SLOVENSKI STANDARD
SIST EN 12094-8:1998

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Vgrajeni gasilni sistemi - Komponente za plinske gasilne sisteme - 8. del: Zahteve in preskusne metode za gibljive spoje v sistemih za gašenje s CO2

Fixed firefighting system - Components for gas extinguishing systems - Part 8: requirements and test methods for flexible connectors for CO2 systems

Ortsfeste Brandbekämpfungsanlagen - Bauteile für Löschanlagen mit gasförmigen Löschmitteln - Teil 8: Anforderungen und Prüfverfahren für flexible Verbindungen für CO2-Anlagen

Installations fixes de lutte contre l'incendie - Eléments constitutifs pour installations d'extinction a gaz - Partie 8: Exigences et méthodes d'essais pour raccord flexibles pour systemes a CO2

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13.220.10 Gašenje požara Fire-fighting

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English version

Fixed firefighting system - Components for gas extinguishing systems - Part 8: Requirements and test methods for flexible connectors for CO_2 systems

Installations fixes de lutte contre l'incendie - Eléments constitutifs pour installations d'extinction à gaz - Partie 8: Exigences et méthodes d'essais pour raccord flexibles pour systèmes à CO_2

Ortsfeste Brandbekämpfungsanlagen - Bauteile für Löschanlagen mit gasförmigen Löschmitteln - Teil 8: Anforderungen und Prüfverfahren für flexible Verbindungen für CO_2-Anlagen

This European Standard was approved by CEN on 22 February 1998.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

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 Standard is part of a series concerned with gas extinguishing system components.

The following European standards are planned to cover:

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

EN 12094 "Fixed fire fighting systems - Components for gas extinguishing systems" will consist of the following parts:

- 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 control devices
- Part 4: Requirements and test methods for high- pressure container valves 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 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 switches and switch type pressure gauges
- 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
- Part 14: Requirements and test methods for isolating valves for low pressure containers
- Part 15: Requirements and test methods for pressure relief valves
- Part 16: Requirements and test methods for odorisers
- Part 17: Requirements and test methods for pipe hangers
- Part 18: Requirements and test methods for emergency stop devices
- Part 19: Requirements and test methods for pressure gauges
- Part 20: Requirements and test methods for compatibility of components

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 September 1998, and conflicting national standards shall be withdrawn at the latest by September 1998.

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.

Product certification: Users of this European Standard are advised to consider the desirability of independent certification of product conformity with this Standard based on testing and continuing surveillance, which may be coupled with assessment of a manufacturer quality systems against the appropriate European standards EN ISO 9001, EN ISO 9002 or EN ISO 9003.

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

NOTE: 1 bar = 10^5 N m^{-2} = 100 kPa

1 Scope

This European Standard specifies requirements and describes test methods for flexible connectors used in CO_2 firefighting systems.

NOTE: If gases other than CO_2 are used in pneumatic pilot lines, this Standard may be used as guidance for flexible connectors in pilot lines.

2 Normative References

This European Standard incorporates by dated or undated references, provisions from other publications. This 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.

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 Definitions

For the purposes of this standard the following definitions apply:

3.1 flexible connector: Link between two parts which are subject to relative movement or subject to tolerances.

3.2 high pressure system: System in which the CO_2 is stored at ambient temperature.

NOTE: The absolute pressure of the CO_2 in storage is 58,6 bar at 21°C.

3.3 low pressure system: System in which the CO_2 is stored in bulk at low temperature.

NOTE: The absolute pressure of the CO_2 in storage is 19,6 bar at -20°C.

3.4 type 1 connector: Flexible connector for connecting high pressure CO_2 containers to a manifold.

3.5 type 2 connector: Flexible connector for use in distribution pipework downstream the manifold / selector valve.

3.6 type 3 connector: Flexible connector for use in pneumatic pilot lines.

3.7 working pressure: Pressure at which the component is used in the system.

4 Requirements

4.1 General design

Metal parts of flexible connectors shall be made of stainless steel, copper, copper alloy or corrosion-protected steel (e.g. galvanized).

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

Flexible connectors need to be designed so that the function cannot be adversely affected by ageing or environmental influences.

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

Flexible connectors shall be specified by the manufacturer for working pressure according to table 1.

Table 1: Working pressure

pressure in bar

Type of the flexible connector	CO_2 high pressure component	CO_2 low pressure component
Type 1	140	not applicable
Type 2	60	25
Type 3	As specified by the manufacturer	

4.2 Connection threads

Connection threads shall comply with European Standards or International Standards for threads, e.g. ISO 7-1 or ISO 228-1.

4.3 Resistance to leakage

Flexible connectors shall not leak, and shall show no sign of damage which could impair proper function when pressurized up to 1,5 times the working pressure according to table 1 when tested in accordance with 5.4.

4.4 Resistance to bursting

Flexible connectors shall not burst when pressurized up to 3 times the working pressure according to table 1 when tested in accordance with 5.5.

4.5 Resistance of type 2 connectors to pressure and heat

Type 2 connectors shall not leak, and shall show no sign of damage which could impair proper function when tested at the appropriate pressure and temperature given in table 2 when tested in accordance with 5.6.

Table 2: Test conditions for resistance of type 2 connectors to pressure and heat

Test condition	Test pressure bar	Test temperature °C
For use in low pressure systems	25	600
For use in high pressure systems	60	600

4.6 Resistance of type 2 connectors to heat and cold shock

Type 2 connectors shall not leak, and shall show no sign of damage which could impair proper function when tested in accordance with 5.7.

4.7 Resistance to cold

Flexible connectors shall show no visible sign of damage when tested in accordance with 5.8.

4.8 Resistance of type 2 connectors to flexing

Type 2 connectors shall not leak when tested in accordance with 5.9.

4.9 Marking

Flexible connectors shall be marked with the following:

a) manufacturer's name or trademark;
b) model designation;
c) working pressure;
d) serial or batch number.

NOTE: The markings should be non-detachable, non-flammable (with exception of a) and c) when marked on the flammable hose material), permanent, and legible.

4.10 Documentation

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

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

a) a general description of the equipment, including a list of the features and functions

b) a technical specification including:

1) the working pressure
2) the bursting pressure (at least 3 times the working pressure)
3) the minimum bending radius
4) the maximum bending angle
5) the suitability for use in various environments
6) mounting instructions

c) maintenance instructions.

4.10.3 The manufacturer shall also prepare, maintain and submit the following detailed description of the overall mechanical design:

a) the main parts of the component and their tasks
b) the way in which the parts interact
c) component list
d) layouts
e) design drawings.

This documentation shall also comprise details of any components specific to the manufacturer.

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

5 Type test methods

5.1 Conditions

Assemble the flexible connector for test in accordance with the manufacturer's recommendations. Except when specified otherwise carry out the tests at (20 ± 5) °C.

5.2 Samples

The manufacturer shall submit for tests three samples for type 1 and type 3 flexible connectors and six samples for type 2 connectors. One of these samples is needed for reference.

If for type 2 connectors the same materials and parts are used to provide a range of connectors, use six samples not less than 350 mm long. The sequence of tests is shown in table 3 and is given by the numbers 1, 2, 3 etc. in the table. A, B etc. are the different samples.

Table 3: Sequence of tests

Test method	Sample						
	Type 1 and Type 3		Type 2				
	A	B	A	B	C	D	E
5.3 Compliance	1	1	1	1	1	1	1
5.4 Resistance to leakage		2 and 4		2 and 4	3	3	3
5.5 Resistance to bursting	2		2				
5.6 Resistance of type 2 connectors to pressure and heat					2		
5.7 Resistance of type 2 connectors to heat and cold shock						2	
5.8 Resistance to cold		3		3			
5.9 Resistance to flexing							2

5.3 Compliance

A visual and measurement check shall be made to determine whether the test samples correspond to the requirements of the documentation according to 4.10.

5.4 Test for resistance to leakage

Connect the inlet of the sample to a hydraulic pressure supply and block the outlet. Vent the system and increase the pressure by (2 ± 1) bar s^{-1} up to the test pressure $^{+5}_{0}$ %.

Maintain this pressure for a period of (10 $^{+1}_{0}$) min. At the end of this period release the hydraulic pressure and examine the sample for damage.

5.5 Test for resistance to bursting

Connect the inlet of the sample to a hydraulic pressure supply and block the outlet. Vent the system and increase the pressure at (5 ± 1) bar s^{-1} up to the test pressure $^{+5}_{0}$ %.

Maintain this pressure for a period of (10 $^{+1}_{0}$) min. At the end of this period release the hydraulic pressure and examine the sample.

5.6 Test for resistance of type 2 connectors to pressure and heat

Connect the sample to a vessel delivering an absolute pressure of (60 ± 3) bar for high pressure or (25 ± 2) bar for low pressure. Block the outlet. Subject the sample to a temperature of (600 ± 30) °C in a furnace for a period of (10 $^{+2}_{0}$) min. Then pressurise the heated sample for (30 ± 5) s with gaseous CO_2, nitrogen or air at test pressure. Remove the sample from the furnace and test for leakage in accordance with 5.4.

5.7 Test for resistance of type 2 flexible connectors to heat and cold shock

Connect the sample to a CO_2 vessel which 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 which allows to control the CO_2 -flow from the vessel. The nominal diameter of the pipework between the vessel and the bypass-valve shall be at least 25 mm. The nominal diameter of the bypass-valve and the connected pipe to the sample shall be 25 mm. The length of the connected pipe shall be (1 ± 0,1) m. In one position, the test 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 s. At the outlet of the sample connect a nozzle with a 10 mm orifice. Subject the sample to a temperature of (600 ± 30) °C in a furnace for a period of (10 $^{+2}_{0}$) min. Just before completion of the heating period commence CO_2 -flow through the