Safety Data Sheet
BAVARIA Carbon dioxide Fire Extinguisher

Section 1- Chemical Product and Company Identification

Trade Name/Label Name:	**BAVARIA Carbon dioxide Fire Extinguisher**
CAS Number:	
Trading Name:	Carbon dioxide Fire Extinguisher Sigma 2 /Sigma 5
Synonyms:	
Name of Supplier/Manufacturer:	BAVARIA Brandschutz Industrie GmbH & Co. KG
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Section 2- Hazards identification

2.1 Classification of the substance or mixture

Hazard Class and Category Code(s), Regulation (EC) No 1272/2008

Physical hazards :Gasses under pressure – Refrigirated liquied gas – Warning – (CLP: Press. Gas) – H281

Classification EC 67/548 or EC 1999/45

Classification : Not included in Annex VI. No EC labeling required.
Not classified as dangerous substance/mixture

2.2 Label elements

Labelling Regulation EC 1272/2008 (CLP)

Hazard pictograms

Hazard pictograms code : GHS04

Signal words : Warning

Hazard statements : H281 – Contains refrigerated gas, may cause cryogenic Burns or injury

Precautionary statements

- Prevention : P282 – Wear cold insulating gloves, face shield, eye protection
- Response : P336+P315 – Thaw frosted parts with lukewarm water. Do no rub affected area. Get immediate medical advice/attention.
- Storage : P403 – Store in a well-ventilated place.

2.3 Other hazards

: Asphyxiant in high concentrations

Section 3- Composition/information on ingredients

3.1 Substance / 3.2 Mixture

Name	Product identifier	%	Classification according to the Regulation (EC) No. 1272/2008 [CLP]
Carbon dioxide (refrigerated)	(CAS No) 124-3-9 (EC No) 204-696-9	100	(DSD) Not classified [DSD/DPD] (CLP) Press. Gas [H281]

	(Index No) ---- (REACH-No) *1		

Contains no other components or impurities which will influence the classification of the product.
*1: Listed in Annex IV / V REACH, exempted from registration.
*2: Registration deadline not expired.
*3: Registration not required: Substance manufactured or imported < 1t/y
Full text of R-phrases see chapter 16
Full text of H-statements see chapter 16

Section 4- First aid measures

4.1 Description of first aid measures

- Inhalation : 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 contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion : Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects, both acute and delayed

: 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.

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 the mixture

Specific hazards : Exposure to fire may cause containers to rupture/explode.
Hazardous combustion products : None.

5.3 Advice for firefighters

Specific methods : If possible, stop flow of product. If leaking do not spray water onto container. Water surrounding area (from protected position) to contain fire.
Use fire control measures appropriate to the surrounding fire.
Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
Use water spray or fog to knock down fire fumes if possible.

Special protective equipment for fire fighters : Use self-contained breathing apparatus. Standard EN 137 - self-contained open-circuit compressed air breathing apparatus with full face mask.
Standard protective clothing and equipment (Self Contained

	Breathing Apparatus) for fire fighters. EN 469: Protective clothing for firefighters. EN 659: Protective gloves for firefighters.

Section 6- Accidental release measures

6.1	**Personal precautions, protective equipment and emergency procedures**
	: Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Use protective clothing. Ensure adequate air ventilation. Evacuate area. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Try to stop release.
6.2	**Environmental precautions**
	: Try to stop release.
6.3	**Methods and material for containment and cleaning up**
	: Liquid spillages can cause embrittlement of structural materials.
6.4	**Reference to other sections**
	: See also sections 8 and 13.

Section 7- Handling and storage

7.1 Precautions for safe handling

Safe use of the product	: Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas upplier if in doubt. Do not smoke while handling product. Avoid suck back of water, acid and alkalis. Only experienced and properly instructed persons should handle gases under pressure. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. Ensure the complete gas system was (or is regularily) checked for leaks before use. The product must be handled in accordance with good industrial hygiene and safety procedures. Consider pressure relief device(s) in gas installations.
Safe handling of the gas receptacle	: Refer to supplier's container handling instructions. Do not allow backfeed into the container. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Keep container valve outlets clean and free from contaminants particularly oil and water. Never attempt to transfer gases from one cylinder/container to another. Never use direct flame or electrical heating devices to raise the pressure of a container. Damaged valves should be reported immediately to the supplier.

General	: Containers, which contain or have contained flammable or explosive substances, must not be inerted with liquid carbon dioxide. Potential production of solid CO2 particles must be ruled out. In order to rule out potential electrostatic discharge production, the system must be adequately grounded.
7.2 Conditions for safe storage, including any incompatibilities	
Storage	: Keep container below 50°C in a well ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Stored containers should be periodically checked for general condition and leakage. Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Containers should be stored in the vertical position and properly secured to prevent toppling. Container valve guards or caps should be in place. Keep away from combustible materials.
7.3 Specific end usage	
	: None.

Section 8- Exposure controls/personal protection

8.1 Control parameters	
Occupational Exposure Limits	: ILV (EU) - 8 H - [mg/m³] : 9000
Carbon dioxide (refrigerated)	: ILV (EU) - 8 H - [ppm] : 5000 : AGW (8h) - Germany [mg/m³] TRGS 900 : 9100 : AGW (8h) - Germany [ppm] TRGS 900 : 5000
DNEL: Derived no effect level (Workers)	: None available.
PNEC: Predicted no effect Concentration	: None available.
8.2 Exposure controls	
8.2.1. Appropriate engineering controls	: Provide adequate general and local exhaust ventilation. Systems under pressure shoud be regularily checked for leakages. Ensure exposure is below occupational exposure limits (where available). Oxygen detectors should be used when asphixiating gases may be released. Consider work permit system e.g. for maintenance activities.
8.2.2. Individual protection measures e.g. personal protective equipment	: Protect eyes, face and skin from liquid splashes. A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and select the PPE that matches the relevant risk. The following recommendations should be considered. PPE compliant to the recommended EN / ISO standards should be selected.
• Eye / face protection	: Wear goggles and a face shield when transfilling or breaking transfer connections Wear safety glasses with side shields Standard EN 166 - Personal eye-protection.
- Hand protection	: Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk.
- Other	: Wear safety shoes while handling containers.

	Standard 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 atmosphere. Standard EN 137 - self-contained open-circuit compressed air breathing apparatus with full face mask.
• **Thermal hazards**	: Wear cold insulating gloves when transfilling or breaking transfer connections. Standard EN 511 - Cold insulating gloves
8.2.3. Environmental exposure controls	: None necessary.

Section 9- Physical and chemical properties

9.1 Information on the basic physical and chemical properties

Appearance	
Physical state at 20°C / 101.3kPa	: Gas.
Colour	: Colourless.
Odour	: No odour warning properties.
Odour threshold	: Odour threshold is subjective and inadequate to warn for overexposure.
Molar mass [g/mol]	: 44
Melting point [°C]	: -56.6
Boiling point [°C]	: -78.5 (s)
Critical temperature [°C]	: 30
Flash point [°C]	: Not applicable for gases and gas-mixtures.
Evaporation rate (ether=1)	: Not applicable for gases and gas-mixtures.
Flammability range [vol% in air]	: Nonflammable.
Vapour pressure [20°C]	: 57.3 bar
Relative density, gas (air=1)	: 1.52
Relative density, liquid (water=1)	: 1.03
Solubility in water [mg/l]	: 2000 Completely soluble.
Partition coefficient n-octanol/water [log Pow]	: 0.83
Auto-ignition temperature [°C]	: Not applicable.

9.2 Other infromation

Other data	: 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-sections below.

10.2 Chemical stability

: Stable under normal conditions.

10.3 Possibility of hazardous reactions

: None.

10.4 Conditions to avoid

: None under recommended storage and handling conditions (see section 7).

10.5 Incompatible materials	
	: None. For additional information on compatibility refer to ISO 11114
10.6 Hazardous decomposition products	
	: None.

Section 11- Toxicological information

11.1 Information on toxicological effects

Acute toxicity	: In high concentrations cause rapid circulatory insufficiency even at normal levels of oxygen concentration. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness and 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.
Carcinogenicity	: No known effects from this product.
Germ cell mutagenicity	: No known effects from this product.
Reproductive toxicity	: No known effects from this product.
STOT-single exposure	: No known effects from this product.
STOT-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 Result of PBT and vPvB assessment	
	: Not classified as PBT or vPvB.
12.6 Other adverse effects	
	: Can cause frost damage to vegetation.
Effect on ozone layer	: None.
Effect on the global warming	: When discharged in large quantities may contribute to the greenhouse effect.
Global warming potential [CO2=1]	: 1

Section 13- Disposal consideration

13.1 Waste treatment methods	
	May be vented to atmosphere in a well ventilated place. Discharge to atmosphere in large quantities should be avoided. Do not discharge into any place where its accumulation could be

	dangerous. Consult supplier for specific recommendations. Refer to the code of practice of EIGA (Doc. 30/10 “Disposal of Gases, downloadable at http:// www.eiga.org) for more guidance on suitable disposal methods
List of hazardous waste	: 16 05 05: Gases in pressure containers other than those mentioned in 16 05 04.

13.2 Additional information

: None.

Section 14- Transport information

UN number : 1044

Labelling ADR, IMDG, IATA

: 2.2 : Nonflammable, nontoxic gas.

Land transport (ADR/RID)

Class	: 2
UN proper shipping name	: fire extinguisher with compressed or liquid gas
Transport hazard class(es)	: 2.2
Special provision	:225, 594
Limited quantities	:120ml
Expected quantities	:E0
Classification code	: 6 A
Packing Instruction(s)	: P003, special provision PP91
Packaging	: MP9
Tunnel Restriction	: E Passage forbidden through tunnels of category E
Loading and unloading	: CV9
Environmental hazards	: None.

Sea transport (IMDG)

Proper shipping name	: fire extinguisher with compressed or liquid gas
Class	: 2.2
Special provision	:225
Limited quantities	:120ml
Expected quantities	:E0
Emergency Schedule (EmS) - Fire	: F-C
Emergency Schedule (EmS) - Spillage	: S-V
Packing instruction	: P003, Special provision PP91
IMDG-Marine pollutant	: No
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	: Not applicable.

Special precautions for user

: - Ensure there is adequate ventilation.
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 containers are firmly secured.
- Ensure cylinder valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.

	- Ensure valve protection device (where provided) is correctly fitted. Avoid transport on vehicles where the load space is not separated from the driver's compartment.

Section 15- Regulatory information

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

EU legislation

Restrictions on use	: None.
Seveso directive 96/82/EC	: Not covered.

15.2 Chemical safety assessment

: A CSA does not need to be carried out for this product.

Section 16- Other information

Indication of changes	: Revised safety data sheet in accordance with commission regulation (EU) No 453/2010
Training advice	: The hazard of asphyxiation is often overlooked and must be stressed during operator training.
List of full text of H-statements in section 3.	: H281 - Contains refrigerated gas; may cause cryogenic burns or injury.
Note	: This Safety Data Sheet has been established in accordance with the applicable European Union legislation.
DISCLAIMER OF LIABILITY	: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Details given in this document are believed to be correct at the time of going to press. 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.