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 uses. 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 : Calgaz Ltd
Units 21/22 Rosevale Road Parkhouse Industrial Estate West
ST5 7EF Newcastle Under Lyme - UNITED KINGDOM
T +44 (0) 1782 566 897
www.calgaz.com
info@calgaz.com (not 24hr)

1.4. Emergency telephone number

Emergency telephone number : Tel 24hr (EU): +44 (0) 1235 239670

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.

Not classified as PBT or vPvB.

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	18 – 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 1A, 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 1A, 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 1B, H221 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.
  Product does not burn, use fire control measures appropriate for the surrounding fire.
- 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

No additional information available

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 regularily) 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. Use only oxygen approved lubricants and oxygen approved sealings. 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 containers 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 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 content of the container. 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/m³)	7 mg/m³
IOELV TWA (ppm)	5 ppm
IOELV STEL (mg/m³)	14 mg/m³
IOELV STEL (ppm)	10 ppm
Regulatory reference	COMMISSION DIRECTIVE 2009/161/EU
Austria - Occupational Exposure Limits	
Local name	Schwefelwasserstoff
MAK [mg/m³]	7 mg/m³
MAK [ppm]	5 ppm
MAK Short time value [mg/m³]	7 mg/m³ (Mow)
MAK Short time value [ppm]	5 ppm (Mow)
Regulatory reference	BGBl. II Nr. 238/2018
Belgium - Occupational Exposure Limits	
Local name	Hydrogène (sulfure d') # Waterstofsulfide
Limit value [mg/m³]	7 mg/m³
Limit value [ppm]	5 ppm
Short time value [mg/m³]	14 mg/m³
Short time value [ppm]	10 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 21/01/2020
Bulgaria - Occupational Exposure Limits	
Local name	Сероводород
OEL TWA (mg/m³)	7 mg/m³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m³)	14 mg/m³
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.5 от 17 Януари 2020 г.)
Croatia - Occupational Exposure Limits	
Local name	Vodikov sulfid
GVI (granična vrijednost izloženosti) (mg/m³)	7 mg/m³
GVI (granična vrijednost izloženosti) (ppm)	5 ppm
KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m³)	14 mg/m³
KGVI (kratkotrajna granična vrijednost izloženosti) (ppm)	10 ppm
Naznake (HR)	Direktiva: 2009/161/EU
Regulatory reference	Pravilnik o izmjenama i dopunama Pravilnika o graničnim vrijednostima izloženosti opasnim tvarima pri radu i o biološkim graničnim vrijednostima (NN 91/2018)
Cyprus - Occupational Exposure Limits	
Local name	Υδρόθειο
OEL TWA (mg/m³)	7 mg/m³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m³)	14 mg/m³
OEL STEL (ppm)	10 ppm
Regulatory reference	Κανονισμοί του 2012 (Κ.Δ.Π. 70/2012)
Czech Republic - Occupational Exposure Limits	
Local name	Sirovodík (Sulfan)
Expoziční limity (PEL) (mg/m³)	7 mg/m³
Expoziční limity (PEL) (ppm)	5 ppm
Expoziční limity (NPK-P) (mg/m³)	14 mg/m³
Expoziční limity (NPK-P) (ppm)	10 ppm
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 41/2020 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Hydrogensulfid (Svovlbrinte)
Grænseværdi (8 timer) (mg/m³)	7 mg/m³
Grænseværdi (8 timer) (ppm)	5 ppm

Regulatory reference	BEK nr 1458 af 13/12/2019
Estonia - Occupational Exposure Limits	
Local name	Vesiniksulfiid
OEL TWA (mg/m³)	7 mg/m³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m³)	14 mg/m³
OEL STEL (ppm)	10 ppm
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 17.10.2019, 2); Vabariigi Valitsuse 10. märtsi 2019. a määruse nr 84
Finland - Occupational Exposure Limits	
Local name	Rikkivety
HTP-arvo (8h) (mg/m³)	7 mg/m³
HTP-arvo (8h) (ppm)	5 ppm
HTP-arvo (15 min)	14 mg/m³
HTP-arvo (15 min) (ppm)	10 ppm
Regulatory reference	HTP-ARVOT 2018 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	Hydrogène sulfuré (Sulfure d'hydrogène)
VME [mg/m³]	7 mg/m³
VME [ppm]	5 ppm
VLE [mg/m³]	14 mg/m³
VLE [ppm]	10 ppm
Note (FR)	Valeurs règlementaires contraignantes
Regulatory reference	Article R4412-149 du Code du travail (réf.: INRS ED 984, 2016; Décret n° 2019-1487)
Germany - Occupational Exposure Limits (TRGS 900)	
TRGS 900 Local name	Hydrogensulfid
Occupational exposure limit value (mg/m³)	7.1 mg/m³
Occupational exposure limit value (ppm)	5 ppm
Peak exposure limitation factor	2(I)
TRGS 900 Remark	EU;DFG;AGS;Y
TRGS 900 Regulatory reference	TRGS900
Gibraltar - Occupational Exposure Limits	
Name of agent	Hydrogen sulphide
Eight hours mg/m3	7 mg/m³
Eight hours ppm	5 ppm
Short-term mg/m3	14 mg/m³
Short-term ppm	10 ppm
Regulatory reference	Factories (Control of Chemical Agents at Work) Regulations 2003 (LN. 2018/181)
Greece - Occupational Exposure Limits	
Local name	Υδρόθειο
OEL TWA (mg/m³)	7 mg/m³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m³)	10 mg/m³
OEL STEL (ppm)	14 ppm
Regulatory reference	Π.Δ. 12/2012 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	KÉN-HIDROGÉN
AK-érték	7 mg/m³
CK-érték	14 mg/m³
Megjegyzések (HU)	i (ingerlő anyag, amely izgatja a bőrt, nyálkahártyát, szemet vagy mindhármat); EU3 (2009/161 /EK irányelvben közölt érték); N (Irritáló anyagok, egyszerű fojtógázok, csekély egészségkárosító hatással bíró anyagok)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről

Ireland - Occupational Exposure Limits	
Local name	Hydrogen sulphide
OEL (8 hours ref) (mg/m³)	7 mg/m³
OEL (8 hours ref) (ppm)	5 ppm
OEL (15 min ref) (mg/m3)	14 mg/m³
OEL (15 min ref) (ppm)	10 ppm
Notes (IE)	IOELV (Indicative Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2020
Italy - Occupational Exposure Limits	
Local name	Acido solfidrico
OEL TWA (mg/m³)	7 mg/m³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m³)	14 mg/m³
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	Sērūdeņradis
OEL TWA (mg/m³)	7 mg/m³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m³)	14 mg/m³
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/m³)	7 mg/m³
IPRV (ppm)	5 ppm
TPRV (mg/m³)	14 mg/m³
TPRV (ppm)	10 ppm
NRV (mg/m³)	20 mg/m³
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/m³)	7 mg/m³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m³)	14 mg/m³
OEL STEL (ppm)	10 ppm
Regulatory reference	Mémorial A Nº 684 de 2018 concernant la protection de la sécurité et de la santé des salariés contre les risques liés à des agents chimiques sur le lieu de travail
Malta - Occupational Exposure Limits	
Local name	Hydrogen sulphide
OEL TWA (mg/m³)	7 mg/m³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m³)	14 mg/m³
OEL STEL (ppm)	10 ppm
Regulatory reference	S.L.424.24 - Chemical Agents at Work Regulations (L.N.57 of 2018)
Netherlands - Occupational Exposure Limits	
Local name	Zwavelwaterstof
Grenswaarde TGG 8H (mg/m³)	2.3 mg/m³
Regulatory reference	Arbeidsomstandighedenregeling 2020
Poland - Occupational Exposure Limits	
Local name	Siarkowodór
NDS (mg/m³)	7 mg/m³
NDSCh (mg/m³)	14 mg/m³
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/m³)	7 mg/m³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m³)	14 mg/m³
OEL STEL (ppm)	10 ppm
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 157/2020)
Serbia - Occupational Exposure Limits	
Local name	водоник сулфид
OEL TWA (mg/m³)	7 mg/m³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m³)	14 mg/m³
OEL STEL (ppm)	10 ppm
Regulatory reference	ПРАВИЛНИК о превентивним мерама за безбедан и здрав рад при излагању хемијским материјама (,,Службени гласник РС”, бр. 106/09 и 117/17)
Slovakia - Occupational Exposure Limits	
Local name	Sírovodík (sulfán)
NPHV (priemerná) (mg/m³)	7 mg/m³
NPHV (priemerná) (ppm)	5 ppm
OEL STEL (mg/m³)	14 mg/m³
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/m³)	7 mg/m³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m³)	14 mg/m³
OEL STEL (ppm)	10 ppm
Remark (SI)	Y (Snovi, pri katerih ni nevarnosti za zarodek ob upoštevanju mejnih vrednosti in bat vrednosti), EU
KTV factor SI	2
Regulatory reference	Uradni list RS, št. 78/2019 z dne 20.12.2019
Spain - Occupational Exposure Limits	
Local name	Sulfuro de hidrógeno
VLA-ED (mg/m³)	7 mg/m³
VLA-ED (ppm)	5 ppm
VLA-EC (mg/m³)	14 mg/m³
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	Vätesulfid (Svavelväte)
nivågränsvärde (NVG) (mg/m³)	7 mg/m³
nivågränsvärde (NVG) (ppm)	5 ppm
kortidsvärde (KTV) (mg/m³)	14 mg/m³
kortidsvärde (KTV) (ppm)	10 ppm
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Hydrogen sulphide
WEL TWA (mg/m³)	7 mg/m³
WEL TWA (ppm)	5 ppm
WEL STEL (mg/m³)	14 mg/m³
WEL STEL (OEL STEL) [ppm]	10 ppm
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE

Iceland - Occupational Exposure Limits	
Local name	Vetnissúlfíð (brennisteinsvetni)
OEL (8 hours ref) (mg/m³)	7 mg/m³
OEL (8 hours ref) (ppm)	5 ppm
OEL (15 min ref) (mg/m3)	14 mg/m³
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/m³)	7 mg/m³
Grenseverdier (AN) (ppm)	5 ppm
Grenseverdier (Takverdi) (mg/m³)	14 mg/m³
Grenseverdier (Takverdi) (ppm)	10 ppm
Merknader (NO)	E: EU har en veiledende grenseverdi for stoffet.
Regulatory reference	FOR-2020-04-06-695
Switzerland - Occupational Exposure Limits	
Local name	Hydrogène sulfuré / Schwefelwasserstoff
MAK (mg/m³)	7.1 mg/m³
MAK (ppm)	5 ppm
KZGW (mg/m³)	14.2 mg/m³
KZGW (ppm)	10 ppm
Notation	SS_C / SS_C
Remark	Notationen: SS_C
Regulatory reference	www.suva.ch, 01.01.2020
Turkey - Occupational Exposure Limits	
Local name	Hidrojen sülfit
OEL TWA (mg/m³)	7 mg/m³
OEL TWA (ppm)	5 ppm
OEL STEL (mg/m³)	14 mg/m³
OEL STEL (ppm)	10 ppm
Regulatory reference	12 Ağustos 2013 Tarihli ve 28733 Sayılı Resmî Gazete
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/m³)	23 mg/m³
IOELV TWA (ppm)	20 ppm
IOELV STEL (mg/m³)	117 mg/m³
IOELV STEL (ppm)	100 ppm
Regulatory reference	COMMISSION DIRECTIVE (EU) 2017/164
Austria - Occupational Exposure Limits	
Local name	Kohlenstoffmonoxid
MAK [mg/m³]	33 mg/m³ (gilt für Arbeiten im Tunnel- und Untertagebau bis 21.8.2023) 23 mg/m³
MAK [ppm]	30 ppm (gilt für Arbeiten im Tunnel- und Untertagebau bis 21.8.2023) 20 ppm
MAK Short time value [mg/m³]	66 mg/m³ (4x 15(Miw) min) (gilt für Arbeiten im Tunnel- und Untertagebau bis 21.8.2023) 66 mg/m³ (4x 15(Miw) min)
MAK Short time value [ppm]	60 ppm (4x 15(Miw) min) (gilt für Arbeiten im Tunnel- und Untertagebau bis 21.8.2023) 60 ppm (4x 15(Miw) min)
Regulatory reference	BGBl. II Nr. 238/2018

Belgium - Occupational Exposure Limits	
Local name	Carbone (monoxyde de) # Koolstofmonoxide
Limit value [mg/m³]	23 mg/m³
Limit value [ppm]	20 ppm
Short time value [mg/m³]	117 mg/m³
Short time value [ppm]	100 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 21/01/2020
Bulgaria - Occupational Exposure Limits	
Local name	Въглероден моноксид
OEL TWA (mg/m³)	40 mg/m³ За мините с подземен добив и прокарването на подземни тунели, до 21 август 2023 г. 23 mg/m³ За мините с подземен добив и прокарването на подземни тунели граничните стойности влизат в сила от 21 август 2023 г.
OEL TWA (ppm)	20 ppm За мините с подземен добив и прокарването на подземни тунели граничните стойности влизат в сила от 21 август 2023 г.
OEL STEL (mg/m³)	200 mg/m³ За мините с подземен добив и прокарването на подземни тунели, до 21 август 2023 г. 117 mg/m³ За мините с подземен добив и прокарването на подземни тунели граничните стойности влизат в сила от 21 август 2023 г.
OEL STEL (ppm)	100 ppm За мините с подземен добив и прокарването на подземни тунели граничните стойности влизат в сила от 21 август 2023 г.
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.5 от 17 Януари 2020 г.)
Croatia - Occupational Exposure Limits	
Local name	Ugljikov monoksid
GVI (granična vrijednost izloženosti) (mg/m³)	35 mg/m³ za djelatnosti podzemnog rudarenja i bušenja tunela, do 21. 8. 2023. 23 mg/m³
GVI (granična vrijednost izloženosti) (ppm)	30 ppm za djelatnosti podzemnog rudarenja i bušenja tunela, do 21. 8. 2023. 20 ppm
KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m³)	232 mg/m³ za djelatnosti podzemnog rudarenja i bušenja tunela, do 21. 8. 2023. 117 mg/m³
KGVI (kratkotrajna granična vrijednost izloženosti) (ppm)	200 ppm za djelatnosti podzemnog rudarenja i bušenja tunela, do 21. 8. 2023. 100 ppm
Naznake (HR)	Direktiva: 2017/164/EU. Napomena: Repr 1A
Regulatory reference	Pravilnik o izmjenama i dopunama Pravilnika o graničnim vrijednostima izloženosti opasnim tvarima pri radu i o biološkim graničnim vrijednostima (NN 91/2018)
Cyprus - Occupational Exposure Limits	
Local name	Μονοξείδιο του άνθρακα
OEL TWA (mg/m³)	23 mg/m³
OEL TWA (ppm)	20 ppm
OEL STEL (mg/m³)	117 mg/m³
OEL STEL (ppm)	100 ppm
Regulatory reference	Κανονισμοί του 2019 (Κ.Δ.Π. 16/2019)
Czech Republic - Occupational Exposure Limits	
Local name	Oxid uhelnatý
Expoziční limity (PEL) (mg/m³)	23 mg/m³
Expoziční limity (PEL) (ppm)	19.8 ppm
Expoziční limity (NPK-P) (mg/m³)	117 mg/m³
Expoziční limity (NPK-P) (ppm)	100.5 ppm

Remark (CZ)	B - u látky je zaveden biologický expoziční test (BET) v moči nebo krvi, P - u látky nelze vyloučit závažné pozdní účinky (s větou H372, H373), T - toxický pro reprodukci kategorie 1A a 1B (s větou H360 včetně příslušných kódů).
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 41/2020 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Carbonmonoxid (Kulilte; Kulmonoxid)
Grænseværdi (8 timer) (mg/m³)	23 mg/m³
Grænseværdi (8 timer) (ppm)	20 ppm
Anmærkninger (DK)	E (betyder, at stoffet har en EF-grænseværdi)
Regulatory reference	BEK nr 1458 af 13/12/2019
Estonia - Occupational Exposure Limits	
Local name	Süsinikmonooksiid
OEL TWA (mg/m³)	40 mg/m³ Allmaakaevandustes (Kehtiv kuni 21.08.2020) 23 mg/m³
OEL TWA (ppm)	35 ppm Allmaakaevandustes (Kehtiv kuni 21.08.2020) 20 ppm
OEL STEL (mg/m³)	120 mg/m³ Allmaakaevandustes (Kehtiv kuni 21.08.2020) 117 mg/m³
OEL STEL (ppm)	100 ppm Allmaakaevandustes (Kehtiv kuni 21.08.2020) 100 ppm
Remark (ET)	R (Reproduktiivtoksiline aine), 9 (Lämmastikdioksiidil ja süsinikmonooksiidil on heitgaasides koos kantserogeensete ainetega eraldi määratud piirnormid. Bensiini- ja vedelgaasimootorite heitgaaside indikaator on süsinikmonooksiid, diiselmootoritel lämmastikdioksiid. Nende puhul ei arvestata aditiivset efekti)
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 17.10.2019, 2); Vabariigi Valitsuse 10. märtsi 2019. a määruse nr 84
Finland - Occupational Exposure Limits	
Local name	Hiilimonoksidi
HTP-arvo (8h) (mg/m³)	23 mg/m³
HTP-arvo (8h) (ppm)	20 ppm
HTP-arvo (15 min)	87 mg/m³
HTP-arvo (15 min) (ppm)	75 ppm
Huomautus (FI)	melu
Regulatory reference	HTP-ARVOT 2018 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	Monoxyde de carbone
VME [mg/m³]	23 mg/m³
VME [ppm]	20 ppm
VLE [mg/m³]	117 mg/m³
VLE [ppm]	100 ppm
Note (FR)	Valeurs règlementaires contraignantes. Les valeurs entrent en vigueur le 1er juillet 2020.
Regulatory reference	Article R4412-149 du Code du travail (réf.: INRS ED 984, 2016; Décret n° 2019-1487)
Germany - Occupational Exposure Limits (TRGS 900)	
TRGS 900 Local name	Kohlenstoffmonoxid
Occupational exposure limit value (mg/m³)	35 mg/m³
Occupational exposure limit value (ppm)	30 ppm
Peak exposure limitation factor	2(II)
TRGS 900 Remark	DFG;Z
TRGS 900 Regulatory reference	TRGS900
Gibraltar - Occupational Exposure Limits	
Name of agent	Carbon monoxide
Eight hours mg/m3	23 mg/m³
Eight hours ppm	20 ppm
Short-term mg/m3	117 mg/m³
Short-term ppm	100 ppm
Regulatory reference	Factories (Control of Chemical Agents at Work) Regulations 2003 (LN. 2018/181)

Greece - Occupational Exposure Limits	
Local name	Μονοξείδιο του άνθρακα
OEL TWA (mg/m³)	23 mg/m³
OEL TWA (ppm)	20 ppm
OEL STEL (mg/m³)	117 mg/m³
OEL STEL (ppm)	100 ppm
Regulatory reference	Π.Δ. 82/2018 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	SZÉN-MONOXID
AK-érték	23 mg/m³ 33 mg/m³ A földalatti bányászat és az alagútfúrás terén
CK-érték	117 mg/m³ 66 mg/m³ A földalatti bányászat és az alagútfúrás terén
Megjegyzések (HU)	BHM (biológiai hatásmutató); EU4 (2017/164 EU irányelvben közölt érték); R+T (Azok az anyagok, amelyek RÖVID és TARTÓS expozíciója is egészségkárosodást okoz)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Carbon monoxide
OEL (8 hours ref) (mg/m³)	23 mg/m³
OEL (8 hours ref) (ppm)	20 ppm
OEL (15 min ref) (mg/m3)	117 mg/m³
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	Chemical Agents Code of Practice 2020
Latvia - Occupational Exposure Limits	
Local name	Oglekļa (II) oksīds (oglekļa monoksīds)
OEL TWA (mg/m³)	20 mg/m³
OEL TWA (ppm)	17 ppm
OEL STEL (mg/m³)	117 mg/m³
OEL STEL (ppm)	100 ppm
Remark (LV)	Ietekme uz dzirdi
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/m³)	23 mg/m³
IPRV (ppm)	20 ppm
TPRV (mg/m³)	117 mg/m³
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/m³)	23 mg/m³
OEL TWA (ppm)	20 ppm
OEL STEL (mg/m³)	117 mg/m³
OEL STEL (ppm)	100 ppm
Regulatory reference	Mémorial A N° 684 de 2018 concernant la protection de la sécurité et de la santé des salariés contre les risques liés à des agents chimiques sur le lieu de travail
Malta - Occupational Exposure Limits	
Local name	Carbon monoxide
OEL TWA (mg/m³)	23 mg/m³
OEL TWA (ppm)	20 ppm

OEL STEL (mg/m³)	117 mg/m³
OEL STEL (ppm)	100 ppm
Regulatory reference	S.L.424.24 - Chemical Agents at Work Regulations (L.N.57 of 2018)
Netherlands - Occupational Exposure Limits	
Local name	Koolmonoxide
Grenswaarde TGG 8H (mg/m³)	23 mg/m³
Grenswaarde TGG 15MIN (mg/m³)	117 mg/m³
Regulatory reference	Arbeidsomstandighedenregeling 2020
Poland - Occupational Exposure Limits	
Local name	Tlenek węgla
NDS (mg/m³)	23 mg/m³
NDSCh (mg/m³)	117 mg/m³
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/m³)	20 mg/m³ Exploatărilor miniere subterane și al șantierelor de săpare a tunelurilor și puțurilor 23 mg/m³ (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/m³)	30 mg/m³ Exploatărilor miniere subterane și al șantierelor de săpare a tunelurilor și puțurilor 117 mg/m³ (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	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 157/2020)
Slovakia - Occupational Exposure Limits	
Local name	Výfukové plyny ako CO
NPHV (priemerná) (mg/m³)	25 mg/m³ podzemnej ťažbe a razení tunelov 23 mg/m³
NPHV (priemerná) (ppm)	20 ppm podzemnej ťažbe a razení tunelov 20 ppm
OEL STEL (mg/m³)	117 mg/m³
OEL STEL (ppm)	100 ppm
Upozornenie (SK)	5) NPEL majú prechodné obdobie do 21. augusta 2023, ktoré sa týka expozície zamestnancov pri podzemnej ťažbe a razení tunelov. Osobitný limit je určený pre oxid uhoľnatý (CO) a oxid dusičitý (NO2), ktoré sa vyskytujú vo výfukových plynoch, na hodnotenie kombinovaných účinkov vrátane karcinogénnych. Tieto chemické faktory potom slúžia ako indikátory expozície, ričom za akceptovateľnú expozíciu sa považuje dodržanie oboch limitov.
Regulatory reference	Nariadenie vlády č. 33/2018 Z. z.
Slovenia - Occupational Exposure Limits	
Local name	ogljikov monoksid
OEL TWA (mg/m³)	23 mg/m³
OEL TWA (ppm)	20 ppm
OEL STEL (mg/m³)	117 mg/m³
OEL STEL (ppm)	100 ppm
Remark (SI)	BAT (Biološka mejna vrednost), EU
KTV factor SI	2
Regulatory reference	Uradni list RS, št. 78/2019 z dne 20.12.2019
Spain - Occupational Exposure Limits	
Local name	Monóxido de carbono

VLA-ED (mg/m³)	23 mg/m³ 29 mg/m³ 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/m³)	117 mg/m³
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) nº 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
Sweden - Occupational Exposure Limits	
Local name	Kolmonoxid (Avgaser som kolmonoxid)
nivågränsvärde (NVG) (mg/m³)	23 mg/m³ 25 mg/m³ När det gäller underjord- eller tunnelarbete
nivågränsvärde (NVG) (ppm)	20 ppm 20 ppm När det gäller underjord- eller tunnelarbete
kortidsvärde (KTV) (mg/m³)	117 mg/m³ 117 mg/m³ 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 korttidsgränsvärde 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/m³)	23 mg/m³ 35 mg/m³ 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/m³)	117 mg/m³ 232 mg/m³ Limits applicable to underground mining & tunnelling industries ONLY until 21/8/23
WEL STEL (OEL STEL) [ppm]	100 ppm 200 ppm Limits applicable to underground mining & tunnelling industries ONLY until 21/8/23
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE

Iceland - Occupational Exposure Limits	
Local name	Kolsýringur
OEL (8 hours ref) (mg/m³)	23 mg/m³
OEL (8 hours ref) (ppm)	20 ppm
OEL (15 min ref) (mg/m3)	117 mg/m³
OEL (15 min ref) (ppm)	100 ppm
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 1069/2018)
Norway - Occupational Exposure Limits	
Local name	Karbonmonoksid
Grenseverdier (AN) (mg/m³)	23 mg/m³ 29 mg/m³ For bransjene gruvedrift under jord og tunnelvirksomhet gjelder følgende grenseverdi for karbonmonoksid frem til 21. august 2023
Grenseverdier (AN) (ppm)	20 ppm 25 ppm For bransjene gruvedrift under jord og tunnelvirksomhet gjelder følgende grenseverdi for karbonmonoksid frem til 21. august 2023
Grenseverdier (Korttidsverdi) (mg/m3)	117 mg/m³
Grenseverdier (Korttidsverdi) (ppm)	100 ppm 100 ppm For bransjene gruvedrift under jord og tunnelvirksomhet gjelder følgende grenseverdi for karbonmonoksid frem til 21. august 2023
Merknader (NO)	R: Kjemikalier som skal betraktes som reproduksjonstoksiske; E: EU har en veiledende grenseverdi for stoffet; 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.
Regulatory reference	FOR-2020-04-06-695
Switzerland - Occupational Exposure Limits	
Local name	Monoxyde de carbone / Kohlenmonoxid [Kohlenoxid, Kohlenstoffmonoxid]
MAK (mg/m³)	35 mg/m³
MAK (ppm)	30 ppm
KZGW (mg/m³)	70 mg/m³
KZGW (ppm)	60 ppm
Critical toxicity	COHb / COHb
Notation	SS_B, O^B, B / SS_B, O^L, B
Remark	NIOSH
Regulatory reference	www.suva.ch, 01.01.2020
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 21/01/2020
Bulgaria - Occupational Exposure Limits	
Local name	Метан
OEL TWA (mg/m³)	500 mg/m³
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.5 от 17 Януари 2020 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 typetettyihin tiloihin kulkuun liittyy merkittävä tukehtumisriski ja hengenvaara. Liian alhaiselta happipitoisuudelta suojaudutaan valvomalla työilman happipitoisuutta ja tarkoituksenmukaisin teknisin järjestelyin sekä suojaimin, 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 typpi.
Regulatory reference	HTP-ARVOT 2018 (Sosiaali- ja terveysministeriö)
Ireland - Occupational Exposure Limits	
Local name	Aliphatic hydrocarbon gases Alkanes (C1-C3): Methane
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	Chemical Agents Code of Practice 2020
Romania - Occupational Exposure Limits	
Local name	Metan
OEL TWA (mg/m³)	1200 mg/m³
OEL TWA (ppm)	1834 ppm
OEL STEL (mg/m³)	1500 mg/m³
OEL STEL (ppm)	2292 ppm
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 157/2020)
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/m³)	6700 mg/m³
MAK (ppm)	10000 ppm
Critical toxicity	Formel / Formal
Remark	Kritische Toxizität: Formal
Regulatory reference	www.suva.ch, 01.01.2020
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 O2 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/m³
Acute - systemic effects, inhalation	14 mg/m³
Long-term - local effects, inhalation	7 mg/m³
Long-term - systemic effects, inhalation	7 mg/m³

carbon monoxide (630-08-0)	
DNEL: Derived no effect level (Workers)	
Acute - local effects, inhalation	117 ppm
Acute - systemic effects, inhalation	117 mg/m³
Long-term - local effects, inhalation	23 ppm
Long-term - systemic effects, inhalation	23 mg/m³

PNEC (Predicted No-Effect Concentration) : None established.

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.
Data for mixture are not available.

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

carbon monoxide (630-08-0)	
LC50 Inhalation - Rat [ppm]	3760 ppm/1h (ADR) 1300 ppm/4h (CLP)

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
EC50 72h - Algae [mg/l]	1.87 mg/l
LC50 96 h - Fish [mg/l]	0.007 - 0.019 mg/l

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 container 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. (Nitrogen, hydrogen sulphide)

Transport by air (ICAO-TI / IATA-DGR) : Compressed gas, n.o.s. (Nitrogen, hydrogen sulphide)

Transport by sea (IMDG) : COMPRESSED GAS, N.O.S. (Nitrogen, hydrogen sulphide)

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 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
Regulatory reference	:	Ensure all national/local regulations are observed.

15.2. Chemical safety assessment

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

SECTION 16: Other information

Indication of changes	:	Revised safety data sheet in accordance with commission regulation (EU) No 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

PPE - Personal Protection Equipment

UFI : Unique Formula Identifier

Training advice : None.

Further information : Classification using data from databases maintained by the European Industrial Gases Association (EIGA). Data is maintained in EIGA doc 169 : 'Classification and Labelling Guide', downloadable at : http://www.eiga.eu.

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 1A	Flammable gases, Category 1A
Flam. Gas 1B	Flammable gases, Category 1B
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.
H221	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.

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