

Version 1.2 Revision Date 24.03.2020 Supercedes Version: 1.1 SDS Number 300000049530 Print Date 05.03.2022

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

1.1. Product identifier : G28.3B

Unique formula identifier : UFI: 8D5E-24D7-900A-CD2E

Refer to Section 3 for REACH information

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

Use of the : Industrial and professional use. Perform risk assessment prior to use.

Substance/Mixture

Restrictions on Use : Not for consumer use.

1.3. Details of the supplier of the safety data sheet

plier : Air Products Plc et 2 Millennium Gate Westmere Drive

> Crewe Cheshire

Email Address – Technical

Information

: GASTECH@airproducts.com

Telephone : +44(0)3457 020202

1.4. Emergency : +44(0)8085 020202

telephone number

NHS Direct in England or Wales 0845 46 47 or NHS 24 in Scotland 08454 24 24

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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Flammable gases - Category 1 H220:Extremely flammable gas.

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

2.2. Label elements

Hazard pictograms/symbols



Signal Word: Danger

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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 :Eliminate all ignition sources if safe to do so.

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

2.3. Other hazards

High pressure gas.

Can cause rapid suffocation.

Extremely flammable.

May form explosive mixtures in air.

Immediate fire and explosion hazard exists when mixed with air at concentrations exceeding the lower flammability limit (LFL).

High concentrations that can cause rapid suffocation are within the flammable range and should not be entered. Avoid breathing gas.

Self-contained breathing apparatus (SCBA) may be required.

Mixture does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

SECTION 3: Composition/information on ingredients

3.1. Substances : Not applicable.

3.2. Mixtures

Components	EINECS / ELINCS Number	CAS Number	Concentration
			(Volume)
Hydrogen	215-605-7	1333-74-0	10 %
Ethane	200-814-8	74-84-0	17 %
Nitrogen	231-783-9	7727-37-9	23 %
Methane	200-812-7	74-82-8	50 %

Components	Classification (CLP)	REACH Reg. #
Hydrogen	Flam. gas 1 ;H220 Press. Gas (Comp.) ;H280	*1
Ethane	Flam. gas 1 ;H220 Press. Gas (Liq.) ;H280	*1
Nitrogen	Press. Gas (Comp.) ;H280	*1
Methane	Flam. gas 1 ;H220 Press. Gas (Comp.) ;H280	*1

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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 : Remov

: 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. IF exposed or concerned: Get

medical advice/attention.

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

Inhalation : In case of shortness of breath, give oxygen. Move 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. Seek medical advice.

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 : If exposed or concerned: Get medical attention/advice.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

: Shutting off the source of the gas is the preferred method of control.

Be aware of the risk of formation of static electricity with the use of CO2

extinguishers and do not use them in places where a flammable atmosphere may

be present.

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

: Combustion by-products may be toxic. Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Keep containers and surroundings cool with water spray. Extinguish fire only if gas flow can be

stopped. If possible, shut off the source of gas and allow the fire to burn itself out.

Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. Move

away from container and cool with water from a protected position. Keep adjacent cylinders cool by spraying with large amounts of water until fire burns itself out. If flames are accidentally extinguished, explosive re-ignition may occur;

^{*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.

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therefore, appropriate measures should be taken (e.g. total evacuation to protect persons from cylinder fragments and toxic fumes should a rupture occur).

5.3. Advice for firefighters

In confined space use self-contained breathing apparatus. 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. Remove all sources of ignition. Never enter a confined space or other area where the flammable gas concentration is greater the 10% of its lower flammable limit. Ventilate the area.

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

: Ventilate the area. Approach suspected leak areas with caution.

Additional advice

: Increase ventilation to the release area and monitor concentrations. 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, safely vent the pressure, and purge with an inert gas before attempting repairs.

6.4. Reference to other sections

: For more information refer to Sections 8 & 13

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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

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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. Purge air from system before introducing gas. 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). Ensure equipment is adequately earthed.

7.2. Conditions for safe storage, including any incompatibilities

Containers should be stored in a purpose build compound which should be well ventilated, preferably in the open air. Observe all regulations and local requirements regarding storage of containers. Stored containers should be periodically checked for general condition and leakage. 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). Smoking should be prohibited within storage areas or while handling product or containers. Display "No Smoking or Open Flames" signs in the storage areas. The amounts of flammable or toxic gases in storage should be kept to a minimum. 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. All electrical equipment in the storage areas should be compatible with flammable materials stored. Containers containing flammable gases should be stored away from other combustible materials. Where necessary containers containing oxygen and oxidants should be separated from flammable gases by a fire resistant partition.

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

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

DNEL: Derived no effect level (Workers)

None available.

PNEC: predicted no effect concentration

None available.

8.2. Exposure controls

Engineering measures

Provide natural or explosion-proof ventilation that is adequate to ensure flammable gas does not reach its lower

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explosive limit.

Personal protective equipment

Respiratory protection : High concentrations that can cause rapid suffocation are within the flammable

range and should not be entered.

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.

: Consider the use of flame resistant anti-static safety clothing. Skin and body protection

Standard EN ISO 14116 - Limited flame spread materials.

Standard EN ISO 1149-5 - Protective clothing: Electrostatic properties.

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.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

(a/b) Physical state/Colour : Compressed gas. Colorless.

(c) Odour Not determined.

Mixture contains one or more component(s) which have the following odor: No (c) Odour

odor warning properties.

: 0.6817 (air = 1) Lighter or similar to air. (e) Relative Density

(f) Melting point / freezing point : No data available.

(h) Vapor pressure : No data available.

(i) Water solubility No data available.

(i) Partition coefficient: n-octanol/water [log Kow] Not known.

(k) pH : Not applicable for gases and gas mixtures.

(I) Viscosity : No reliable data available.

(m) Particle characteristics : Not applicable for gases and gas mixtures.

(n) Upper and lower explosion / : No data available.

flammability limits

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(o) Flash point : Not applicable for gases and gas mixtures.

(p) Autoignition temperature : Not known.

(q) Decomposition

temperature Not applicable.

9.2. Other information

Explosive properties : Not applicable.

Oxidizing properties : No data available.

Molecular Weight : 19.74 g/mol

Odor threshold : Odour threshold is subjective and inadequate to warn of overexposure.

: Not applicable for gases and gas mixtures. Evaporation rate

: Refer to product classification in Section 2 Flammability (solid, gas)

Upper flammability limit : Not determined. Lower flammability limit : Not determined.

Relative vapor density : No data available.

SECTION 10: Stability and reactivity

: No reactivity hazard other than the effects described in sub-sections below. 10.1. Reactivity

: Stable under normal conditions. 10.2. Chemical stability

10.3. Possibility of hazardous

reactions

: No data available.

10.4. Conditions to avoid : Heat, flames and sparks. May form explosive mixtures with air and oxidizing

agents.

10.5. Incompatible materials : Oxygen.

Oxidizing agents.

10.6. Hazardous

: Incomplete combustion may form carbon monoxide. decomposition products

Under normal conditions of storage and use, hazardous decomposition products

should not be produced.

SECTION 11: Toxicological information

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11.1. Information on toxicological effects

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 Inhalation may cause central nervous system effects. In high concentrations

may cause asphyxiation. Symptoms may include loss of

mobility/consciousness. Victim may not be aware of 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.

Exposure to oxygen deficient atmosphere may cause the following **Symptoms**

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.

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

: No data available. Carcinogenicity

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.

SECTION 12: Ecological information

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12.1. Toxicity

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

Toxicity to fish - Components

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

Toxicity to daphnia - Components

Methane EC50 (48 h): 69.4 mg/l Species: Daphnia

magna.

Toxicity to algae - Components

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

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

organisms

12.2. Persistence and degradability

No data available.

12.3. Bioaccumulative potential

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

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. 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

Hydrogen : 6 Ethane : 6 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. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Refer to the EIGA code of practice Doc. 30

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"Disposal of Gases", downloadable at http://www.eiga.org for more guidance on suitable disposal methods. List of hazardous waste codes: 16 05 04*: gases in pressure containers (including halons) containing hazardous substances.

Contaminated packaging : Return cylinder to supplier.

SECTION 14: Transport information

14.1. UN number

UN/ID No. : UN1954

14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : COMPRESSED GAS, FLAMMABLE, N.O.S., (Methane, Ethane)

Transport by air (ICAO-TI / IATA-DGR) : Compressed gas, flammable, n.o.s., (Methane, Ethane)

Transport by sea (IMDG) : COMPRESSED GAS, FLAMMABLE, N.O.S., (Methane, Ethane)

14.3. Transport hazard class(es)

Label(s) : 2.1

Transport by road/rail (ADR/RID)

Class or Division : 2
ADR/RID Hazard ID no. : 23
Tunnel Code : (B/D)

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

Class or Division : 2.1

Transport by sea (IMDG)

Class or Division : 2.1

14.4. Packing group

Transport by road/rail (ADR/RID) : 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 (ADR/RID)

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 forbidden

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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. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable.

SECTION 15: Regulatory information

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

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on Inventory.
Canada	DSL	Included on Inventory.
Australia	AICS	Included on Inventory.
Japan	ENCS	Included on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.
Philippines	PICCS	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.

COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

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.

Control of Substances Hazardous to Health Regulations 2002 (as amended)

Health and Safety at Work etc. Act 1974

Management of Health and Safety at Work Regulations (Northern Ireland) 2000 c.388, and as amended

Management of Health and Safety at Work Regulations 1999 (S.I. number 3242)

The Health and Safety at Work etc. Act 1974 (Application to

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Environmentally Hazardous Substances) Regulations 2002 (England and Wales and Scotland) 11 March 2002 c.282, and as amended

Health and Safety at Work Order (Application to Environmentally Hazardous Substances) Regulations (Northern Ireland) 2003 (Northern Ireland) 14 March 2003 c52, and as amended

The Control of Major Accident Hazards Regulations 2015 c483

The Control of Major Accident Hazards Regulations (Northern Ireland) 2015 c325

The Pressure Systems Safety Regulations 2000 (S.I. number 128) link to Pressure Equipment Directive (97/23/EC)

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2011 c1885, and as amended

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations with amendments (Northern Ireland) 2011 c365

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 c.407

The Water Environment Regulations (Northern Ireland) 2017 c.81

Pollution Prevention and Control Act 1999 c.24

The Fluorinated Greenhouse Gases Regulations 2015 c.310

The Fluorinated Greenhouse Gases Regulations (Northern Ireland) 2015 c.425

The Acetylene Safety (England and Wales and Scotland) Regulations 2014 c.1639

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972 c.917

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations (Northern Ireland) 1975 c.256

Dangerous Substances and Explosive Atmospheres Regulations (Northern Ireland) 2003 c.152

The Dangerous Substances and Explosive Atmospheres Regulations 2002 c.2776

Pollution Prevention and Control Act 1999

The Environmental Permitting (England and Wales) Regulations 2016

Ozone Depleting Substances Regulations 2015

15.2. Chemical safety assessment

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

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SECTION 16: Other information

Ensure all national/local regulations are observed.

Hazard Statements:

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

Indication of Method:

Flammable gases Category 1 Extremely flammable gas. Calculation 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

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

ARIEL database

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

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

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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) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Details given in this document are believed to be correct at the time of going to press. 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.