

G4-QUAD-1-34**G4-QUAD-1-34**

2.2 : Non-flammable, non-toxic gases

Warning**SECTION 1. Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**Trade name : G4-QUAD-1-34
SDS Nr : G4-QUAD-1-34**1.2. Relevant identified uses of the substance or mixture and uses advised against**Relevant identified uses : Industrial and professional. Perform risk assessment prior to use.
Test gas/Calibration gas. Laboratory use. Contact supplier for more information on uses.**1.3. Details of the supplier of the safety data sheet**Company identification : Scientific and Technical Gases Ltd
Units 1 + 2 Speedwell Road
Parkhouse Industrial Estate
ST5 7RG Newcastle Under Lyme, Staffordshire UNITED KINGDOM
Fax: +44 (0) 1782 564 906
Web: www.stgas.eu
Email: info@stgas.eu (Not 24 Hours)**1.4. Emergency telephone number**

Emergency telephone number : Tel 24hr: +44 (0) 870 190 6777

SECTION 2. Hazards identification**2.1. Classification of the substance or mixture****Hazard Class and Category Code Regulation EC 1272/2008 (CLP)**

• Physical hazards : Gases under pressure - Compressed gas - Warning - (CLP : Press. Gas) - H280

Classification EC 67/548 or EC 1999/45

: Not classified as dangerous substance / mixture.

2.2. Label elements**Labelling Regulation EC 1272/2008 (CLP)**

• Hazard pictograms

• Hazard pictograms code : GHS04
• Signal word : Warning
• Hazard statements : H280 - Contains gas under pressure; may explode if heated.
• Precautionary statements**Scientific and Technical Gases Ltd**

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SECTION 2. Hazards identification (continued)

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

2.3. Other hazards

: None.

SECTION 3. Composition/information on ingredients

3.1. Substance / 3.2. Mixture

Mixture.

Substance name	Contents	CAS No EC No Index No Registration no	Classification(DSD)	Classification(CLP)
Hydrogen sulphide	: 0.0015 %	7783-06-4 231-977-3 016-001-00-4 * 2	F+; R12 T+; R26 N; R50	Acute Tox. 2 (H330) Flam. Gas 1 (H220) Repr. 1 (H360) Press. Gas Liquefied (H280) Aquatic Acute 1 (H400)
Carbon monoxide	: 0.01 %	630-08-0 211-128-3 006-001-00-2 01-2119480165-39-	F+; R12 Repr. Cat. 1; R61 T; R23-48/23	Flam. Gas 1 (H220) Repr. 1A (H360D) Acute Tox. 3 (H331) STOT RE 1 (H372) Press. Gas Compressed (H280)
Methane	: 2.2 %	74-82-8 200-812-7 601-001-00-4 * 1	F+; R12	Flam. Gas 1 (H220) Press. Gas Compressed (H280)
Oxygen	: 18 %	7782-44-7 231-956-9 008-001-00-8 * 1	O; R8	Ox. Gas 1 (H270) Press. Gas Compressed (H280)
Nitrogen	: 79.7885 %	7727-37-9 231-783-9 ----- *1	Not classified (DSD)	Press. Gas Compressed (H280)

Contains no other components or impurities which will influence the classification of the product.

* 1: Listed in Annex IV / V REACH, exempted from registration.

* 2: Registration deadline not expired.

* 3: Registration not required: Substance manufactured or imported < 1t/y.

Full text of R-phrases see section 16. Full text of H-statements see section 16.

SECTION 4. First aid measures

4.1. Description of first aid measures

- Inhalation : Adverse effects not expected from this product.
- Skin contact : Adverse effects not expected from this product.
- Eye contact : Adverse effects not expected from this product.
- Ingestion : Ingestion is not considered a potential route of exposure.

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

: No effect on living tissue.
Refer to section 11.

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

: None.

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SECTION 5. Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Water spray or fog.
- Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

- Specific hazards : Supports combustion.
Exposure to fire may cause containers to rupture/explode.

5.3. Advice for fire-fighters

- Specific methods : If possible, stop flow of product.
Use fire control measures appropriate for the surrounding fire.
Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles 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.

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

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- : Try to stop release.

6.2. Environmental precautions

- : None.

6.3. Methods and material for containment and cleaning up

- : None.

6.4. Reference to other sections

- : See also sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

- Safe use of the product : Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Only experienced and properly instructed persons should handle gases under pressure. The substance must be handled in accordance with good industrial hygiene and safety procedures.
Do not smoke while handling product.
Ensure the complete gas system was (or is regularly) checked for leaks before use.
Consider pressure relief device(s) in gas installations.

- Safe handling of the gas receptacle : Refer to supplier's container handling instructions.
Do not allow backfeed into the container.
Protect cylinders from physical damage; do not drag, roll, slide or drop.
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.
If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.
Never attempt to repair or modify container valves or safety relief devices.
Damaged valves should be reported immediately to the supplier.

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SECTION 7. Handling and storage (continued)

Keep container valve outlets clean and free from contaminants particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another.
Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.
Containers should be stored in the vertical position and properly secured to prevent toppling.

7.2. Conditions for safe storage, including any incompatibilities

: Keep container below 50°C in a well ventilated place.
Observe all regulations and local requirements regarding storage of containers.
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.
Stored containers should be periodically checked for general condition 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 materials.

7.3. Specific end use(s)

: None.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure Limits

Carbon monoxide

: TLV© -TWA [ppm] : 25
: LTEL - UK [mg/m³] : 35
: LTEL - UK [ppm] : 30
: STEL - UK [mg/m³] : 232
: STEL - UK [ppm] : 200
: VME - France [mg/m³] : 55
: VME - France [ppm] : 50
: MAK (AU) Tagesmittelwert (ml/m³) : 30
: MAK (AU) Tagesmittelwert (mg/m³) : 33
: MAK (AU) Kurzzeitwerte (ml/m³) : 60
: MAK (AU) Kurzzeitwerte (mg/m³) : 66
: VLA-ED - Spain [ppm] : 25
: VLA-ED - Spain [mg/m³] : 29
: NGV - [ppm] : 35
: NGV - [mg/m³] : 40
: KTV - [ppm] : 100
: KTV - [mg/m³] : 120
: Grænserværdier (DK) (ppm) : 25
: HTP-vården (FI) - 8 H - [ppm] : 30
: HTP-vården (FI) - 8 H - [mg/m³] : 35
: HTP-vården - 15min - [ppm] : 75
: Grænserværdier (DK) mg/m³ : 29
: HTP-vården - 15min - [mg/m³] : 87
: Grenseverdi (NO) 8 timers [ppm] : 25
: Grenseverdi (NO) 8 timers [mg/m³] : 29
: TGG 8 uur (NL) (mg/m³) : 29

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SECTION 8. Exposure controls/personal protection (continued)

: VLE-CH [mg/m³] : 35
 : VLE-CH [ppm] : 30
 : VME-CH [mg/m³] : 35
 : 8-Hour TWA (PL) (NDS) (mg/m³) : 23
 : 15-Minute STEL (PL)(NDSCh) (mg/m³) : 117
 : Value 8h (CZ) [mg/m³] : 30
 : TLV-TWA (Belgium) (ppm) : 25
 : TWA BE 8h [mg/m³] : 29
 : Value 15min. (CZ) [mg/m³] : 150
 : Valoare limita maxima (RO) 8 ore [mg/m³] : 20
 : Valoare limita maxima (RO) 8 ore [ppm] : 17.5
 : Valoare limita maxima (RO) Termen scurt 15min [mg/m³] : 30
 : Valoare limita maxima (RO) Termen scurt 15min [ppm] : 26
 : TWA LT 8h [ppm] : 35
 : TWA LT 8h [mg/m³] : 40
 : STEL LT 15min [ppm] : 100
 : STEL LT 15min [mg/m³] : 120
 : TWA BG 8h [mg/m³] : 40
 : STEL BG 15min [mg/m³] : 200
 : TWA EE 8h [ppm] : 20
 : TWA EE 8h [mg/m³] : 25
 : STEL EE 15min [ppm] : 100
 : STEL EE 15min [mg/m³] : 120
 : HTP-värden (FI) - 8 H - [ppm] : 1000
 : VME-CH [mg/m³] : 6700
 : TLV-TWA (Belgium) (ppm) : 1000
 : Valoare limita maxima (RO) 8 ore [mg/m³] : 1200
 : Valoare limita maxima (RO) 8 ore [ppm] : 1834
 : Valoare limita maxima (RO) Termen scurt 15min [mg/m³] : 1500
 : Valoare limita maxima (RO) Termen scurt 15min [ppm] : 2292
 : TWA BG 8h [mg/m³] : 500
 : TLV[©]-TWA [ppm] : 1
 : TLV[©]-STEL [ppm] : 5
 : ILV (EU) - 8 H - [mg/m³] : 7
 : ILV (EU) - 8 H - [ppm] : 5
 : ILV (EU) - 15 min - [mg/m³] : 14
 : ILV (EU) - 15 min - [ppm] : 10
 : LTEL - UK [mg/m³] : 7
 : LTEL - UK [ppm] : 5
 : STEL - UK [mg/m³] : 14
 : STEL - UK [ppm] : 10
 : VLE - France [mg/m³] : 14
 : VLE - France [ppm] : 10
 : VME - France [mg/m³] : 7
 : VME - France [ppm] : 5
 : AGW (8h) - Germany [mg/m³] TRGS 900 : 7.1
 : AGW (8h) - Germany [ppm] TRGS 900 : 5
 : Exceeding factor AGW - Germany TRGS 900 : 2
 : MAK (AU) Tagesmittelwert (ml/m³) : 5

Methane

Hydrogen sulphide

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SECTION 8. Exposure controls/personal protection (continued)

: MAK (AU) Tagesmittelwert (mg/m³) : 7
 : MAK (AU) Kurzzeitwerte (ml/m³) : 5
 : MAK (AU) Kurzzeitwerte (mg/m³) : 7
 : VLA-ED - Spain [ppm] : 5
 : VLA-ED - Spain [mg/m³] : 7
 : VLA-EC - Spain [ppm] : 10
 : VLA-EC - Spain [mg/m³] : 14
 : HTP-värden (FI) - 8 H - [ppm] : 5
 : HTP-värden (FI) - 8 H - [mg/m³] : 7
 : HTP-värden - 15min - [ppm] : 10
 : HTP-värden - 15min - [mg/m³] : 14
 : Grenseverdi (NO) Max Kons. [mg/m³] : 15
 : Grenseverdi (NO) Max Kons. [ppm] : 10
 : TGG 8 uur (NL) (mg/m³) : 2.3
 : VLE-CH [mg/m³] : 14.2
 : VLE-CH [ppm] : 10
 : VME-CH [mg/m³] : 7.1
 : VME-CH [ppm] : 5
 : 8-Hour TWA (PL) (NDS) (mg/m³) : 7
 : 15-Minute STEL (PL)(NDSch) (mg/m³) : 14
 : TGV - [mg/m³] : 20
 : TGV - [ppm] : 15
 : Valori Limite di Soglia (IT) 8 ore [ppm] : 5
 : Valori Limite di Soglia (IT) 8 ore [mg/m³] : 7
 : Valori Limite di Soglia (IT) Breve Term [ppm] : 10
 : Valori Limite di Soglia (IT) Breve Termine [mg/m³] : 14
 : TLV-TWA (Belgium) (ppm) : 5
 : TWA BE 8h [mg/m³] : 7
 : TLV-STEL (Belgium) (ppm) : 10
 : STEL BE 15min [mg/m³] : 14
 : Value 8h (CZ) [ppm] : 7.2
 : Value 8h (CZ) [mg/m³] : 10
 : Value 15min. (CZ) [ppm] : 14.4
 : Value 15min. (CZ) [mg/m³] : 20
 : ÁK-érték (HU) 8h [mg/m³] : 7
 : CK-érték (HU) 15min [mg/m³] : 14
 : TWA LT 8h [ppm] : 5
 : TWA LT 8h [mg/m³] : 7
 : STEL LT 15min [ppm] : 10
 : STEL LT 15min [mg/m³] : 14
 : TWA BG 8h [mg/m³] : 14
 : STEL BG 15min [mg/m³] : 21
 : TWA EE 8h [ppm] : 5
 : TWA EE 8h [mg/m³] : 7
 : STEL EE 15min [ppm] : 10
 : STEL EE 15min [mg/m³] : 14
 : TWA GR 8h [ppm] : 10
 : TWA GR 8h [mg/m³] : 15
 : STEL GR 15min [ppm] : 15

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: STEL GR 15min [mg/m³] : 21
: STEL-POR 15min [ppm] : 15
: TWA-POR 8h [ppm] : 10
: OEL (IE)-(8-hour reference period) [ppm] : 5
: OEL (IE)-(15min reference period) [ppm] : 10
: OEL (IE)-LTEL [mg/m³] : 7
: OEL (IE)-(15min reference period) [mg/m³] : 14
: TWA SL 8h [ppm] : 5
: TWA SL 8h [mg/m³] : 7
: TWA IS 8h [ppm] : 10
: TWA IS 8h [mg/m³] : 14
: Pakgildi [ppm] : 15
: STEL IS 15min [mg/m³] : 20
: Value 8h (SK) [ppm] : 10
: Value 8h (SK) [mg/m³] : 14

DNEL: Derived no effect level (Workers)**Carbon monoxide**

: Inhalation-short term (local) [ppm] : 100
: Inhalation-short term (systemic) [ppm] : 100
: Inhalation-long term (local) [ppm] : 20
: Inhalation-long term (systemic) [ppm] : 20

DMEL: Derived minimum effect level (Workers)

: No data available.

PNEC: Predicted no effect concentration

: No data available.

8.2. Exposure controls**8.2.1. Appropriate engineering controls**

: 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.

8.2.2. Individual protection measures, e.g. personal protective equipment

: 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:
PPE compliant to the recommended EN/ISO standards should be selected.

• Eye/face protection

: Wear safety glasses with side shields.
Standard EN 166 - Personal eye-protection.

• Skin protection**- Hand protection**

: Wear working gloves when handling gas containers.
Standard EN 388 - Protective gloves against mechanical risk.

- Other

: Wear safety shoes while handling containers.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

• Respiratory protection

: Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

• Thermal hazards

: None necessary.

8.2.3. Environmental exposure controls

: None necessary.

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SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	
Physical state at 20°C / 101.3kPa	: Gas.
Colour	: Mixture contains one or more component(s) which have the following colour(s): Colourless.
Odour	: There may be no odour warning properties, odour is subjective and inadequate to warn of overexposure. Mixture contains one or more component(s) which have the following odour(s): Odourless. Rotten eggs.
Odour threshold	: Odour threshold is subjective and inadequate to warn for overexposure.
pH value	: Not applicable for gas-mixtures.
Molar mass [g/mol]	: Not applicable for gas-mixtures.
Melting point [°C]	: Not applicable for gas-mixtures.
Boiling point [°C]	: Not applicable for gas-mixtures.
Flash point [°C]	: Not applicable for gas-mixtures.
Evaporation rate (ether=1)	: Not applicable for gas-mixtures.
Flammability range [vol% in air]	: Not applicable for gas-mixtures.
Vapour pressure [20°C]	: Not applicable.
Relative density, gas (air=1)	: Lighter or similar to air.
Solubility in water [mg/l]	: Solubility in water of component(s) of the mixture : • Nitrogen : 20 • Oxygen : 39 • Methane : 26 • Carbon monoxide : 30 • Hydrogen sulphide : 3980
Partition coefficient n-octanol/water [log Kow]	: Not applicable for gas-mixtures.
Viscosity at 20°C [mPa.s]	: Not applicable.
Explosive Properties	: Not applicable.
Oxidising Properties	: None.

9.2. Other information

Other data : 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

: None.

10.4. Conditions to avoid

: None.

10.5. Incompatible materials

: None.

10.6. Hazardous decomposition products

: None.

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SECTION 11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: No toxicological effects from this product.
Rat inhalation LC50 [ppm/4h]	: • Carbon monoxide : 1880 • Hydrogen sulphide : 356
Skin corrosion/irritation	: No known effects from this product.
Serious eye damage/irritation	: No known effects from this product.
Respiratory or skin sensitisation	: No known effects from this product.
Carcinogenicity	: No known effects from this product.
Germ cell mutagenicity	: No known effects from this product.
Toxic for reproduction : Fertility	: No known effects from this product.
Toxic for reproduction : unborn child	: No known effects from this product.
STOT-single exposure	: No known effects from this product.
STOT-repeated exposure	: No known effects from this product.
Aspiration hazard	: Not applicable for gases and gas-mixtures.

SECTION 12. Ecological information

12.1. Toxicity

	: No ecological damage caused by this product.
EC50 48h - Daphnia magna [mg/l]	: • Methane : 69.4 • Carbon monoxide : Study scientifically unjustified. • Hydrogen sulphide : 0.12
EC50 72h Algae [mg/l]	: • Methane : 19.4 • Carbon monoxide : Study scientifically unjustified. • Hydrogen sulphide : 1.87
LC50-96 h - fish [mg/l]	: • Methane : 147.5 • Carbon monoxide : Study scientifically unjustified. • Hydrogen sulphide : 0.007 - 0.019

12.2. Persistence and degradability

: No data available.

12.3. Bioaccumulative potential

: No data available.

12.4. Mobility in soil

: No data available.

12.5. Results of PBT and vPvB assessment

: Not classified as PBT or vPvB.

12.6. Other adverse effects

Effect on ozone layer	: None.
Effect on the global warming	: Contains greenhouse gas(es) not covered by 842/2006/EC.

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: May be vented to atmosphere.
Do not discharge into any place where its accumulation could be dangerous.
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.
Contact supplier if guidance is required.

: 16 05 05: Gases in pressure containers other than those mentioned in 16 05 04.

List of hazardous wastes

13.2. Additional information

: None.

SECTION 14. Transport information

UN number : 1956
Labelling ADR, IMDG, IATA



: 2.2 : Non-flammable, non-toxic gases

Land transport (ADR/RID)

H.I. nr : 20
UN proper shipping name : COMPRESSED GAS, N.O.S. (Nitrogen, Oxygen)
Transport hazard class(es) : 2
Classification code : 1 A
Packing Instruction(s) : P200
Tunnel Restriction : E : Passage forbidden through tunnels of category E.
Environmental hazards : None.

Sea transport (IMDG)

Proper shipping name : COMPRESSED GAS, N.O.S. (Nitrogen, Oxygen)
Class : 2.2
Emergency Schedule (EmS) - Fire : F-C
Emergency Schedule (EmS) - Spillage : S-V
Packing instruction : P200
IMDG-Marine pollutant : No

Air transport (ICAO-TI / IATA-DGR)

Proper shipping name (IATA) : COMPRESSED GAS, N.O.S. (Nitrogen, Oxygen)
Class : 2.2
Passenger and Cargo Aircraft :
Packing instruction - Passenger and Cargo Aircraft : 200
Cargo Aircraft only :
Packing instruction - Cargo Aircraft only : 200

Special precautions for user

: 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.

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- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.

SECTION 15. Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**EU legislation

Seveso directive 96/82/EC : Not covered.

National legislation

National legislation : Ensure all national/local regulations are observed.

15.2. Chemical safety assessment

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

SECTION 16. Other information**Indication of changes** : Revised safety data sheet in accordance with commission regulation (EU) No 453/2010.**Training advice** : Receptacle under pressure.**List of full text of R-phrases in section 3.** : R8 : Contact with combustible material may cause fire.
R12 : Extremely flammable.

R23 : Toxic by inhalation.

R26 : Very toxic by inhalation.

R48/23 : Toxic : danger of serious damage to health by prolonged exposure through inhalation.

R50 : Very toxic to aquatic organisms.

R61 : May cause harm to the unborn child.

List of full text of H-statements in section 3. : - 20

H220 - Extremely flammable gas.

H270 - May cause or intensify fire; oxidiser.

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

H330 - Fatal if inhaled.

H331 - Toxic if inhaled.

H360D - May damage fertility or the unborn child.

H372 - Causes damage to organs through prolonged or repeated exposure.

H400 - Very toxic to aquatic life.

Further information : Classification in accordance with calculation methods of regulation (EC) 1272/2008 CLP / (EC) 1999/45 DPD.

This Safety Data Sheet has been established in accordance with the applicable European Union legislation.

DISCLAIMER OF LIABILITY : Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

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.

End of document**Scientific and Technical Gases Ltd**

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