

Regulation (EC) No 1272/2008 the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353,

31.12.2008, as amended.

SEVESO III: EU. Directive 2012/18/EU (SEVESO III) on major accident hazards involving dangerous substances, Annex I : Not covered.

15.2. Chemical safety assessment

A CSA does not need to be carried out for this product.

SECTION 16: Other information

Ensure all national/local regulations are observed.

Hazard Statements:
H220 Extremely flammable gas.
H221 Flammable gas.
H270 May cause or intensify fire; oxidiser.
H280 Contains gas under pressure; may explode if heated.
H319 Causes serious eye irritation.
H330 Fatal if inhaled.
H331 Toxic if inhaled.
H335 May cause respiratory irritation.
H360D May damage the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure.
H373 May cause damage to organs through prolonged or repeated exposure.
H400 Very toxic to aquatic life

Indication of Method:
Gases under pressure Compressed gas. Contains gas under pressure; may explode if heated. Calculation method

Abbreviations and acronyms:
ATE - Acute Toxicity Estimate
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
EINECS - European Inventory of Existing Commercial Chemical Substances
ELINCS - European List of Notified Chemical Substances
CAS# - Chemical Abstract Service number
PPE - Personal Protection Equipment
Kow - octanol-water partition coefficient
DNEL - Derived No Effect Level
LC50 - Lethal Concentration to 50 % of a test population
LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose)
NOEC - No Observed Effect Concentration
PNEC - Predicted No Effect Concentration
RMM - Risk Management Measure
OEL - Occupational Exposure Limit
PBT - Persistent, Bioaccumulative and Toxic
vPvB - Very Persistent and Very Bioaccumulative
STOT - Specific Target Organ Toxicity
CSA - Chemical Safety Assessment
EN - European Standard
UN - United Nations
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road

IATA - International Air Transport Association
IMDG - International Maritime Dangerous Goods
RID - Regulations concerning the International Carriage of Dangerous Goods by Rail
ADN - The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
WGK - Water Hazard Class

Key literature references and sources for data:
ECHA - Guidance on the compilation of safety data sheets
ECHA - Guidance on the application of the CLP Criteria
ECHA - Database of registered substances https://echa.europa.eu
3E database

Prepared by : Air Products and Chemicals, Inc. Global EH&S Department

For additional information, please visit our web site at http://www.airproducts.com

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws. COMMISSION REGULATION (EU) 2020/878 of 18 June 2020 amending Annex II to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

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