SRI LANKA STANDARD 638:1984
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SPECIFICATION FOR
PORTABLE FIRE EXTINGUISHERS CARBON DIOXIDE TYPE

SRI LANKA STANDARDS INSTITUTION

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SLS 638:1984

Gr. 7

SRI LANKA STANDARDS INSTITUTION
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Sri Lanka.

SRI LANKA STANDARD

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FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1984-02-22, after the draft, finalized by the Drafting Committee on Fire Protection and Fire Fighting has been approved by the Mechanical Engineering Divisional Committee.

All values in this standard have been given in metric units.

This specification applies to metal bodied portable fire extinguishers of carbon dioxide type in which carbon dioxide is expelled as the extinguishing agent.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or observation shall be rounded off in accordance with CS 102. Number of figures to be retained in the rounded off values shall be the same as that of the specified value in this standard.

The references made to foreign standard specifications will be replaced with relevant Sri Lanka Standard Specifications when they are available.

The assistance derived from the publications of the Standards Association of Australia, the Indian Standards Institution, and the British Standards Institution in the preparation of this standard is gratefully acknowledged.

1 SCOPE

This standard lays down requirements regarding capacity, principle materials, construction, method of operation, performance and tests for metal bodied portable fire extinguishers of carbon dioxide type.

2 REFERENCES

BS 5045 Transportable gas containers

Part 1 Seamless steel gas containers above 0.5 litre water capacity.

Part 2 Steel containers upto 130 litres water capacity with welded seams

CS 102 Presentation of numerical values

CS 374 Standard atmospheric conditions for conditioning and testing

SLS 428 Random sampling methods.

3 DEFINITIONS

For the purpose of this specification the following definitions shall apply:

3.1 **portable fire extinguisher**: A first aid fire fighting appliance which can be carried by hand and operated by hand and the maximum mass should not exceed 20 kg.

3.2 **carbon dioxide fire extinguisher**: Extinguisher which expels carbon dioxide as the extinguishing medium.

3.3 **filling ratio**: The ratio of the mass of gas introduced into a container to the mass of water at 15 °C that fills the container, fitted for use with valve and any internal fittings.

NOTE - The water capacity stamped on a container may refer to the minimum designed water capacity of the container without fittings in which case the net water capacity should be ascertained.

4 REQUIREMENTS

4.1 Materials and constructions

4.1.1 *Body*

4.1.1.1 The body of the extinguisher (gas cylinder) shall be designed and constructed in accordance with one of the approved cylinder specifications.

BS 5045 Part 1 excluding Clauses 13.2 and 13.3 of this standard

or

BS 5045 Part 2 excluding Clauses 14.2 and 14.3 of this standard (Until such time Sri Lanka Standard is available)

4.1.1.2 The external surface of the body of the extinguisher shall be treated or coated to resist atmospheric corrosion and shall be finished to comply with the requirements of 5 (Marking).

4.1.1.3 Threads for necks and valve stems shall be as shown in Figure 1 and Table 1. These threads shall be of right-hand form, having a pitch of 2 mm cut normal to the surface of the cone.

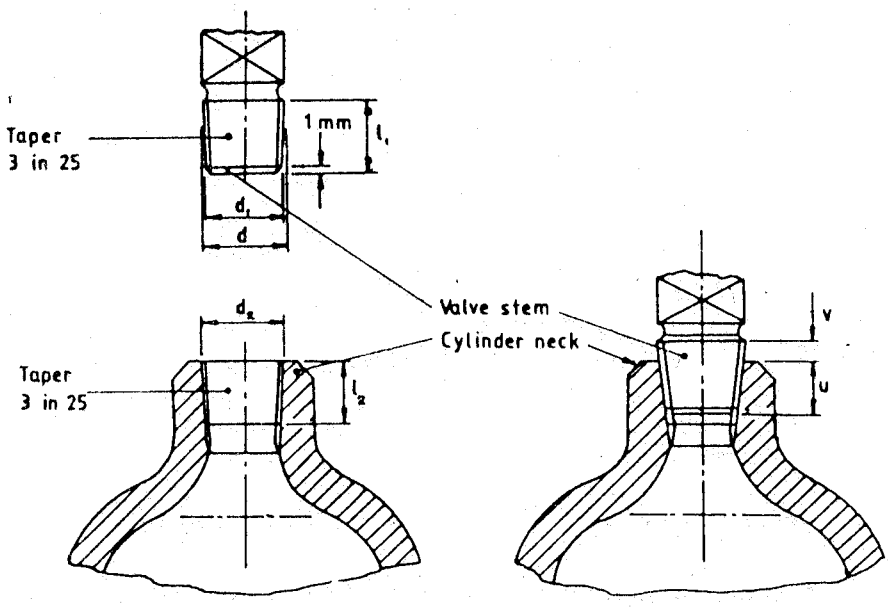

FIGURE 1 - Thread for valve stem and neck

TABLE 1 - Thread for valve stem and neck

(All dimensions in millimetres)

Gas cylinder valve		Valve stem			Assembly		Cylinder neck	
Nominal size	Type	d+0.12	d_1+0.12	l_1	u at theoretical thread dimensions	y	d_2-0.12	l_2 min
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
28.8	A	28.8	25.8	26	17.67	8.33	27.8	22

4.1.1.4 Threads of valve outlets shall be as shown in Table 2. These threads shall be of right-hand form, having a pitch of 2 mm parallel.

TABLE 2 - Threads of valve outlet

(All dimensions is millimetres)

Thread size	Valve outlet external thread				Union connection internal thread						
	Major diameter d		Effective diameter d_2		Minor diameter d_1		Major diameter D^{20*}	Effective diameter D_2		Minor diameter D_1	
	max.	min.	max.	min.	max.	min.	min.	min.	max.	min.	max.
W 21.80x1/14 in	21.780	21.387	20.638	20.503	19.47	19.11	21.80	20.63	20.77	19.49	20.06

* *No maximum is specified for the major diameter.*

4.1.2 *Discharge valve or operating head*

The discharge valve of an extinguisher shall be capable of being operated satisfactorily, when the extinguisher is operated intermittently.

4.1.2.1 These shall be provided with safety release to release the gas at a pressure between 18.0 MPa and 20.0 MPa.

The valve of the squeeze grip, trigger or lever type shall have a carrying or operating handle and withstand a pressure of 23.5 MPa.

4.1.2.2 The actuating mechanism shall be such that its purpose is apparent and the operation is simple and obvious.

4.1.3 *Handle*

A carrying handle of adequate strength shall be provided. Such a handle may form an integral part of the operating head.

4.1.4 *Supporting fixture*

The extinguisher shall be provided with a bracket or mounting device into or on which it can be mounted and from which it can be readily removed.

4.1.5 *Discharge fittings*

4.1.5.1 Internal discharge tube

The internal discharge tube shall be made of copper, steel, aluminium, or a suitable plastic material and be securely fixed to the valve or operating head.

4.1.5.2 Nozzle

The nozzle shall be of brass, gunmetal, aluminium or stainless steel.

4.1.5.3 Discharge hose

Where a discharge hose is provided it shall be flexible and shall have a minimum working pressure of 20.0 MPa. The hose shall not be subjected to any internal pressure until the extinguisher is in operation.

4.1.5.4 Discharge horn

a) General

A discharge horn shall be fitted and shall be of a material that is shatter resistant, durable and of adequate strength.

It shall be so designed and constructed as to direct the discharge and limit the entrainment of air. It shall be constructed of electrically non-conductive material.

b) Horn fitted to operating head

Where the horn is fitted directly to the operating head and is intended to be adjustable, the joint shall be so constructed that it enables free movement without leaks developing, and shall be of a type which will enable the horn to be directed without being held in position.

c) Horn fitted to hose

Where the horn is not fitted directly to the discharge head but to a hose, provision shall be made for firmly securing it to the body of the extinguisher when not in use. This may be clips or other means which provide for quick release. Where the nozzle and horn are fitted on a hose, there shall be a handgrip on the horn constructed of thermal insulating material to protect the operator's hand from the effects of freezing.

4.2 Capacity (size)

The extinguishers shall have capacities of not less than 1, 2, 3, 4 and 5 k/g of carbon dioxide when filled to the specified filling ratio.

4.3 Filling ratio and charge

All extinguishers shall be dry internally and shall be filled with dry carbon dioxide to the filling ratio 0.667 with a tolerance of +0 per cent,- 5 per cent by nominal mass.

4.4 Method of operation

The extinguisher shall be designed to be operated in the normal upright position. The extinguisher shall incorporate safety device to prevent accidental operation. This device may form part of the actuating mechanism or of the support bracket.

Suitable mechanical means shall be provided whereby the sealing device is opened or pierced, thus causing the contents of the extinguisher to be discharged.

4.5 Performance

4.5.1 *Discharge time*

The design and construction of the extinguisher shall be such that when it is correctly charged and operated with the cylinder at an angle of 45 degrees to the vertical and at standard atmospheric conditions for conditioning and testing (CS 374), the valve being

held in the fully open position, it shall discharge not less than 95 per cent of its contents in the form of a continuous discharge within the appropriate period specified in Table 3 from the time of the operating the valve.

The body shall be weighed 30 minutes after the discharge period and shall be wiped and dried before checking contents.

TABLE 3 - Discharge time

Nominal size of extinguisher (kg)	Discharge time, seconds	
	Min.	Max.
1	6	14
2	8	16
3	8	18
4	10	20
5	10	24

4.5.2 *Intermittent discharge*

An extinguisher shall be capable of being operated intermittently without freeze up of the valve seat and causing any leak with an interrupted discharge cycle of 3 S open, 3 S closed until not less than 95 per cent of the contents is discharged, at standard atmospheric conditions for conditioning and testing (CS 374).

4.5.3 *Leakage*

There shall be no leakage of carbon dioxide from the valve or fittings when the extinguisher is being used.

5 MARKING

5.1 Every extinguisher shall be marked legibly and indelibly with the following informations:

a) Manufacturer's name and address;

b) Brand name if any;

c) The words "CARBON DIOXIDE TYPE";

d) Method of operation with illustrations;

e) Capacity;

f) The words "RECHARGE AFTER USE";

g) The year of manufacture;

h) Cylinder marking as required by the relevant standard which was used for the construction and testing of the cylinder; and

j) Marking of suitability for class of fire.

5.2 Information b), c) and h) shall be given in Sinhala, Tamil and English.

NOTE - Written instructions shall be issued by the manufacturer to the customer covering maintenance procedure.

5.3 Colour

Colour of the extinguisher shall be black.

5.4 The extinguishers may also be marked with the Certification Mark of the Sri Lanka Standards Institution illustrated below on permission being granted for such marking by the Sri Lanka Standards Institution.

NOTE - The use of the Sri Lanka Standards Institution Certification Mark (SLS Mark) is governed by the provisions of the Sri Lanka Standards Institution Act and the regulations framed thereunder. The SLS mark on products covered by a Sri Lanka Standard is an assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control, which is devised and supervised by the Institution and operated by the producer. SLS Marked products are also continuously checked by the Institution for conformity to that standard as a further safeguard. Details of conditions under which a permit for the use of the Certification Mark may be granted to manufacturers or processors may be obtained from the Sri Lanka Standards Institution.

6 TESTS

6.1 Hydraulic test

Every extinguisher shall be able to withstand the hydraulic test pressure specified either in BS 5045 Part 1 or in BS 5045 Part 2.

6.2 Checking for leakage of gas

6.2.1 *Standard gas leakage test*

Every extinguisher shall be correctly charged and weighed and subjected to the standard gas leakage test. The charged extinguisher shall be stored for a period of not less than 21 days, following which it shall be weighed to determine whether there has been any loss of contents. Any extinguisher showing loss of contents shall be rejected.

7 SAMPLING

7.1 Lot

All portable CO_2 type fire extinguisher of the same design and capacity produced by the same manufacturer from similar material under almost identical conditions of manufacture shall be grouped together to constitute a lot.

7.2 Scale of sampling

7.2.1 Each lot shall be considered individually for the purpose of evaluation of quality in accordance with this specification.

7.2.2 Each fire extinguisher in the lot shall be inspected for tests specified in 6 of this standard and the extinguishers not conforming to the requirements shall be rejected.

7.2.3 After inspecting the lot for 7.2.2 a sample of fire extinguisher shall be drawn from the lot in accordance with Table 4.

7.2.4 Items shall be selected at random. In order to ensure randomness of selection random number table as given in SLS 428 shall be used.

TABLE 4 - Scale of sampling

Number of items in the lot (1)	Number of items to be selected (2)	Sub sample for testing (3)
Up to 25	5	3
26 to 50	8	5
51 to 100	13	8
101 and above	20	13

7.3 Number of tests

7.3.1 Each item in the sample selected as given in Column 2 of Table 4 shall be examined visually in respect of the requirements specified in 4 as far as possible.

7.3.2 From the items examined visually and found satisfactory a sub sample of size as given in Column 3 of Table 4 shall be taken at random and subjected to the performance tests (4.5.1 and 4.5.2).

8 CRITERIA FOR CONFORMITY

The lot shall be considered to be in conformity with requirements of this specification if the following conditions are satisfied:

8.1 All fire extinguisher inspected as in 7.2.2 satisfies the requirements specified in 6.

8.2 All the items inspected visually as in 7.3.1 satisfy the relevant requirements.

8.3 Items of sub sample tested as in 7.3.2 satisfy the relevant requirements.

SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI *which includes surveillance inspection of the factory, testing of both factory and market samples.*

Further particulars of the terms and conditions of the permit may be obtained from the Sri *Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.*

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SRI LANKA STANDARDS INSTITUTION

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Science & Technology.

The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in turn are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.

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