BRITISH STANDARD

BS EN
12094-7:2001

Fixed firefighting systems — Components for gas extinguishing systems —

Part 7: Requirements and test methods for nozzles for CO_2 systems

The European Standard EN 12094-7:2000 has the status of a British Standard

ICS 13.220.10; 13.220.20

National foreword

This British Standard is the official English language version of EN 12094-7:2000.

This European Standard is the subject to transitional arrangements agreed under a Commission mandate which is intended to lead to CE marking in support of the Construction Products Directive. In order to allow for any changes in national regulations, the Member States have agreed a transition period of 21 months before CE marking becomes effective.

The UK participation in its preparation was entrusted by Technical Committee FSH/18, Fixed firefighting systems, to Subcommittee FSH/18/6, Gaseous extinguishing media and systems, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 18, an inside back cover and a back cover.

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Fixed firefighting systems — Components for gas extinguishing systems — Part 7: Requirements and test methods for nozzles for CO_2 systems

Installations fixes de lutte contre l'incendie — Eléments constitutifs des installations d'extinction à gaz — Partie 7: Exigences et méthodes d'essai pour les diffuseurs de systèmes à CO_2

Ortsfeste Brandbekämpfungsanlagen — Bauteile für Löschanlagen mit gasförmigen Löschmitteln — Teil 7: Anforderungen und Prüfverfahren für Düsen für CO_2-Anlagen

This European Standard was approved by CEN on 18 November 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 191, Fixed firefighting systems, the Secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2001, and conflicting national standards shall be withdrawn at the latest by September 2002.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 89/106/EEC.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

This part of EN 12094 is one of a number of European Standards prepared by CEN/TC 191 covering components for gas extinguishing systems.

They are included in a series of European Standards planned to cover:

— gas extinguishing systems (EN 12094);
— sprinkler systems (EN 12259 and EN 12845);
— powder systems (EN 12416);
— explosion protection systems (EN 26184);
— foam systems (EN 13565);
— hose systems (EN 671);
— smoke and heat control systems (EN 12101);
— water spray systems.

The following parts of this European Standard are planned:

— Part 1: Requirements and test methods for electrical automatic control and delay devices;
— Part 2: Requirements and test methods for non-electrical automatic control and delay devices;
— Part 3: Requirements and test methods for manual triggering and stop devices;
— Part 4: Requirements and test methods for high-pressure container valve assemblies and actuators;
— Part 5: Requirements and test methods for selector valves and actuators for CO_2 systems;
— Part 6: Requirements and test methods for non-electrical disable devices for CO_2 systems;
— Part 7: Requirements and test methods for nozzles for CO_2 systems;
— Part 8: Requirements and test methods for flexible connectors for CO_2 systems;
— Part 9: Requirements and test methods for special fire detectors;
— Part 10: Requirements and test methods for pressure gauges and pressure switches;
— Part 11: Requirements and test methods for weighing devices;
— Part 12: Requirements and test methods for alarm devices;
— Part 13: Requirements and test methods for check valves and non-return valves;
— Part 16: Requirements and test methods for odorizing devices for CO_2 low pressure systems;
— Part 17: Requirements and test methods for pipe hangers;
— Part 20: Requirements and test methods for compatibility of components.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

It has been assumed in the preparation of this standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

All pressure data in this European Standard are given as gauge pressures in bar, unless otherwise stated.

NOTE 1 bar = 10^5 Nm^{-2} = 100 kPa.

1 Scope

This European Standard specifies requirements and test methods for nozzles that introduce the extinguishing agent into a CO_2 protected zone.

The design of the nozzles will influence discharge rate and thus the pressure drop in the piping network. The extinguishing agent normally arrives at the nozzle in two-phase flow form (liquid-gaseous mixture). It expands into the protected volume to form a gas or a gas-and-dry-ice mixture depending on the nozzle type.

This standard should only be used as guidance for testing nozzles that work on different principles.

2 Normative references

This European Standard incorporates by dated or undated references, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation*

3 Terms and definitions

For the purposes of this European Standard the following terms and definitions apply.

3.1
cross section
total area of all smallest geometrical single areas

3.2
distribution characteristics
volume in which CO_2 is distributed uniformly from a nozzle

3.3
filter
component to prevent blockage of nozzles

3.4
flow rate
mass flow of CO_2 against time

3.5
functional reliability
ability of function under different working conditions

3.6
high pressure container
cylinder filled with CO_2 under ambient temperature conditions

NOTE The pressure at 20 °C is 56,3 bar.

3.7
local application nozzle
nozzle, from which CO_2 is discharged over a partial closed or open hazard

3.8
low pressure container
insulated tank filled with CO_2 equipped with a cooling machine

NOTE The pressure at - 20°C is 18,7 bar.

3.9
nozzle
component to achieve a predetermined flow rate and a uniformed distribution characteristic of the CO_2 into or onto a protected hazard

3.10
nozzle cover
component to protect nozzles against exterior dirt

3.11
resistance coefficient
value for the calculation of the pressure drop in a component under two-phase flow condition

3.12
room protection nozzle
nozzle, from which CO_2 is discharged for distribution throughout an enclosure

3.13
two-phase flow
partial change of phase of a fluid from a liquid to vapour under flowing conditions

3.14
working pressure
pressure at which the component is used in the system

4 Requirements

4.1 General design

The test sample shall comply with the technical description (drawings, parts list, description of functions, operating and installation instructions) when checked in accordance to 5.3.

Metal parts of nozzles shall be made of stainless steel, copper, copper alloy or galvanised steel.

All materials shall be resistant to media with which they come into contact.

Nozzles shall be designed so that the function cannot be adversely affected by ageing or environmental influences.

Non-metallic materials and elastomers shall be selected to be stable and not alter their performance over the working life recommended by the manufacturer.

4.2 Connection threads

Connection threads shall comply with ISO 7-1 or ISO 228-1 for threads.

4.3 Nozzle opening cross section

The minimum dimension of any individual discharge opening of the nozzle shall not be smaller than 1 mm.

Nozzles with dimension of discharge opening ≥ 3 mm shall not be equipped with a filter. Nozzles with dimensions of discharge openings < 3 mm shall be equipped with a filter.

The filter shall be made of corrosion resistant metal. The unrestricted filter surface area shall be at least five times the nozzle cross section. The mesh of the filter shall be between 0,5 mm and 0,8 mm, measured in the plane of the hole.

To prevent blockage of the nozzle by dry-ice the cross sectional area of the nozzle should decrease in the direction of flow. High-pressure nozzles with increasing cross sections shall be tested additionally under both conditions in accordance with 5.4. Orifice plates are not allowed.

4.4 Nozzle protection covers

If the nozzle opening is protected against exterior dirt with a cap or similar cover, this cover shall eject clear of the nozzle's full opening cross section at extinguishant pressures between 0,1 bar and 3 bar when tested in accordance with 5.8. The cover shall not affect extinguishant distribution.

4.5 Flow rate

The manufacturer shall specify the flow rate of the nozzle, in kilograms of CO_2 per second for instance, for the pressure ranges shown in Table 1.

Table 1 — Pressure range for nozzles

pressure in bar

Type of system	Range of pressure at the starting point p_{abs}	Range of pressure at the working point p_{abs}
Low pressure CO_2	10 to 18	8,6 to 16,5
High pressure CO_2	14 to 50	12 to 40

Where filters are installed, these shall be taken into account when determining the flow rate. The performance characteristics shall be tested in accordance with 5.5.

4.6 Distribution characteristics

The distribution of CO_2 shall be tested in accordance with 5.4.1 for room protection nozzles and in accordance with 5.4.2 for local application nozzles.

4.7 Resistance to pressure and heat

The extinguishing nozzles shall be able to withstand the test pressures and temperatures given in Table 2.

Table 2 — Test pressure and temperature

Type of system	Test pressure bar	Test temperature °C
High-pressure CO_2	60	600
Low-pressure CO_2	25	600

Following testing for pressure and heat resistance in accordance with 5.6, the nozzles shall show no signs of deterioration that could impair proper performance.

4.8 Resistance to heat and cold shock

The nozzles shall withstand both the high temperatures generated during a fire and the cold shock caused by the extinguishant as it is discharged. Following testing for heat and cold shock resistance in accordance with 5.7, the nozzles shall show no signs of deterioration that could impair proper functioning.

4.9 Resistance to corrosion

The performance of the nozzles shall not be adversely affected as a result of the corrosion test in accordance with 5.9.

4.10 Resistance to stress corrosion

Any copper alloy part used in nozzles shall not crack, when tested in accordance with 5.10.

4.11 Resistance to vibration

Nozzles assembled from several parts shall not be damaged, when tested in accordance with 5.11.

4.12 Documentation

4.12.1 The manufacturer shall prepare and maintain documentation that specifies the installation, operation, routine testing and maintenance of the component and all other aspects relating to its incorporation within a fire extinguishing system.

4.12.2 The documentation shall be submitted to the testing authority and shall comprise at least the following:

- a) general description of the equipment, including a list of the features and functions;
- b) technical specification including:
  1) the information as given in 4.5;
  2) the suitability for use in various environments;
  3) mounting instructions;
- c) maintenance instructions.

4.12.3 The manufacturer shall also prepare, maintain and submit the following detailed documentation:

- a) description of the overall mechanical design including:
  1) the main parts of components and their tasks;
  2) the way in which the parts interact;
- b) component lists;
- c) layouts;
- d) design drawings.

This documentation shall also comprise details of any subcomponents.

4.12.4 All documentation normally supplied by and specified by the manufacturer for use by the end user shall be supplied with the device and constitute part of the supply.

5 Type test methods

5.1 Conditions

The components shall be tested assembled as recommended for installation by the manufacturer. The tests shall be carried at out a temperature of (20 ± 5) °C, except when otherwise stated.

The tolerance for all test parameters is ± 5 %, unless otherwise stated.

5.2 Samples and order of tests

When testing a nozzle type with only one size, four test samples are necessary. The order of tests is shown in Table 3.

Table 3 — Order of tests

Test methods	Order of tests			
	Sample A	Sample B	Sample C	Sample D
5.3 Compliance	1	1	1	1
5.4 Determination of distribution characteristics	—	—	2	—
5.5 Determination of flow rate	2/4	—	—	—
5.6 Test for resistance to pressure and heat	—	2	—	—
5.7 Test for resistance to heat and cold shock	—	3	—	—
5.8 Nozzle cover	—	—	—	2
5.9 Test for resistance to corrosion	3	—	—	—
5.10 Test for resistance to stress corrosion	—	—	—	3
5.11 Vibration test	—	—	3	—

When testing a series of nozzles, where the nozzles are of identical design with the exception of their size (cross section of discharge opening), the following test samples are necessary:

— 2 test samples of smallest size;
— 1 test sample of medium size;
— 2 test samples of largest size;
— 1 or more test samples of a size agreed with the testing body.

NOTE By this agreement, the dimensions of already available test rooms for test 5.4 may be taken into account.

The order of tests for this case shall be as follows:

— first test sample of smallest size: as test sample A of Table 3;
— second test sample of smallest size: as test sample D of Table 3;
— test sample of medium size: as test sample A of Table 3 without tests 3 and 4;
— first test sample of largest size: as test sample A of Table 3 without tests 3 and 4;
— second test sample of largest size: as test sample B of Table 3;
— test sample(s) of the size agreed with the testing body: as test sample C of Table 3.

5.3 Compliance

This test relates to the requirement of 4.1.

A visual and measurement check shall be made to determine whether the nozzles correspond to the description in the technical literature (drawings, parts lists, description of function, operating and installation instruction), and whether the device complies with this standard.

5.4 Determination of distribution characteristics

5.4.1 Room protection nozzles

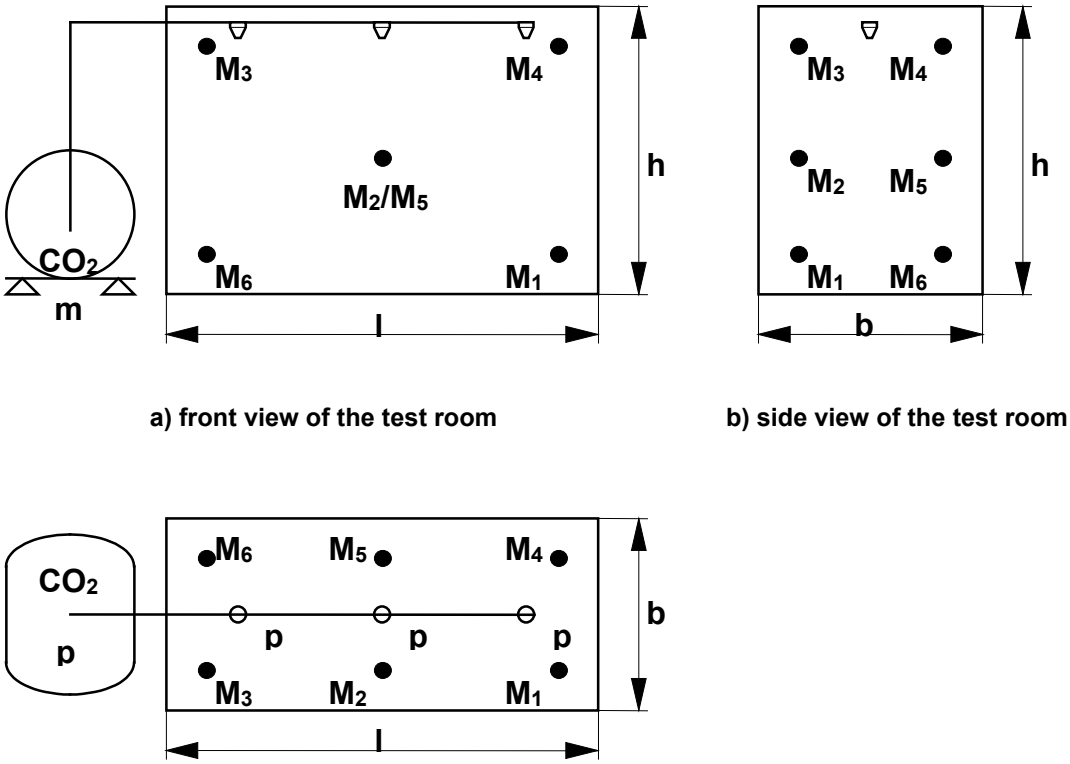
This test relates to the requirement of 4.6.

For testing the distribution characteristics with one or more nozzles in a test room the following test conditions shall be set-up:

a) Relative humidity in the test room (60 ± 10) %;
b) Pressure in the CO_2 supply container (20 ± 1) bar;
c) Pressure at the nozzle: (13 ± 2) bar;
d) Flow rate (1 ± 0,1) kg m^{-3} referenced to the volume of the test room;
e) Gaseous phase time maximum 10 s. The mass flow during this time shall not exceed 10 % of the mass of the liquid phase;
f) Liquid phase time (60 ± 2) s. The CO_2 supply shall be shut down immediately after this period.

Concentration measurements shall be made to determine whether the CO_2 is distributed evenly in the volume served by the nozzle(s). The deviation of the concentration of the different measuring points shall be at maximum five percentage points (60 ± 10) s after the end of the discharge. The test set-up is shown in Figure 1.

A visual check shall be made, to ensure that no significant quantity of CO_2 dry-ice is present in the test room 15 min after the conclusion of testing.



Components

p	pressure measuring point
m	mass measuring point
h	room height, in metres (m)
b	width of room according to the flow rate of nozzle, in metres (m)
l	length of room according to the flow rate of nozzle, in metres (m)
M_1 to M_6	concentration measuring points 1 to 6

Arrangement for concentration measuring points:

— height above floor
  M_1 ; M_6: 0,1 x *h*
  M_2 ; M_5: 0,5 x *h*
  M_3 ; M_4 0,9 x *h*

— distance from walls
  M_1, M_2, M_3 and M_4: 0,1 x *l* from wall of length b and 0,1 x *b* from wall of length *l*
  M_2 and M_5: 0,5 x *l* from wall of length b and 0,1 x *b* from wall of length *l*.

Figure 1 — Test configuration for room protection nozzles

5.4.2 Local application nozzles

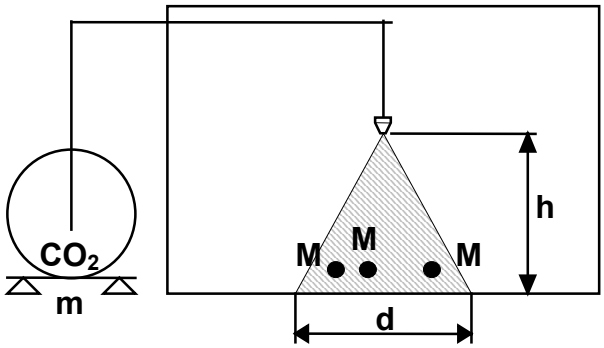
5.4.2.1 Distribution characteristics

This test relates to the requirements of 4.6.

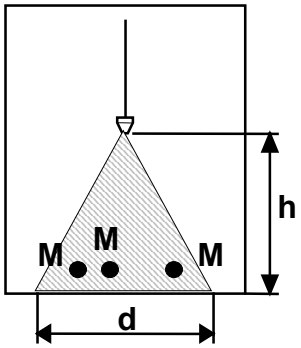
For testing the distribution characteristics one nozzle in a test room, with a volume of minimum five times the volume protected by the nozzle, is used with the following test conditions set-up:

a) relative humidity in the test room (60 ± 10) %;
b) pressure in the CO_2 supply container: (20 ± 2) bar;
c) pressure at the nozzle: (10 ± 1) bar;
d) gaseous phase time maximum 10 s. The mass flow shall not exceed 10 % of the mass of the liquid phase;
e) liquid phase time (30 ± 2) s. The CO_2 supply shall be shut down immediately after this period;
f) flow rate as given by the manufacturer;
g) nozzle related protection volume or area, as given by the manufacturer.

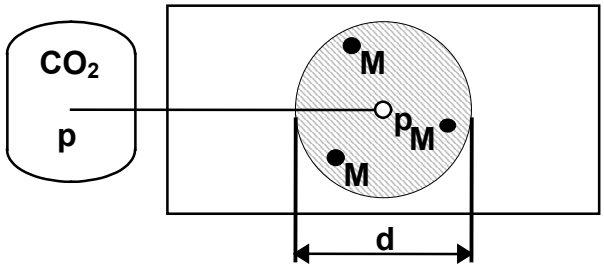
Concentration measurements shall be made to determine whether the CO_2 is distributed evenly in the nozzle related protection volume served by the nozzle. The CO_2 concentration while the liquid phase time shall be for at least 20 s above 34 % at each measuring point. The test set-up is shown in Figure 2.



a) front view of the test room



b) side view of the test room



c) top view of the test room

Components

p	pressure measuring point
m	mass measuring point
M	3 concentration measuring points 0,1 *h* above the floor evenly arranged on a circle with the diameter of 0,8 *d*

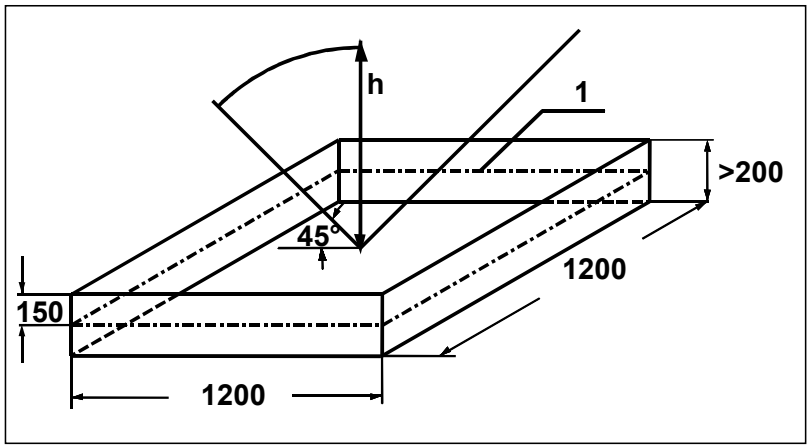
Figure 2 — Test configuration for local application nozzles

5.4.2.2 Jet velocity test

This test relates to the requirements of 4.6.

The local application nozzle shall be mounted above a basin partially filled with water, as shown in Figure 3, at a distance (h) as specified by the manufacturer. The conditions in the supply container shall be the same as those in 5.4.1. The start pressure in the high-pressure container shall be more than (120 ± 5) bar. The pressure at the nozzle shall be (16 ± 1) bar for low-pressure and (40 ± 2) bar for high-pressure nozzles. The nozzle shall not splash any water out of the test tray when directed at the water surface at an angle of 90° and 45° to the surface of the liquid.

Dimensions in millimetres



Key

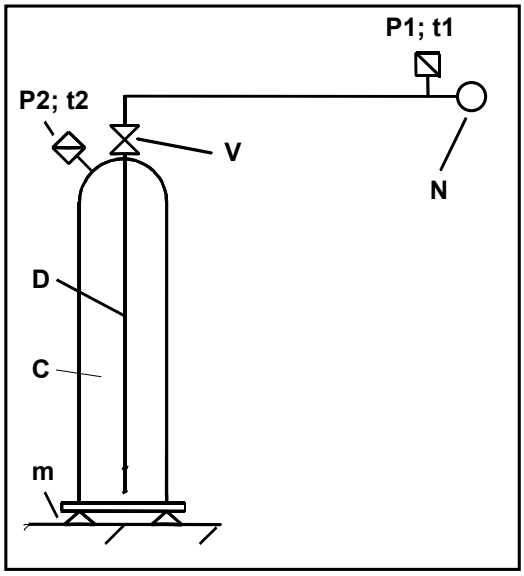
1 water level
h height above water level

Figure 3 — Test tray for distribution tests for local application nozzles

5.5 Determination of flow rate

This test relates to the requirements of 4.5.

Checks shall be made to determine whether the test samples comply with the flow rate indicated by the manufacturer. Deviations shall not exceed ± 10 %. The test set-up is shown in Figure 4.



Components

t1	Temperature at the nozzle
t2	Temperature in the container
P1	Pressure at the nozzle
P2	Pressure in the container
C	supply container (low- or high-pressure)
V	container valve
D	diptube
M	mass measuring point
N	nozzle

Figure 4 — Test configuration for flow rate test

5.6 Test for resistance to pressure and heat

This test relates to the requirements of 4.7.

A nozzle is connected to the test vessel. The nozzle is connected with a pressure source and is subjected to a temperature of (600 ± 30) °C for a period of 10 min. Then the gaseous test medium, e.g. CO_2, nitrogen or air shall flow through the heated nozzle body for at least 10 s, for high pressure nozzles at (60 ± 3) bar and for low pressure nozzles at (25 ± 2) bar. The pressure shall be measured at a distance of (1 ± 0,1) m from the nozzle.

5.7 Test for resistance to heat and cold shock

The test relates to the requirements of 4.8.

Connect the sample to a CO_2 vessel that incorporates a diptube and is capable of delivering liquid CO_2 at an absolute pressure of (20 ± 1) bar. A 2-position, 3-port ball valve (bypass-valve) shall be installed in the pipework between the vessel and the sample that allows the CO_2 -flow from the vessel to be controlled. The nominal diameter of the pipework between the vessel and the bypass-valve shall be not less than three times the diameter of a circle equivalent to the cross section of the nozzle tested. The nominal diameter of the bypass-valve and the connected pipe shall be not less than two times the diameter of a circle equivalent to the cross section of the nozzle tested. The length of the connected pipe shall be (1 ± 0,1) m. In one position, the bypass-valve allows the CO_2 to pass through the sample. In the other position, the bypass position, the outlet to the sample is closed and the CO_2 flow is diverted via an appropriate pipework, which is dimensioned to reach a stable flow of liquid CO_2 at the bypass-valve within (30 ± 5) s. Subject the sample to a temperature of (600 ± 30) °C in a furnace for a period of 10 min. Just before completion of the heating period commence CO_2 flow through the bypass. Upon stabilisation of liquid CO_2 flow and completion of the heating period divert flow through the sample for a period of 30 s. Remove the sample from the furnace for inspection.

5.8 Nozzle cover

This test relates to the requirements of 4.4.

The nozzle with cover shall be mounted on pipe equipped with a pressure gauge. The pressure in the pipe shall be raised by 1 bar/min. The pressure required to open the cover shall be measured.

5.9 Test for resistance to corrosion

This test relates to the requirements of 4.9.

A sample shall be suspended freely in its normal installation attitude.

The test set-up comprises a container 5 l volume, made of heat-resistant glass and with a corrosion-resistant cover which is shaped to prevent condensate dripping onto the samples. (If a container 10 l volume is used, the quantities of chemicals given below shall be doubled.) The container is heated electrically and the side walls are cooled with water. A thermostat regulates the heating so as to maintain a temperature of approximately 45 °C inside the container. During testing water is passed through a cooling coil wrapped around the container; it should flow fast enough that its temperature at the discharge point is below 30 °C.

The combination of heating and cooling is designed to insure that vapours will condense on the surface of the samples. The sulphur dioxide atmosphere is generated in the 5 l container with a solution of 20 g of sodium thiosulphate ($Na_2S_2O_3$ x $5H_2O$) in 500 cm^3 of distilled water, to which 20 cm^3 of dilute sulphuric acid is added daily. The dilute sulphuric acid comprises 128 cm^3 of one molar sulphuric acid (H_2SO_4) dissolved in 1 l of distilled water. The test samples shall be removed from the container after eight days; the container shall be cleaned. Then the procedure described above is repeated for a further period of eight days.

After a total of 16 d, the samples are removed from the container and allowed to dry for seven days at a temperature of (20 ± 5) °C at maximum relative humidity of 70 %.

5.10 Test for resistance to stress corrosion

This test relates to the requirements of 4.10.

Use a glass container of (20 ± 10) l volume fitted with a capillary tube vent. The aqueous ammonia solution shall have a specific weight of (0,94 ± 0,02) kg/l. The container is filled with (10 ± 0,5) ml of the solution for each litre of container volume.

Degrease the sample for test and expose for 10 days to the moist atmosphere of ammonia and air, at a temperature of (34 ± 2)°C. The samples are positioned (40 ± 5) mm above the level of the liquid.

After testing, the samples are cleaned and dried and subjected to careful visual examination. To make cracking clearly visible, the liquid penetration method shall be used.

5.11 Test for resistance to vibration

This test relates to the requirements of 4.11.

The sample is attached to a vibration table using fixed materials provided by the manufacturer.

The sample is then subjected to sine-wave vibration in all three axes, in a range of 10 Hz to 150 Hz. The frequency is raised uniformly at a rate of one octave every 30 min. The vibration acceleration is 1 *g* in the frequency range from 10 Hz to 50 Hz and 3 *g* in the 51 Hz to 150 Hz range.

No deterioration or detachment of parts shall occur. The components shall be able to function after the vibration test.

6 Marking

Nozzles shall be marked with the following information:

a) supplier's name or trademark;
b) model designation/size;
c) serial or batch number.

The markings shall be non-detachable, non-flammable, permanent and legible.

7 Evaluation of conformity

7.1 General

The compliance of a nozzle for CO_2 systems with the requirements of this standard shall be demonstrated by:

— initial type testing,
— factory production control by the manufacturer (see 7.3).

7.2 Initial type testing

Initial type testing shall be performed on first application of this standard. Tests previously performed in accordance with the provisions of this standard (e.g. same product, same characteristic(s), test method, sampling procedure, system of evaluation of conformity) may be taken into account. In addition, initial type testing shall be performed at the beginning of the production of a product type or at the beginning of a new method of production (where these may affect the stated properties).

All characteristics given in clause 4 shall be subject to initial type testing.

7.3 Factory production control (FPC)

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market conform with the stated performance characteristics. The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product, and shall be sufficiently detailed to ensure that the conformity of the product is apparent.

An FPC system conforming with the requirements of the relevant part(s) of EN ISO 9000, and made specific to the requirements of this standard, shall be considered to satisfy the above requirements.

The results of inspections, tests or assessments requiring action shall be recorded, as shall any action taken. The action to be taken when control values or criteria are not met shall be recorded.

Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Directive

ZA.1 Clauses of this European Standard addressing the provisions of the EU Construction Products Directive

This European Standard has been prepared under a Mandate given to CEN by the European Commission and the European Free Trade Association.

The clauses of this European Standard shown in this annex meet the requirements of the Mandate given under the EU Construction Products Directive (89/106/EEC).

Compliance with these clauses confers a presumption of fitness of the construction products covered by this European Standard for their intended use.

WARNING Other requirements and other EU Directives, not affecting the fitness for intended use may be applicable to a construction product falling within the scope of this standard.

NOTE In addition to any specific clauses relating to dangerous substances contained in this Standard, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply. An informative database of European and national provisions on dangerous substances is available at the Construction web site on EUROPA (CREATE, accessed through http://europa.eu.int).

Construction product: Nozzles for CO_2 systems.

Intended use(s): Components for use in gas extinguishing systems installed in buildings and field areas as a part of a complete operating system.

Table ZA.1 — Relevant clauses

Requirement/characteristic from the mandate	Requirement clauses in this standard	Mandated levels and/or classes	Notes
Distribution of extinguishing media	4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11		

ZA.2 Procedure for the attestation of conformity of nozzles of CO_2 systems

Nozzles for CO_2 systems for the intended use listed shall follow the system(s) of attestation of conformity shown in Table ZA.2

Table ZA.2 — Attestation of conformity systems

Product	Intended use	Level(s) or class(es)	Attestation of conformity system(s)
Nozzles for CO_2 systems	Fire safety	—	1
NOTE System 1: See CPD Annex III.2.(i), without audit testing of samples			

The product certification body will certify the initial type testing of all characteristics given in Table ZA.1, in accordance with the provisions of 7.2, and for the initial inspection of the factory and of the factory production control, and for the continuous surveillance, assessment and approval of the factory production control, all characteristics shall be of interest to the approved body, see 7.3.

ZA.3 CE marking

The CE marking shall be shown on the component body. In addition, the CE marking shall appear on the packaging and/or on the accompanying commercial documents, together with the following characteristics:

— identification number of the certification body;
— name or identifying mark of the producer/supplier;
— last two digits of the year in which the marking was affixed;
— appropriate number of the EC-certificate of conformity;
— number of this standard (EN 12094-7);
— type of nozzle (room protection and/or local application);
— type of the system (CO_2 high-pressure fire extinguishing systems and/or CO_2 low-pressure fire extinguishing systems);
— total discharge cross section, in square millimetres;
— flow characteristics as specified in accordance with 4.5.

Figure ZA.1 gives an example of the information to be given on the accompanying commercial documents.

Figure ZA.1 — Example CE marking information

CE

01234

Any Co Ltd, P.O. Box 21, B1050
00
01234 — CPD – 001

EN 12094-7
Room protection nozzle for CO_2 high-pressure fire extinguishing systems
Total discharge cross section 100 m^2
Flow characteristics (values and/or formulas)

In addition to any specific information relating to dangerous substances shown above, the product should also be accompanied, when and where required and in the appropriate form, by documentation listing any other legislation on dangerous substances for which compliance is claimed, together with any information required by that legislation.

NOTE European legislation without national derogations need not be mentioned.

ZA.4 EC certificate and declaration of conformity

The manufacturer, or his agent established in the European Economic Area (EEA), shall prepare and retain a declaration of conformity, which entitles the manufacturer or his agent to affix the CE marking. This declaration shall included:

— name and address of the manufacturer, or his authorised representative established in the EEA, and the place of production;
— description of the product (e.g. type, identification, use), and a copy of the information accompanying the CE marking;
— provisions to which the product conforms (e.g. Annex ZA of this European Standard);
— particular conditions applicable to the use of the product (if necessary);
— name and address (or identification number) of the approved body (bodies);
— name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or of his authorised representative.

For characteristics where certification is required (System 1), the declaration shall contain a certificate of conformity with, in addition to the information above, the following information:

— name and address of the certification body;
— certificate number;
— conditions and period of validity of the certificate, where applicable;
— name of, and position held by, the person empowered to sign the certificate.

Bibliography

EN ISO 9001, *Quality systems — Model for quality assurance in design/development, production, installation and servicing* (ISO 9001:1994)

EN ISO 9002, *Quality systems — Model for quality assurance in production, installation and servicing* (ISO 9002:1994)

EN ISO 9003, *Quality systems — Model for quality assurance in final inspection and test* (ISO 9003:1994)

EN 45001, *General criteria for the operation of testing laboratories*

EN 45011, *General criteria for certification bodies operating product certification*

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