

isi Deutschland GmbH

Postfach 19 03 60, D-42703 Solingen
Mitteliterstraße 12-16, D-42719 Solingen-Wald
Tel.: +49 (0212) 397-0 Fax: +49 (0212) 31-7040

Safety Data Sheet Carbon Dioxide CO²

Page 1 of 3

Product : Carbon Dioxide (CO²) - Filled Gas Cylinder
Reference : Substance Identification (UN)No. 1013
Code : Hazchem Code 2XE

1. IDENTIFICATION OF THE PREPARATION AND THE COMPANY

Chemical Name : Carbon Dioxide (CO²)
Applications : Inflation of Life Jackets
Supplier : ISI Deutschland GmbH
Emergency Telephone : + (49) 212 - 397 - 0

2. COMPOSITION / INFORMATION ON INGREDIENTS

Carbon Dioxide is supplied in cylinders as a liquid under its own vapour pressure which varies with temperature. It is non-toxic, non-flammable and heavier than air.

3. HAZARDS IDENTIFICATION

Toxicity: occupational exposure standard. (OES) 5000 vpm. Asphyxiant vapour.
Danger to life at 10-20% v/v in air. Danger to persons lying on the floor as the vapour is heavier than air.
Liquefied gas in container under vapour pressure of about 58 bar (g).
Note: carbon dioxide cannot exist as a liquid at atmospheric pressure.
Large volume increase on phase change - one volume of liquid or solid will give about 500 or 900 volumes of gas, respectively, at ambient conditions.
Slightly corrosive in the presence of moisture.
Solid on skin may cause cold burns.

4. FIRST AID MEASURES

Eyes : If substance has got into the eyes, immediately wash out with plenty of water for several minutes.

Skin : Irrigate affected area with tepid water for five minutes. Apply a sterile dressing and treat as a thermal burn. Seek medical advice and ensure that the possibility of severe internal burns from exposure to very low temperature is clearly understood.

Inhalation : Minimising personal risk, immediately remove victim to uncontaminated area. Ensure there is no obstruction to the airways. If breathing is weak or stopped, apply artificial respiration with simultaneous administration of oxygen, preferably using oxygen resuscitator. Summon ambulance. Keep warm and rested.

Ingestion : No statement

5. FIRE FIGHTING MEASURES

In general, vacate area, call emergency services. If unable to extinguish fire keep containers cool with water hosed from a safe distance. Inform the emergency services of the nature of the product and the possibility of rupture (the cylinder is fitted with a burst cap which will rupture and allow contents to completely discharge if heat causes the carbon dioxide pressure to exceed the maximum permissible service level). Severe danger of rocketing containers.

6. ACCIDENTAL RELEASE MEASURES

If container in enclosed area, evacuate the area. Arrange for area to be ventilated and check atmosphere before re-entry. Move container to safe area.

Safety Data Sheet Carbon Dioxide
Page 2 of 3
7. HANDLING AND STORAGE

- Usage Precautions** : Never lift a container by the cap. Use a trolley or other suitable device or technique for transporting heavy containers, even for a short distance. Never use direct flame or electrical heating devices to raise the pressure of a container. Containers should not be subjected to temperatures above 45°C. Never attempt to refill an empty container. Never attempt to transfer gases from one container to another. Do not use containers as rollers or supports, or for any other purpose than to contain the gas as supplied. Do not subject containers to abnormal mechanical shocks which may cause damage to their integrity.
- Storage Precautions** : Containers should be stored in a well ventilated area. Store containers in a location free from fire risk and away from sources of heat and ignition. Designation as a "No smoking area" is recommended. The storage area should be kept clear and access should be restricted to authorised persons only. The area should be clearly marked as a store. Containers in storage should be properly secured to prevent toppling or rolling. Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Store full and empty containers separately and arrange full containers so that the oldest stock is used first. Gas containers should be segregated in the storage area according to the various categories. Containers held in storage should be periodically checked for general condition and leakage.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

- Protective Equipment** : Ascertain that an adequate supply of water is available for first aid or fire fighting.
- Protective Gloves** : Recommended
- Eye Protection** : Wear suitable eye protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	Liquefied pressure gas, colourless, odourless, non-flammable
Molecular weight	: 44.01
Vapour pressure (15°C)	: 50.85 bar
Density of gas (15°C, 1 bar)	: 1.8474 g/l
Specific gravity, gas (air = 1)	: 1.528
Critical temperature	: 31.1 °C
Critical pressure	: 73.825 bar
Triple point (5.185 bar)	: -56.6 °C
Solubility of gas in water (15°C, 1 bar)	: 1.9788 g/l

Note: All pressures are absolute

10. STABILITY AND REACTIVITY

- Stability** : No statement

Safety Data Sheet Carbon Dioxide

Page 3 of 3

11. TOXICOLOGICAL INFORMATION

Carbon dioxide (which is normally present in atmospheric air at the level of approximately 350 vpm (0.035%)), regulates the breathing function and an increase in concentration will cause increased breathing rate. The occupational exposure standard (OES) is 5000 vpm (0.5%), but changes in the breathing rate may not be noticed until there is a concentration of 20.000 vpm (2%) when the rate will increase to about 50% above the normal level. Prolonged exposure at this level for several hours may cause a headache and a feeling of exhaustion.

At high concentrations carbon dioxide may cause asphyxiation and can paralyse the respiratory centre. Breathing an atmosphere rich in carbon dioxide can cause immediate loss of consciousness and rapid death. Symptoms of asphyxiation may include rapid and gasping respiration, rapid fatigue, nausea, vomiting, cyanosis and may lead to loss of consciousness or death from anoxia.

12. ECOLOGICAL INFORMATION

Degradability : The chromate layer which protects the zinc-plating, contains chromium in the oxidation state of VI

13. DISPOSAL CONSIDERATIONS

Disposal Methods : Never dump at sea.
Inform waste disposal contractor of material to be disposed of - zinc-plated and chrome stabilised steel.
Never dispose of a filled cylinder.

14. TRANSPORT INFORMATION

Road : Klasse 2 Ziff. 2 a ADR/GGVS European regulation
Air : Klasse 2.2 UN-No. 1013
Sea : Klasse 2 UN-No. 1013 - Page 2111 IMDG Code; EmS:2-09,
MFAG: 615

15. REGULATORY INFORMATION

Regulatory References : Gas-cylinders comply with the requirements of the CEN standards (EN 395, 396, 399, sections 4.7 & 7.2) for life-jackets and also the requirements for Inflation Medium Containers in the proposed third Edition of UL1191.

16. OTHER INFORMATION

No statement.

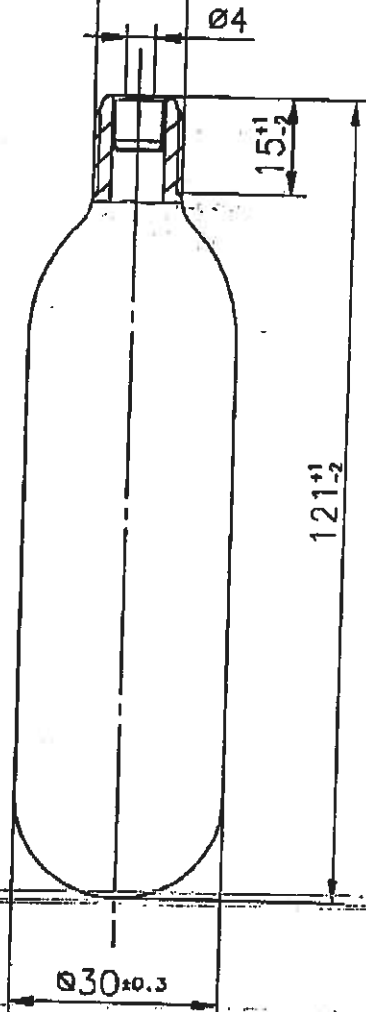
08 JUNI 2000

38 GRAM CO₂
1/2"-20 UNF-1A NECK

ARTICLE No: 36203

NET WEIGHT FÖLLGEWICHT POIDS DE REMPLISSAGE EN	CO ₂ CO ₂ CO ₂	38 ⁺¹ ₋₂ G
WATER CAPACITY VOLUMEN CAPACITE EN EAU		52 ml MIN
FILLING DENSITY FÖLLFAKTOR FACTEUR DE REMPLISSAGE		75% MAX
TEST PRESSURE PRÖFDRUCK PRESSION D'ESSAI		250 BAR
BURST PRESSURE OF CYLINDER BERSTDRUCK DES ZYLINDERS PRESSION D'ECLATEMENTE DU CYLINDER		>560 BAR
CAP RELIEF PRESSURE ABBLASDRUCK DER KAPPE PRESSION D'EMETTRE DU CAPUCHON		450-560 BAR
CAP PIERCING FORCE KAPPEN ANSTECKKRAFT FORCE DE PERCUTION		≤300 N
CAP PIERCING WORK ARBEIT BEIM DURCHSTECHEM DER KAPPE TRAVAIL PAR PERFORATION DU CAPUCHON		≤525 mJ

1/2"-20 UNF-1A



MARKING PROCESS:
MARKING :
BESCHRIFTUNG:
INSCRIPTION :

PIECES PER CARTON: 115 WT.OF CARTON: 17.5 KG
CARTON MARKING: CARBON DIOXIDE; 2.2; UN1013

PARTS LIST

UNFILLED CYLINDER	CO052030
CAP	80118
LABEL (WHEN USED)	80804
CO ₂ (E290) - ISI SPEC 0192 - 99.95% PURITY	

6	99-10-11	n.Drg	RS
5	97-06-02	layout	RS
4	96-07-25	c	RS
3	96-06-25	b	RS
is.No.	Date	change	Name
own	96-01-31		RS

ISI Components © COPYRIGHT
Kärachnergasse 6a
AN ISI GROUP COMPANY A-1212 Vienna AUSTRIA

Whose products are the subject of patent protection in AUSTRIA, EUROPE and principal countries of the world. This drawing and all information or descriptive matter set out therein are confidential and copyright and must not be disclosed loaned copied or used for manufacturing tendering or other purposes without the prior and written consent of the owners.

TITLE: 38G CO ₂ THREADED NECK CYLINDER 38G CO ₂ ZYLINDER MIT HALSGEWINDE BOUTEILLE DE 38G CO ₂ AVEC FILETAGE		
Mat:	W-NR.1.0338 DIN 1624 St4 SPECIAL DEEP DRAWING STEEL	
DrgNo:	36203 6	Surface finish
Art.No:	36203	Scale
this DrgNo	36203 5a	DIN 50961
repr. DrgNo:	36203 5a	1:1
		Fe/Zn5Cd

dimensions in mm

Safety Data Sheet Carbon Dioxide CO²

Page 1 of 3

Product : Carbon Dioxide (CO²) - Filled Gas Cylinder
Reference : Substance Identification (UN)No. 1013
Code : Hazchem Code 2XE

1. IDENTIFICATION OF THE PREPARATION AND THE COMPANY

Chemical Name : Carbon Dioxide (CO²)
Applications : Inflation of Life Jackets
Supplier : ISI Deutschland GmbH
Emergency Telephone : + (49) 212 - 397 - 0

2. COMPOSITION / INFORMATION ON INGREDIENTS

Carbon Dioxide is supplied in cylinders as a liquid under its own vapour pressure which varies with temperature. It is non-toxic, non-flammable and heavier than air.

3. HAZARDS IDENTIFICATION

Toxicity: occupational exposure standard. (OES) 5000 vpm. Asphyxiant vapour.
 Danger to life at 10-20% v/v in air. Danger to persons lying on the floor as the vapour is heavier than air.
 Liquefied gas in container under vapour pressure of about 56 bar (g).
 Note: carbon dioxide cannot exist as a liquid at atmospheric pressure.
 Large volume increase on phase change - one volume of liquid or solid will give about 500 or 900 volumes of gas, respectively, at ambient conditions.
 Slightly corrosive in the presence of moisture.
 Solid on skin may cause cold burns.

4. FIRST AID MEASURES

Eyes : If substance has got into the eyes, immediately wash out with plenty of water for several minutes.
Skin : Irrigate affected area with tepid water for five minutes. Apply a sterile dressing and treat as a thermal burn. Seek medical advice and ensure that the possibility of severe internal burns from exposure to very low temperature is clearly understood.
Inhalation : Minimising personal risk, immediately remove victim to uncontaminated area. Ensure there is no obstruction to the airways. If breathing is weak or stopped, apply artificial respiration with simultaneous administration of oxygen, preferably using oxygen resuscitator. Summon ambulance. Keep warm and rested.
Ingestion : No statement

5. FIRE FIGHTING MEASURES

In general, vacate area, call emergency services, if unable to extinguish fire keep containers cool with water hosed from a safe distance. Inform the emergency services of the nature of the product and the possibility of rupture (the cylinder is fitted with a burst cap which will rupture and allow contents to completely discharge if heat causes the carbon dioxide pressure to exceed the maximum permissible service level). Severe danger of rocketing containers.

6. ACCIDENTAL RELEASE MEASURES

If container in enclosed area, evacuate the area. Arrange for area to be ventilated and check atmosphere before re-entry. Move container to safe area.

Safety data sheet Carbon dioxide

Creation date : 19.05.2006
Revision date : 19.05.2006

Version : 1.0

DE / E

SDS No. : 8377
page 1 / 2

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

Product name

Carbon dioxide

Chemical formula CO₂

Known uses

Not known.

Company identification

Linde AG, Gas and Engineering, Linde Gas Division Seitnerstraße
70, D-82049 Pullach

Emergency phone numbers: +49-89-7446-0

2 COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation: Substance

Components/Impurities

CAS Nr: 124-38-9

EEC Nr (from EINECS) : 204-696-9

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

3 HAZARDS IDENTIFICATION

Risk advice to man and the environment

Liquefied gas

4 FIRST AID MEASURES

Inhalation

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Low concentrations of CO₂ cause increased respiration and headache. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

Skin/eye contact

Immediately flush eyes thoroughly with water for at least 15 minutes. In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance

Ingestion

Ingestion is not considered a potential route of exposure.

5 FIRE FIGHTING MEASURES

Specific hazards

Exposure to fire may cause containers to rupture/explode. Non flammable

Hazardous combustion products

None

Suitable extinguishing media

All known extinguishants can be used.

Specific methods

If possible, stop flow of product. Move container away or cool with water from a protected position.

Special protective equipment for fire fighters

In confined space use self-contained breathing apparatus.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions

Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation.

Environmental precautions

Try to stop release. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

Clean up methods

Ventilate area.

7 HANDLING AND STORAGE

Handling and storage

Suck back of water into the container must be prevented. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Refer to supplier's container handling instructions.

Prevent bottles from falling down. Keep container below 50°C in a well ventilated place. Observe "Technische Regeln Druckgase (TRG) 280 Ziffer 5"

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit value

Value type	value	Note
Germany - MAK	5.000 ppm	TRGS 900

Personal protection

Ensure adequate ventilation.

9 PHYSICAL AND CHEMICAL PROPERTIES

General information

Appearance/Colour: Colourless gas

Odour: No odour warning properties.

Important information on environment, health and safety

Molecular weight: 44 g/mol

Melting point: -56,6 °C

Sublimation point: -78,5 °C

Critical temperature: 31 °C

Autoignition temperature: Not applicable

Flammability range: Not applicable

Relative density, gas: 1,52

Relative density, liquid: 0,82

Solubility mg/l water: 2000 mg/l

Maximum filling pressure (bar): 57 bar

Other data

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

10 STABILITY AND REACTIVITY

Stability and reactivity

Stable under normal conditions.

11 TOXICOLOGICAL INFORMATION

General

No known toxicological effects from this product.

Acute toxicity

Concentrations above 8% CO₂ can cause rapid circulatory insufficiency. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness.

12 ECOLOGICAL INFORMATION

General

When discharged in large quantities may contribute to the greenhouse effect.

13 DISPOSAL CONSIDERATIONS

General

Do not discharge into any place where its accumulation could be dangerous. To atmosphere in a well ventilated place. Discharge to atmosphere in large quantities should be avoided. Contact supplier if guidance is required.

EWC Nr. 16 05 01

Safety data sheet
Carbon dioxide

Creation date : 19.05.2006
Revision date : 19.05.2006

Version : 1.0

DE / E

SDS No. : 8377
page 2 / 2

14 TRANSPORT INFORMATION

ADR/RID

Class	2	Classification Code	2A
UN number and proper shipping name			
UN 1013 Carbon dioxide			
UN 1013 Carbon dioxide			
ADR/RID-Labels	2.2	Hazard number	20
Packing Instruction	P200		

IMDG

Class	2.2
UN number and proper shipping name	
UN 1013 Carbon dioxide	
ADR/RID-Labels	2.2
Packing Instruction	P200
EmS	FC, SV

IATA

Class	2.2
UN number and proper shipping name	
UN 1013 Carbon dioxide	
ADR/RID-Labels	2.2
Packing Instruction	P200

Other transport information

Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured and: - cylinder valve is closed and not leaking - valve outlet cap nut or plug (where provided) is correctly fitted - valve protection device (where provided) is correctly fitted - there is adequate ventilation. - compliance with applicable regulations.

15 REGULATORY INFORMATION

Number in Annex I of Dir 67/548
Not included in Annex I.
EC Classification
Not classified as hazardous to health.
Labelling
- Symbols

No symbol required.

Water pollution class

Not polluting to waters according to VwVwS from 27.07.2005.

16 OTHER INFORMATION

Ensure all national/local regulations are observed. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Advice

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

Further informations

Linde safety advice

No. 3	Oxygen deficiency
No. 7	Safe handling of gas cylinders and cylinder bundles
No. 11	Transport of gas receptacles in vehicles
No. 12	Handling of carbon dioxide CO ₂

End of document