



CH4 0,01 %;C2H6 0,01 %;C3H8 0,01 %;C4H10 0,01 %;C4H10 0,01 %;He 99,95 % in Minican

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

1.1 Product identifier

Product name: CH4 0,01 %;C2H6 0,01 %;C3H8 0,01 %;C4H10 0,01 %;C4H10 0,01 %;He 99,95

% in Minican

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

Identified uses: Industrial and professional. Perform risk assessment prior to use.

Uses advised against Consumer use.

1.3 Details of the supplier of the safety data sheet

Supplier

Linde Gas GmbH Telephone: +43 50 4273

Carl-von-Linde-Platz 1 A-4651 Stadl-Paura

E-mail: office@at.linde-gas.com

1.4 Emergency telephone number: Emergency number Linde: + 43 50 4273 (during business hours), Poisoning Information

Center: +43 1 406 43 43

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

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

Not classified

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

Physical Hazards

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

heated.

2.2 Label Elements



Signal Words: Warning

Hazard Statement(s): H280: Contains gas under pressure; may explode if heated.





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Precautionary Statement

Prevention: None.

Response: None.

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

Disposal: None.

Supplemental label information

EIGA-As: Asphyxiant in high concentrations.

2.3 Other hazards: None.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical name	Chemical formula	Concentration	CAS-No.	EC No.	REACH Registration No.	Notes
butane	C4H10	100PPM	106-97-8	203-448-7	01-2119474691-32	#
methane	CH4	100PPM	74-82-8	200-812-7	01-2119474442-39	
ethane	C2H6	100PPM	74-84-0	200-814-8	01-2119486765-21	
propane	C3H8	100PPM	74-98-6	200-827-9	01-2119486944-21	#
Helium	Не	99,9500%	7440-59-7	231-168-5	Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.	
Isobutane	C4H10	100PPM	75-28-5	200-857-2	01-2119485395-27	#

The concentrations of the components in the SDS header, product name on page one and in section 3.2 are in mol due to regulatory requirements. All concentrations are nominal.

[#] This substance has workplace exposure limit(s).

 $PBT: persistent, \, bioaccumulative \, and \, toxic \, substance.$

vPvB: very persistent and very bioaccumulative substance.





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Classification

Chemical name	Classificat	ion	Notes
butane	DSD:	F+; R12	
	CLP:	Flam. Gas 1;H220, Press. Gas Liquef. Gas;H280	
methane	DSD:	F+; R12	
	CLP:	Flam. Gas 1;H220, Press. Gas Compr. Gas;H280	Note U
ethane	DSD:	F+; R12	
	CLP:	Flam. Gas 1;H220, Press. Gas Liquef. Gas;H280	
propane	DSD:	F+; R12	
	CLP:	Flam. Gas 1;H220, Press. Gas Liquef. Gas;H280	
Helium	DSD:	none	
	CLP:	Press. Gas Compr. Gas;H280	
Isobutane	DSD:	F+; R12	
	CLP:	Flam. Gas 1;H220, Press. Gas Liquef. Gas;H280	

DSD: Directive 67/548/EEC.

CLP: Regulation No. 1272/2008.

Note U. When put on the market gases have to be classified as 'Gases under pressure', in one of the groups compressed gas, liquefied gas, refrigerated liquefied gas or dissolved gas. The group depends on the physical state in which the gas is packaged and therefore has to be assigned case by case.

The full text for all R-phrases and H-statements is displayed in section 16.

SECTION 4: First aid measures

General: In high concentrations may cause asphyxiation. Symptoms may include loss of

mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

4.1 Description of first aid measures

In high concentrations may cause asphyxiation. Symptoms may include loss of

mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

Eye contact: Adverse effects not expected from this product.

Skin 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:

Respiratory arrest.





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4.3 Indication of any immediate medical attention and special treatment needed

Hazards: None.

Treatment: None.

SECTION 5: Firefighting measures

General Fire Hazards: Heat may cause the containers to explode.

5.1 Extinguishing media

Suitable extinguishing media: Material will not burn. In case of fire in the surroundings: use appropriate

extinguishing agent.

Unsuitable extinguishing

media:

None.

5.2 Special hazards arising from the

substance or mixture:

None.

Hazardous Combustion Products: None.

5.3 Advice for firefighters

Special fire fighting

procedures:

In case of fire: Stop leak if safe to do so. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate

the source of the fire or let it burn out.

Special protective equipment

for fire-fighters:

Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Guideline: EN 469 Protective clothing for firefighters. Performance requirements for protective clothing for firefighting. EN 15090 Footwear for firefighters. EN 659 Protective gloves for firefighters. EN 443 Helmets for fire fighting in buildings and other structures. EN 137 Respiratory protective devices - Self-contained opencircuit compressed air breathing apparatus with full face mask - Requirements,

testing, marking.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures: Evacuate area. Provide adequate ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Guideline EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

6.2 Environmental Precautions: Prevent further leakage or spillage if safe to do so.

6.3 Methods and material for containment and cleaning up:

Provide adequate ventilation.





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6.4 Reference to other sections: Refer to sections 8 and 13.

SECTION 7: Handling and storage:

7.1 Precautions for safe handling:

Only experienced and properly instructed persons should handle gases under pressure. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Secure cylinders in an upright position at all times, close all valves when not in use. Provide adequate ventilation. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Avoid suckback of water, acid and alkalis. Keep container below 50°C in a well ventilated place. Observe all regulations and local requirements regarding storage of containers. When using do not eat, drink or smoke. Store in accordance with local/regional/national/international regulations. Never use direct flame or electrical heating devices to raise the pressure of a container. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Damaged valves should be reported immediately to the supplier Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Keep container valve outlets clean and free from contaminates particularly oil and water. If user experiences any difficulty operating container valve discontinue use and contact supplier. Never attempt to transfer gases from one container to another. Container valve guards or caps should be in place.

7.2 Conditions for safe storage, including any incompatibilities:

Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible material.

7.3 Specific end use(s): None.





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SECTION 8: Exposure controls/personal protection

8.1 Control Parameters

Occupational Exposure Limits

Chemical name	type	Exposure Limit Values		Source	
butane	MAK CEIL	1.600 ppm	3.800	Austria. MAK List, OEL Ordinance (GwV),	
			mg/m3	BGBI. II, no. 184/2001 (09 2007)	
	MAK	800 ppm	1.900	Austria. MAK List, OEL Ordinance (GwV),	
			mg/m3	BGBI. II, no. 184/2001 (09 2007)	
propane	MAK	1.000 ppm	1.800	Austria. MAK List, OEL Ordinance (GwV),	
			mg/m3	BGBI. II, no. 184/2001 (09 2007)	
	MAK CEIL	2.000 ppm	3.600	Austria. MAK List, OEL Ordinance (GwV),	
			mg/m3	BGBI. II, no. 184/2001 (09 2007)	
Isobutane	MAK CEIL	1.600 ppm	3.800	Austria. MAK List, OEL Ordinance (GwV),	
			mg/m3	BGBI. II, no. 184/2001 (09 2007)	
	MAK	800 ppm	1.900	Austria. MAK List, OEL Ordinance (GwV),	
			mg/m3	BGBI. II, no. 184/2001 (09 2007)	

8.2 Exposure controls

Appropriate engineering controls:

Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Oxygen detectors should be used when asphyxiating gases may be released. Systems under pressure should be regularly checked for leakages. Preferably use permanent leak tight connections (eg. welded pipes). Do not eat, drink or smoke when using the product.

Individual protection measures, such as personal protective equipment

General information: A risk assessment should be conducted and documented in each work area to

assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Keep self contained breathing apparatus readily available for emergency use. Personal protective equipment for the body should be selected based on the task

being performed and the risks involved.

Eye/face protection: Wear eye protection to EN 166 when using gases.

Guideline: EN 166 Personal Eye Protection.

Skin protection

Hand Protection: Wear working gloves while handling containers

Guideline: EN 388 Protective gloves against mechanical risks.

Body protection: No special precautions.

Other: Wear safety shoes while handling containers

Guideline: ISO 20345 Personal protective equipment - Safety footwear.





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Respiratory Protection: Not required.

Thermal hazards: No precautionary measures are necessary.

Hygiene measures: Specific risk management measures are not required beyond good industrial

hygiene and safety procedures. Do not eat, drink or smoke when using the

product.

Environmental exposure

controls:

For waste disposal, see section 13 of the SDS.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state: Gas

Form: Compressed gas

Color: C4H10: Colorless
CH4: Colorless
C2H6: Colorless
C3H8: Colorless

He: Colorless C4H10: Colorless

Odor: C4H10: Gasoline-like or natural gas odor

CH4: Odorless C2H6: Odorless C3H8: Odorless He: Odorless

C4H10: Slight odor, Gasoline-like or natural gas odor

Odor Threshold: Odor threshold is subjective and is inadequate to warn of over

exposure.

pH: not applicable.
Melting Point: No data available.
Boiling Point: No data available.
Sublimation Point: not applicable.
Critical Temp. (°C): No data available.

Flash Point:Not applicable to gases and gas mixtures. **Evaporation Rate:**Not applicable to gases and gas mixtures.

Flammability (solid, gas): This product is not flammable.

Flammability Limit - Upper (%): not applicable. Flammability Limit - Lower (%): not applicable.

Vapor pressure:No reliable data available.Vapor density (air=1):0,14 (calculated) (15 °C)

Relative density: No data available.

Solubility(ies)





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Solubility in Water:

Partition coefficient (n-octanol/water):

Autoignition Temperature:

Not known.

not applicable.

Not known.

Viscosity

Kinematic viscosity:No data available.Dynamic viscosity:No data available.Explosive properties:Not applicable.Oxidizing properties:not applicable.

9.2 Other information: None.

SECTION 10: Stability and reactivity

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

10.2 Chemical Stability: Stable under normal conditions.

10.3 Possibility of Hazardous

Reactions:

None.

10.4 Conditions to Avoid: None.

10.5 Incompatible Materials: No reaction with any common materials in dry or wet conditions.

10.6 Hazardous Decomposition

Products:

Under normal conditions of storage and use, hazardous decomposition products $% \left(1\right) =\left(1\right) \left(1$

should not be produced.

SECTION 11: Toxicological information

General information: None.

11.1 Information on toxicological effects

Acute toxicity - Oral

Product Based on available data, the classification criteria are not met.

Acute toxicity - Dermal

Product Based on available data, the classification criteria are not met.

Acute toxicity - Inhalation

Product Not classified for acute toxicity based on available data.





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Component Information

methane LC 50 (Rat, 4 h): > 13023 ppm Remarks: Vapor

Isobutane LC 50 (Rat, 15 min): 570000 ppm

Repeated dose toxicity
Component Information

methane NOAEC (Rat, Inhalation): 4000 ppm

LOAEC (Rat, Inhalation): 12000 ppm

ethane NOAEC (Rat, Inhalation): 19678 mg/m³

Skin Corrosion/Irritation

Product Based on available data, the classification criteria are not met.

Serious Eye Damage/Eye Irritation

Product Based on available data, the classification criteria are not met.

Component Information

butane Not irritating

ethane Not irritating

Respiratory or Skin Sensitization

Product Based on available data, the classification criteria are not met.

Germ Cell Mutagenicity

Product Based on available data, the classification criteria are not met.

In vitro

Component Information

methane Chromosome aberration (OECD Guideline 473 (In Vitro Mammalian Chromosome

Aberration Test)): Negative.

ethane Ames test in vitro: (OECD Guideline 471 (Bacterial Reverse Mutation Test)):

Negative.

In vivo

Component Information

methane Drosophila Sex-Linked Recessive Lethal Assay (SLRL) test: Negative.

ethane Drosophila Sex-Linked Recessive Lethal Assay (SLRL) test: Negative.





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Carcinogenicity

Based on available data, the classification criteria are not met. **Product**

Reproductive toxicity

Product Based on available data, the classification criteria are not met.

Reproductive toxicity (Fertility) **Component Information**

> methane Gestation: Rat Inhalation (OECD Guideline 422 (Combined Repeated Dose Toxicity

> > Study with the Reproduction / Developmental Toxicity Screening Test))

NOAEC: 9.000 ppm

Fertility: Rat Inhalation (OECD Guideline 422 (Combined Repeated Dose Toxicity

Study with the Reproduction / Developmental Toxicity Screening Test))

NOAEC: 3.000 ppm

Developmental toxicity (Teratogenicity)

Component Information

methane Rat Inhalation (OECD Guideline 422 (Combined Repeated Dose Toxicity Study

with the Reproduction / Developmental Toxicity Screening Test))

NOAEC: 9.000 ppm

Specific Target Organ Toxicity - Single Exposure

Product Based on available data, the classification criteria are not met.

Component Information

Specific Target Organ Toxicity - Repeated Exposure

Product Based on available data, the classification criteria are not met.

Aspiration Hazard

Product Not applicable to gases and gas mixtures...

SECTION 12: Ecological information

12.1 Toxicity

Acute toxicity

Product No ecological damage caused by this product.

Acute toxicity - Fish **Component Information**

methane LC 50 (Various (Freshwater), 96 h): 27,98 mg/l (calculated)

ethane LC50 (Fish, 96 h): 91,4 mg/l

LC50 (Fish, 96 h): 49,9 mg/l propane





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Acute toxicity - Aquatic Invertebrates

Component Information

methane LC 50 (Water flea (Daphnia magna), 48 h): 27,14 mg/l

ethane EC50 (Water flea (Daphnia magna), 48 h): 46,6 mg/l

propane EC50 (Water flea (Daphnia magna), 48 h): 27,1 mg/l

Toxicity to microorganisms

Component Information

methane EC 50 (Alga, 96 h): 19,37 mg/l Not harmful to microorganisms

ethane EC50 (Alga, 72 h): 16,5 mg/l

propane EC50 (Alga, 72 h): 11,9 mg/l

12.2 Persistence and Degradability

Product Not applicable to gases and gas mixtures...

Biodegradation

Component Information

methane 100 %

12.3 Bioaccumulative Potential

Product The product is expected to biodegrade and is not expected to persist for long

periods in an aquatic environment.

12.4 Mobility in Soil

Product Because of its high volatility, the product is unlikely to cause ground or water

pollution.

Component Information

methane Henry's Law Constant: 3.690 MPa (25 °C)

12.5 Results of PBT and vPvB

assessment

Product Not classified as PBT or vPvB.





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12.6 Other Adverse Effects:

Global Warming Potential

Global warming potential: 0

Contains fluorinated greenhouse gases covered by the Kyoto protocol. When discharged in large quantities may contribute to the greenhouse effect.

Component Information

methane <u>UN / IPCC. Greenhouse Gas Global Warming Potentials (IPCC Fourth Assessment</u>

Report, Climate Change, Table TS.2
- Global warming potential: 25 100-yr

butane

ethane Global warming potential: 6

propane Global warming potential: 3

Isobutane Global warming potential: 3

SECTION 13: Disposal considerations

13.1 Waste treatment methods

General information: Do not discharge into any place where its accumulation could be dangerous. Vent

to atmosphere in a well ventilated place.

Disposal methods: Refer to the EIGA code of practice (Doc.30 "Disposal of Gases", downloadable at

http://www.eiga.org) for more guidance on suitable disposal methods. Dispose of container via supplier only. Discharge, treatment, or disposal may be subject to

national, state, or local laws.

European Waste Codes

Container: 16 05 05: Gases in pressure containers other than those mentioned in 16 05

04.





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SECTION 14: Transport information

ADR

14.1 UN Number: UN 1950 14.2 UN Proper Shipping Name: AEROSOLS

14.3 Transport Hazard Class(es)

Class: 2
Label(s): 2.2
Hazard No. (ADR): Tunnel restriction code: (E)

14.4 Packing Group: -

14.5 Environmental hazards: not applicable

14.6 Special precautions for user:

RID

14.1 UN Number: UN 195014.2 UN Proper Shipping Name AEROSOLS

14.3 Transport Hazard Class(es)

Class: 2
Label(s): 2.2

14.4 Packing Group: -

14.5 Environmental hazards: not applicable

14.6 Special precautions for user: -

IMDG

14.1 UN Number: UN 195014.2 UN Proper Shipping Name: AEROSOLS

14.3 Transport Hazard Class(es)

 Class:
 2.2

 Label(s):
 2.2

 EmS No.:
 F-D, S-U

14.3 Packing Group:

14.5 Environmental hazards: not applicable

14.6 Special precautions for user: -

IATA

14.1 UN Number: UN 1950

14.2 Proper Shipping Name: Aerosols, non-flammable

14.3 Transport Hazard Class(es):

 Class:
 2.2

 Label(s):
 2.2

14.4 Packing Group: -

14.5 Environmental hazards: not applicable

14.6 Special precautions for user:

Other information

Passenger and cargo aircraft: Allowed. Cargo aircraft only: Allowed.



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14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: not applicable

Additional identification: Avoid transport on vehicles where the load space is not separated from

the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured. Ensure that the container valve is closed and not leaking. Container valve guards or caps should be in place. Ensure

adequate air ventilation.

SECTION 15: Regulatory information

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

EU Regulations

Regulation (EC) No. 1907/2006 Annex XVII Substances subject to restriction on marketing and use:

Chemical name	CAS-No.	Concentration
butane	106-97-8	- <0,1%
propane	74-98-6	- <0,1%

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

Chemical name	CAS-No.	Concentration
methane	74-82-8	0 - <0,1%
ethane	74-84-0	0 - <0,1%
propane	74-98-6	0 - <0,1%

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

Chemical name	CAS-No.	Concentration
methane	74-82-8	0 - <0,1%
ethane	74-84-0	0 - <0,1%
propane	74-98-6	0 - <0,1%

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





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Chemical name	CAS-No.	Concentration
butane	106-97-8	0 - <0,1%
ethane	74-84-0	0 - <0,1%
propane	74-98-6	0 - <0,1%
Isobutane	75-28-5	0 - <0,1%

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

Chemical name	CAS-No.	Concentration
butane	106-97-8	0 - <0,1%
methane	74-82-8	0 - <0,1%
ethane	74-84-0	0 - <0,1%
propane	74-98-6	0 - <0,1%
Isobutane	75-28-5	0 - <0,1%

National Regulations

Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work Directive 89/686/EEC on personal protective equipment Only products that comply with the food regulations (EC) No. 1333/2008 and (EU) No. 231/2012 and are labelled as such may be used as food additives.

This Safety Data Sheet has been produced to comply with Regulation (EU) 453/2010.

15.2 Chemical safety assessment: No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

Revision Information: Not relevant.





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Key literature references and sources for data:

Various sources of data have been used in the compilation of this SDS, they include

but are not exclusive to:

Agency for Toxic Substances and Diseases Registry (ATSDR)

(http://www.atsdr.cdc.gov/).

European Chemical Agency: Guidance on the Compilation of Safety Data Sheets.

European Chemical Agency: Information on Registered Substances http://apps.echa.europa.eu/registered/registered-sub.aspx#search

European Industrial Gases Association (EIGA) Doc. 169 Classification and Labelling

guide.

International Programme on Chemical Safety (http://www.inchem.org/) ISO 10156:2010 Gases and gas mixtures - Determination of fire potential and

oxidizing ability for the selection of cylinder valve outlets.

Matheson Gas Data Book, 7th Edition.

National Institute for Standards and Technology (NIST) Standard Reference Database

Number 69.

The ESIS (European chemical Substances 5 Information System) platform of the former European Chemicals Bureau (ECB) ESIS (http://ecb.jrc.ec.europa.eu/esis/).

The European Chemical Industry Council (CEFIC) ERICards.

United States of America's National Library of Medicine's toxicology data network

TOXNET (http://toxnet.nlm.nih.gov/index.html)

Threshold Limit Values (TLV) from the American Conference of Governmental

Industrial Hygienists (ACGIH).

Substance specific information from suppliers.

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

Wording of the R-phrases and H-statements in section 2 and 3

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

R12 Extremely flammable.

Training information: Users of breathing apparatus must be trained. The hazard of asphyxiation is often

overlooked and must be stressed during operator training. Ensure operators

understand the hazards.

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

Press. Gas Compr. Gas, H280

Other information: Before using this product in any new process or experiment, a thorough material

compatibility and safety study should be carried out. Ensure adequate air ventilation. Ensure all national/local regulations are observed. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting

from its use can be accepted.

Last revised date: 10.12.2015

Disclaimer: This information is provided without warranty. The information is believed to be

correct. This information should be used to make an independent determination of

the methods to safeguard workers and the environment.