

SAFETY DATA SHEET

Version 2.1
Revision Date 11.12.2023
Supersedes Version: 2.0

SDS Number 300000077442
Print Date 15.08.2025

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

1.1. Product identifier : Hobbybrew® Carbon Dioxide

CAS No. : 124-38-9

Chemical formula : CO₂

Synonyms : Carbonic Anhydride, Carbonic Acid Gas

REACH Registration Number: Listed in Annex IV / V REACH, exempted from registration.

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

Use of the Substance/Mixture : Food Industries. Perform risk assessment prior to use.

Restrictions on Use : Not for consumer use.

1.3. Details of the supplier of the safety data sheet : Gas Direct Ltd
Newbiggin Lane, Westerhope
Newcastle upon Tyne
NE5 1LX

Email Address – Technical Information : ordergd@gasdirect.co.uk

Telephone : Tel Nr. +44 (0) 330 123 3230

1.4. Emergency telephone number : +44 (0) 8085 020202
Call NHS, 111 for free from a landline or mobile phone

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

2.2. Label elements

Hazard pictograms/symbols

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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

May increase respiration and heart rate.

Can cause rapid suffocation.

Compressed liquefied gas.

Direct contact with liquid can cause frostbite.

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

SECTION 3: Composition/information on ingredients

3.1. Substances

Components	EC number	CAS Number	Concentration (Weight)
Carbon dioxide	204-696-9	124-38-9	100 %

Components	Classification (CLP)	REACH Reg. No.
Carbon dioxide	Press. Gas (Liq.) ;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.

Specific concentration limits, M-factors and ATEs are not applicable for components of this product.

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

3.2. Mixtures : Not applicable.

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 the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

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Keep eye wide open while rinsing. Seek medical advice.

- Skin contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Seek medical advice. Wash frost-bitten areas with plenty of water. Do not remove clothing. Cover wound with sterile dressing.
- Ingestion : Ingestion is not considered a potential route of exposure.
- Inhalation : 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. In case of shortness of breath, give oxygen.

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

- Symptoms : Shivering fit. Sweating. Blurred vision. Headache. Increased pulse rate. Shortness of breath. Rapid respiration. Frostbite. 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 : 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. If possible, stop flow of product. Keep adjacent cylinders cool by spraying with large amounts of water until the fire burns itself out.

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

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

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- 6.2. Environmental precautions : Should not be released into the environment. Do not discharge into any place where its accumulation could be dangerous. Prevent further leakage or spillage. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
- 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, 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.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 50°C (122°F). 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. 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). Never attempt to increase liquid withdrawal rate by pressurizing the container without first checking with the supplier. Never permit liquefied gas to become trapped in parts of the system as this may result in hydraulic rupture.

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 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. 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

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should be stored in a purpose build compound which should be well ventilated, preferably in the open air. 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 with 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)

Carbon dioxide	Time Weighted Average (TWA)	5,000 ppm	9,150 mg/m3	UK. EH40 Workplace Exposure Limits (WELs), as amended
Carbon dioxide	Short Term Exposure Limit (STEL)	15,000 ppm	27,400 mg/m3	UK. EH40 Workplace Exposure Limits (WELs), as amended
Carbon dioxide	Time Weighted Average (TWA)	5,000 ppm	9,000 mg/m3	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended

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 mechanical ventilation to prevent accumulation above exposure limits.
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.
Wear cold insulating gloves when transfilling or breaking transfer connections.
Standard EN 511 - Cold insulating gloves.

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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.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

(a) Physical state	: Gaseous. Liquefied gas.
(b) Colour	: Colorless.
(c) Odour	: No odor warning properties. Odour threshold is subjective and inadequate to warn of overexposure.
(d) Melting point/freezing point	: -56.6 °C (-70 °F)
(e) Boiling point/range	: Not applicable.
(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	: 3.7
(l) Kinematic viscosity	: 0.047 mm ² /s
(m) Water solubility [20°C]	: 2.000 g/l
(n) Partition coefficient n-octanol/water (log value)	: 0.83
(o) Vapour pressure	: 57,300 hPa at 20 °C
(p) Density and/or relative density	: 0.0018 g/cm ³ at 21 °C 0.82 (water = 1)
(q) Relative vapour density	: 1.5197 (air = 1) Heavier than air.

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(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.

Critical temperature : 31.05 °C (88 °F)

Molar mass : 44.01 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 : Direct sources of heat.

10.5. Incompatible materials : Bases.
Powdered metals.

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

Likely routes of exposure

Effects on Eye : Contact with liquid may cause cold burns/frostbite.

Effects on Skin : Contact with liquid may cause cold burns/frostbite.

Inhalation Effects : Concentrations of 10% CO₂ or more can produce unconsciousness or death. Unlike simple asphyxiants, carbon dioxide has the ability to cause death even when normal oxygen levels (20-21%) are maintained. Carbon Dioxide is physiologically active, affecting circulation and breathing. At concentrations between 2 and 10%, carbon dioxide can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. 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.

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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. Shivering fit. Sweating. Blurred vision. Headache. Increased pulse rate. Shortness of breath. Rapid respiration. Frostbite.

Acute toxicity

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

Acute Inhalation Toxicity : Unlike simple asphyxiants, carbon dioxide has the ability to cause death even when normal oxygen levels (20-21%) are maintained. 5% CO₂ has been found to act synergistically to increase the toxicity of certain other gases (CO, NO₂). CO₂ has been shown to enhance the production of carboxy- or met-hemoglobin by these gases possibly due to carbon dioxide's stimulatory effects on the respiratory and circulatory systems.

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.

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Toxicity to fish - Components

Carbon dioxide

LC50 (1 h) : 240 mg/l

Species : Rainbow trout (Oncorhynchus mykiss).

Carbon dioxide

LC50 (96 h) : 35 mg/l

Species : Rainbow trout (Oncorhynchus mykiss).

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)".

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

When discharged in large quantities may contribute to the greenhouse effect.

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	:	1

SECTION 13: Disposal considerations

13.1. Waste treatment methods : Contact supplier if guidance is required. 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.

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SECTION 14: Transport information

14.1. UN number or ID number

UN/ID No. : UN1013

14.2. UN proper shipping name

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

Transport by air (ICAO-TI / IATA-DGR) : Carbon dioxide

Transport by sea (IMDG) : CARBON DIOXIDE

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 : (C/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

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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

The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019 No. 2019/758

The REACH etc. (Amendment etc.) (EU Exit) (No. 2) Regulations 2019 No. 2019/858

The REACH etc. (Amendment etc.) (EU Exit) (No. 3) Regulations 2019 No. 2019/1144

The REACH etc. (Amendment etc.) (EU Exit) Regulations 2020 No. 2020/1577

The REACH etc. (Amendment) Regulations 2021 No. 2021/904

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 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

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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

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.

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Hazard Statements:

H280 Contains gas under pressure; may explode if heated.

Indication of Method:

Gases under pressure Liquefied 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).

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.

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