



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date:	16.01.2013	Version: 1.4	SDS No.: 000010021692
Last revised date:	07.06.2022		1/31

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

1.1 Product identifier

Product name:	Methane, compressed
Trade name:	Gasart 314 Methan 2.5, Gasart 420 Methan 3.5 / 4.5 / 5.5
Other Name:	G20 (EN 437)

Additional identification

Chemical name:	methane
Chemical formula:	CH4
INDEX No.	601-001-00-4
CAS-No.	74-82-8
EC No.	200-812-7
REACH Registration No.	Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.

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. Transfiling gas or liquid, Use as a fuel Use as an Intermediate (transported, on-site isolated). Use for electronic component manufacture. Using gas alone or in mixtures for the calibration of analysis equipment. Using gas as feedstock in chemical processes.
Uses advised against	Consumer use.

1.3 Details of the supplier of the safety data sheet

Supplier	Telephone: +43 50 4273
Linde Gas GmbH	
Carl-von-Linde-Platz 1	
A-4651 Stadl-Paura	
E-mail: office@at.linde-gas.com	

1.4 Emergency telephone number: Emergency number UMC0: +49 89 220 61012 (German), +44 1865 407333 (English)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

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

Physical Hazards



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
2/31

Flammable gas	Category 1	H220: Extremely flammable gas.
Gases under pressure	Compressed gas	H280: Contains gas under pressure; may explode if heated.

2.2 Label Elements



Signal Word:	Danger
Hazard Statement(s):	H220: Extremely flammable gas. H280: Contains gas under pressure; may explode if heated.
Precautionary Statements	
General	None.
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: In case of leakage, eliminate all ignition sources.
Storage:	P403: Store in a well-ventilated place.
Disposal	None.
2.3 Other hazards	None.



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
 Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
 3/31

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name methane
INDEX No.: 601-001-00-4
CAS-No.: 74-82-8
EC No.: 200-812-7
REACH Registration No.: Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.
Purity: 100%
 The purity of the substance in this section is used for classification only, and does not represent the actual purity of the substance as supplied, for which other documentation should be consulted.
Trade name: Gasart 314 Methan 2.5, Gasart 420 Methan 3.5 / 4.5 / 5.5

Chemical name	Chemical formula	Concentration	CAS-No.	REACH Registration No.	M-Factor:	Notes
methane	CH ₄	100%	74-82-8	Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.	-	

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.

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

Inhalation: 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.



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date:	16.01.2013	Version: 1.4	SDS No.: 000010021692
Last revised date:	07.06.2022		4/31

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.

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: Water. Dry powder. Foam.

Unsuitable extinguishing media: Carbon Dioxide.

5.2 Special hazards arising from the substance or mixture: Incomplete combustion may form carbon monoxide

5.3 Advice for firefighters

Special fire fighting procedures: In case of fire: Stop leak if safe to do so. Do not extinguish flames at leak because possibility of uncontrolled explosive reignition exists. 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 open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
5/31

SECTION 6: Accidental release measures

- | | |
|---|---|
| 6.1 Personal precautions, protective equipment and emergency procedures: | Evacuate area. Provide adequate ventilation. Consider the risk of potentially explosive atmospheres. In case of leakage, eliminate all ignition sources. Monitor the concentration of the released product. 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. 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. Eliminate sources of ignition. |
| 6.4 Reference to other sections: | Refer to sections 8 and 13. |

**SAFETY DATA SHEET**

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressedIssue Date: 16.01.2013
Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
6/31**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. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Purge air from system before introducing gas. Containers, which contain or have contained flammable or explosive substances, must not be inerted with liquid carbon dioxide. Assess the risk of a potentially explosive atmosphere and the need for suitable equipment i.e. explosion-proof. Take precautionary measures against static discharges. Keep away from ignition sources (including static discharges). Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres. Use non-sparking tools. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Ensure the complete system has been (or is regularly) checked for leaks before use. 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 contaminants 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.



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date:	16.01.2013	Version: 1.4	SDS No.: 000010021692
Last revised date:	07.06.2022		7/31

7.2 Conditions for safe storage, including any incompatibilities: All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere. Segregate from oxidant gases and other oxidants being stored. 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.

SECTION 8: Exposure controls/personal protection

8.1 Control Parameters

Occupational Exposure Limits

None of the components have assigned exposure limits.

8.2 Exposure controls

Appropriate engineering controls:

Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Provide adequate general and local exhaust ventilation. Keep concentrations well below lower explosion limits. Gas detectors should be used when quantities of flammable gases or vapours may be released. Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Systems under pressure should be regularly checked for leakages. Product to be handled in a closed system. Only use permanent leak tight installations (e.g. welded pipes). Take precautionary measures against static discharges.

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. Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment. Do not eat, drink or smoke when using the product. The substance is not classified for human health hazards or for environment effects and it is not PBT or vPvB so that no exposure assessment or risk characterisation is required. For tasks where the intervention of workers is required, the substance must be handled in accordance with good industrial hygiene and safety procedures.



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date:	16.01.2013	Version: 1.4	SDS No.: 000010021692
Last revised date:	07.06.2022		8/31

- Eye/face protection:** Wear eye protection to EN 166 when using gases.
Guideline: EN 166 Personal Eye Protection.

- Skin protection**
- Hand Protection:** Guideline: EN 388 Protective gloves against mechanical risks.
Additional Information: Wear working gloves while handling containers

- Body protection:** Wear fire resistant or flame retardant clothing.
Guideline: ISO/TR 2801:2007 Clothing for protection against heat and flame --
General recommendations for selection, care and use of protective clothing.

- Other:** Wear safety shoes while handling containers
Guideline: ISO 20345 Personal protective equipment - Safety footwear.

- Respiratory Protection:** When allowed by a risk assessment Respiratory Protective Equipment (RPE) may be used The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD. Self-contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres
Guideline: EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

- 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:** Colorless
- Odor:** Odorless
- Odor Threshold:** Odor threshold is subjective and is inadequate to warn of over exposure.
- pH:** Not applicable.



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date:	16.01.2013	Version: 1.4	SDS No.: 000010021692
Last revised date:	07.06.2022		9/31

Melting Point:	-182,47 °C Experimental result, Key study
Boiling Point:	-161,48 °C (1.013 hPa) Experimental result, Key study
Sublimation Point:	Not applicable.
Critical Temp. (°C):	-82,0 °C
Flash Point:	Not applicable to gases and gas mixtures.
Evaporation Rate:	Not applicable to gases and gas mixtures.
Flammability (solid, gas):	Flammable Gas
Flammability Limit - Upper (%):	17 %(V)
Flammability Limit - Lower (%):	4,4 %(V)
Vapor pressure:	No reliable data available.
Vapor density (air=1):	0,6
Relative density:	0,42 (25 °C)
Solubility(ies)	
Solubility in Water:	22 mg/l (25 °C)
Partition coefficient (n-octanol/water):	1,09
Autoignition Temperature:	595 °C
Decomposition Temperature:	Not known.
Viscosity	
Kinematic viscosity:	No data available.
Dynamic viscosity:	0,011 mPa.s (27 °C)
Explosive properties:	Not applicable.
Oxidizing properties:	Not applicable.
9.2 Other information:	None.
Molecular weight:	16,04 g/mol (CH ₄)
Minimum ignition energy:	0,21 mJ

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:	Can form a potentially explosive atmosphere in air. May react violently with oxidants.
10.4 Conditions to avoid:	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date:	16.01.2013	Version: 1.4	SDS No.: 000010021692
Last revised date:	07.06.2022		10/31

10.5 Incompatible Materials: Air and oxidizers. For material compatibility see latest version of ISO-11114.

10.6 Hazardous Decomposition Products: Under normal conditions of storage and use, hazardous decomposition products 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 Based on available data, the classification criteria are not met.

methane LC 50 (Rat, 10 min): > 800000 ppm Remarks: Inhalation Experimental result, Key study

Repeated dose toxicity methane NOAEL (Rat(Female, Male), Inhalation, 13 Weeks): 10.000 ppm(m) Inhalation Read-across based on grouping of substances (category approach), Key study

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.

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 methane Chromosome aberration (OECD Guideline 473 (In Vitro Mammalian Chromosome Aberration Test)): Negative.



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013 Version: 1.4 SDS No.: 000010021692
 Last revised date: 07.06.2022 11/31

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

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

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

Reproductive toxicity (Fertility)
 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)
 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.

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

General information: Not applicable

12.1 Toxicity

Acute toxicity
 Product No ecological damage caused by this product.

Acute toxicity - Fish
 methane LC 50 (Various, 96 h): 49,9 mg/l (QSAR) Remarks: QSAR QSAR, Key study



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
12/31

Acute toxicity - Aquatic Invertebrates

methane LC 50 (Daphnia sp., 48 h): 69,43 mg/l Remarks: QSAR QSAR, Key study

Toxicity to microorganisms

methane EC 50 (Alga, 96 h): 8,57 mg/l

12.2 Persistence and Degradability

Product

Not applicable to gases and gas mixtures..

Biodegradation

methane 50 % (3,19 d) Detected in water. QSAR, Weight of Evidence study

12.3 Bioaccumulative potential

Product

The subject 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.

12.5 Results of PBT and vPvB assessment

Product

Not classified as PBT or vPvB.

12.6 Other adverse effects:

Global Warming Potential

Global warming potential: 25
Contains greenhouse gas(es). When discharged in large quantities may contribute to the greenhouse effect.

methane

EU. Non-Fluorinated Substance GWPs (Annex IV), Regulation 517/2014/EU on fluorinated greenhouse gases
- Global warming potential: 25



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
 Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
 13/31

SECTION 13: Disposal considerations

13.1 Waste treatment methods

General information: Do not discharge into any place where its accumulation could be dangerous. Consult supplier for specific recommendations. 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.

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 04*: Gases in pressure containers (including halons) containing dangerous substances.

SECTION 14: Transport information

ADR

14.1 UN Number: UN 1971
 14.2 UN Proper Shipping Name: METHANE, COMPRESSED
 14.3 Transport Hazard Class(es)
 Class: 2
 Label(s): 2.1
 Hazard No. (ADR): 23
 Tunnel restriction code: (B/D)
 14.4 Packing Group: -
 14.5 Environmental hazards: Not applicable
 14.6 Special precautions for user: -

RID

14.1 UN Number: UN 1971
 14.2 UN Proper Shipping Name: METHANE, COMPRESSED
 14.3 Transport Hazard Class(es)
 Class: 2
 Label(s): 2.1
 14.4 Packing Group: -
 14.5 Environmental hazards: Not applicable
 14.6 Special precautions for user: -



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date:	16.01.2013	Version: 1.4	SDS No.: 000010021692
Last revised date:	07.06.2022		14/31

IMDG

14.1 UN Number:	UN 1971
14.2 UN Proper Shipping Name:	METHANE, COMPRESSED
14.3 Transport Hazard Class(es)	
Class:	2.1
Label(s):	2.1
EmS No.:	F-D, S-U
14.4 Packing Group:	-
14.5 Environmental hazards:	Not applicable
14.6 Special precautions for user:	-

IATA

14.1 UN Number:	UN 1971
14.2 Proper Shipping Name:	Methane, compressed
14.3 Transport Hazard Class(es):	
Class:	2.1
Label(s):	2.1
14.4 Packing Group:	-
14.5 Environmental hazards:	Not applicable
14.6 Special precautions for user:	-
Other information	
Passenger and cargo aircraft:	Forbidden.
Cargo aircraft only:	Allowed.

14.7 Transport in bulk according to Annex II of MARPOL 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:



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
15/31

Chemical name	CAS-No.	Concentration
methane	74-82-8	100%

EU. Directive 2012/18/EU (SEVESO III) on major accident hazards involving dangerous substances, as amended.:

Classification	Lower-tier Requirements	Upper-tier Requirements
P2: Flammable gases, Category 1 or 2	10 t	50 t

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

Chemical name	CAS-No.	Concentration
methane	74-82-8	100%

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 2016/425/EEC on personal protective equipment Directive 2014/34/EU on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX) 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) 2015/830.

15.2 Chemical safety assessment: Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration. A CSA does not need to be carried out for this product.

SECTION 16: Other information

Revision Information: Not relevant.



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013 Version: 1.4 SDS No.: 000010021692
 Last revised date: 07.06.2022 16/31

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", as amended.
 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 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 H-statements in section 2 and 3

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.

Training information: Users of breathing apparatus must be trained. Ensure operators understand the flammability hazard.

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

Flam. Gas 1, H220
 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. Ensure equipment is adequately earthed. 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.



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
17/31

Last revised date: 07.06.2022

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.



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
 Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
 18/31

Annex to the extended Safety Data Sheet (eSDS)

Content

Exposure Scenario 1)	Industrial:, Formulation of mixtures with gas in pressure receptacles, Transfilling gas or liquid., Use as a fuel, Using gas alone or in mixtures for the calibration of analysis equipment., Laboratory activities, Use as feedstock in chemical processes, use as an Intermediate (transported, on-site isolated)., Manufacture of fine chemicals, Use for electronic component manufacture.
Exposure Scenario 2)	Professional:, Use as a fuel, Using gas alone or in mixtures for the calibration of analysis equipment., Laboratory activities

Exposure Scenario 1)

Exposure Scenario worker

1.Industrial:, Formulation of mixtures with gas in pressure receptacles, Transfilling gas or liquid., Use as a fuel, Using gas alone or in mixtures for the calibration of analysis equipment., Laboratory activities, Use as feedstock in chemical processes, use as an Intermediate (transported, on-site isolated)., Manufacture of fine chemicals, Use for electronic component manufacture.

List of use descriptors	
Sector(s) of use	SU9: Manufacture of fine chemicals SU16: Manufacture of computer, electronic and optical products, electrical equipment SU24: Scientific research and development
Product categories [PC]:	PC13: Fuels PC21: Laboratory chemicals PC33: Semiconductors
Name of contributing environmental scenario and corresponding ERC	<u>Industrial use:</u> ERC2: Formulation into mixture ERC6a: Use of intermediate ERC7: Use of functional fluid at industrial site



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
 Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
 19/31

Contributing Scenarios	<p><u>Industrial use:</u> PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</p> <p>PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</p> <p>PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities</p> <p>PROC15: Use as laboratory reagent</p> <p>PROC16: Use of fuels</p>
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2.1. Contributing exposure scenario controlling environmental exposure for: Industrial use, Formulation of mixtures with gas in pressure receptacles, Transfilling gas or liquid., Use as a fuel, Using gas alone or in mixtures for the calibration of analysis equipment., Laboratory activities, Use as feedstock in chemical processes, use as an Intermediate (transported, on-site isolated),, Manufacture of fine chemicals, Use for electronic component manufacture.

Product characteristics

Concentration of the substance in a mixture:	Covers percentage substance in the product up to 100 %.
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Physical form of the product	See section 9 of the SDS.
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Viscosity:	
Kinematic viscosity:	No data available.
Dynamic viscosity:	0,011 mPa.s (27 °C)

Amounts used

Annual amount per site	The actual tonnage handled per site is not considered to influence the immissions as such for this scenario as there is practically no release
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Frequency and duration of use

Batch process:	260 Emission days
Continuous process:	260 Emission days



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
 Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
 20/31

Environment factors not influenced by risk management

Other given operational conditions affecting environmental exposure

Other relevant operational conditions	not relevant
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Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release

See section 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Handle substance within a closed system. Effectiveness: 98 %.
Soil	not relevant
Water	not relevant
Sediment:	not relevant
Remarks:	not relevant

Organisational measures to prevent/limit release from site:

none

Conditions and measures related to sewage treatment plant

type:	not relevant
Discharge rate:	not relevant
Treatment effectiveness:	not relevant
Sludge treatment technique:	not relevant
Measures to limit air emissions:	not relevant
Remarks:	Wastewater emission controls are not applicable as there is no direct release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

SDS_AT - 000010021692



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
 Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
 21/31

Suitable waste treatment	Treatment effectiveness	Remarks
See section 13 of the SDS		External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment:

Suitable recovery operations:	Treatment effectiveness	Remarks
See section 13 of the SDS		External recovery and recycling of waste should comply with applicable local and/or national regulations.

Additional good practice advice beyond the REACH Chemical Safety Report

Ensure operatives are trained to minimise releases

2.2. Contributing exposure scenario controlling worker exposure for: Industrial use, Formulation of mixtures with gas in pressure receptacles, Transfiling gas or liquid., Use as a fuel, Using gas alone or in mixtures for the calibration of analysis equipment., Laboratory activities, Use as feedstock in chemical processes, use as an Intermediate (transported, on-site isolated),, Manufacture of fine chemicals, Use for electronic component manufacture.

Process Categories:	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC15: Use as laboratory reagent PROC16: Use of fuels
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Product characteristics

Concentration of the substance in a mixture:	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical form of the product:	See section 9 of the SDS.
Vapour pressure:	not relevant
Process temperature:	not relevant



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
 Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
 22/31

Remarks	not relevant
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Amounts used

The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation (industrial vs. professional) and level of containment/automation (as reflected in the PROCs and technical conditions) is the main determinant of the process-intrinsic emission potential.

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
Covers daily exposures up to 8 hours		5 days per week	PROC1, PROC3, PROC8b, PROC15, PROC16

Human factors not influenced by risk management

This information is not available.

Other given operational conditions affecting workers exposure

Other relevant operational conditions: . See section 8 of the SDS.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release

See section 8 of the safety data sheet

Technical conditions and measures to control dispersion from source towards the worker

inhalation exposure	dermal exposure	eye exposure	oral exposure	Remarks
Provide a basic standard of general ventilation (1 to 3 air changes per hour).				Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
Provide a basic standard of general ventilation (1 to 3 air changes per				Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
23/31

hour).				exposure or processes with equivalent containment condition
Local exhaust ventilation				Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
Provide a basic standard of general ventilation (1 to 3 air changes per hour).				Transfer of substance or mixture (charging and discharging) at dedicated facilities
Local exhaust ventilation				Transfer of substance or mixture (charging and discharging) at dedicated facilities
Provide a good standard of controlled ventilation (10 to 15 air changes per hour).				Use as laboratory reagent
Local exhaust ventilation				Use as laboratory reagent
Provide a basic standard of general ventilation (1 to 3 air changes per hour).				Use of fuels

Organisational measures to prevent/limit releases, dispersion and exposure

inhalation exposure	dermal exposure	eye exposure	oral exposure	Remarks
				See section 7 of the SDS. Ensure operatives are trained to minimise exposures. Ensure supervision is in place to check that the RMMs are



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
24/31

				in place and are being used correctly and that the OCS are being followed
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Conditions and measures related to personal protection, hygiene and health evaluation

inhalation exposure	dermal exposure	eye exposure	oral exposure	Remarks
				See section 8 of the safety data sheet (Personal protection equipment)

Additional good practice advice beyond the REACH Chemical Safety Report

See section 7 of the SDS. Handle product within a closed system. Apply a good standard of general or controlled ventilation when maintenance activities are carried out.

3. Exposure estimation

Environment:

Industrial use, Formulation of mixtures with gas in pressure receptacles, Transfilling gas or liquid., Use as a fuel, Using gas alone or in mixtures for the calibration of analysis equipment., Laboratory activities, Use as feedstock in chemical processes, use as an Intermediate (transported, on-site isolated)., Manufacture of fine chemicals, Use for electronic component manufacture.:

ERC2, ERC6a, ERC7:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Air		< 1		Not classified as PBT or vPvB. As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

Health:

Industrial use, Formulation of mixtures with gas in pressure receptacles, Transfilling gas or liquid., Use as a fuel, Using gas alone or in mixtures for the calibration of analysis equipment., Laboratory activities, Use as feedstock in chemical processes, use as an Intermediate (transported, on-site isolated)., Manufacture of fine chemicals, Use for electronic component manufacture.:



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
 Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
 25/31

PROC1, PROC3, PROC8b, PROC15, PROC16:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
inhalation exposure	Indoor/Outdoor use.		< 1		As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and risk characterization was performed.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Check that RMMs and OCs are as described above or of equivalent efficiency Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. For scaling see <http://www.ecetoc.org/tra>

Exposure Scenario 2)

Exposure Scenario worker

1. Professional, Use as a fuel, Using gas alone or in mixtures for the calibration of analysis equipment., Laboratory activities

List of use descriptors	
Sector(s) of use	SU24: Scientific research and development
Product categories [PC]:	PC21: Laboratory chemicals

Name of contributing environmental scenario and corresponding ERC	<p><u>Professional use:</u> ERC8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)</p> <p>ERC8b: Widespread use of reactive processing aid (no inclusion into or onto article, indoor)</p> <p>ERC8e: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)</p> <p>ERC9a: Widespread use of functional fluid (indoor)</p> <p>ERC9b: Widespread use of functional fluid (outdoor)</p>
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SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
 Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
 26/31

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Contributing Scenarios	<u>Professional use:</u> PROC15: Use as laboratory reagent PROC16: Use of fuels
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2.1. Contributing exposure scenario controlling environmental exposure for: Professional use, Use as a fuel, Using gas alone or in mixtures for the calibration of analysis equipment., Laboratory activities

Product characteristics

Concentration of the substance in a mixture:	Covers percentage substance in the product up to 100 %.
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Physical form of the product	See section 9 of the SDS.
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Viscosity:	
Kinematic viscosity:	No data available.
Dynamic viscosity:	0,011 mPa.s (27 °C)

Amounts used

Annual amount per site	The actual tonnage handled per site is not considered to influence the immissions as such for this scenario as there is practically no release
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Frequency and duration of use

Batch process:	260 Emission days
Continuous process:	260 Emission days

Environment factors not influenced by risk management

Other given operational conditions affecting environmental exposure

Other relevant operational conditions	not relevant
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Risk management measures (RMM)



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
 Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
 27/31

Technical conditions and measures at process level (source) to prevent release

See section 8 of the safety data sheet (Environmental exposure controls).

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Air	Handle substance within a closed system. Effectiveness: 98 %.
Soil	not relevant
Water	not relevant
Sediment:	not relevant
Remarks:	not relevant

Organisational measures to prevent/limit release from site:

none

Conditions and measures related to sewage treatment plant

type:	not relevant
Discharge rate:	not relevant
Treatment effectiveness:	not relevant
Sludge treatment technique:	not relevant
Measures to limit air emissions:	not relevant
Remarks:	Wastewater emission controls are not applicable as there is no direct release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Fraction of used amount transferred to external waste treatment:

Suitable waste treatment	Treatment effectiveness	Remarks
See section 13 of the SDS		External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Fraction of used amount transferred to external waste treatment:

Suitable recovery operations:	Treatment effectiveness	Remarks



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
28/31

See section 13 of the SDS	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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Additional good practice advice beyond the REACH Chemical Safety Report

Ensure operatives are trained to minimise releases

2.2. Contributing exposure scenario controlling worker exposure for: Professional use, Use as a fuel, Using gas alone or in mixtures for the calibration of analysis equipment., Laboratory activities

Process Categories:	PROC15: Use as laboratory reagent PROC16: Use of fuels
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Product characteristics

Concentration of the substance in a mixture:	Covers percentage substance in the product up to 100 % (unless stated differently).
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Physical form of the product:	See section 9 of the SDS.
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Vapour pressure:	not relevant
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Process temperature:	not relevant
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Remarks	not relevant
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Amounts used

The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation (industrial vs. professional) and level of containment/automation (as reflected in the PROCs and technical conditions) is the main determinant of the process-intrinsic emission potential.

Frequency and duration of use

	Use duration:	Frequency of use:	Remarks
Covers daily exposures up to 8 hours		5 days per week	PROC15, PROC16

Human factors not influenced by risk management

This information is not available.

Other given operational conditions affecting workers exposure



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
 Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
 29/31

Other relevant operational conditions: . See section 8 of the SDS.

Risk management measures (RMM)

Technical conditions and measures at process level (source) to prevent release

See section 8 of the safety data sheet

Technical conditions and measures to control dispersion from source towards the worker

inhalation exposure	dermal exposure	eye exposure	oral exposure	Remarks
Provide a good standard of controlled ventilation (10 to 15 air changes per hour).				Use as laboratory reagent
Local exhaust ventilation				Use as laboratory reagent
Provide a basic standard of general ventilation (1 to 3 air changes per hour).				Use of fuels

Organisational measures to prevent/limit releases, dispersion and exposure

inhalation exposure	dermal exposure	eye exposure	oral exposure	Remarks
				See section 7 of the SDS. Ensure operatives are trained to minimise exposures. Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed

Conditions and measures related to personal protection, hygiene and health evaluation



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
30/31

inhalation exposure	dermal exposure	eye exposure	oral exposure	Remarks
				See section 8 of the safety data sheet (Personal protection equipment)

Additional good practice advice beyond the REACH Chemical Safety Report

See section 7 of the SDS. Handle product within a closed system. Apply a good standard of general or controlled ventilation when maintenance activities are carried out.

3. Exposure estimation

Environment:

Professional use, Use as a fuel, Using gas alone or in mixtures for the calibration of analysis equipment., Laboratory activities:

ERC8a, ERC8b, ERC8e, ERC9a, ERC9b:

Compartment	Predicted environmental concentration (PEC)	Risk characterisation ratio (RCR)	Method	Remarks
Air		< 1		Not classified as PBT or vPvB. As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

Health:

Professional use, Use as a fuel, Using gas alone or in mixtures for the calibration of analysis equipment., Laboratory activities:

PROC15, PROC16:

Route of Exposure	Specific condition	Exposure level	Risk characterisation ratio (RCR)	Method	Remarks
inhalation exposure	Indoor use		< 1		As no toxicological hazard was identified no human-related (worker/consumer) exposure assessment and



SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Methane, compressed

Issue Date: 16.01.2013
Last revised date: 07.06.2022

Version: 1.4

SDS No.: 000010021692
31/31

					risk characterization was performed.
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4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

Check that RMMs and OCs are as described above or of equivalent efficiency Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. For scaling see <http://www.ecetoc.org/tra>