

Warning



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

1.1. Product identifier

Trade name : H2S Quad with Methane LEL

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

Relevant identified uses : Industrial and professional. Perform risk assessment prior to use.
Test gas/Calibration gas.
Contact supplier for more information on uses.

Uses advised against : Consumer use.

1.3. Details of the supplier of the safety data sheet

Company identification : GASCO
320 Scarlet Boulevard
34677 Oldsmar - USA
gascogas.com
info@gascogas.com

1.4. Emergency telephone number

Emergency telephone number : 1-703-527-3887 (CHEMTREC 24HRS)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Physical hazards : Gases under pressure : Compressed gas H280

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS04

Signal word (CLP) : Warning

Hazard statements (CLP) : H280 - Contains gas under pressure; may explode if heated.

Precautionary statements (CLP)

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

2.3. Other hazards

: None.

SECTION 3: Composition/information on ingredients

3.1. Substances : Not applicable

3.2. Mixtures

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Nitrogen	(CAS-No.) 7727-37-9 (EC-No.) 231-783-9 (EC Index-No.) (REACH-no) *1	75.9	Press. Gas (Comp.), H280
Oxygen	(CAS-No.) 7782-44-7 (EC-No.) 231-956-9 (EC Index-No.) 008-001-00-8 (REACH-no) *1	<= 21	Ox. Gas 1, H270 Press. Gas (Comp.), H280
Methane	(CAS-No.) 74-82-8 (EC-No.) 200-812-7 (EC Index-No.) 601-001-00-4 (REACH-no) 01-2119474442-39	<= 2.5	Flam. Gas 1, H220 Press. Gas (Comp.), H280
Hydrogen sulphide	(CAS-No.) 7783-06-4 (EC-No.) 231-977-3 (EC Index-No.) 016-001-00-4 (REACH-no) 01-2119445737-29	<= 0.5	Flam. Gas 1, H220 Press. Gas (Liq.), H280 Acute Tox. 2 (Inhalation:gas), H330 STOT SE 3, H335 Aquatic Acute 1, H400
Carbon monoxide	(CAS-No.) 630-08-0 (EC-No.) 211-128-3 (EC Index-No.) 006-001-00-2 (REACH-no) 01-2119480165-39	<= 0.1	Flam. Gas 1, H220 Press. Gas (Comp.), H280 Acute Tox. 3 (Inhalation:gas), H331 Repr. 1A, H360D STOT RE 1, H372

Full text of H-statements: see section 16

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

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

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

SECTION 4: First aid measures

4.1. Description of first aid measures

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

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

: Refer to section 11.

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

: None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

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

5.2. Special hazards arising from the substance or mixture

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

5.3. Advice for firefighters

- Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
If possible, stop flow of product.
Use water spray or fog to knock down fire fumes if possible.
Move containers away from the fire area if this can be done without risk.
- Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- : Act in accordance with local emergency plan.
Stay upwind.

6.2. Environmental precautions

- : None.

6.3. Methods and material for containment and cleaning up

- : None.

6.4. Reference to other sections

- : See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Safe use of the product : The product must be handled in accordance with good industrial hygiene and safety procedures.
 Only experienced and properly instructed persons should handle gases under pressure.
 Consider pressure relief device(s) in gas installations.
 Ensure the complete gas system was (or is regularly) checked for leaks before use.
 Do not smoke while handling product.
 Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
 Avoid suck back of water, acid and alkalis.
 Do not breathe gas.
 Avoid release of product into work area.
- Safe handling of the gas receptacle : Refer to supplier's container handling instructions.
 Do not allow backfeed into the container.
 Protect cylinders from physical damage; do not drag, roll, slide or drop.
 When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
 Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
 If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.
 Never attempt to repair or modify container valves or safety relief devices.
 Damaged valves should be reported immediately to the supplier.
 Keep container valve outlets clean and free from contaminants particularly oil and water.
 Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
 Close container valve after each use and when empty, even if still connected to equipment.
 Never attempt to transfer gases from one cylinder/container to another.
 Never use direct flame or electrical heating devices to raise the pressure of a container.
 Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.
 Suck back of water into the container must be prevented.
 Open valve slowly to avoid pressure shock.

7.2. Conditions for safe storage, including any incompatibilities

- : Observe all regulations and local requirements regarding storage of containers.
 Containers should not be stored in conditions likely to encourage corrosion.
 Container valve guards or caps should be in place.
 Containers should be stored in the vertical position and properly secured to prevent them from falling over.
 Stored containers should be periodically checked for general condition and leakage.
 Keep container below 50°C in a well ventilated place.
 Store containers in location free from fire risk and away from sources of heat and ignition.
 Keep away from combustible materials.

7.3. Specific end use(s)

- : None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Hydrogen sulphide (7783-06-4)	
EU - Occupational Exposure Limits	
Local name	Hydrogen sulphide
IOELV TWA (mg/m ³)	7 mg/m ³
IOELV TWA (ppm)	5 ppm
IOELV STEL (mg/m ³)	14 mg/m ³

IOELV STEL (ppm)	10 ppm
Regulatory reference	COMMISSION DIRECTIVE 2009/161/EU
Austria - Occupational Exposure Limits	
Local name	Schwefelwasserstoff
MAK (mg/m ³)	7 mg/m ³
MAK (ppm)	5 ppm
MAK Short time value (mg/m ³)	7 mg/m ³
MAK Short time value (ppm)	5 ppm
Regulatory reference	BGBI. II Nr. 186/2015
Belgium - Occupational Exposure Limits	
Local name	Hydrogène (sulfure d') # Waterstofsulfide
Limit value (mg/m ³)	7 mg/m ³
Limit value (ppm)	5 ppm
Short time value (mg/m ³)	14 mg/m ³
Short time value (ppm)	10 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 02/09/2018
Bulgaria - Occupational Exposure Limits	
Local name	Сероводород
OEL TWA (mg/m ³)	7 mg/m ³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m ³)	14 mg/m ³
OEL STEL (ppm)	10 ppm
Notes	• (Химични агенти, за които са определени гранични стойности във въздуха на работната среда за Европейската общност)
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр.73 от 4 септември 2018 г.)
Croatia - Occupational Exposure Limits	
Local name	Vodikov sulfid
GVI (granična vrijednost izloženosti) (mg/m ³)	7 mg/m ³
GVI (granična vrijednost izloženosti) (ppm)	5 ppm
KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m ³)	14 mg/m ³
KGVI (kratkotrajna granična vrijednost izloženosti) (ppm)	10 ppm
Naznake (HR)	EU*** (naznaka da se radi o tvarima za koje su utvrđene indikativne granične vrijednosti izloženosti prema Direktivi 2009/161/ EU (treća lista)); F+ (vrlo lako zapaljivo); T+ (vrlo otrovno); N (opasno za okoliš)
Regulatory reference	Pravilnik o izmjenama i dopunama Pravilnika o graničnim vrijednostima izloženosti opasnim tvarima pri radu i o biološkim graničnim vrijednostima (NN, br. 75/13)
Czech Republic - Occupational Exposure Limits	
Local name	Sirovodík (Sulfan)
Expoziční limity (PEL) (mg/m ³)	7 mg/m ³
Expoziční limity (PEL) (ppm)	5 ppm
Expoziční limity (NPK-P) (mg/m ³)	14 mg/m ³
Expoziční limity (NPK-P) (ppm)	10 ppm
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (zpracovány změny č. 246/2018 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Hydrogensulfid (Svovlbrinte)
Grænseværdie (langvarig) (mg/m ³)	7 mg/m ³
Grænseværdie (langvarig) (ppm)	5 ppm
Regulatory reference	BEK nr 655 af 31/05/2018
Estonia - Occupational Exposure Limits	
Local name	Vesiniksulfid
OEL TWA (mg/m ³)	7 mg/m ³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m ³)	14 mg/m ³
OEL STEL (ppm)	10 ppm
Regulatory reference	Vabariigi Valitsuse 18. septembri 2001. a määruse nr 293 (RT I, 30.11.2011, 5)
Finland - Occupational Exposure Limits	
Local name	Rikkivety
HTP-arvo (8h) (mg/m ³)	7 mg/m ³
HTP-arvo (8h) (ppm)	5 ppm

HTP-arvo (15 min)	14 mg/m ³
HTP-arvo (15 min) (ppm)	10 ppm
Regulatory reference	HTP-ARVOT 2018 (Sosiaali- ja terveystieteiden ministeriö)
France - Occupational Exposure Limits	
Local name	Hydrogène sulfuré
VME (mg/m ³)	7 mg/m ³
VME (ppm)	5 ppm
VLE (mg/m ³)	14 mg/m ³
VLE (ppm)	10 ppm
Note (FR)	Valeurs réglementaires contraignantes
Regulatory reference	Article R4412-149 du Code du travail (réf.: INRS ED 984, 2016)
Germany - Occupational Exposure Limits (TRGS 900)	
TRGS 900 Local name	Hydrogensulfid
TRGS 900 Occupational exposure limit value (mg/m ³)	7.1 mg/m ³
TRGS 900 Occupational exposure limit value (ppm)	5 ppm
TRGS 900 Limitation of exposure peaks	2(l)
TRGS 900 Remark	EU;DFG;AGS;Y
TRGS 900 Regulatory reference	TRGS900
Greece - Occupational Exposure Limits	
Local name	Υδροθειο
OEL TWA (mg/m ³)	7 mg/m ³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m ³)	10 mg/m ³
OEL STEL (ppm)	14 ppm
Regulatory reference	Π.Δ. 12/2012
Hungary - Occupational Exposure Limits	
Local name	KÉN-HIDROGÉN
AK-érték	7 mg/m ³
CK-érték	14 mg/m ³
Megjegyzések (HU)	i (ingerlő anyag, amely irritálja a bőrt, nyálkahártyát, szemet vagy mindhármát); EU3 (2009/161 /EK irányelvben közölt érték)
Regulatory reference	25/2000. (IX. 30.) EüM–SZCSM együttes rendelet a munkahelyek kémiai biztonságáról
Ireland - Occupational Exposure Limits	
Local name	Hydrogen sulphide
OEL (8 hours ref) (mg/m ³)	7 mg/m ³
OEL (8 hours ref) (ppm)	5 ppm
OEL (15 min ref) (mg/m ³)	14 mg/m ³
OEL (15 min ref) (ppm)	10 ppm
Notes (IE)	IOELV (Indicative Occupational Exposure Limit Values)
Regulatory reference	Code of Practice for the Chemical Agents Regulations 2018
Italy - Occupational Exposure Limits	
Local name	Acido solfidrico
OEL TWA (mg/m ³)	7 mg/m ³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m ³)	14 mg/m ³
OEL STEL (ppm)	10 ppm
Regulatory reference	Allegato XXXVIII del D.Lgs. 9 aprile 2008, n. 81 e s.m.i.
Latvia - Occupational Exposure Limits	
Local name	Sērūdenradis
OEL TWA (mg/m ³)	7 mg/m ³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m ³)	14 mg/m ³
OEL STEL (ppm)	10 ppm
Regulatory reference	Ministru kabineta 2007.gada 15.maija noteikumiem Nr.325 (Grozījumi Ministru kabineta 2011.gada 1.februārī noteikumiem Nr.92)
Lithuania - Occupational Exposure Limits	
Local name	Vandenilio sulfidas
IPRV (mg/m ³)	7 mg/m ³
IPRV (ppm)	5 ppm
TPRV (mg/m ³)	14 mg/m ³
TPRV (ppm)	10 ppm
NRV (mg/m ³)	20 mg/m ³

NRV (ppm)	15 ppm
Remark (LT)	Ū (ūmus poveikis)
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
Luxembourg - Occupational Exposure Limits	
Local name	Sulfure d'hydrogène
OEL TWA (mg/m ³)	7 mg/m ³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m ³)	14 mg/m ³
OEL STEL (ppm)	10 ppm
Regulatory reference	Mémorial A N° 684 de 2018
Malta - Occupational Exposure Limits	
Local name	Hydrogen sulphide
OEL TWA (mg/m ³)	7 mg/m ³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m ³)	14 mg/m ³
OEL STEL (ppm)	10 ppm
Regulatory reference	S.L.424.24 (L.N.57 of 2018)
Netherlands - Occupational Exposure Limits	
Local name	Zwavelwaterstof
Grenswaarde TGG 8H (mg/m ³)	2.3 mg/m ³
Regulatory reference	Arbeidsomstandighedenregeling 2018
Poland - Occupational Exposure Limits	
Local name	Siarkowodór
NDS (mg/m ³)	7 mg/m ³
NDSch (mg/m ³)	14 mg/m ³
Regulatory reference	Dz. U. 2018 poz. 1286
Portugal - Occupational Exposure Limits	
Local name	Ácido sulfídrico
OEL TWA (ppm)	1 ppm
OEL STEL (ppm)	5 ppm
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Hidrogen sulfurat/Sulfură de hidrogen
OEL TWA (mg/m ³)	7 mg/m ³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m ³)	14 mg/m ³
OEL STEL (ppm)	10 ppm
Regulatory reference	Hotărârea nr. 584/2018
Slovakia - Occupational Exposure Limits	
Local name	Sírovodík (sulfán)
NPHV (priemerná) (mg/m ³)	7 mg/m ³
NPHV (priemerná) (ppm)	5 ppm
OEL STEL (mg/m ³)	14 mg/m ³
OEL STEL (ppm)	10 ppm
Regulatory reference	Nariadenie vlády č. 33/2018 Z.z.
Slovenia - Occupational Exposure Limits	
Local name	vodikov sulfid
OEL TWA (mg/m ³)	7 mg/m ³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m ³)	14 mg/m ³
OEL STEL (ppm)	10 ppm
KTV factor SL	2
Regulatory reference	Uradni list RS, št. 78/2018 z dne 4.12.2018
Spain - Occupational Exposure Limits	
Local name	Sulfuro de hidrógeno
VLA-ED (mg/m ³)	7 mg/m ³
VLA-ED (ppm)	5 ppm
VLA-EC (mg/m ³)	14 mg/m ³
VLA-EC (ppm)	10 ppm
Notes	VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2019. INSHT

Sweden - Occupational Exposure Limits	
Local name	Vätessulfid (Svavelväte)
nivågränsvärde (NVG) (mg/m ³)	7 mg/m ³
nivågränsvärde (NVG) (ppm)	5 ppm
kortidsvärde (KTV) (mg/m ³)	14 mg/m ³
kortidsvärde (KTV) (ppm)	10 ppm
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Hydrogen sulphide
WEL TWA (mg/m ³)	7 mg/m ³
WEL TWA (ppm)	5 ppm
WEL STEL (mg/m ³)	14 mg/m ³
WEL STEL (ppm)	10 ppm
Regulatory reference	EH40/2005 (Third edition, 2018). HSE
Iceland - Occupational Exposure Limits	
Local name	Vetnissúlfíð (brennisteinsvetni)
OEL (8 hours ref) (mg/m ³)	7 mg/m ³
OEL (8 hours ref) (ppm)	5 ppm
OEL (15 min ref) (mg/m ³)	14 mg/m ³
OEL (15 min ref) (ppm)	10 ppm
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 1296/2012)
Norway - Occupational Exposure Limits	
Local name	Hydrogensulfid
Grenseverdier (AN) (mg/m ³)	7 mg/m ³
Grenseverdier (AN) (ppm)	5 ppm
Grenseverdier (Takverdi) (mg/m ³)	14 mg/m ³
Grenseverdier (Takverdi) (ppm)	10 ppm
Merknader (NO)	E (EU har en veiledende grenseverdi for stoffet)
Regulatory reference	FOR-2018-08-21-1255
Switzerland - Occupational Exposure Limits	
Local name	Hydrogène sulfuré / Schwefelwasserstoff
MAK (mg/m ³)	7.1 mg/m ³
MAK (ppm)	5 ppm
KZGW (mg/m ³)	14.2 mg/m ³
KZGW (ppm)	10 ppm
Remark	Notationen: SS _C
Regulatory reference	www.suva.ch, 01.11.2018
Turkey - Occupational Exposure Limits	
Local name	Hidrojen sülfid
OEL TWA (mg/m ³)	7 mg/m ³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m ³)	14 mg/m ³
OEL STEL (ppm)	10 ppm
Regulatory reference	12 Ağustos 2013 Tarihli ve 28733 Sayılı Resmî Gazete
Taiwan - Occupational Exposure Limits	
OEL Ceilings (mg/m ³)	10 mg/m ³
OEL Ceilings (ppm)	14 ppm
Remark (TW)	Category C1 special chemical
Regulatory reference	Standards of Permissible Exposure Limits of Airborne Hazardous Substances in Workplace (Amended Feb 1 2010)
Australia - Occupational Exposure Limits	
Local name	Hydrogen sulphide
TWA (mg/m ³)	14 mg/m ³
TWA (ppm)	10 ppm
STEL (mg/m ³)	21 mg/m ³
STEL (ppm)	15 ppm
USA - ACGIH - Occupational Exposure Limits	
Local name	Hydrogen sulfide
ACGIH TWA (ppm)	1 ppm
ACGIH STEL (ppm)	5 ppm
Remark (ACGIH)	TLV® Basis: URT irr; CNS impair
Regulatory reference	ACGIH 2019

Carbon monoxide (630-08-0)	
EU - Occupational Exposure Limits	
Local name	Carbon monoxide
IOELV TWA (mg/m ³)	23 mg/m ³
IOELV TWA (ppm)	20 ppm
IOELV STEL (mg/m ³)	117 mg/m ³
IOELV STEL (ppm)	100 ppm
Notes	SCOEL Recommendations (1995)
Regulatory reference	COMMISSION DIRECTIVE (EU) 2017/164
Austria - Occupational Exposure Limits	
Local name	Kohlenstoffmonoxid
MAK (mg/m ³)	33 mg/m ³
MAK (ppm)	30 ppm
MAK Short time value (mg/m ³)	66 mg/m ³
MAK Short time value (ppm)	60 ppm
Regulatory reference	BGBI. II Nr. 186/2015
Belgium - Occupational Exposure Limits	
Local name	Carbone (monoxyde de) # Koolstofmonoxide
Limit value (mg/m ³)	23 mg/m ³
Limit value (ppm)	20 ppm
Short time value (mg/m ³)	117 mg/m ³
Short time value (ppm)	100 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 02/09/2018
Bulgaria - Occupational Exposure Limits	
Local name	Въглероден моноксид
OEL TWA (mg/m ³)	23 mg/m ³
OEL TWA (ppm)	20 ppm
OEL STEL (mg/m ³)	117 mg/m ³
OEL STEL (ppm)	100 ppm
Notes	• (Химични агенти, за които са определени гранични стойности във въздуха на работната среда за Европейската общност)
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр.73 от 4 септември 2018 г.)
Croatia - Occupational Exposure Limits	
Local name	Ugljikov monksid
GVI (granična vrijednost izloženosti) (mg/m ³)	35 mg/m ³
GVI (granična vrijednost izloženosti) (ppm)	30 ppm
KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m ³)	232 mg/m ³
KGVI (kratkotrajna granična vrijednost izloženosti) (ppm)	200 ppm
Naznake (HR)	F+ (vrlo lako zapaljivo); T (otrovno); BVG; Repr. kat. 1 (tvari za koje se zna da smanjuju plodnost kod ljudi i/ili – tvari za koje se zna da iskazuju razvojnu toksičnost kod ljudi)
Regulatory reference	Pravilnik o izmjenama i dopunama Pravilnika o граничним vrijednostima izloženosti opasnim tvarima pri radu i o biološkim граничним vrijednostima (NN, br. 75/13)
Czech Republic - Occupational Exposure Limits	
Local name	Oxid uhelnatý
Expoziční limity (PEL) (mg/m ³)	23 mg/m ³
Expoziční limity (PEL) (ppm)	20.08 ppm
Expoziční limity (NPK-P) (mg/m ³)	117 mg/m ³
Expoziční limity (NPK-P) (ppm)	102.14 ppm
Remark (CZ)	P (u látky nelze vyloučit závažné pozdní účinky)
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (zpracovány změny č. 246/2018 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Carbonmonoxid (Kulilte; Kulmonoxid)
Grænseværdie (langvarig) (mg/m ³)	23 mg/m ³
Grænseværdie (langvarig) (ppm)	20 ppm
Anmærkninger (DK)	E (betyder, at stoffet har en EF-grænseværdi)
Regulatory reference	BEK nr 655 af 31/05/2018
Estonia - Occupational Exposure Limits	
Local name	Süsinikmonooksiid

OEL TWA (mg/m ³)	40 mg/m ³ Allmaakaevandustes 25 mg/m ³ heitgaasina 23 mg/m ³
OEL TWA (ppm)	35 ppm Allmaakaevandustes 20 ppm heitgaasina 20 ppm
OEL STEL (mg/m ³)	120 mg/m ³ Allmaakaevandustes 117 mg/m ³
OEL STEL (ppm)	100 ppm Allmaakaevandustes 100 ppm
Remark (ET)	R (Reproduktiivtoksilised ained), 9 (Lämmastikdioksiidil ja süsinikmonooksiidil on heitgaasides koos kantserogeensete ainetega eraldi määratud piirnормid. Bensiini- ja vedelgaasimootorite heitgaaside indikaator on süsinikmonooksiid, diiselmootoritel lämmastikdioksiid. Nende puhul ei arvestata aditiivset efekti), Allmaakaevandustes jõustub piirnорм 21.08.2020
Regulatory reference	Vabariigi Valitsuse 18. septembri 2001. a määruse nr 293 (21.08.2018)
Finland - Occupational Exposure Limits	
Local name	Hiiimonoksidi
HTP-arvo (8h) (mg/m ³)	23 mg/m ³
HTP-arvo (8h) (ppm)	20 ppm
HTP-arvo (15 min)	87 mg/m ³
HTP-arvo (15 min) (ppm)	75 ppm
Huomautus (FI)	melu
Regulatory reference	HTP-ARVOT 2018 (Sosiaali- ja tervaysministeriö)
France - Occupational Exposure Limits	
Local name	Carbone (oxyde de)
VME (mg/m ³)	55 mg/m ³
VME (ppm)	50 ppm
Note (FR)	Valeurs recommandées/admises; substance classée toxique pour la reproduction de catégorie 1A
Regulatory reference	Circulaire du Ministère du travail (réf.: INRS ED 984, 2016)
Germany - Occupational Exposure Limits (TRGS 900)	
TRGS 900 Local name	Kohlenstoffmonoxid
TRGS 900 Occupational exposure limit value (mg/m ³)	35 mg/m ³
TRGS 900 Occupational exposure limit value (ppm)	30 ppm
TRGS 900 Limitation of exposure peaks	2(II)
TRGS 900 Remark	DFG;Z
TRGS 900 Regulatory reference	TRGS900
Greece - Occupational Exposure Limits	
Local name	Μονοξειδίο του άνθρακα
OEL TWA (mg/m ³)	55 mg/m ³
OEL TWA (ppm)	50 ppm
OEL STEL (mg/m ³)	330 mg/m ³
OEL STEL (ppm)	300 ppm
Regulatory reference	Π.Δ. 90/1999
Hungary - Occupational Exposure Limits	
Local name	SZÉN-MONOXID
AK-érték	23 mg/m ³ 33 mg/m ³ a föld alatti bányászat és az alagútfúrás terén vonatkozó határértékek
CK-érték	117 mg/m ³ 66 mg/m ³ a föld alatti bányászat és az alagútfúrás terén vonatkozó határértékek
Megjegyzések (HU)	EU4 (2017/164 EU irányelvben közölt érték), BHM (biológiai hatásmutató)
Regulatory reference	25/2000. (IX. 30.) EüM-SZCSM együttes rendelet a munkahelyek kémiai biztonságáról
Ireland - Occupational Exposure Limits	
Local name	Carbon monoxide
OEL (8 hours ref) (mg/m ³)	23 mg/m ³
OEL (8 hours ref) (ppm)	20 ppm
OEL (15 min ref) (mg/m ³)	117 mg/m ³
OEL (15 min ref) (ppm)	100 ppm

Notes (IE)	Repr.1A (Substances which are known human reproductive toxicants), IOELV (Indicative Occupational Exposure Limit Values)
Regulatory reference	Code of Practice for the Chemical Agents Regulations 2018
Latvia - Occupational Exposure Limits	
Local name	Oglekļa (II) oksīds (oglekļa monoksīds)
OEL TWA (mg/m ³)	20 mg/m ³
OEL TWA (ppm)	17 ppm
OEL STEL (mg/m ³)	117 mg/m ³
OEL STEL (ppm)	100 ppm
Regulatory reference	Ministru kabineta 2007.gada 15.maija noteikumiem Nr.325 (Grozījumi Ministru kabineta 2018. gada 10. jūlijā noteikumiem Nr.407)
Lithuania - Occupational Exposure Limits	
Local name	Anglies monoksidas
IPRV (mg/m ³)	23 mg/m ³
IPRV (ppm)	20 ppm
TPRV (mg/m ³)	117 mg/m ³
TPRV (ppm)	100 ppm
Remark (LT)	R (reprodukcijai toksiškas poveikis); Ū (ūmus poveikis)
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
Luxembourg - Occupational Exposure Limits	
Local name	Monoxyde de carbone
OEL TWA (mg/m ³)	23 mg/m ³
OEL TWA (ppm)	20 ppm
OEL STEL (mg/m ³)	117 mg/m ³
OEL STEL (ppm)	100 ppm
Regulatory reference	Mémorial A N° 684 de 2018
Malta - Occupational Exposure Limits	
Local name	Carbon monoxide
OEL TWA (mg/m ³)	23 mg/m ³
OEL TWA (ppm)	20 ppm
OEL STEL (mg/m ³)	117 mg/m ³
OEL STEL (ppm)	100 ppm
Regulatory reference	S.L.424.24 (L.N.57 of 2018)
Netherlands - Occupational Exposure Limits	
Local name	Koolmonoxide
Grenswaarde TGG 8H (mg/m ³)	23 mg/m ³
Grenswaarde TGG 15MIN (mg/m ³)	117 mg/m ³
Regulatory reference	Arbeidsomstandighedenregeling 2018
Poland - Occupational Exposure Limits	
Local name	Tlenek węgla
NDS (mg/m ³)	23 mg/m ³
NDSCh (mg/m ³)	117 mg/m ³
Regulatory reference	Dz. U. 2018 poz. 1286
Portugal - Occupational Exposure Limits	
Local name	Monóxido de carbono
OEL TWA (ppm)	25 ppm
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Monoxid de carbon
OEL TWA (mg/m ³)	20 mg/m ³ Exploatărilor miniere subterane și al șantierelor de săpare a tunelurilor și puțurilor 23 mg/m ³ (Pentru substanțe chimice în fază gazoasă sau de vapori, valoarea-limită este exprimată la 20°C și la 101,3 kPa)
OEL TWA (ppm)	17.5 ppm Exploatărilor miniere subterane și al șantierelor de săpare a tunelurilor și puțurilor 20 ppm
OEL STEL (mg/m ³)	30 mg/m ³ Exploatărilor miniere subterane și al șantierelor de săpare a tunelurilor și puțurilor 117 mg/m ³ (Pentru substanțe chimice în fază gazoasă sau de vapori, valoarea-limită este exprimată la 20°C și la 101,3 kPa)
OEL STEL (ppm)	26 ppm Exploatărilor miniere subterane și al șantierelor de săpare a tunelurilor și puțurilor 100 ppm

Regulatory reference	Hotárärea nr. 584/2018
Slovakia - Occupational Exposure Limits	
Local name	Oxid uhoľnatý
NPHV (priemerná) (mg/m ³)	35 mg/m ³ podzemnej ťažbe a razení tunelov 23 mg/m ³
NPHV (priemerná) (ppm)	30 ppm podzemnej ťažbe a razení tunelov 20 ppm
OEL STEL (mg/m ³)	70 mg/m ³ podzemnej ťažbe a razení tunelov 117 mg/m ³
OEL STEL (ppm)	60 ppm podzemnej ťažbe a razení tunelov 100 ppm
Upozornenie (SK)	5) NPEL majú prechodné obdobie do 21. augusta 2023, ktoré sa týka expozície zamestnancov pri podzemnej ťažbe a razení tunelov
Regulatory reference	Nariadenie vlády č. 33/2018 Z.z.
Slovenia - Occupational Exposure Limits	
Local name	ogljikov monoksid
OEL TWA (mg/m ³)	23 mg/m ³
OEL TWA (ppm)	20 ppm
OEL STEL (mg/m ³)	117 mg/m ³
OEL STEL (ppm)	100 ppm
KTV factor SL	2
Regulatory reference	Uradni list RS, št. 78/2018 z dne 4.12.2018
Spain - Occupational Exposure Limits	
Local name	Monóxido de carbono
VLA-ED (mg/m ³)	23 mg/m ³ 29 mg/m ³ Para este agente existe un periodo transitorio, que terminará, a más tardar, el 21 de agosto de 2023, para los sectores de la minería subterránea y la construcción de túneles.
VLA-ED (ppm)	20 ppm 25 ppm Para este agente existe un periodo transitorio, que terminará, a más tardar, el 21 de agosto de 2023, para los sectores de la minería subterránea y la construcción de túneles.
VLA-EC (mg/m ³)	117 mg/m ³
VLA-EC (ppm)	100 ppm
Notes	VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo), TR1A (Cuando las pruebas utilizadas para la clasificación procedan principalmente de datos en humanos), VLB® (Agente químico que tiene Valor Límite Biológico), , r (Esta sustancia tiene establecidas restricciones a la fabricación, la comercialización o el uso en los términos especificados en el "Reglamento (CE) n° 1907/2006 sobre Registro, Evaluación, Autorización y Restricción de sustancias y preparados químicos" (REACH) de 18 de diciembre de 2006 (DOUE L 369 de 30 de diciembre de 2006). Las restricciones de una sustancia pueden aplicarse a todos los usos o sólo a usos concretos. El anexo XVII del Reglamento REACH contiene la lista de todas las sustancias restringidas y especifica los usos que se han restringido).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2019. INSHT

Spain - Biological limit values	
Spain - BLV	<p>3.5 % of hemoglobin Parámetro: Carboxihemoglobina - Medio: Sangre - Momento de muestreo: Final de la jornada laboral - Notas: F (Fondo. El indicador está generalmente presente en cantidades detectables en personas no expuestas laboralmente. Estos niveles de fondo están considerados en el valor VLB), I (Significa que el indicador biológico es inespecífico puesto que puede encontrarse después de la exposición a otros agentes químicos)</p> <p>20 ppm Parámetro: CO - Medio: Aire alveolar (fracción final del aire exhalado) - Momento de muestreo: Final de la jornada laboral - Notas: F (Fondo. El indicador está generalmente presente en cantidades detectables en personas no expuestas laboralmente. Estos niveles de fondo están considerados en el valor VLB), I (Significa que el indicador biológico es inespecífico puesto que puede encontrarse después de la exposición a otros agentes químicos)</p>
Sweden - Occupational Exposure Limits	
Local name	Kolmonoxid (Avgaser som kolmonoxid)
nivågränsvärde (NVG) (mg/m ³)	23 mg/m ³ 25 mg/m ³ När det gäller underjord- eller tunnelarbete
nivågränsvärde (NVG) (ppm)	20 ppm 20 ppm När det gäller underjord- eller tunnelarbete
kortidsvärde (KTV) (mg/m ³)	117 mg/m ³ 117 mg/m ³ När det gäller underjord- eller tunnelarbete
kortidsvärde (KTV) (ppm)	100 ppm 100 ppm När det gäller underjord- eller tunnelarbete
Anmärkning (SE)	B (Ämnet kan orsaka hörselskada. Exponering för ämnet nära det befintliga yrkeshygieniska gränsvärdet och vid samtidig exponering för buller nära insatsvärdet 80 dB kan orsaka hörselskada); R (Ämnet är reproduktionsstörande. Med reproduktionsstörande ämnen avses ämnen som kan medföra skadliga effekter på fortplantningsförmågan eller avkommans utveckling); V (Vägledande kortidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas)
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Carbon monoxide
WEL TWA (mg/m ³)	23 mg/m ³ 35 mg/m ³ Limits applicable to underground mining & tunnelling industries ONLY until 21/8/23
WEL TWA (ppm)	20 ppm 30 ppm Limits applicable to underground mining & tunnelling industries ONLY until 21/8/23
WEL STEL (mg/m ³)	117 mg/m ³ 232 mg/m ³ Limits applicable to underground mining & tunnelling industries ONLY until 21/8/23
WEL STEL (ppm)	100 ppm 200 ppm Limits applicable to underground mining & tunnelling industries ONLY until 21/8/23
Remark (WEL)	BMGV (Biological monitoring guidance values are listed in Table 2)
Regulatory reference	EH40/2005 (Third edition, 2018). HSE
Iceland - Occupational Exposure Limits	
Local name	Kolmónoxíð (kolsýrlingur)
OEL (8 hours ref) (mg/m ³)	29 mg/m ³
OEL (8 hours ref) (ppm)	25 ppm
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Karbonmonoksid
Grenseverdier (AN) (mg/m ³)	23 mg/m ³ 29 mg/m ³ For bransjene gruvedrift under jord og tunnelvirksomhet

Grenseverdier (AN) (ppm)	20 ppm 25 ppm For bransjene gruvedrift under jord og tunnelvirksomhet
Grenseverdier (Korttidsverdi) (mg/m ³)	117 mg/m ³
Grenseverdier (Korttidsverdi) (ppm)	100 ppm 100 ppm For bransjene gruvedrift under jord og tunnelvirksomhet
Merknader (NO)	R (Kjemikalier som skal betraktes som reproduksjonstoksiske); E (EU har en veiledende grenseverdi for stoffet); S (Korttidsverdi er en verdi for gjennomsnittskonsentrasjonen av et kjemisk stoff i pustesonen til en arbeidstaker som ikke skal overskrides i en fastsatt referanseperiode. Referanseperioden er 15 minutter); 6) Enkelte bedrifter innen smelteverkindustrien vil av teknisk-økonomiske årsaker ikke kunne overholde denne korttidsverdien. Det er disse bedriftenes ansvar å dokumentere et forsvarlig arbeidsmiljø. Det skal utarbeides skriftlig instruks for arbeid i CO-atmosfære. For bransjene gruvedrift under jord og tunnelvirksomhet frem til 21.august 2023
Regulatory reference	FOR-2018-08-21-1255
Switzerland - Occupational Exposure Limits	
Local name	Monoxyde de carbone / Kohlenmonoxid [Kohlenoxid]
MAK (mg/m ³)	35 mg/m ³
MAK (ppm)	30 ppm
KZGW (mg/m ³)	70 mg/m ³
KZGW (ppm)	60 ppm
Remark	Kritische Toxizität: COHb; Messmethoden: NIOSH; Notationen: SS _B , O ₂ , B
Regulatory reference	www.suva.ch, 01.11.2018
Taiwan - Occupational Exposure Limits	
OEL TWA (mg/m ³)	40 mg/m ³
OEL TWA (ppm)	35 ppm
Remark (TW)	Category D special chemical
Regulatory reference	Standards of Permissible Exposure Limits of Airborne Hazardous Substances in Workplace (Amended Feb 1 2010)
Australia - Occupational Exposure Limits	
Local name	Carbon monoxide
TWA (mg/m ³)	34 mg/m ³
TWA (ppm)	30 ppm
USA - ACGIH - Occupational Exposure Limits	
Local name	Carbon monoxide
ACGIH TWA (ppm)	25 ppm
Remark (ACGIH)	TLV® Basis: COHb-emia. Notations: BEI
Regulatory reference	ACGIH 2019
Methane (74-82-8)	
Belgium - Occupational Exposure Limits	
Local name	Hydrocarbures aliphatiques sous forme gazeuse: (Alcanes C1-C3) # Alifatische koolwaterstoffen in gas-vorm: Alkanen (C1-C3)
Limit value (ppm)	1000 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 02/09/2018
Bulgaria - Occupational Exposure Limits	
Local name	Метан
OEL TWA (mg/m ³)	500 mg/m ³
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр.73 от 4 септември 2018 г.)
Finland - Occupational Exposure Limits	
Local name	Metaani
HTP-arvo (8h) (ppm)	1000 ppm

Huomautus (FI)	Happea syrjäyttämällä tukahduttavat kaasut: Eräät kaasut voivat suurina pitoisuuksina vaikuttaa tukahduttavasti ilman muita merkittäviä fysiologisia vaikutuksia. Hapen puutetta voi ilmaantua työilman normaalin happipitoisuuden (noin 21 %) laskiessa alle 18 %:n. Erityisesti tyytettyihin tiloihin kulkuun liittyy merkittävä tukehtumisriski ja hengenvaara. Liian alhaiselta happipitoisuudelta suojaudutaan valvomalla työilman happipitoisuutta ja tarkoituksenmukaisin teknisin järjestelyin sekä suojaamalla, johon hengityskelpoista ilmaa saadaan letkuilla tai säiliöstä riippumatta ympäröivästä ilmasta. Erityisen herkkiä alhaiselle happipitoisuudelle voivat olla eräitä sydän- ja keuhkosairauksia sairastavat työntekijät. Jotkut tukahduttavista kaasuista, kuten vety ja asetyleeni, ovat erittäin helposti syttyviä jo pienemmissä pitoisuuksissa, ja myös tämän vuoksi niiden työilmapitoisuus on pidettävä alhaisena. Muita happea syrjäyttämällä tukahduttavia kaasuja ovat mm. helium, neon, argon ja jo edellä mainittu tyyppi.
Regulatory reference	HTP-ARVOT 2018 (Sosiaali- ja terveysministeriö)
Ireland - Occupational Exposure Limits	
Local name	Methane
OEL (8 hours ref) (ppm)	1000 ppm
Notes (IE)	Asphx. (Gaseous chemical substances which may not produce significant physiological effects in the exposed employee, but when present in high concentrations will act as simple asphyxiants).
Regulatory reference	Code of Practice for the Chemical Agents Regulations 2018
Romania - Occupational Exposure Limits	
Local name	Metan
OEL TWA (mg/m ³)	1200 mg/m ³
OEL TWA (ppm)	1834 ppm
OEL STEL (mg/m ³)	1500 mg/m ³
OEL STEL (ppm)	2292 ppm
Regulatory reference	Hotărârea nr. 584/2018
Spain - Occupational Exposure Limits	
Local name	Metano
VLA-ED (ppm)	1000 ppm Hidrocarburos alifáticos alcanos (C1 – C4) y sus mezclas, gases (Butano; Etano; Metano; Propano)
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2019. INSHT
Switzerland - Occupational Exposure Limits	
Local name	Méthane / Methan
MAK (mg/m ³)	6700 mg/m ³
MAK (ppm)	10000 ppm
Remark	Kritische Toxizität: Formal
Regulatory reference	www.suva.ch, 01.11.2018
USA - ACGIH - Occupational Exposure Limits	
Local name	Methane
Remark (ACGIH)	TLV® Basis: Simple Asphyxiant
Regulatory reference	ACGIH 2019
Nitrogen (7727-37-9)	
Belgium - Occupational Exposure Limits	
Local name	Azote # Stikstof
Remark (BE)	A: la mention "A" signifie que l'agent libère un gaz ou une vapeur qui n'ont en eux-mêmes aucun effet physiologique mais peuvent diminuer le taux d'oxygène dans l'air. Lorsque le taux d'oxygène descend en dessous de 17-18 % (vol/vol) le manque d'oxygène provoque des suffocations qu'aucun symptôme préalable n'annonce. # A: de vermelding "A" betekent dat dit agens gas of damp vrijgeeft dat of die op zich geen fysiologische werking heeft, maar het zuurstofgehalte in de lucht verlaagt. Wanneer het zuurstofgehalte daalt onder de 17-18 % (vol/vol), veroorzaakt het zuurstoftekort verstikking, die zich manifesteert zonder dat er een waarschuwing aan voorafgaat.
Regulatory reference	Koninklijk besluit/Arrêté royal 02/09/2018
Ireland - Occupational Exposure Limits	
Local name	Nitrogen

Notes (IE)	Asphx. (Gaseous chemical substances which may not produce significant physiological effects in the exposed employee, but when present in high concentrations will act as simple asphyxiants).
Regulatory reference	Code of Practice for the Chemical Agents Regulations 2018
Spain - Occupational Exposure Limits	
Local name	Nitrógeno
Notes	b (Asfixiantes simples. Ciertos gases y vapores presentes en el aire actúan desplazando al oxígeno y disminuyendo su concentración en el aire, sin efecto toxicológico. Estas sustancias no tienen un valor límite ambiental asignado y el único factor limitador de la concentración viene dado por el oxígeno disponible en el aire, que debe ser al menos del 19,5 % de O ₂ equivalente a nivel del mar. Este valor proporciona una cantidad adecuada de oxígeno para la mayoría de los trabajos realizados, incluyendo un margen de seguridad).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2019. INSHT
Switzerland - Occupational Exposure Limits	
Local name	Azote / Stickstoff
Regulatory reference	www.suva.ch, 01.11.2018
USA - ACGIH - Occupational Exposure Limits	
Local name	Nitrogen
Remark (ACGIH)	TLV® Basis: Simple Asphyxiant
Regulatory reference	ACGIH 2019

Hydrogen sulphide (7783-06-4)	
DNEL: Derived no effect level (Workers)	
Acute - local effects, inhalation	14 mg/m ³
Acute - systemic effects, inhalation	14 mg/m ³
Long-term - local effects, inhalation	7 mg/m ³
Long-term - systemic effects, inhalation	7 mg/m ³

Carbon monoxide (630-08-0)	
DNEL: Derived no effect level (Workers)	
Acute - local effects, inhalation	100 ppm
Acute - systemic effects, inhalation	117 mg/m ³
Long-term - local effects, inhalation	23 ppm
Long-term - systemic effects, inhalation	23 mg/m ³

Hydrogen sulphide (7783-06-4)	
PNEC: Predicted no effect concentration	
Aqua (freshwater)	0.00005 mg/l
Aquatic, intermittent releases	0.0005 mg/l
Micro-organisms in sewage treatment plant (STP)	1.33 mg/l

8.2. Exposure controls

8.2.1. Appropriate engineering controls

- : Provide adequate general and local exhaust ventilation.
- Systems under pressure should be regularly checked for leakages.
- Ensure exposure is below occupational exposure limits (where available).
- Consider the use of a work permit system e.g. for maintenance activities.

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

- : A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered:
- PPE compliant to the recommended EN/ISO standards should be selected.

• Eye/face protection

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

• Skin protection

- Hand protection : Wear working gloves when handling gas containers.
Standard EN 388 - Protective gloves against mechanical risk.
- Other : Wear safety shoes while handling containers.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
- Respiratory protection : Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known.
Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers.
Consult respiratory device supplier's product information for the selection of the appropriate device.
Gas filters do not protect against oxygen deficiency.
Standard EN 14387 - Gas filter(s), combined filter(s) and standard EN136, full face masks .
- Thermal hazards : None in addition to the above sections.

8.2.3. Environmental exposure controls

: None necessary.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

- Physical state at 20°C / 101.3kPa : Gas
- Colour : Mixture contains one or more component(s) which have the following colour(s):
Colourless.

Odour : There may be no odour warning properties, odour is subjective and inadequate to warn of overexposure.
Mixture contains one or more component(s) which have the following odour:
Rotten eggs.

Odour threshold : Odour threshold is subjective and inadequate to warn of overexposure.

pH : Not applicable for gases and gas mixtures.

Melting point / Freezing point : Not applicable for gas mixtures.

Boiling point : Not applicable for gas mixtures.

Flash point : Not applicable for gases and gas mixtures.

Evaporation rate : Not applicable for gases and gas mixtures.

Flammability (solid, gas) : Non flammable.

Explosive limits : Non flammable.

Vapour pressure [20°C] : Not applicable.

Vapour pressure [50°C] : Not applicable.

Vapour density : Not applicable.

Relative density, gas (air=1) : Lighter or similar to air.

Partition coefficient n-octanol/water (Log Kow) : Not applicable for gas mixtures.

Auto-ignition temperature : Non flammable.

Decomposition temperature : Not applicable.

Viscosity : No reliable data available.

Explosive properties : Not applicable.

Oxidising properties : Not applicable.

9.2. Other information

Molar mass : Not applicable for gas mixtures.

Other data : None.

SECTION 10: Stability and reactivity

10.1. Reactivity

: No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

: Stable under normal conditions.

10.3. Possibility of hazardous reactions

: Stable under normal conditions of use.

10.4. Conditions to avoid

: Avoid moisture in installation systems.

10.5. Incompatible materials

: For additional information on compatibility refer to 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

11.1. Information on toxicological effects

Acute toxicity

: Classification criteria are not met.

Hydrogen sulphide (7783-06-4)

LC50 inhalation rat (ppm)	356 ppm/4h
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Carbon monoxide (630-08-0)

LC50 inhalation rat (ppm)	3760 ppm/1h 1300 ppm/4h
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Skin corrosion/irritation

: No known effects from this product.

Serious eye damage/irritation

: No known effects from this product.

Respiratory or skin sensitisation

: No known effects from this product.

Germ cell mutagenicity

: No known effects from this product.

Carcinogenicity

: No known effects from this product.

Toxic for reproduction : Fertility

: No known effects from this product.

Toxic for reproduction : unborn child

: Classification criteria are not met.

STOT-single exposure

: Classification criteria are not met.

STOT-repeated exposure

: Classification criteria are not met.

Aspiration hazard

: Not applicable for gases and gas mixtures.

SECTION 12: Ecological information

12.1. Toxicity

Assessment

: Classification criteria are not met.

EC50 48h - Daphnia magna [mg/l]

: No data available.

EC50 72h - Algae [mg/l]

: No data available.

LC50 96 h - Fish [mg/l]

: No data available.

Hydrogen sulphide (7783-06-4)

EC50 48h - Daphnia magna [mg/l]	0.12 mg/l
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EC50 72h - Algae [mg/l]	1.87 mg/l
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LC50 96 h - Fish [mg/l]	0.007 - 0.019
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Carbon monoxide (630-08-0)	
EC50 48h - Daphnia magna [mg/l]	Study scientifically unjustified.
EC50 72h - Algae [mg/l]	Study scientifically unjustified.
LC50 96 h - Fish [mg/l]	Study scientifically unjustified.
Methane (74-82-8)	
EC50 48h - Daphnia magna [mg/l]	69.4 mg/l
EC50 72h - Algae [mg/l]	19.4 mg/l
LC50 96 h - Fish [mg/l]	147.5 mg/l

12.2. Persistence and degradability

Assessment : No data available.

12.3. Bioaccumulative potential

Assessment : No data available.

12.4. Mobility in soil

Assessment : Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.

12.5. Results of PBT and vPvB assessment

Assessment : Not classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects : No known effects from this product.
 Effect on the ozone layer : None.
 Effect on global warming : Contains greenhouse gas(es).

SECTION 13: Disposal considerations

13.1. Waste treatment methods

May be vented to atmosphere in a well ventilated place.
 Do not discharge into any place where its accumulation could be dangerous.
 Return unused product in original cylinder to supplier.

List of hazardous waste codes (from Commission Decision 2000/532/EC as amended)

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

13.2. Additional information

: External treatment and disposal of waste should comply with applicable local and/or national regulations.

SECTION 14: Transport information

14.1. UN number

UN-No. : 1956

14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : COMPRESSED GAS, N.O.S. (Oxygen ; Nitrogen MIXTURE)
Transport by air (ICAO-TI / IATA-DGR) : Compressed gas, n.o.s. (Oxygen ; Nitrogen MIXTURE)
Transport by sea (IMDG) : COMPRESSED GAS, N.O.S. (Oxygen ; Nitrogen MIXTURE)

14.3. Transport hazard class(es)

Labelling

:



2.2 : Non-flammable, non-toxic gases.

Transport by road/rail (ADR/RID)

Class : 2
 Classification code : 1A
 Hazard identification number : 20
 Tunnel Restriction : E - Passage forbidden through tunnels of category E

Transport by air (ICAO-TI / IATA-DGR)

Class / Div. (Sub. risk(s)) : 2.2

Transport by sea (IMDG)

Class / Div. (Sub. risk(s)) : 2.2
 Emergency Schedule (EmS) - Fire : F-C
 Emergency Schedule (EmS) - Spillage : S-V

14.4. Packing group

Transport by road/rail (ADR/RID) : Not applicable
 Transport by air (ICAO-TI / IATA-DGR) : Not applicable
 Transport by sea (IMDG) : Not applicable

14.5. Environmental hazards

Transport by road/rail (ADR/RID) : None.
 Transport by air (ICAO-TI / IATA-DGR) : None.
 Transport by sea (IMDG) : None.

14.6. Special precautions for user

Packing Instruction(s)

Transport by road/rail (ADR/RID) : P200
 Transport by air (ICAO-TI / IATA-DGR)
 Passenger and Cargo Aircraft : 200.
 Cargo Aircraft only : 200.
 Transport by sea (IMDG) : P200

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment.
 Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
 Before transporting product containers:
 - Ensure there is adequate ventilation.
 - Ensure that containers are firmly secured.
 - Ensure cylinder valve is closed and not leaking.
 - Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
 - Ensure valve protection device (where provided) is correctly fitted.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

: Not applicable.

SECTION 15: Regulatory information

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

EU-Regulations

Restrictions on use : None.
 Other information, restriction and prohibition regulations : Ensure all national/local regulations are observed.
 Seveso Directive : 2012/18/EU (Seveso III) : Not covered.

National regulations

Water hazard class (WGK) : 1 - Slightly hazardous to water

15.2. Chemical safety assessment

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

SECTION 16: Other information

Indication of changes : Revised safety data sheet in accordance with commission regulation (EU) No N°2015/830.
 Abbreviations and acronyms : ATE - Acute Toxicity Estimate
 CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
 REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
 EINECS - European Inventory of Existing Commercial Chemical Substances
 CAS# - Chemical Abstract Service number
 LC50 - Lethal Concentration to 50 % of a test population
 RMM - Risk Management Measures
 PBT - Persistent, Bioaccumulative and Toxic
 vPvB - Very Persistent and Very Bioaccumulative
 STOT- SE : Specific Target Organ Toxicity - Single Exposure
 CSA - Chemical Safety Assessment
 EN - European Standard
 UN - United Nations
 ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road
 IATA - International Air Transport Association
 IMDG code - International Maritime Dangerous Goods
 RID - Regulations concerning the International Carriage of Dangerous Goods by Rail
 WGK - Water Hazard Class
 STOT - RE : Specific Target Organ Toxicity - Repeated Exposure
 Training advice : None.
 Further information : Classification using data from databases maintained by the European Industrial Gases Association (EIGA).
 Classification in accordance with calculation methods of regulation (EC) 1272/2008 CLP.

Full text of H- and EUH-statements

Acute Tox. 2 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 2
Acute Tox. 3 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 3
Aquatic Acute 1	Hazardous to the aquatic environment — Acute Hazard, Category 1
Flam. Gas 1	Flammable gases, Category 1
Ox. Gas 1	Oxidising Gases, Category 1
Press. Gas (Comp.)	Gases under pressure : Compressed gas
Press. Gas (Liq.)	Gases under pressure : Liquefied gas
Repr. 1A	Reproductive toxicity, Category 1A

STOT RE 1	Specific target organ toxicity — Repeated exposure, Category 1
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation
H220	Extremely flammable gas.
H270	May cause or intensify fire; oxidiser.
H280	Contains gas under pressure; may explode if heated.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
H360D	May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.

DISCLAIMER OF LIABILITY

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

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

Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.