SAFETY DATA SHEET

Based upon Regulation (EC) No 1907/2006, as amended by Regulation (EU) No 2015/830

carbon dioxide, liquefied, under pressure

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

1.1. Product identifier

Product name : carbon dioxide, liquefied, under pressure

Synonyms : aer fixus, liquefied, under pressure; after damp, liquefied, under pressure; air fixe, liquefied, under pressure; carbon dioxide; carbon dioxide gas, liquefied, under pressure; carbonic acid anhydride, liquefied, under pressure; carbonic acid gas, liquefied, under pressure; carbonic acid, liquefied, under pressure; carbonica, liquefied, under pressure; carbonic anhydride, liquefied, under pressure; carbonice, liquefied, under pressure; carbon oxide, liquefied, under pressure; CO2, liquefied, under pressure; dioxide of carbon, liquefied, under pressure; dry ice, liquefied, under pressure; khladon 744 (=carbon dioxide, liquefied, under pressure); liquefied carbon dioxide, under pressure; R-744; refrigerated carbon dioxide, liquefied, under pressure

Registration number REACH : Exempted from registration under REACH in Annex IV (Regulation (EC) No 1907/2006)

Product type REACH : Substance/mono-constituent

CAS number : 124-38-9

EC number : 204-696-9

RTECS number : FF6400000

Molecular mass : 44.01 g/mol

Formula : CO2

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

1.2.1 Relevant identified uses

Industrial and professional use. Before use: carry out a risk assessment

1.2.2 Uses advised against

No uses advised against

1.3. Details of the supplier of the safety data sheet

Supplier of the safety data sheet

BALCHEM NV
Westvaartdijk 85
B-1850 Grimbergen Belgium
☎ +32 2 251 60 87
+32 2 252 17 51
info.grimbergen@balchem.com

Distributor of the product

BALCHEM NV
Westvaartdijk 85
B-1850 Grimbergen Belgium
☎ +32 2 251 60 87
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info.grimbergen@balchem.com

1.4. Emergency telephone number

24h/24h (Telephone advice: English, French, German, Dutch):

+32 14 58 45 45 (BIG)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classified as dangerous according to the criteria of Regulation (EC) No 1272/2008

Class	Category	Hazard statements
Press. Gas	Liquefied gas	H280: Contains gas under pressure; may explode if heated.

2.2. Label elements

Signal word Warning

H-statements

H280 Contains gas under pressure; may explode if heated.

P-statements

P410 + P403 Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards

May cause frostbites
Large spills/in enclosed spaces: risk of oxygen deficiency
May cause frostbites
Harmful to fishes
Harmful to aquatic organisms

SECTION 3: Composition/information on ingredients

3.1. Substances

Name REACH Registration No	CAS No EC No	Conc. (C)	Classification according to CLP	Note	Remark
carbon dioxide	124-38-9 204-696-9	C>99%	Press. Gas - Liquefied gas; H280	(1)(2)	Mono-constituent

(1) For H-statements in full: see heading 16
(2) Substance with a Community workplace exposure limit

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

General:

Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

After inhalation:

Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

After skin contact:

Rinse with water. Take victim to a doctor if irritation persists. In case of frostbites: Wash immediately with lots of water (15 minutes)/shower. Remove clothing while washing. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage. Consult a doctor/medical service. If burned surface > 10%: take victim to hospital.

After eye contact:

Rinse immediately with plenty of water for 15 minutes. Cover eyes aseptically. Do not apply neutralizing agents. Take victim to an ophthalmologist.

After ingestion:

Not applicable.

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

4.2.1 Acute symptoms

After inhalation:

EXPOSURE TO HIGH CONCENTRATIONS: Rapid respiration. Accelerated heart action. Headache. Nausea. Dizziness. Damp/clammy skin. Excited/restless. Visual disturbances. Ringing in the ears. Respiratory difficulties. Disturbances of consciousness. Cramps/uncontrolled muscular contractions.

After skin contact:

Frostbites.

After eye contact:

Frostbites.

After ingestion:

Not applicable.

4.2.2 Delayed symptoms

No effects known.

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

If applicable and available it will be listed below.

SECTION 5: Firefighting measures

5.1. Extinguishing media

5.1.1 Suitable extinguishing media:

Adapt extinguishing media to the environment.

5.1.2 Unsuitable extinguishing media:

No unsuitable extinguishing media known.

5.2. Special hazards arising from the substance or mixture

On exposure to temperature rise: pressure rise and possible bursting of container.

5.3. Advice for firefighters

5.3.1 Instructions:

Cool tanks/drums with water spray/remove them into safety. Physical explosion risk: cool from behind cover. Do not move the load if exposed to heat. After cooling: persistant risk of physical explosion.

5.3.2 Special protective equipment for fire-fighters:

Insulating gloves. Protective clothing. Large spills/in enclosed spaces: compressed air apparatus. Heat/fire exposure: compressed air/oxygen apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Keep upwind. Seal off low-lying areas. Close doors and windows of adjacent premises. No naked flames. Carry out specific temperature controls. Large spills/in confined spaces: consider evacuation.

6.1.1 Protective equipment for non-emergency personnel

See heading 8.2

6.1.2 Protective equipment for emergency responders

Insulating gloves. Protective clothing. Large spills/in enclosed spaces: compressed air apparatus.

Suitable protective clothing

See heading 8.2

6.2. Environmental precautions

Contain released substance, pump into suitable containers. Plug the leak, cut off the supply. Tip the container on one side to stop the leakage.

6.3. Methods and material for containment and cleaning up

Damaged/cooled tanks must be emptied.

6.4. Reference to other sections

See heading 13.

SECTION 7: Handling and storage

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

7.1. Precautions for safe handling

Keep away from naked flames/heat. Gas/vapour heavier than air at 20°C. Observe normal hygiene standards.

7.2. Conditions for safe storage, including any incompatibilities

7.2.1 Safe storage requirements:

Storage temperature: < 50 °C. Store in a dry area. Ventilation at floor level. Meet the legal requirements. Secure cylinders tightly to prevent overturning. Keep only in the original container.

7.2.2 Keep away from:

Heat sources, (strong) bases, metal powders.

7.2.3 Suitable packaging material:

No data available

7.2.4 Non suitable packaging material:

No data available

7.3. Specific end use(s)

If applicable and available, exposure scenarios are attached in annex. See information supplied by the manufacturer.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 Occupational exposure

a) Occupational exposure limit values

If limit values are applicable and available these will be listed below.

The Netherlands

Kooldioxide	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	4919 ppm
	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	9000 mg/m³

EU

Carbon dioxide	Time-weighted average exposure limit 8 h (Indicative occupational exposure limit value)	5000 ppm
	Time-weighted average exposure limit 8 h (Indicative occupational exposure limit value)	9000 mg/m³

Belgium

Carbone (dioxyde de)	Time-weighted average exposure limit 8 h	5000 ppm (A)
	Time-weighted average exposure limit 8 h	9131 mg/m³ (A)
	Short time value	30000 ppm (A)
	Short time value	54784 mg/m³ (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

USA (TLV-ACGIH)

Carbon dioxide	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	5000 ppm
	Short time value (TLV - Adopted Value)	30000 ppm

Germany

Kohlenstoffdioxid	Time-weighted average exposure limit 8 h (TRGS 900)	5000 ppm
	Time-weighted average exposure limit 8 h (TRGS 900)	9100 mg/m³

France

Carbone (dioxyde de)	Time-weighted average exposure limit 8 h (VRI: Valeur réglementaire indicative)	5000 ppm
	Time-weighted average exposure limit 8 h (VRI: Valeur réglementaire indicative)	9000 mg/m³

UK

Carbon dioxide	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	5000 ppm
	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	9150 mg/m³
	Short time value (Workplace exposure limit (EH40/2005))	15000 ppm
	Short time value (Workplace exposure limit (EH40/2005))	27400 mg/m³

b) National biological limit values

If limit values are applicable and available these will be listed below.

8.1.2 Sampling methods

Product name	Test	Number
Carbon Dioxide	NIOSH	6603
Carbon Dioxide	OSHA	ID 172

8.1.3 Applicable limit values when using the substance or mixture as intended

If limit values are applicable and available these will be listed below.

8.1.4 DNEL/PNEC values

If applicable and available it will be listed below.

8.1.5 Control banding

If applicable and available it will be listed below.

8.2. Exposure controls

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

8.2.1 Appropriate engineering controls

Keep away from naked flames/heat. Measure the oxygen concentration in the air. Carry operations in the open/under local exhaust/ventilation or with respiratory protection.

8.2.2 Individual protection measures, such as personal protective equipment

Observe normal hygiene standards. Do not eat, drink or smoke during work.

a) Respiratory protection:

High vapour/gas concentration: self-contained respirator.

b) Hand protection:

Insulated gloves.

c) Eye protection:

Safety glasses. In case of splash hazard: face shield.

d) Skin protection:

Protective clothing.

8.2.3 Environmental exposure controls:

See headings 6.2, 6.3 and 13

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical form	Liquefied gas
Odour	Odourless
Odour threshold	Not applicable

Colour	Colourless
Particle size	Not applicable (gas)
Explosion limits	No data available
Flammability	Non combustible
Log Kow	0.83 ; Experimental value
Dynamic viscosity	0.000070 Pa.s ; 20 °C
Kinematic viscosity	0.0467 mm²/s ; 20 °C
Melting point	-57 °C ; 5000 hPa
Boiling point	Not applicable
Flash point	Not applicable
Evaporation rate	No data available
Relative vapour density	1.5
Vapour pressure	58240 hPa ; 20 °C
Solubility	water ; 0.29 g/100 ml
	ethanol ; soluble
	ether ; soluble
	acetone ; soluble
	methanol ; soluble
	toluene ; soluble
	methyl acetate ; soluble
	heptane ; soluble
Relative density	1.5 ; -79 °C
Decomposition temperature	No data available
Auto-ignition temperature	No data available
Explosive properties	No chemical group associated with explosive properties
Oxidising properties	No chemical group associated with oxidising properties
pH	3.70

9.2. Other information

Critical temperature	31 °C
Critical pressure	73815 hPa
Absolute density	1560 kg/m³ ; -79 °C
Sublimation temperature	-79 °C

SECTION 10: Stability and reactivity

10.1. Reactivity

Substance has acid reaction.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Violent to explosive reaction with (some) metal powders. Reacts with (some) bases: release of heat.

10.4. Conditions to avoid

Keep away from naked flames/heat.

10.5. Incompatible materials

(strong) bases, metal powders.

10.6. Hazardous decomposition products

No data available.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

11.1.1 Test results

Acute toxicity

carbon dioxide, liquefied, under pressure

No (test)data available

Conclusion

Not classified for acute toxicity

Corrosion/irritation

carbon dioxide, liquefied, under pressure

No (test)data available

Conclusion

Not classified as irritating to the skin
Not classified as irritating to the eyes
Not classified as irritating to the respiratory system

Respiratory or skin sensitisation

carbon dioxide, liquefied, under pressure
No (test)data available

Conclusion
Not classified as sensitizing for skin
Not classified as sensitizing for inhalation

Specific target organ toxicity

carbon dioxide, liquefied, under pressure
No (test)data available

Conclusion
Not classified for subchronic toxicity

Mutagenicity (in vitro)

carbon dioxide, liquefied, under pressure
No (test)data available

Mutagenicity (in vivo)

carbon dioxide, liquefied, under pressure
No (test)data available

Carcinogenicity

carbon dioxide, liquefied, under pressure
No (test)data available

Reproductive toxicity

carbon dioxide, liquefied, under pressure
No (test)data available

Conclusion CMR
Not classified for carcinogenicity
Not classified for mutagenic or genotoxic toxicity
Not classified for reprotoxic or developmental toxicity

Toxicity other effects

carbon dioxide, liquefied, under pressure
No (test)data available

Chronic effects from short and long-term exposure

carbon dioxide, liquefied, under pressure
ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Change in the haemogramme/blood composition. Low arterial pressure.

SECTION 12: Ecological information

12.1. Toxicity

carbon dioxide, liquefied, under pressure

	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LC50		35 mg/l	96 h	Salmo gairdneri			Literature study; Lethal

Conclusion
Harmful to fishes
Harmful to aquatic organisms
pH shift
Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008

12.2. Persistence and degradability

carbon dioxide, liquefied, under pressure
Half-life soil (t1/2 soil)

Method	Value	Primary degradation/mineralisation	Value determination
Not applicable			

Conclusion

Biodegradability: not applicable

12.3. Bioaccumulative potential

carbon dioxide, liquefied, under pressure

Log Kow

Method	Remark	Value	Temperature	Value determination
		0.83		Experimental value

Conclusion

Low potential for bioaccumulation (Log Kow < 4)

12.4. Mobility in soil

carbon dioxide, liquefied, under pressure

Volatility (Henry's Law constant H)

Value	Method	Temperature	Remark	Value determination
0.0152 atm m³/mol		25 °C		Estimated value

Conclusion

Not applicable (gas)

12.5. Results of PBT and vPvB assessment

The criteria of PBT and vPvB as listed in Annex XIII of Regulation (EC) No 1907/2006 do not apply to inorganic substances.

12.6. Other adverse effects

carbon dioxide, liquefied, under pressure

Global warming potential (GWP)

Included in the list of substances which may contribute to the greenhouse effect (IPCC)

Ozone-depleting potential (ODP)

Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009)

SECTION 13: Disposal considerations

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

13.1. Waste treatment methods

13.1.1 Provisions relating to waste

Waste material code (Directive 2008/98/EC, Decision 2000/0532/EC).
16 05 05 (gases in pressure containers and discarded chemicals: gases in pressure containers other than those mentioned in 16 05 04). Depending on branch of industry and production process, also other waste codes may be applicable. Can be considered as non-hazardous waste according to Regulation (EU) No 1357/2014.

13.1.2 Disposal methods

Refer to manufacturer/supplier for information on recovery/ recycling. Remove waste in accordance with local and/or national regulations.

13.1.3 Packaging/Container

Waste material code packaging (Directive 2008/98/EC).
15 01 04 (metallic packaging).

SECTION 14: Transport information

Road (ADR)

14.1. UN number

UN number	1013

14.2. UN proper shipping name

Proper shipping name	Carbon dioxide

14.3. Transport hazard class(es)

Hazard identification number	20
Class	2
Classification code	2A

14.4. Packing group

Packing group	
Labels	2.2

14.5. Environmental hazards

Environmentally hazardous substance mark	no

14.6. Special precautions for user

Special provisions	584

Special provisions	653
Special provisions	662
Limited quantities	Combination packagings: not more than 120 ml per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass)

Rail (RID)

14.1. UN number

UN number	1013

14.2. UN proper shipping name

Proper shipping name	Carbon dioxide

14.3. Transport hazard class(es)

Hazard identification number	20
Class	2
Classification code	2A

14.4. Packing group

Packing group	
Labels	2.2 (+13)

14.5. Environmental hazards

Environmentally hazardous substance mark	no

14.6. Special precautions for user

Special provisions	584
Special provisions	653
Special provisions	662
Limited quantities	Combination packagings: not more than 120 ml per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass)

Inland waterways (ADN)

14.1. UN number

UN number	1013

14.2. UN proper shipping name

Proper shipping name	Carbon dioxide

14.3. Transport hazard class(es)

Class	2
Classification code	2A

14.4. Packing group

Packing group	
Labels	2.2

14.5. Environmental hazards

Environmentally hazardous substance mark	no

14.6. Special precautions for user

Special provisions	584
Special provisions	653
Special provisions	662
Limited quantities	Combination packagings: not more than 120 ml per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass)

Sea (IMDG/IMSBC)

14.1. UN number

UN number	1013

14.2. UN proper shipping name

Proper shipping name	Carbon dioxide

14.3. Transport hazard class(es)

Class	2.2

14.4. Packing group

Packing group	
Labels	2.2

14.5. Environmental hazards

Marine pollutant	-
Environmentally hazardous substance mark	no

14.6. Special precautions for user

Special provisions	
Limited quantities	Combination packagings: not more than 120 ml per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass)

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

Annex II of MARPOL 73/78	Not applicable

Air (ICAO-TI/IATA-DGR)

14.1. UN number

UN number	1013

14.2. UN proper shipping name

Proper shipping name	Carbon dioxide

14.3. Transport hazard class(es)

Class	2.2

14.4. Packing group

Packing group	
Labels	2.2

14.5. Environmental hazards

Environmentally hazardous substance mark	no

14.6. Special precautions for user

Special provisions	
Passenger and cargo transport: limited quantities: maximum net quantity per packaging	Forbidden

SECTION 15: Regulatory information

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

European legislation:

VOC content Directive 2010/75/EU

VOC content	Remark
	Not applicable (inorganic)

Plant protection products

Included in implementing Regulation (EU) No 540/2011, annex part A

National legislation The Netherlands

Waste identification (the Netherlands)	LWCA (the Netherlands): KGA category 06
Waterbezwaarlijkheid	9

National legislation Germany

WGK	nwg; Classification non-water polluting in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS) of 27 July 2005 (Anhang 1)

National legislation France

No data available

National legislation Belgium

No data available

Other relevant data

No data available

15.2. Chemical safety assessment

No chemical safety assessment has been conducted.

SECTION 16: Other information

Full text of any H-statements referred to under headings 2 and 3:

H280 Contains gas under pressure; may explode if heated.

(*) = INTERNAL CLASSIFICATION BY BIG

PBT-substances = persistent, bioaccumulative and toxic substances

CLP (EU-GHS) Classification, labelling and packaging (Globally Harmonised System in Europe)

The information in this safety data sheet is based on data and samples provided to BIG. The sheet was written to the best of our ability and according to the state of knowledge at that time. The safety data sheet only constitutes a guideline for the safe handling, use, consumption, storage, transport and disposal of the substances/preparations/mixtures mentioned under point 1. New safety data sheets are written from time to time. Only the most recent versions may be used. Old versions must be destroyed. Unless indicated otherwise word for word on the safety data sheet, the information does not apply to substances/preparations/mixtures in purer form, mixed with other substances or in processes. The safety data sheet offers no quality specification for the substances/preparations/mixtures in question. Compliance with the instructions in this safety data sheet does not release the user from the obligation to take all measures dictated by common sense, regulations and recommendations or which are necessary and/or useful based on the real applicable circumstances. BIG does not guarantee the accuracy or exhaustiveness of the information provided and cannot be held liable for any changes by third parties. This safety data sheet is only to be used within the European Union, Switzerland, Iceland, Norway and Liechtenstein. Any use outside of this area is at your own risk. Use of this safety data sheet is subject to the licence and liability limiting conditions as stated in your BIG licence agreement or when this is failing the general conditions of BIG. All intellectual property rights to this sheet are the property of BIG and its distribution and reproduction are limited. Consult the mentioned agreement/conditions for details.