

Material Safety Data Sheet

**in accordance with Regulation (EC) No. 1907/2006 (REACH) and Sec. 5
of the German Ordinance on Hazardous Materials (*GefStoffV*)**

Natural gas, dried

Revised on: June 1, 2015

Version: 5.1

Replaces version of: July 1, 2014

1. Identification of the substance/preparation and of the company/undertaking

1.1 Product identifier

Trade name: natural gas, dried
natural gas according to DVGW Code G260,
2nd gas family
CAS No.: 68410-63-9
EINECS No.: 270-085-9

Exempt from the obligation to register in accordance with Annex V to Regulation (EC) No. 1907/2006 (REACH)

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

Identified uses

Source of energy, feedstock, motor fuel

Uses advised against

Not applicable

1.3 Details of the supplier of the safety data sheet

Manufacturer/supplier: Open Grid Europe GmbH
(Address of gas supplier): Kallenbergstrasse 5, 45141 Essen, Germany
Phone: +49 (0)201/3642-0
Fax: +49 (0)201/3642-13900
Email: Sicherheitsdatenblatt@open-grid-europe.com
Contact for technical information: Gas Quality Center of Competence
Phone: +49 (0)201/3642-18578
Fax: +49 (0)201/3642-818578

1.4 Emergency phone number

+49 (0)800/3355330

2. Hazards identification



2.1 Classification of the substance or mixture

In accordance with Regulation (EC) No. 1272/2008 (GHS/CLP)

Hazard class/hazard category	Hazard statement code
Extremely flammable gas/category 1	H220
Contains gas under pressure; may explode when heated	H280

2.2 Label elements

In accordance with Regulation (EC) No. 1272/2008 (GHS/CLP)

Hazard pictograms:	 
Signal word:	Danger
Hazard statements:	H220: Extremely flammable gas H280: Contains gas under pressure; may explode when heated
Precautionary statements:	
Prevention:	P102: Keep out of the reach of children P210: Keep away from heat/sparks/open flames/hot surfaces - No smoking P243: Take precautionary measures against static discharge P377: Leaking gas fire: Do not extinguish until leak can be stopped safely P381: Eliminate all ignition sources if safe to do so
Response:	P410+P403: Protect from sunlight and store in a well-ventilated place

2.3 Other hazards

Does not meet the criteria for PBT or vPvB set out in Annex XIII to Regulation (EC) No. 1907/2006 (REACH).

Natural gas is flammable.

Gas under pressure may explode when heated.

Forms ignitable mixtures with air; explosion hazard within the explosion limits.

Very weakly narcotic gas.

At high concentrations, danger of asphyxiation by displacement of oxygen.

Dangers from pressures in the case of intentional or unintentional release:

Noise, shockwave, frostbites caused by freezing.

Odorless in non-odorized state.

Ignited gas may cause burns. Risks to health cannot be excluded because of accompanying substances in the gas.

Climate-changing effect.

Warning:

Work on gas installations/lines may be carried out solely by specialist staff familiar with the associated risks and the necessary precautions.

3. Composition/information on ingredients

Chemical characterization

Mixture of hydrocarbons and inert gases whose relative portions may vary within the subsequent rounded limits.

The data in vol% deviate only slightly from the data in mol% (mol% is the mole fraction in percent).

3.1 Mixtures

Hazardous ingredients in accordance with Regulation (EC) No. 1272/2008 (GHS/CLP)

CAS No. / EINECS No. / INDEX No.	Chemical name	Vol%	Hazard class/hazard category/hazard statement code
74-82-8 / 200-812-7 / 601-001-00-4	Methane	80 to 99	Flammable gases / hazard category 1 / H220 Gases under pressure / compressed gases - H280
74-84-0 / 200-814-8 / 601-002-00-X	Ethane	< 12	Flammable gases / hazard category 1 / H220 Gases under pressure / liquefied gases / H280
74-98-6 / 200-827-9 / 601-003-00-5	Propane	< 6	Flammable gases / hazard category 1 / H220 Gases under pressure / liquefied gases / H280
106-97-8 / 203-448-7 / 601-004-00-0	n-Butane	Σ < 2	Flammable gases / hazard category 1 / H220 Gases under pressure / liquefied gases / H280
75-28-5 / 200-857-2 / 600-004-00-0	Isobutane		Flammable gases / hazard category 1 / H220 Gases under pressure / liquefied gases / H280
7727-37-9 / 231-783-9	Nitrogen ¹⁾	< 15	Gases under pressure / compressed gases - caution / H280
124-38-9 / 204-696-9	Carbon dioxide ²⁾	< 6	Gases under pressure / compressed gases - caution / H280
1333-74-0 / 215-605-7 / 001-001-00-9	Hydrogen	≤ 2	Flammable gases / hazard category 1 / H220 Gases under pressure / liquefied gases / H280

¹⁾ Specified for the sake of completeness

²⁾ Specified because of existing EU workplace threshold limit value

4. First-aid measures

4.1 Description of first-aid measures

4.1.1 Natural gas, dried, non-pressurized

After inhalation

Rapid removal from danger zone.

Call emergency physician, if required.

Initiate first-aid measures, if required, including resuscitation measures.

Due to danger of explosion, use oxygen only outside the danger zone.

After skin contact/burns/frostbite

Not applicable.

After eye contact

Not irritating, no treatment required.

After ingestion

Not applicable.

4.1.2 Natural gas, dried, under high pressure

After inhalation

Rapid removal from danger zone.

Call emergency physician, if required.

Initiate first-aid measures, if required, including resuscitation measures.

Due to danger of explosion, use oxygen only outside the danger zone.

After skin contact/burns/frostbite

Cover with dry, sterile bandage without applying pressure; call physician, if required.

After eye contact

Call emergency physician, if required.

If required, rinse with running water for 10 to 15 mins with the eye lid open.

Initiate first-aid measures, if required.

Cover with dry, sterile bandage without applying pressure; call ophthalmologist, if required.

After ingestion

Not applicable.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Well suited: dry extinguishing agents.

Less well/conditionally suited: carbon dioxide, water with appropriate extinguishing technology.

Mobile carbon dioxide and water extinguishers are usually not suitable to extinguish gas fires.

Unsuitable extinguishing media

Foam, full water jet.

5.2 Special exposure hazards arising from the substance or preparation

In closed spaces, do not extinguish flames until the gas leakage has stopped, since otherwise an ignitable mixture may form.

Incomplete combustion may produce carbon monoxide (danger of poisoning).

5.3 Fire-fighting information

Stop gas leakage/gas supply flow

Special protective equipment for fire fighters

Self-contained breathing apparatus if necessary, flame-retardant protective clothing, heat-protective clothing.

Additional information

Ensure self-protection.

Keep away unauthorized persons.

Cordon off danger area; form safety zone.

Eliminate ignition sources.

Cool environment with water.

Cool containers at risk by sprinkling with water, if necessary with water spray jet.

Prevent backfiring.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency measures

Evacuate danger zone and cordon off liberally; keep away unauthorized persons.

In the case of a gas leak in the open, remain on the windward side.

Provide adequate ventilation.

Before staff (qualified staff only!) may enter the danger zone, the gas concentration must be measured with a suitable device to prove the harmlessness of the atmosphere.

Use personal protective equipment.

Ensure self-protection.

Avoid ignition sources.

6.2 Environmental precautions

Stop gas leakage.

6.3 Methods and material for containment and clean-up

Form safety zone.

Ventilate rooms sufficiently.

Use suitable measurement device to establish the safeness of the danger zone before entering again.

6.4 Reference to other sections

Observe precautions described in Sec. 8.

7. Handling and storage

7.1 Precautions for safe handling

Natural gas is transported in self-contained systems (pipes, container if necessary).

Intentional gas release may be carried out by qualified staff only.

Natural gas is lighter than air.

7.2 Conditions for safe storage including incompatibilities

Information on storage conditions

Containers with natural gas may not be stored together with oxidizing substances and/or combustible materials/flammable liquids.

Storage rooms must be ventilated.

Equipment, systems or containers must be kept tightly closed.

Comply with technical rules for compressed gases (TRBS 3145).

VCI storage class: 2A.

Precautions for fire and explosion protection

When handling and storing natural gas, explosion protection measures must be taken (e.g. monitoring of the absence of gas with a suitable device, ventilation, avoidance of ignition sources, designation of explosion protection zones / danger zones). These must be defined during the risk assessment to be carried out first.

Avoid risks from explosive atmospheres:

Reference is made to the technical rules for operational safety (e.g. TRBS 2152 Parts 1 to 3; TRBS 2153) and the explosion protection rules applicable (BGR 104).

7.3 Specific uses

Combustion for the generation of heat, feedstock in the chemical industry.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limit values: national occupational exposure limits (OELs) / EU indicative occupational exposure limit values

Propane: CAS No.: 74-98-6
Source: TRGS 900 – Occupational Exposure Limits (D)
Value: 1,000 ppm (v/v) / 1,800 mg/m³
Peak limitation: Exceedance factor 4, category II

n-Butane: CAS No.: 106-97-8
Source: TRGS 900 – Occupational Exposure Limits (D)
Value: 1,000 ppm (v/v) / 2,400 mg/m³
Peak limitation: Exceedance factor 4, category II

Isobutane: CAS No.: 75-28-5
Source: TRGS 900 – Occupational Exposure Limits (D)
Value: 1,000 ppm (v/v) / 2,400 mg/m³
Peak limitation: Exceedance factor 4, category II

Carbon dioxide: CAS No.: 124-38-9
Source: TRGS 900 – Occupational Exposure Limits (D) and Directive 2006/15/EC
Value: 5,000 ppm (v/v) / 9,100 mg/m³ or 5,000 ppm (v/v) / 9,000 mg/m³
Peak limitation: Exceedance factor 2, category II

Note: at 20% of the lower explosive limit (20% LEL), none of the above-mentioned workplace limit values is reached.

8.2 Exposure controls

In the case of possible gas leakage: monitoring of the gas concentration in the work or danger zone. For monitoring of the gas concentration (CH₄), appropriate measuring instruments and procedures must be used.

When determining gas concentrations:

Take required protective measures in accordance with risk assessment. Initiate measures for the elimination of the hazard. Comply with Sec. 6 on accidental release measures.

Personal protective equipment

Technical and organizational measures have priority over the use of personal protective equipment. If residual risks should remain despite technical and organizational measures, appropriate protective equipment is to be used.

Respiratory protection:

Use of appropriate respiratory protection according to the results of the risk assessment.

Generally, the following applies: if filter devices are unsuitable as a protective measure (e.g. in the case of oxygen contents in the respiratory air of less than 17% vol% or in the case of unknown ambient conditions), self-contained respiratory protection is required.

Other personal protective equipment:

When working on gas systems or containers, appropriate protective measures against injury must be taken (e.g. protective gloves, safety goggles, helmets, conductive safety shoes, flame-retardant protective clothing according to DIN EN ISO 11612, hearing protection; see also BGR 500, 2.31).

Environmental exposure controls

Release of natural gas should be avoided because of its global warming potential.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

The physical and chemical properties of natural gas depend on its composition. Compositions may vary over a relatively wide range. The table below therefore lists ranges for the physical and chemical properties of natural gas. The pressure-dependent data are referred to an absolute pressure of 1,013.25 hPa.

Physical state at 25 °C / 1,013.25 hPa:	gaseous
a) Color:	colorless
b) Odor:	odorless,
c) Odour threshold:	possibly odorized according to DVGW Code of Practice G280-1
d) pH:	nonapplicable
e) Melting point / freezing point:	- 183 °C (methane)
f) Initial boiling point and boiling range:	- 195 °C bis - 155 °C
g) Flash point:	nonapplicable
h) Evaporation rate at 25 °C:	nonapplicable
i) Flammability (solid, gas):	yes
j) Upper/lower flammability or explosive limits at 20 °C (DIN EN 1839):	4 vol% to 17 vol%
k) Vapour pressure at 25 °C:	nonapplicable
l) Vapour density at 0 °C / 101.3 kPa:	0.7 kg/m ³ bis 1.0 kg/m ³
m) Relative density (air = 1):	0.55 to 0.75
n) Water solubility at 20 °C:	0.03 m ³ /m ³ to 0.08 m ³ /m ³
o) Partition coefficient: n-octanol / water [log K _{ow}]:	1.09 (methane)
n) Auto- Ignition temperature (DIN 51794):	when mixed with air, 575 °C to 640 °C
q) Decomposition temperature:	not available
r) Viscosity at 0 °C / 101.3 kPa:	10.9 µPas (methane)

- s) Explosive properties: formation of explosive gas/air mixtures possible
Minimum ignition energy at 20 °C: 0.25 mJ (methane)
- t) Oxidising properties: not oxidising

9.2 Other information

Explosion group: II A
Temperature class: T1
Fire class: C

10. Stability and reactivity

10.1 Reactivity

Natural gas is flammable.
Gas under pressure may explode when heated.
Forms ignitable mixtures in conjunction with air; risk of explosion within explosion limits.

10.2 Chemical stability

Stable under normal ambient conditions and at the temperature and pressure conditions to be expected during storage.

10.3 Possibility of hazardous reactions

Not applicable.

10.4 Conditions to avoid

Ignitable mixtures in conjunction with ignition sources.

10.5 Incompatible materials

Oxidizing substances.

10.6 Hazardous decomposition products

Incomplete combustion may produce carbon monoxide (danger of poisoning).

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Not acutely toxic

Irritation

Non-irritant

Corrosivity

Non-corrosive

Sensitization

Not sensitizing

Toxicity in the case of repeated doses

Non-toxic

Carcinogenicity

Not carcinogenic

Mutagenicity

Not mutagenic (does not damage genetic material)

Reproductive toxicity

Not toxic for reproduction

12. Ecological information

12.1 Toxicity

Toxicity to fish, aquatic invertebrates, aquatic plants, soil organisms, terrestrial plants, and other terrestrial non-mammals including birds:

Non-toxic

12.2 Persistence and degradability

The hydrocarbons considered are not hydrolyzed in water. The hydrocarbons methane, ethane, propane, and butane are eliminated primarily through indirect photolysis. Their degradation products are carbon dioxide and water.

12.3 Bioaccumulative potential

Bioaccumulation is not known for methane, ethane, propane, or butane.

12.4 Mobility in soil

The calculation according to Mackay, level I, for distribution into the environmental compartments of air, biota, sediments, soil and water shows that of the hydrocarbons methane ethane, propane and butane, 100% are redistributed to the air.

12.5 Results of PBT and vPvB assessment

Does not meet the criteria for PBT or vPvB in accordance with Annex XIII to Regulation (EC) No. 1907/2006 (REACH).

12.6 Other adverse effects

For methane (CH₄) the **global warming potential (GWP** ³⁾) is 21 (to Kyoto Protocol) / 25 (to WG I AR4 IPCC).

³⁾ Mass-related **global warming potential** of methane for a period of 100 years.
The GWP value of 21 means that 1 kg of CH₄ is 21 times as climate-forcing as 1 kg of CO₂; accordingly, the GWP value of 25 means that 1 kg of CH₄ is 25 times as climate-forcing as 1 kg of CO₂.

Further information

BSB value, CSB value: not applicable

13. Disposal considerations

13.1 Waste treatment methods

Release of natural gas should be avoided because of its global warming potential.
The possibility of recycling or combustion is to be assessed on a case-by-case basis.

Small quantities of natural gas may be released safely to the outside (specify protection zone).⁴⁾ Large quantities of natural gas may be flared in a controlled manner, where necessary.

Intentional release of a dangerous quantity of natural gas in closed spaces is not permissible.
BGR 104 and TRBS 2152 must be complied with.

⁴⁾ At the outlet, an explosion protection zone must be designated whose size shall in case of doubt be determined by calculation or measurement of the gas concentration. DVGW Note G 442 must be complied with.

Waste code according to the Waste Catalog Ordinance (*Abfallverzeichnis-Verordnung, AVV*)
16 05 04 Gases containing hazardous substances in pressure vessels (including halogenated hydrocarbons)

14. Transportation information

Natural gas is transported in pipes, if necessary also in steel cylinders or other containers. Where natural gas is packed by the user and prepared for transportation or transported, the regulations relevant to the respective mode of transportation must be complied with.

14.1 UN number

UN number: 1971

14.2 UN proper shipping name

NATURAL GAS, COMPRESSED (with high methane content)

14.3 Transportation hazard classes

Class 2, flammable gas

14.4 Packing group

Not applicable

14.5 Environmental hazards

Not harmful to the environment

14.6 Specific precautions for user

See Sec. 7

14.7 Transportation in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

15. Regulatory information

As amended

15.1 Safety, Health and Environmental Regulations / Legislation Specific to the Substance or Mixture

Water hazard class

Class: NHW (no hazard to water)

EU regulations

Regulation (EC) No. 1907/2006 – REACH

Regulation (EC) No. 1272/2008 – GHS/CLP

Regulation (EC) No. 453/2010

Directive 2006/121/EC

Regulation (EU) No. 1025/2012 – OJ No. L 316

Directive 89/391/EEC – Safety and Health at Work Framework Directive

Directive 98/24/EC – Chemical Agents at Work Directive

National regulations (Germany)

Basically, the following regulations must be complied with:

ArbSchG – Arbeitsschutzgesetz (labor protection law)

Berufsgenossenschaftliche Vorschriften (regulations of employers' liability insurance association)

GefStoffV – Gefahrstoffverordnung (dangerous substances ordinance)

BetrSichV – Betriebssicherheitsverordnung (occupational safety ordinance)

ProdSV 11 – Elfte Verordnung zum Produktsicherheitsgesetz (Explosionsschutzverordnung) (11th ordinance on product safety law – explosion protection ordinance)

*12. BImSchV - Störfallverordnung*⁵⁾ (12th federal immission ordinance – statutory order on hazardous incidents)

JArbSchG - Jugendarbeitsschutzgesetz, Sec. 22 (youth labor law, Sec. 22)

MuSchRiV - Verordnung zum Schutze der Mütter am Arbeitsplatz (ordinance on the protection of mothers in the workplace)

GGVSEB - Verordnung über die innerstaatliche und grenzüberschreitende Beförderung gefährlicher Güter auf der Straße, mit Eisenbahnen und auf Binnengewässern

(Gefahrgutverordnung Straße, Eisenbahn und Binnenschifffahrt - GGVSEB)

(Ordinance on the Transport of Dangerous Goods by Road, Rail and Inland Waterways),

Luftverkehrsrecht (air traffic regulations - GGVSEB)

⁵⁾ subject to the statutory order on hazardous incidents (substances listed in Annex I; substance # 11 (extremely flammable, liquefied gases and natural gas) column 4 50,000kg; column 5, 200,000kg)

National technical rules

BGR 104 (explosion protection rules)

BGR 500, Sec. 2.31 (work on gas pipelines)

BGR 500, Sec. 2.39 (facilities for line-based gas supplies to the general public)

Technical rules for hazardous substances (e.g. TRBS 3145)

Technical rules for hazardous substances (e.g. TRGS 900)

Technical rules of DVGW

Technical operational safety rules (e.g. TRBS 2152)

15.2 Chemical safety assessment

A chemical safety assessment is not necessary.

16. Other information

The occupational health and safety regulations issued by DGUV Deutsche Gesetzliche Unfallversicherung as amended must be complied with including the relevant implementation orders.

Restriction of usage recommended by manufacturer

Source of energy, feedstock, motor fuel

Other relevant documents/sources

HEDSET (Harmonized Electronic Data Set) Existing Substances Regulation No. 793/93 (EEC) of 23 March 1993. "Natural gas, dried" EINECS No. 270-085-9, CAS No. 68410-63-9

Kyoto Protocol / WG I AR4 IPCC

Van't Zelfde, P.; Omar, M.H.; LePair-Schroten, H.G.M.; Dokoupil, Z., Solid-liquid equilibrium diagram for the argon + methane system., Physica (Amsterdam), 1968, 38, 241-51

GESTIS-database on hazardous substances, Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA)

Changes compared to previous version

Guidance on the compilation of safety data sheets, European Chemicals Agency (ECHA), December 2014

Other information

The information listed describes only the safety requirements of the product and is based on the current state of knowledge. It does not constitute a warranty of any specific properties of the product described. All preceding material safety data sheets for dried natural gas are rendered invalid by the present version.

Directive 94/9/EC amended in accordance with Regulation (EC) No. 1025/2012 – OJ No. L 316