

**Safety Data Sheet according to Regulation (EC)
No. 1907/2006 (REACH)**

Printed 16.07.2018
Revision 16.07.2018 (GB) Version 10.1

Carbon monoxide
0500 - 0506



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

1.1. Product identifier

Name of product	Carbon monoxide Art-Nr(n): 0500 - 0506
Name of substance	carbon monoxide
Index No	006-001-00-2
EC No	211-128-3
REACH registration number	01-2119480165-39
CAS No	630-08-0

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

Identified uses

Remark

Restricted to professional users.

Recommended intended purpose(s)

Basic substance.

1.3. Details of the supplier of the safety data sheet

Manufacturer/distributor	GHC Gerling, Holz & Co. Handels GmbH Ruhrstraße 113, D-22761 Hamburg Phone +49 40 853 123-0, Fax +49 40 853 123-66 E-Mail hamburg@ghc.de Internet www.ghc.com
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Advice

GHC Gerling, Holz & Co. Handels GmbH
Phone +49 40 853 123-0
Fax +49 40 853 123-66
E-mail (competent person):
msds@ghc.de

1.4. Emergency telephone number

Emergency advice	Giftinformationszentrum (Poison Control Centre) Mainz Phone +49 6131 19240
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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Hazard classes and Hazard categories	Hazard Statements	Classification procedure
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Flam. Gas 1	H220
Compr. Gas	H280
Acute Tox. 3	H331
Repr. 1A	H360D
STOT RE 1	H372

Hazard statements for physical hazards

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

**Safety Data Sheet according to Regulation (EC)
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Carbon monoxide
0500 - 0506

Hazard statements for health hazards

H331 Toxic if inhaled.
H360D May damage the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure.

Additional hints

Listed substance (Regulation (EC) No 1272/2008, Annex VI, part 3).

2.2. Label elements

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



GHS02



GHS06



GHS08

Signal word

Danger

Hazard statements for physical hazards

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

Hazard statements for health hazards

H331 Toxic if inhaled.
H360D May damage the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure.

Precautionary Statements

! Prevention

P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260 Do not breathe gas.

Response

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 In case of leakage, eliminate all ignition sources.

Storage

P403 Store in a well-ventilated place.
P405 Store locked up.

Special rules for supplemental label elements for certain mixtures

Restricted to professional users.

2.3. Other hazards

! Information pertaining to special dangers for human and environment

Can form explosive mixture with air.
No odour warning properties.

Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

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Carbon monoxide
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SECTION 3: Composition/ information on ingredients

3.1. Substances

Description

Content: > 99 %

CAS No 630-08-0

carbon monoxide

EC No 211-128-3

Index No 006-001-00-2

REACH registration number 01-2119480165-39

3.2. Mixtures

not applicable

! SECTION 4: First aid measures

4.1. Description of first aid measures

General information

Remove contaminated soaked clothing immediately and dispose it safely.

Adhere to personal protective measures when giving first aid.

Seek medical advice immediately.

In case of inhalation

Remove the casualty into fresh air and keep him immobile.

In case of breathing difficulties give oxygen.

In case of respiratory standstill give artificial respiration by respiratory bag (Ambu bag) or respirator. Send for a doctor.

! In case of skin contact

No special actions required.

! In case of eye contact

No special actions required.

In case of ingestion

Ingestion is not considered a potential route of exposure.

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

Physician's information / possible symptoms

Eye defects

Unconsciousness

Headache

Convulsions

Circulatory collapse.

Dizziness

Physician's information / possible dangers

Risk of pulmonary oedema

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

Treatment (Advice to doctor)

If necessary, give oxygen.

Continue to monitor for pneumonia and pulmonary oedema.

The treatment is only effective realized as emergency measure.

Monitor circulation.

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Carbon monoxide
0500 - 0506

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Dry powder
Carbon dioxide
Water spray jet

Unsuitable extinguishing media

Full water jet

5.2. Special hazards arising from the substance or mixture

Formation of explosive gas mixtures in air.

5.3. Advice for firefighters

Special protective equipment for fire-fighters

Use breathing apparatus with independent air supply (isolated).
Wear full protective clothing.

Additional information

Cool endangered containers with water spray jet.
Exposure to fire may cause containers to rupture / explode.
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur.
Extinguish any other fire.
Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations.

! SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Evacuate area.
Keep people away and stay on the upwind side.
Keep away sources of ignition.

For emergency responders

Remove persons to safety.
Personal protection by wearing close-fitting protective clothing and breathing apparatus.
Eliminate all ignition sources if safe to do so.

6.2. Environmental precautions

If possible, stop flow of product.
Prevent spread over a wide area (e.g. by containment or oil barriers).
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
If necessary, secure leaky pressure receptacles in a salvage packaging.

6.3. Methods and material for containment and cleaning up

Ensure adequate air ventilation.

6.4. Reference to other sections

Safe handling: see section 7
Disposal: see section 13
Personal protection equipment: see section 8

**Safety Data Sheet according to Regulation (EC)
No. 1907/2006 (REACH)**

Printed 16.07.2018
Revision 16.07.2018 (GB) Version 10.1

Carbon monoxide
0500 - 0506

! SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Use only in thoroughly ventilated areas.
Transfer and handle only in enclosed systems.
Containers' temperature may not be increased above 50 °C.
Do not heat with open flames.
The working pressure in the receptacle must not exceed 2/3 of the test pressure of the pressure receptacle.
Take measures against electrostatically charging.
Use antistatic tools.
Prevent cylinders from falling over.
Ensure valve outlet cap nut or plug is correctly fitted.
Ensure valve protection device is correctly fitted.
Open valve slowly to avoid pressure shock.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature.
Do not allow backfeed into the container.
Suck back of water into the container must be prevented.
No water to valves, flanges and other fittings.
Purging of pipes and valves with inert gases - to avoid: water, solvents.
Containers and installations thoroughly earthing (grounding).

! General protective measures

Do not inhale gases.

Hygiene measures

At work do not eat, drink, smoke or take drugs.
Wash hands before breaks and after work.

Advice on protection against fire and explosion

Do not smoke.
The product is combustible.
Because of risk of explosion avoid vapours getting into cellar, sewage system and holes.
Formation of explosive gas mixtures in air.
Pay attention to general rules of internal fire prevention.
Avoid effect of heat.

7.2. Conditions for safe storage, including any incompatibilities

! Requirements for storage rooms and vessels

Ventilate store-rooms thoroughly.
Monitor storage rooms with gas sensor.
Use transportable pressure equipment.
Suitable materials: Normalised carbon steel, tempered alloy steel, aluminium alloys, austenitic stainless steels.
Valve: Suitable materials: Brass, copper alloys, carbon steels, aluminium alloys, austenitic stainless steels.
Other material details see ISO 11114.
All regulations and local requirements for the storage of containers have to be respected.

! Advice on storage compatibility

Do not store together with spontaneously flammable materials.
Do not store together with combustible liquids or combustible solids.
Do not store together with animal feedstuffs.
Do not store together with explosives.
Do not store together with infectious substances.
Do not store together with radioactive material.
Do not store together with toxic liquids or toxic solids.
Do not store together with food.
Do not store together with oxidizing liquids or oxidizing solids.

Safety Data Sheet according to Regulation (EC)

No. 1907/2006 (REACH)

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Revision 16.07.2018 (GB) Version 10.1

Carbon monoxide

0500 - 0506



Further information on storage conditions

Ensure valve protection device is correctly fitted.

Store closed container at cool and aired place.

Store only in original container at temperature of 50°C maximum (=122°F).

Prevent cylinders from falling over.

Protect from heat/overheating.

7.3. Specific end use(s)

! Recommendation(s) for intended use

No further recommendations.

! SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Ingredients with occupational exposure limits to be monitored

CAS No	Name	Code	[mg/m3]	[ppm]	Remark
630-08-0	Carbon monoxide	WEL, 8 hours	35	30	Bmgv, UK
		Short-term	232	200	
630-08-0	carbon monoxide	OEL, 8 hours	23	20	SCOEL, EU
		Short-term	117	100	
630-08-0	Carbon monoxide	PEL, 8 hours	55	50	OSHA, USA
630-08-0	Carbon monoxide	REL, 8 hours	40	35	NIOSH
		Short-term	229	200	

DNEL-/PNEC-values

DNEL worker

CAS No	Substance name	Value	Code	Remark
630-08-0	carbon monoxide	117 mg/m3	DNEL acute inhalative (local)	
		117 mg/m3	DNEL acute inhalative (systemic)	
		23 mg/m3	DNEL long-term inhalative (local)	
		23 mg/m3	DNEL long-term inhalative (systemic)	

8.2. Exposure controls

! Respiratory protection

Keep self contained breathing apparatus readily available for emergency use.

At concentrations above the range of application of filter units, with oxygen contents below 17 vol.-% or in unclear conditions, a self-contained breathing apparatus must be used.

Short term: filter apparatus, special gas filter, CO

Respiratory protection complying with EN 137.

Respiratory protection complying with EN 14387.

Hand protection

Leather gloves

Safety gloves according EN 388

! Eye protection

Protective goggles according to EN 166, in case of increased risk add protective face shield.

**Safety Data Sheet according to Regulation (EC)
No. 1907/2006 (REACH)**

Printed 16.07.2018
Revision 16.07.2018 (GB) Version 10.1

Carbon monoxide
0500 - 0506



! Other protection measures

Safety shoes with steel toe.
Body covering work clothing, or chemical resistant suit at increased risk.
flame-stopping protective clothing

Appropriate engineering controls

Transfer and handle only in enclosed systems.

! SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance compressed gas	Colour colourless	Odour odourless
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Odour threshold

no
Product is imperceptible by smell.

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value	not applicable				
boiling point	-191,5 °C		1013 hPa		
melting point	-205 °C				
Flash point	-192 °C				
Vapourisation rate	not applicable				
Flammable (solid)	not applicable				
Flammability (gas)	inflammable				
Ignition temperature	605 °C				
Self ignition temperature	607 °C				
Lower explosion limit	11,3 Vol-%				
Upper explosion limit	75,6 Vol-%				
Vapour pressure	not applicable				
Relative density	1,25 kg/m ³	0 °C	1013 hPa		
Vapour density	0,97				
Solubility in water	30 mg/l	20 °C			

**Safety Data Sheet according to Regulation (EC)
No. 1907/2006 (REACH)**

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Revision 16.07.2018 (GB) Version 10.1

Carbon monoxide
0500 - 0506

	Value	Temperature	at	Method	Remark
Solubility/other					soluble in organic solvent
Partition coefficient n-octanol/water (log P O/W)	1,78				
Decomposition temperature	not determined				
Viscosity dynamic	not applicable				
Oxidising properties	no				
Explosive properties	no				
9.2. Other information	No information available.				

! SECTION 10: Stability and reactivity

10.1. Reactivity

See section "Possibility of hazardous reactions".

10.2. Chemical stability

Stable under recommended conditions of use and storage (see section 7).

10.3. Possibility of hazardous reactions

May react violently with oxidants.
Reactions with numerous chemical compounds.
Formation of explosive gas/air mixtures.
Reactions with oxygen.
Reactions with metals in powder form.
Reactions with metal salts in powder form.
Reactions with peroxides.
Reactions with amines.

10.4. Conditions to avoid

Heat sources / heat - risk of bursting.
Sources of ignition.
Avoid contact with open flames, glowing metal surfaces, etc..

10.5. Incompatible materials

Substances to avoid

Aluminium
Chlorine
Fluorine
Peroxide
Powdered metals
Oxygen
Sulphur
Nitrogen oxides (NO_x)
Metallic salts in powder form.

**Safety Data Sheet according to Regulation (EC)
No. 1907/2006 (REACH)**

Printed 16.07.2018
Revision 16.07.2018 (GB) Version 10.1

Carbon monoxide
0500 - 0506



Oxidants.
Amines.

10.6. Hazardous decomposition products

No hazardous decomposition products known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity/Irritation/Sensitization

	Value/Validation	Species	Method	Remark
LD50 acute oral	Study technically not feasible.			
LD50 acute dermal	Study technically not feasible.			
LC50 acute inhalation	1300 ppm (4 h)	Rat (male)	OECD 403	
Skin irritation		Study scientifically not necessary.		
Eye irritation		Study scientifically not necessary.		
Skin sensitization		Study scientifically not necessary.		
Sensitization respiratory system		Study technically not feasible.		

Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
Subchronic Toxicity	LOAEL 200 ppm (504 d) Inhalation	Rat (female)		
Mutagenicity	not determined			
Reproduction-Toxicity				May cause harm to the unborn child.
Carcinogenicity	NOAEC 200 ppm Inhalation.	Rat	OECD 452	No indications of carcinogenic effects are available from long-term trials.

Specific target organ toxicity (single exposure)

Substance or mixture is not classified in GHS-criteria as specific target organ toxic with single exposure.

Safety Data Sheet according to Regulation (EC)

No. 1907/2006 (REACH)

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Revision 16.07.2018 (GB) Version 10.1

Carbon monoxide

0500 - 0506



Specific target organ toxicity (repeated exposure)

Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard

not applicable

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicological effects

	Value	Species	Method	Validation
Fish	LC50 672,6 mg/l (96 h)	Fish	QSAR	
Daphnia	LC50 307,5 mg/l (48 h)	Daphnia	QSAR	
Algae	EC50 124,4 mg/l (96 h)	Algae	QSAR	

12.2. Persistence and degradability

	Elimination rate	Method of analysis	Method	Validation
Physico-chemical degradability				not applicable

Biological degradability

Inorganic product, cannot be eliminated from the water by biological purification processes.

12.3. Bioaccumulative potential

The product has not been tested. Because of the product's consistency and low solubility in water bioavailability is not likely.

12.4. Mobility in soil

Because of its high volatility, it is unlikely that the product soil, water caused.

12.5. Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6. Other adverse effects

No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste code No.

16 05 04*

Name of waste

gases in pressure containers (including halons) containing hazardous substances

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 2008/98/EC on hazardous waste.

Recommendations for the product

Dispose of as hazardous waste.

Recommendations for packaging

Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

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No. 1907/2006 (REACH)**

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Revision 16.07.2018 (GB) Version 10.1

Carbon monoxide
0500 - 0506



SECTION 14: Transport information

	ADR/RID	IMDG	IATA-DGR
14.1. UN number	1016	1016	1016
14.2. UN proper shipping name	CARBON MONOXIDE, COMPRESSED	CARBON MONOXIDE, COMPRESSED	Carbon monoxide, compressed
14.3. Transport hazard class(es)	2.3 (2.1)	2.3 (2.1)	2.3 (2.1)
14.4. Packing group	-	-	-
14.5. Environmental hazards	No	No	No

14.6. Special precautions for user

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

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

not applicable

No transport as bulk according IBC - Code.

Land and inland navigation transport ADR/RID

Hazard label(s) 2.3+2.1

tunnel restriction code B/D

Classification code 1TF

Marine transport IMDG

Ems: F-D, S-U

! SECTION 15: Regulatory information

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

! Other regulations (EU)

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 28 - 30.

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 40.

Observe regulation 98/24/EC for employee health protection against the threat of chemical substances in the workplace.

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances.

15.2. Chemical Safety Assessment

For this substance a chemical safety assessment has been carried out.

SECTION 16: Other information

Recommended uses and restrictions

National and local regulations concerning chemicals shall be observed.

Further information

All declarations of safety-data-sheet refer to pure substance.

The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Indication of changes: "!" = Data changed compared with the previous version. Previous version: 10.0

Safety Data Sheet according to Regulation (EC)

No. 1907/2006 (REACH)

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Revision 16.07.2018 (GB) Version 10.1

Carbon monoxide

0500 - 0506



Sources of key data used

For the preparation of this safety data sheet, information from our suppliers as well as data from the "database of registered substances" of the European Chemicals Agency (ECHA) were used.