SAFETY DATA SHEET

Based on Directive 2001/58/EC of the Commission of the European Communities

CARBON DIOXIDE, SOLID

1. Identification of the substance/preparation and of the company/undertaking

1.1 Identification of the substance or preparation:

Synonyms: dry ice, Carbo-glace dry ice, Carbo-glace

CAS No.	: 124-38-9		
EC index No.	: N.A.	**NFPA code**	: 1-0-0(*)
EINECS No.	: 204-696-9	**Molecular weight**	: 44.01
RTECS No.	: FF640000	**Formula**	: CO_2

1.2 Use of the substance or the preparation:
Coolant
Industrial use

1.3 Company/undertaking identification:
A.C.P. N.V.
Dellestraat 55
B-3550 Zolder
Tel. : +32 13 53 03 03
Fax : +32 13 53 03 00
Email: acp@acpco2.be

1.4 Telephone number for emergency:
See 1.3

2. Composition/information on ingredients

Hazardous ingredients	CAS No. EINECS/ELINCS No.	Conc. in %	Hazard symbol	Risks (R-phrases)
carbon dioxide	124-38-9 204-696-9	> 99.5	-	-

3. Hazards identification

- No hazard classification in accordance with directive 67/548/EEC
- On heating: pressure rise with explosion of tanks/drums

4. First aid measures

4.1 Eye contact:
- Rinse immediately with plenty of water for 15 minutes
- Do not apply neutralizing agents
- Consult a doctor/medical service

4.2 Skin contact:
- Rinse immediately with plenty of water for 15 minutes
- Do not remove clothing if it sticks to the skin
- Consult a doctor/medical service

4.3 After inhalation:
- If breathing problems develop: consult a doctor/medical service
- Remove the victim into fresh air
- Unconscious: maintain adequate airway and respiration

4.4 After ingestion:
- Rinse mouth with water
- If you feel unwell: consult a doctor/medical service

5. Fire-fighting measures

5.1 Suitable extinguishing media:
- Non combustible
- Extinguishing media for surrounding fires: all extinguishing media allowed

5.2 Unsuitable extinguishing media:
- None

5.3 Special exposure hazards:
- N.D.

5.4 Instructions:
- Not applicable

5.5 Special protective equipment for firefighters:
- Heat/fire exposure: compressed air/oxygen apparatus
- Large spills/in enclosed spaces: compressed air apparatus

6. Accidental release measures

6.1 Personal protection/precautions:
See heading 8.1/8.3/10.3

6.2 Environmental precautions:
- Not applicable

6.3 Methods of cleaning up:
- Shovel solid spill into open drums
- Wash clothing and equipment after handling

7. Handling and storage

7.1 Handling:
- Observe normal hygiene standards

7.2 Storage:
- Store in a cool area
- Ventilation at floor level
- Provide for a cooling system
- Meet the legal requirements
- Keep away from: heat sources, bases

Storage temperature	:	N.D.	**°C**
Quantity limits	:	N.D.	**kg**
Storage life	:	N.D.	**days**
Materials for packaging	:		

- suitable : steel, stainless steel, synthetic material, paper
- to avoid : N.D.

7.3 Specific uses:
- Dry ice blasting

8. Exposure controls/Personal protection

8.1 Exposure limit values:

carbon dioxide

TLV-TWA	:		**mg/m³**	5000	**ppm**
TLV-STEL	:		**mg/m³**	30000	**ppm**
TLV-Ceiling	:		**mg/m³**		**ppm**
OES-LTEL	:	(9150)	**mg/m³**	(5000)	**ppm**
OES-STEL	:	(27400)	**mg/m³**	(15000)	**ppm**
MAK	:	9100	**mg/m³**	5000	**ppm**
TRK	:		**mg/m³**		**ppm**
MAC-TGG 8 h	:	9000	**mg/m³**		
MAC-TGG 15 min.	:		**mg/m³**		
MAC-Ceiling	:		**mg/m³**		
VME-8 h	:		**mg/m³**		**ppm**
VLE-15 min.	:		**mg/m³**		**ppm**
GWBB-8 h	:	9131	**mg/m³**	5000	**ppm**
GWK-15 min.	:	54784	**mg/m³**	30000	**ppm**
Momentary value	:		**mg/m³**		**ppm**
EC	:	9000	**mg/m³**	5000	**ppm**
EC-STEL	:		**mg/m³**		**ppm**

Sampling methods:

- Carbon Dioxide	NIOSH 6603
- Carbon Dioxide	OSHA ID 172

8.2 Exposure controls:

8.2.1 Occupational exposure controls:
- Measure the oxygen concentration in the air
- Work under local exhaust/ventilation

8.2.2 Environmental exposure controls: see heading 13

8.3 Personal protection:

8.3.1 respiratory protection:
- High gas/vapour concentration: compressed air/oxygen apparatus

8.3.2 hand protection:
- Insulated gloves
  Suitable materials: Leather, Viton, Butyl rubber, Chloroprene rubber, Chlorinated polyethylene, Chlorosulfonated polyethylene, Neoprene
- Breakthrough time: N.D.

8.3.3 eye protection:
- Safety glasses

8.3.4 skin protection:
- Protective clothing
  Suitable materials: Leather, Viton, Butyl rubber, Chloroprene rubber, Chlorinated polyethylene, Chlorosulfonated polyethylene, Neoprene

9. Physical and chemical properties

9.1 General information:

Appearance (at 20°C)	:	Gas / Solid in various shapes
Odour	:	Odourless
Colour	:	White

9.2 Important health, safety and environmental information:

pH value	:	N.A.	
Boiling point/boiling range	:	N.D.	
Flashpoint	:	N.A.	
Explosion limits	:	N.D.	
Vapour pressure (at 20°C)	:	57300	**hPa**
Vapour pressure (at 50°C)	:	N.D.	
Relative density (at -65°C)	:	1.5	
Water solubility	:	88	**g/100 ml**
Soluble in	:	Ethanol, ether, acetone, methyl alcohol, toluene, heptane, methyl acetate	
Relative vapour density	:	N.D.	
Viscosity	:	0.000015	**Pa.s**
Partition coefficient n-octanol/water	:	N.D.	
Evaporation rate			
ratio to butyl acetate	:	N.D.	
ratio to ether	:	N.D.	

9.3 Other information:

Melting point/melting range (at 5bar)	:	-57	**°C**
Auto-ignition point	:	N.D.	
Saturation concentration	:	N.D.	
Sublimation temperature	:	-79	**°C**

10. Stability and reactivity

10.1 Conditions to avoid/reactivity:
- Stable under normal conditions

10.2 Materials to avoid:
- Keep away from: heat sources, bases

10.3 Hazardous decomposition products:
- Reacts with (some) bases: release of heat

11. Toxicological information

11.1 Acute toxicity:

carbon dioxide

LD50 oral rat	:	N.D.	**mg/kg**
LD50 dermal rabbit	:	N.D.	**mg/kg**
LD50 dermal rabbit	:	N.D.	**mg/kg**
LC50 inhalation rat	:	N.D.	**mg/l/4 h**
LC50 inhalation rat	:	N.D.	**ppm/4 h**

11.2 Chronic toxicity:

carbon dioxide

EC carc. cat.	:	not listed
EC muta. cat.	:	not listed
EC repr. cat.	:	not listed
Carcinogenicity (TLV)	:	not listed
Carcinogenicity (MAC)	:	not listed
Carcinogenicity (VME)	:	not listed
Carcinogenicity (GWBB)	:	not listed
Carcinogenicity (MAK)	:	not listed
Mutagenicity (MAK)	:	not listed
Teratogenicity (MAK)	:	not listed
IARC classification	:	not listed

11.3 Routes of exposure: inhalation, eyes and skin

11.4 Acute effects/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

11.5 Chronic effects:

- Not listed in carcinogenicity class (IARC,EC,TLV,MAK)
- Not listed in mutagenicity class (EC,MAK)
- Not listed in teratogenicity class (EC,MAK)

ON CONTINUOUS EXPOSURE/CONTACT:
- Change in the haemogramme/blood composition
- Low arterial pressure

12. Ecological information

12.1 Ecotoxicity:

carbon dioxide:
- LC50 (96 h) : 35 mg/l (SALMO GAIRDNERI/ONCORHYNCHUS MYKISS)

12.2 Mobility:

- **Volatile organic compounds (VOC):** N.A.
- Soluble in water

For other physicochemical properties see section 9

12.3 Persistence and degradability:

- **biodegradation BOD_5** : N.A. **% ThOD**
- **water** : N.D.
- **soil** : **T ½:** N.A. **days**

12.4 Bioaccumulative potential:

- **log P_{ow}** : N.D.
- **BCF** : N.D.
- Not bioaccumulative

12.5 Other adverse effects:

- **WGK** : - (classification in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS) of 17 May 1999)
- **Effect on the ozone layer** : Not dangerous for the ozone layer (Council Regulation (EC) No 3093/94, O.J. L333 of 22/12/94)
- **Greenhouse effect** : May contribute to the greenhouse effect
- **Effect on waste water purification** : N.D.

13. Disposal considerations

13.1 Provisions relating to waste:
- Waste material code (75/442/EEC, Council Decision 2001/118/EC, O.J. L47 of 16/2/2001): 16 05 05 (gases in pressure containers other than those mentioned in 16 05 04)
- Waste material code (Flanders): 652
- KGA (the Netherlands): category 06

13.2 Disposal methods:
- N.D.

13.3 Packaging:
- Waste material code packaging (75/442/EEC, Council Decision 2001/118/EC, O.J. L47 of 16/2/2001): 15 01 02 (plastic packaging) or 15 01 04 (metallic packaging)

14. Transport information

14.1 Classification of the substance in compliance with UN Recommendations

UN-number	:	1845
CLASS	:	9
SUB RISKS	:	-
PACKING	:	III
PROPER SHIPPING NAME	:	

UN 1845, Carbon dioxide, solid (dry ice)

14.2 ADR (transport by road)

CLASS	:	NOT SUBJECT
PACKING	:	
DANGER LABEL TANKS	:	
DANGER LABEL PACKAGES	:	

14.3 RID (transport by rail) NOT SUBJECT

CLASS	:	
PACKING	:	
DANGER LABEL TANKS	:	
DANGER LABEL PACKAGES	:	

14.4 ADNR (transport by inland waterways)

CLASS	:	NOT SUBJECT
PACKING	:	
DANGER LABEL TANKS	:	
DANGER LABEL PACKAGES	:	

14.5 IMDG (maritime transport)

CLASS	:	9
SUB RISKS	:	-
PACKING	:	III
MFAG	:	
EMS	:	8-08
MARINE POLLUTANT	:	-

14.6 ICAO (air transport)

CLASS	:	9
SUB RISKS	:	-
PACKING	:	III
PACKING INSTRUCTIONS PASSENGER AIRCRAFT	:	904
PACKING INSTRUCTIONS CARGO AIRCRAFT	:	904

14.7 Special precautions in connection with transport	:	not restricted for any mode of international transport

15. Regulatory information

Labelling in accordance with directive 67/548/EEC

NOT APPLICABLE

16. Other information

The information provided on this MSDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

N.A. = NOT APPLICABLE
N.D. = NOT DETERMINED
***** = INTERNAL CLASSIFICATION

Exposure limits:

TLV : Threshold Limit Value - ACGIH USA 2002
OES : Occupational Exposure Standards - United Kingdom 2001
MEL : Maximum Exposure Limits - United Kingdom 2001
MAK : Maximale Arbeitsplatzkonzentrationen - Germany 2001
TRK : Technische Richtkonzentrationen - Germany 2001
MAC : Maximale aanvaarde concentratie - The Netherlands 2002
VME : Valeurs limites de Moyenne d'Exposition - France 1999
VLE : Valeurs Limites d'Exposition à court terme - France 1999
GWBB: Grenswaarde beroepsmatige blootstelling - Belgium 2002
GWK : Grenswaarde kortstondige blootstelling - Belgium 2002
EC : Indicative occupational exposure limit values - Directive 2000/39/EC

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