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

1.1. Product identifier

Trade name	:	Carbon dioxide in non-refillable gas cylinders
Safety data sheet no.	:	ICO.SD.001.e.05
Chemical description	:	Carbon dioxide
▪ **CAS no.**	:	124-38-9
▪ **EG no.**	:	204-696-9
▪ **Index no.**	:	--
Chemical formula	:	CO_2
Registration number	:	Listed in Annex IV/V of regulation no. EC 1907/2006 (REACH). Exempted from registration.

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

Relevant identified uses	:	For various industrial applications. Perform risk assessment prior to use.

1.3. Details of the supplier of the safety data sheet

Company identification	:	iSi Components GmbH Kuerschnergasse 6A A-1217 Vienna, Austria	Website: www.isi.com/components E-mail: ico@isi.com Phone: +43 1 25099-1803

1.4. Emergency telephone number

Emergency telephone number	:	Poison information hotline	Tel.: +431 406 43 43

Section 2: Hazards identification

2.1. Classification of the substance of mixture

Classification according to EC 1272/2008 (CLP / GHS)

▪ **Physical hazards**	:	Gas under pressure: Liquefied gas – H280: Contains gas under pressure; may explode, if heated.

2.2. Label elements

Labelling according to EC 1272/2008 (CLP / GHS)

▪ **Hazard pictogram(s)** :

▪ **Hazard pictogram codes**	:	GHS04
▪ **Signal word**	:	Warning
▪ **Hazard statement**	:	H280: Contains gas under pressure; may explode if heated.
▪ **Precautionary statements**		
– **General**	:	P102: Keep out of reach of children.
– **Storage**	:	P410+P403: Protect from direct sunlight. Store in a well-ventilated place.

2.3. Other hazards

	:	Asphyxiant in high concentrations. Contact with solid CO_2 (dry ice) or liquid CO_2 may cause cold burns/ frost bite.

Section 3: Composition/information on ingredients

3.1. Substance / 3.2. Mixture

Substance name	Content	CAS no.	EC no.	Index no.	REACH registration no.	Classification (GHS / CLP)
Carbon dioxide	100%	124-38-9	204-696-9	-----	See note	Press. Gas (Liq.) H280

Does not contain any other components or impurities which could affect the classification of this product.
Note: Listed in Appendix IV/V REACH, exempt from registration.
For full text of H statements: see section 16

Section 4: First aid measures

4.1. Description of first aid measures

Inhalation	:	Remove victim to uncontaminated area wearing self-contained respiratory equipment. Keep victim warm and rested. Call a doctor. Attempt artificial respiration, if the victim stops breathing.
Skin contact	:	Spray any cold burns immediately with water for at least 15 minutes. Cover with a sterile dressing. Consult a doctor.
Eye contact	:	Immediately flush eyes thoroughly with water for at least 15 minutes.
Ingestion	:	Ingestion is not considered a possible route of exposure.

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

	:	High concentrations of CO_2 may cause asphyxiation. Symptoms can include loss of mobility/ consciousness. Victim may not be aware of asphyxiation. Low concentrations of cause increased respiration and headache.

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	:	Exposure to fire may cause cylinder to burst/explode.
Hazardous combustion products	:	None.

5.3. Advice for firefighters

Specific methods	:	Adopt firefighting measures to the surroundings of the fire. Cylinder may burst/explode if exposed to direct flame and thermal radiation by fire, respectively.

Special protective equipment for fire fighters	:	Move away from cylinder and cool with water from a safe position. Prevent contaminated quench water from entering sewer systems, basements, work pits or any other areas. If possible, attempt to stop gas release. In confined spaces use self-contained breathing apparatus. Fire fighters shall use standard protective clothing and equipment. *Guidelines:* EN 137 – Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking. EN 469 – Protective clothing for firefighters - Performance requirements for protective clothing for firefighting. EN 659 – Protective gloves for firefighters.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

	:	Attempt to stop gas release. Evecuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Provide adequate ventilation. Prevent from entering sewer systems, basements, work pits or any other areas where accumulation could be hazardous.

6.2. Environmental precautions

	:	Attempt to stop gas release.

6.3. Methods and material for containment and cleaning up

	:	Provide adequate ventilation.

6.4. Reference to other sections

	:	See also section 8 and section 13.

Section 7: Handling and storage

7.1. Precautions for safe handling

Safe use of product	:	Only experienced and properly instructed persons should handle gases under pressure. The substance must be handled in accordance with good industrial hygiene and safety procedures. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. If in doubt, consult supplier. Ensure the complete gas system was (or is regularly) checked for leaks before use. Do not smoke while handling product.

Safe handling of pressurized cylinder	:	Refer to supplier's handling instructions. Only use equipment suitable for this product and its pressure and temperature specified. If in doubt, consult supplier. Do not allow backfeed into cylinder. Never use direct flame or electrical heating devices to raise the pressure of a cylinder. Never attempt to refill an empty cylinder. Never attempt to transfer gases from one cylinder to another. Emerging gas will cause the cylinder to freeze. Do not touch a discharging or recently discharged cylinder with bare hands. Do not use cylinder as roller or support, or for any other purpose than to contain the gas as supplied. Do not subject cylinder to mechanical shocks which may cause damage to their integrity.

7.2. Conditions for safe storage, including any incompatibilities

	:	Keep out of reach of children. Store cylinder in a well-ventilated place at less than 50°C. Store cylinder in a location free from risk of fire and away from sources of heat and ignition. Periodically check cylinder for general conditions and leakage. Do not store cylinder in conditions likely to encourage corrosion. Observe all regulations and local requirements regarding storage of gas cylinders.

7.3. Specific end use(s)

	:	None.

Section 8: Exposure controls/personal protection

8.1. Control parameters

OEL (Occupational Exposure Limits)	:	TWA (EC):	5,000 ppm / 9,000 mg/m^3
		MAK (AUSTRIA):	5,000 ppm / 9,000 mg/m^3
		MAK CEILb(AUSTRIA):	10,000 ppm / 18,000 mg/m^3
DNEL (Derived No-Effect Level)	:	No data available.	
PNEC (Predicted No-Effect Concentration)	:	No data available.	

8.2. Exposure controls

8.2.1. Appropriate engineering controls	:	Ensure adequate air ventilation. Provide adequate general and local ventilation to ensure that defined occupational exposure limits are not exceeded. Systems under pressure should be regularly checked for leakages. Oxygen detectors should be used when asphyxiating gases may be released. Preferably use permanent leak tight connections.
8.2.2. Individual protection measures, e.g. personal protective	:	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

equipment		matches the relevant risk. The following recommendations should be considered: – Select PPE based on the task being performed and risks involved.
▪ **Eye/face protection**	:	Wear eye protection with side shields Guideline: EN 166 – Personal eye protection
▪ **Skin protection**	:	
– **Hand protection**		Wear working gloves while handling gas cylinders. Guideline: EN 388 – Protective gloves against mechanical risks.
– **Other**		Wear safety shoes while handling gas cylinders. Guideline: EN ISO 20345 – Personal protective equipment – Safety footwear.
▪ **Respiratory protection**	:	Self-contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres. Guideline: EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
▪ **Thermal hazards**	:	No precautionary measures necessary.
8.2.3. Environmental exposure controls	:	For waste disposal see section 13.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance		
▪ **Physical state at 20°C/ 101,03kPa**	:	Gas.
▪ **Colour**	:	Colourless.
Odour	:	Odourless.
Odour threshold	:	Odour threshold is subjective and inadequate to warn of overexposure.
pH value		Not applicable.
Molar mass [g/mol]	:	44
Melting point [°C]	:	-56.6
Boiling point [°C]	:	-78.5
Critical temperature [°C]	:	31.0
Flash point	:	Not applicable to gases and gas mixtures.
Evaporation rate (ether = 1)	:	Not applicable to gases and gas mixtures.
Flammability range	:	Non flammable.
Vapour pressure at 20°C [bar]	:	57.3
Relative density, gas (air = 1)	:	1.52
Relative density, liquid (water = 1)	:	0.82
Solubility in water [mg/l]	:	2,000 (completely soluble)
Partition coefficient n-octanol/water [log Kow]	:	0.83
Autoignition temperatur [°C]	:	Not applicable.
Viscosity [20°C]	:	No data available.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.

9.2. Other information

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

Section 10: Stability and reactivity

10.1. Reactivity

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

10.2. Chemical stability

	:	Stable under normal conditions.

10.3. Possibility of hazardous reactions

	:	None.

10.4. Conditions to avoid

	:	None.

10.5. Incompatible materials

	:	None. For additional information - see ISO 11114.

10.6. Hazardous decomposition products

	:	None.

Section 11: Toxicological information

11.1. Information on toxicological effects

Acute Toxicity	:	In high concentrations may cause rapid circulatory deterioration even at normal levels of oxygen concentration. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness and even death.
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.
Reproductive toxicity	:	No known effects from this product.
Spezific Target Organ Toxicity – single exposure		No known effects from this product.
Spezific Target Organ Toxicity – repeated exposure	:	No known effects from this product.
Aspiration hazard	:	Not applicable for gases and gas mixtures.

Section 12: Ecological information

12.1. Toxicity

: No ecological damage caused by this product.

12.2. Persistence and degradability

: No ecological damage caused by this product.

12.3. Bio-accumulative potential

: No ecological damage caused by this product.

12.4. Mobility in soil

: No ecological damage caused by this product.

12.5. Results of PBT- and vPvB assessment

: Not classified as PBT or vPvB.

12.6. Other adverse effects

Effect on ozone layer	:	None.
Global warming potential [CO_2 = 1]	:	1
Effect on the global warming	:	When discharged in large quantities may contribute to the greenhouse effect.

Section 13: Disposal considerations

13.1. Waste treatment information

	:	Do not discharge into any place where its accumulation could be dangerous. May be vented to atmosphere in a well-ventilated place. Dispose of emptied cylinders only. Cylinders are made of recyclable steel and hence a valuable resource. Emptied cylinders should therefore always be recycled. Adhere to local waste regulations when disposing of emptied cylinders. Never dispose of cylinders in an uncontrolled manner (e.g. dumping at sea). Consult your supplier, if you require advice.
List of hazardous waste codes (from Commission Decision 2001/118/EC)	:	16 05 05: Gases in pressure containers other than those mentioned in 16 05 04.

13.2. Additional information

: None.

Section 14: Transport information

14.1 UN number

UN number of filling gas	:	1013

14.2 UN proper shipping name

Land transport (ADR/RID)	:	According to the requirements set out in the relevant version of the ADR. See Annex.
Sea transport (IMDG)	:	According to the requirements set out in the relevant version of the IMDG-Code. See Annex.
Air transport (ICAO-TI / IATA-DGR)	:	According to the requirements set out in the relevant version of the ICAO-TI / IATA-DGR. See Annex.

14.3 Transport hazard class(es)

	:	See Annex.

14.4 Packing group

	:	Not applicable.

14.5 Environmental hazards

	:	Not applicable.

14.6 Special precautions for user

	:	Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure the 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 the gas cylinders: – Ensure there is adequate ventilation. – Ensure the gas cylinders are firmly secured.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 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.
▪ **Seveso directive 96/82/EG**	:	Not covered.

National regulations

▪ **National legislation**	:	Ensure that all national/local regulations are observed.

15.2. Chemical safety assessment

	:	No Chemical Safety Assessment has been carried.

Section 16: Other information

Indication of changes	:	This Safety Data Sheet has been worked out to comply with Regulation (EU) No. 453/2010.
Training advice	:	The hazard of asphyxiation is often overlooked and must be stressed during operator training.
Full text of H-statements in section 2 and 3	:	H280: Contains gas under pressure; may explode if heated.
Further information	:	This safety data sheet has been produced in accordance with the applicable European directives. It applies to all countries which have adopted these directives as part of their national legislation.
Disclaimer of liability	:	The information contained in this safety data sheet has been obtained from sources which we consider reliable. Details given in this document are believed to be correct at the time of going to press. The conditions or methods for handling, storage, use or disposal of the product are not under our control and also possibly out of our information. Because of this and other reasons no liability for injury or damage resulting from its handling, storage, use or disposal can be accepted. This safety data sheet has been worked out for this specific product and may only be used in conjunction with this product. Should this product be part of another product the information contained in this document may be inappropriate.

----------End of Document----------

iSi Components GmbH
Kürschnergasse 6A
A-1210 Wien- Austria
Tel.: +43 1 25099-1803