CARBON DIOXIDE FIRE EXTINGUISHER

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

1.1 – Product identifier	CARBON DIOXIDE FIRE EXTINGUISHER Models: CS2-AB, CS2-AM, CS2-AMM, CS5-AB, CS5-AM
1.2 – Relevant identified uses of the substance or mixture and uses advised against	*Relevant uses:* extinguishing Class B fires. *Uses advised against*: other uses not identified as relevant.
1.3 – Details of the supplier of the safety data sheet	ANAF FIRE PROTECTION S.P.A. Via del Commercio, 4 27020 Torre d'Isola (PV), Italy Tel.: +39 (0)382 45 33 Fax.: + 39 (0)283 92 02 79 e-mail: info@anaf.eu internet: www.anaf.eu
1.4 – Emergency telephone number	Tel.: +39 (0)382 45 33 Number available only at the following: 8.30-12.30, 13.30-17.30 (UTC) – Monday to Friday

SECTION 2 – Hazards identification

2.1 – Classification of the substance or mixture	*Classification of the substance or mixture according to Reg. (EC) no. 1272/2008* The product does not meet the classification criteria in any hazard class in accordance with Regulation (EC) no. 1272/2008 relating to the classification, labelling and packaging of substances and mixtures.
2.2 – Label elements	Pictograms: *none* Warning: *none* Hazard statements: *none* Precautionary statements: *none*
2.3 – Other hazards	*BT, vPvB identification:* the mixture does not contain substances that meet the criteria set out in Annex XIII of Reg. 1907/2006 (REACh) as PBT or vPvB. *Properties as an endocrine disruptor:* the mixture does not contain substances included in the list of art. 59, par. 1, of Reg. 1907/2006 (REACh) due to properties of interference with the endocrine system. The mixture does not contain substances identified as disrupting the endocrine system in accordance with the criteria established in Reg. (EU) 2017/2100 or in Reg. (EU) 2018/605. *Information on other hazards which do not lead to classification:* It contains a high concentration of asphyxiant gas. Contact with the gas can cause cryogenic burns. The gas is heavier than air. It can accumulate in enclosed spaces, particularly at or below ground level.

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SECTION 3 – Composition/information on ingredients

3.1 – Substances Not relevant.

3.2 – Mixtures

Refer to section 16 for the full text of the hazard statements

Substance	Identification number	REACH registration number	Quantity *(% weight)*	Classification (Reg. EC no. 1272/2008)
carbon dioxide	CAS 124-38-9 CE 204-696-9	*substance not subject to registration (included in Annex IV and V, Reg. REACH)*	100%	H280 *Press. Gas (Comp.)*

SECTION 4 – First aid measures

The information refers to the extinguishing agent.

4.1 – Description of first aid measures

Inhalation: move the victim to an unaffected area while wearing a self-contained breathing apparatus. Keep the patient lying down and warm. Call a doctor. Proceed with artificial respiration if breathing stops.
Skin contact (pure product): in case of frostbite, spray with water for at least 15 minutes. Apply sterile gauze. Seek medical assistance.
Eye contact: wash eyes immediately with water for at least 15 minutes.
Ingestion: ingestion is considered an unlikely route of exposure.

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

Inhalation: may cause asphyxiation in high concentrations. Symptoms may include loss of mobility and/or consciousness. Victims may be unaware of the asphyxiation. Low concentrations of CO_2 cause increased respiratory rate and headaches. Refer to section 11.
Skin contact: none known.
Eye contact: none known.
Ingestion: none known.

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

No data available.

SECTION 5 – Firefighting measures

5.1 – Extinguishing media

Suitable fire-extinguishing methods: not applicable. The product is a Class B fire extinguisher.
Unsuitable fire-extinguishing media: not applicable.

5.2 – Special hazards arising from the substance or mixture

Exposure to flames may cause the container to rupture or burst.

5.3 – Advice for firefighters

Use firefighting measures appropriate for the surrounding fire. Exposure to flames and heat may cause the container to rupture. Cool containers exposed to the hazard with jets of water from a protected position. Do not pour contaminated water from the fire into the sewer system.
If possible, stop the spill. If possible, use a spray of water to reduce fumes. Move containers away from the fire area if this can be done safely.

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SECTION 6 – Accidental release measures

6.1 – Personal precautions, protective equipment and emergency procedures	6.1.1 For those not directly involved: operate in accordance with the local emergency plan. Attempt to stop the leak. Evacuate the area. Ensure adequate ventilation. Avoid entering sewers, basements, pits and areas where accumulation can be dangerous. Remain upwind of the leak. 6.1.2 For those who are directly involved: use a self-contained breathing apparatus to enter the affected area if it is not clear that the air is breathable. When the release of asphyxiant gases is possible, oxygen detectors must be used.
6.2 – Environmental precautions	Attempt to stop the leak.
6.3 – Methods and material for containment and cleaning up	6.3.1 For containment: ventilate the area. 6.3.2 For cleaning: not applicable. The contents of the container are a gas. 6.3.3 Other information: nothing in particular.
6.4 – Reference to other sections	Refer to points 8 and 13 for more information.

SECTION 7 – Handling and storage

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7.1 – Precautions for safe handling	The product must be handled in accordance with good industrial safety and hygiene practices. Only experienced and properly trained personnel may handle gases under pressure. Ensure that the fire extinguisher has been (or is regularly) checked before use. Do not smoke while handling the product. Do not inhale the gas. Avoid releasing the product in the work area. Protect containers from physical damage; do not drag, roll, slide or drop them. When moving containers, even short distances, use the appropriate handling equipment (trolleys, hand trucks, etc.) designed for transporting such containers. If any difficulties are encountered when operating the valve, discontinue use and contact the supplier. Never attempt to repair or modify container valves or safety devices. Never attempt to transfer gases from one container to another. Do not use direct flames or electric heaters to increase the internal pressure of the container. Do not remove or hinder the legibility of the labels attached by the supplier to identify the contents of the container.
7.2 – Conditions for safe storage, including any incompatibilities	Observe local regulations and legislative requirements concerning the storage of containers. Containers must not be stored in conditions that could lead to corrosion. Containers must be stored upright and anchored to prevent them from falling. Fire extinguishers must be checked periodically, both for their general condition and to detect any leaks. Keep the container below 50°C in a well-ventilated area.
7.3 – Specific end use(s)	Type B fire extinguisher.

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SECTION 8 – Exposure controls/personal protection

The information refers to the extinguishing agent.

8.1 – Control parameters

carbon dioxide (124-38-9)

OEL TWA	9000 mg/m^3 – 5000 ppm

8.2 – Exposure controls

8.2.1 Appropriate technical controls

When the release of asphyxiant gases is possible, oxygen detectors must be used.

8.2.2. Individual protection

Eye/face protection: wear goggles with side shields.

Hand protection: not required for normal use.

Other: wear normal work clothes.

Respiratory protection: not required for normal use. In low-oxygen environments, a self-contained breathing apparatus or breathing air supply system with mask must be used.

Thermal hazards: no hazards to report.

Environmental exposure controls: use according to good working practices, avoiding dispersal of the product in the environment.

SECTION 9 – Physical and chemical properties

9.1 – Information on basic physical and chemical properties

a. physical state	container under pressure (fire extinguisher)
b. colour	not applicable
c. odour	not applicable
d. melting point/freezing point	carbon dioxide: -78,5 °C
e. boiling point or initial boiling point and boiling range	carbon dioxide: -56,6 °C
f. flammability	not flammable
g. lower and upper explosion limit	not relevant
h. flash point	not applicable
i. auto-ignition temperature	not applicable
j. decomposition temperature	not applicable
k. pH	not applicable
l. kinematic viscosity	not applicable
m. solubility	carbon dioxide: 2000 mg/L in water
n. partition coefficient n-octanol/water (log value)	not applicable
o. vapour pressure	57,3 bar
p. density and/or relative density	not applicable
q. relative vapour density	1,52 (air = 1)
r. particle characteristics	not relevant

9.2 – Other information

Information relating to physical hazard classes:

Critical temperature: carbon dioxide: 30°C

The gas is heavier than air. It can accumulate in enclosed spaces, particularly at or below ground level.

Asphyxiant gas under pressure.

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SECTION 10 – Stability and reactivity

10.1 – Reactivity	No risk of reactivity.
10.2 – Chemical stability	No hazardous reactions if handled or stored in accordance with regulations.
10.3 – Possibility of hazardous reactions	None known.
10.4 – Conditions to avoid	None under the recommended storage conditions and use.
10.5 – Incompatible materials	None known.
10.6 – Hazardous decomposition products	None known.

SECTION 11 – Toxicological information

11.1 – Information on hazard classes as defined in Regulation (EC) No 1272/2008	a. **acute toxicity**: In high concentrations, carbon dioxide (CO_2) rapidly causes respiratory failure. Symptoms include headaches, nausea and vomiting, leading to a loss of consciousness. Unlike simple asphyxiants, carbon dioxide can lead to death even when normal oxygen levels (20-21%) are maintained. It has been found that 5% CO_2 contributes synergistically to increasing the toxicity of other gases (CO, NO_2). CO_2 has been shown to increase the production of carboxyhaemoglobin by these gases, probably due to its stimulation of the respiratory and circulatory systems.
	b. **skin corrosion/irritation**: based on available data, the classification criteria are not met.
	c. **serious eye damage/irritation:** based on available data, the classification criteria are not met.
	d. **respiratory or skin sensitisation:** based on available data, the classification criteria are not met.
	e. **germ cell mutagenicity:** based on available data, the classification criteria are not met.
	f. **carcinogenicity:** based on available data, the classification criteria are not met.
	g. **reproductive toxicity:** based on available data, the classification criteria are not met.
	h. **STOT-single exposure:** based on available data, the classification criteria are not met.
	i. **STOT-repeated exposure:** based on available data, the classification criteria are not met.
	j. **aspiration hazard:** not applicable for gas.
11.2 – Information on other hazards	a. **endocrine disrupting properties**: The mixture does not contain any endocrine-disrupting substances.
	b. **other information:** no data available.

SECTION 12 – Ecological information

12.1 – Toxicity	No data available.

12.2 – Persistence and degradability	Not applicable.
12.3 – Bioaccumulative potential	Not deemed susceptible to bioaccumulation due to a low log Kow (log Kow < 4).
12.4 – Mobility in soil	No data available.
12.5 – Results of PBT and vPvB assessment	Not applicable.
12.6 – Endocrine disrupting properties	No data available.
12.7 – Other adverse effects	Carbon dioxide: Global Warming Potential (GWP): 1

SECTION 13 – Disposal considerations

13.1 – Waste treatment methods	Residues must be disposed of in accordance with current regulations by delivering empty containers to an authorised disposal company equipped to safely handle pressurised containers containing residues of flammable liquids and gases. Empty containers heated above 50°C may burst. Recover if possible. Follow current local or national regulations. For handling and measures in the event waste is accidentally spilled, the indications given in sections 6 and 7 generally apply; however, specific precautions and actions must be evaluated in relation to the composition of the waste. Dispose of the waste after assessing possibilities for its reuse in the same or another production cycle, or for recovery at companies authorised under current legislation. Disposal via discharge into the sewer is not permitted.

SECTION 14 – Transport information

14.1 – UN number or ID number

Regulations	UN number
ADR/RID/ADN	UN 1044
IMDG Code	
ICAO-TI/IATA-DGR	

14.2 – UN proper shipping name

Regulations	Proper shipping number
ADR/RID/ADN	FIRE EXTINGUISHERS with compressed or liquefied gas
IMDG Code	FIRE EXTINGUISHERS with compressed or liquefied gas
ICAO-TI/IATA-DGR	FIRE EXTINGUISHERS with compressed or liquefied gas

14.3 – Transport hazard class(es)

Regulations	Transport hazard class(es)
ADR/RID/ADN	Class 2 Label 2.2 Classification code 6A
IMDG Code	Division 2.2
ICAO-TI/IATA-DGR	Division 2.2

14.4 – Packing group

Regulations	Packing group
ADR/RID/ADN	not applicable
IMDG Code	
ICAO-TI/IATA-DGR	

14.5 – Environmental hazards

Regulations	Environmental hazards
ADR/RID/ADN	not applicable
IMDG Code	
ICAO-TI/IATA-DGR	

14.6 – Special precautions for user

All phases of preparation, handling and transport of dangerous goods, including packaging, documentation, marking and labelling, loading and unloading activities, must be carried out by personnel who have received the necessary training required by the modal regulations.

Specific provisions for ADR/RID/ADN
The fire extinguisher is manufactured, tested, approved and labelled in accordance with the provisions applied in the country of manufacture (as per Special Provision 225).

This article is manufactured and filled in accordance with the provisions applicable in the country of manufacture and is equipped with protection against accidental discharge. If packed according to the provisions described in Special Provision 594, it is not subject to the provisions of ADR/RID/ADN.

Specific provisions for the IMDG-Code:
The fire extinguisher is manufactured, tested, approved and labelled in accordance with the provisions applied in the country of manufacture (as per Special Provision 225).

Specific provisions for ICAO-TI/IATA-DGR:
The fire extinguisher is manufactured, tested, approved and labelled in accordance with the provisions applied in the country of manufacture (as per Special Provision A19).

14.7 – Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15 – Regulatory information

15.1 – Safety, health and environmental regulations/legislation specific for the substance or mixture	Reg. (EC) n. 1907/2006 (REACH)
15.2 – Chemical safety assessment	The supplier has not carried out a chemical safety assessment.

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SECTION 16 – Other information

Document information

The product does not fall under the obligation to draw up and supply a Safety Data Sheet, as it meets the definition of "article". However, the product supplier has drawn up this document, on a voluntary basis, according to the standard required for SDSs, as governed by Annex II of Reg. (EC) 1907/2006 as amended by Reg. (EU) 2020/878.

Notice to users

This document is intended to provide guidance: 1) for appropriate and careful handling of the product by qualified personnel or personnel who work under the supervision of personnel skilled in the handling of chemical substances; 2) for emergency management; 3) for the assessment and management of risks deriving from the use, handling, transport and storage of the product. The product must not be used for purposes other than those indicated in section 1. The information contained in this SDS is based on the knowledge available at the date of compilation relating to the requirements for safety, health, environmental protection and correct use of the product.

The person responsible for this document cannot provide warnings about all the dangers deriving from the use or interaction with other chemicals or materials. The user is responsible for the safe use of the product, the adequacy of the product for the use for which it is applied and its correct disposal.

The information provided is not to be considered a declaration or guarantee, either expressed or implied, of merchantability, fitness for a particular purpose, quality, or of any nature.

The user must bear in mind the possible risks associated with a use other than that for which the product is supplied.

This SDS does not in any case dispense the user from knowledge and from the application of the set of regulations pertinent to his activity.

This SDS does not exempt the user from ensuring that he does not have obligations other than those mentioned and regulating the possession and use of the product for which he is solely responsible.

Change list

Rev. 0 – First emission

Abbreviations and acronyms

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
CAS [Number]: Chemical American Society [Number]
CE50: Median effective concentration
CL50: Average lethal concentration
DL50: Average lethal dose.
DNEL: Derived No Effect Level.
IARC: International Agency for Research on Cancer
ICAO-TI: International Civil Aviation Organization – Technical Instruction
IMDG-Code: International Maritime Dangerous Goods Code
LEL: Lower Explosion Level
PBT: Persistent, Bioaccumulative, Toxic
RID: European Agreement concerning the International Carriage of Dangerous Goods by Railroad
STOT: Specific Target Organ Toxicity
UEL: Upper Explosion Level

vPvB: very persistent, very bioaccumulative.

Hazard statements mentioned in the safety data sheet:
H280 *(Press. Gas (Comp.))* Contains gas under pressure: may explode if heated.

Bibliography:
SDS of similar extinguishing mixtures
ECHA website
IFA-Gestis website