



شرکت ملی گاز ایران - مدیریت پژوهش و فناوری

امور تدوین استانداردها

**IGS**

Iranian Gas Standards

مشخصات فنی خرید

کپسول خاموش کننده قابل حمل گاز کربنیک

CO2 Fire Extinguisher , Portable Type



## ابلاغ مصوبه هیأت مدیره

مدیر محترم پژوهش و فناوری و رئیس شورای استاندارد

باسلام،

به استحضار می‌رساند در جلسه ۱۳۹۶ مورخ ۱۳/۲۳/۱۳۸۸ هیأت مدیره، نامه شماره ک.۰۰۰/۹۵/۱۵۷۲۴۵ مورخ ۱۳/۱۲/۸۸ آن مدیریت در مورد تصویب نهایی استاندارد تحت عنوان "کپسول خاموش کننده نوع گاز کربنیک CO<sub>2</sub>" به شماره تقاضای (IGS-M-SF-001(0) مطرح و مورد تصویب قرار گرفت.

ناصر آبگون

دبیر هیأت مدیره

رونوشت: مدیرعامل محترم شرکت ملی گاز ایران و قائم مقام رئیس هیأت مدیره

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## **1. Scope**

This standard specification covers the minimum requirements for design, material, construction, inspection and, testing, marking and packing of portable & rechargeable metal bodied carbon dioxide fire extinguishers used for protection of all plants, areas and premises of National Iranian Gas Company where there is a risk of fire.

## **2. References**

In preparation of this specification, the following codes and standards have been referred to or considered. The latest edition of these standards and codes to the extent of specified herein, shall form a part of this specification.

### **2.1. Normative references**

BS 341 part 1: 1991, *Transportable gas containers valves.*

BS EN 3 - *Portable fire extinguishers , the below specified parts mainly have been used:*

Part 7: 1996 ,*Characteristics, Performance requirements and test methods*

Part 8: 2006, *Additional requirements to EN3-7 for the construction , resistance to pressure and mechanical test for extinguisher weight minimum allowable pressure equal to or lower than 30 bar*

Part 9: 2006 ,*Additional requirements to EN3-7 for pressure resistance of CO<sub>2</sub> extinguishers*

EN 629 -1:1996, *Transportable gas cylinders – 25 E taper threads for connection of valves to gas cylinders – part 1: specification*

EN ISO 15245-1, *Gas cylinders – parallel threads for connection of valves to gas cylinders – Part 1: specification (ISO 15245-1: 2001)*

EN ISO 11116-1: 1999 , *Gas cylinder – 17E taper thread for connection of valves to gas cylinders-part 1:specifications .*

ISO 6718:1991, *Bursting discs and bursting disc devices .*

### **2.2: Informative References**

IPS-E-SF-100:1993, *Engineering standard for classification of fires and hazard Properties*

### **3. Classification of fires**

The following designations shall be used for the purpose of classifying fire of different natures in order to simplify spoken and written reference to them.

#### **Class A**

These are fires involving solid materials, usually of organic nature in which combustion normally takes place with the formation of glowing embers. wood cloth, paper, rubber, and many other combustible materials are some example.

#### **Class B**

These are fires involving flammable liquids and combustible liquids such as oil, alcohols,.....

#### **Class C**

These are fires involving flammable gases .such as natural gas

#### **Class D**

These are fire involving combustible metals, such as Magnesium, Titanium, Zirconium, Sodium and Potassium.

#### **Class E**

Fires that involve energized electrical equipments.

### **4. Charges and filling tolerances**

#### **4.1. Nominal charges:**

Nominal charges of CO<sub>2</sub> portable fire extinguishers shall be equal to 2 or 5 kgs

#### **4.2. Filling tolerances**

The actual charge of the CO<sub>2</sub> extinguisher shall be equal the nominal charge within the tolerances (-5% to +0% )

#### **4.3. Filling ratio**

There is a relationship between the filling ratio, the maximum allowable pressure and the maximum allowable temperature depending on the pressure-temperature curves of carbon dioxide. Commonly used filling ratios are 0,667, 0,675 and 0,750, and the corresponding max. allowable pressures at 60 °C are shown in Annex B ,EN 3-9:2006.

## 5. Effective range of operating temperature & resistance of mechanical parts

### 5.1. General

Portable fire extinguishers shall be able to operate and be resistant to shock at temperatures between  $-20^{\circ}\text{C}$  (or  $-30^{\circ}\text{C}$  for cities with low temperatures ) and  $+60^{\circ}\text{C}$  ( $T_{\text{max}}$ ) . After the test described in accordance with Annex B, EN 3-7:2004, they shall satisfy the requirements of 5.2.

### 5.2. Requirements

The requirements for all extinguishers are as follows:

- They shall operate satisfactorily
- The discharge shall commence within 10 seconds of the opening of the control valve.
- The discharge duration shall be not less than the applicable value given in table 1

Table 1

| Charge (X) of the extinguishing<br>Medium contained<br>Kg or l | Minimum duration of operation<br>Sec |
|--|--------------------------------------|
| $X \leq 3$   | 6                                    |
| $3 < X \leq 6$   | 9                                    |
| $6 < X \leq 10$  | 12                                   |
| $10 < X$   | 15                                   |

- No more than 10% of initial  $\text{CO}_2$  charge shall remain within the extinguisher after continuous discharge.

## 6 – Material

### 6.1- Body

Non metallic materials for bodies of operating devices are not permitted and other characteristics shall be accordance with EN 3-9 :2006.

#### 6.1.2 - Discharge Horns

**6.1.2.1-** An extinguisher shall be equipped with a discharge horn of water-resistant electrically nonconductive material.

**6.1.2.2** - An extinguisher equipped with a flexible hose shall be provided with a horn handle made of an insulating material (plastic or seasoned hard-wood ) not less than 127 mm long.

**6.1.2.3.** An extinguisher equipped with a flexible hose shall be provided with a bracket to hold the discharge horn when not in use. The bracket securely hold The horn , but the horn shall be able to be readily disengaged for use.

### **6.1.3 - Hose**

**6.1.3.1** An extinguisher having a capacity of more than 3 kg mass of carbon dioxide shall be equipped with a discharge hose . A hose shall be flexible & of sufficient length to allow the horn to be pointed in any direction.

**6.1.3.2** A hose shall contain a metal wire braid & shall have either an outer wrapping of tightly woven high-grade yarn or a cover of natural or synthetic rubber. it shall be equipped with couplings of ferrous metal coated to resist corrosion nonferrous metal or stainless-steel threaded to accept the discharge fitting of the valve & the connector of the discharge horn. The hose shall be capable of being removed & replaced.

If the hose coupling incorporates a nozzle orifice , the threads or attachment means shall prevent the outlet end of the hose from being connected to the discharge valve outlet.

### **6.1.4 - Valve**

All valve shall be suitable for the intended use particularly regarding flow capacity and operation. They shall be used only under temperatures and other conditions for which they are listed or approved . Where the pressure relief device is a bursting disc fitted to valves of seamless containers, the maximum bursting pressure shall not exceed the test pressure of the container. The bursting pressure range for bursting discs fitted to carbon dioxide container valves shall be 180 bar to 200 bar according to BS 341-1:1991 .

## **7. Inspection and Tests**

All tests shall be according to EN 3-7 ,3-8 and 3-9.

## **8. Extinguisher identification**

### **8.1. Color**

The color of the body shall be red RAL 3000 as specified in Farbregister RAL-841-GL.

National regulations may require a zone of color with an area of up to 10 % of the surface area of the extinguisher body to be used to identify the extinguishing agent.

## **8.2. Marking**

The operating, recharging, and inspection and maintenance instructions shall be in the form of an etched or embossed metal nameplate, band, or a pressure-sensitive nameplate permanently attached to the side of the shell or in the form of silk screening of paint directly on the shell. The nameplate shall identify the type of extinguisher with the following information:

- Mark of the extinguisher manufacturer as registered, for identification.
- Serial or batch number of the extinguisher.
- Year of manufacture of the extinguisher , which can be represented by the four digits , e.g.2002.
- Tare in kg, including permanently attached accessories ( necessary for refilling ) .
- Volume of the body - L
- Maximum allowable pressure of the extinguisher assembly with the letters "PS" before and followed by "BAR" or "bar"
- Maximum filling mass – kg
  
- Contained gas.
- Operating temperature range of the extinguisher assembly ( $T_{min}/T_{max}$ )

### **8.2.1. Cylinder**

- The thread code shall be marked (Annex C ,EN 3-9 :2006)
- Test pressure in bar, with the letters "PT" before and followed by "BAR" or "bar". This marking shall be stamped, engraved or embossed.

## **8.3. Labeling**

Nameplate shall be permanently attached to the body of each cylinder media the nameplate shall identify the (carbon – dioxide), the classification of the fire extinguisher and the instruction manual.

## **8.4. Shape of container**



An extinguisher having a capacity of more than 2.5 kg of carbon dioxide shall be capable of standing in an upright position without support.

## **9. Guarantees**

Manufacturer shall guarantee by of acceptance the satisfactory performance of the fire extinguishers in accordance with this specification. The manufacturer shall also guarantee to replace without charge any or all parts defective due to faulty material design or poor workmanship for 18 months after shipment.

## **10. Packaging**

Each extinguisher shall be fully charged and packed in an individual carton. An extinguisher not equipped with a flexible house may be packed without the horn attached but the horn shall be packed with the house and horn assembly detached from the extinguisher but the hose and horn assembly shall be packed in the same carton with the extinguisher .

## **11. Documentation**

The approval test reports shall be issued by certifying body which is accepted by N.I.G.C.

**Data sheet**

Manufacturer's Name :

Order No.

| Item | Subject                                   | Requirements   | Supplier Offer | Remark |
|------|---|--|----------------|--------|
| 1    | Capacity<br>(Kg)                          | 2 <input type="checkbox"/> 2.5 <input type="checkbox"/><br>5 <input type="checkbox"/> 6 <input type="checkbox"/>   |                |        |
| 2    | Weight of charged<br>Extinguisher<br>(Kg) | 6 <input type="checkbox"/> 14 <input type="checkbox"/><br>16 <input type="checkbox"/> 20 (Max) <input type="checkbox"/>  |                |        |
| 3    | Operating<br>Temperature                  | -20 °C to +60 °C <input type="checkbox"/><br>-30 °C to +60 °C <input type="checkbox"/>   |                |        |
| 4    | Location                                  | Indoor <input type="checkbox"/><br>Outdoor <input type="checkbox"/>  |                |        |
| 5    | Fire Class                                | B , C , E <input type="checkbox"/>   |                |        |
| 6    | Discharge Time                            | Acc. To Table 1 <input type="checkbox"/>   |                |        |
| 7    | Hose Type                                 | Flexible <input type="checkbox"/>  |                |        |
| 8    | Accessories                               | Hose <input type="checkbox"/> Wall Mounted <input type="checkbox"/><br>Support <input type="checkbox"/> Bracket <input type="checkbox"/><br>Inscriptions Language <input type="checkbox"/> |                |        |
| 9    | Color                                     | Red <input type="checkbox"/>   |                |        |
| 10   | Technical Literature                      | English <input type="checkbox"/><br>Persian <input type="checkbox"/>   |                |        |

**Continue**

| Item | Subject                | Requirements   | Supplier Offer | Remark |
|------|------------------------|--|----------------|--------|
| 11   | Cylinder Test Pressure | 200 bar ( Min 3000 PSI ) <input type="checkbox"/>  |                |        |
| 12   | Valve                  | Copper alloy<br>ACC to BS 341-1 <input type="checkbox"/>   |                |        |
| 13   | Bursting Disk Test     | 180 to 200 Bar <input type="checkbox"/>  |                |        |
| 14   | Hose Test              | -1,5 times P(T <sub>max</sub> ), the test being carried out at (20 ± 5) °C <input type="checkbox"/><br>- 1,25 times P(T <sub>max</sub> ), the test being carried out at (T <sub>max</sub> ± 2) °C and at the minimum claimed temperature.<br>Acc.to EN 3-7:2004 <input type="checkbox"/> |                |        |

Notes :

- 1 - This data sheet shall be filled, signed and stamped by manufacturer.
- 2- Any deviation from this standard specification shall clearly specified by manufacturer.

| Deviations |
|------------|
|            |

Authorized Signature :

Company's Stamp :