



SLOVENSKI STANDARD
oSIST prEN 12094-13:2016
01-julij-2016

**Vgrajeni gasilni sistemi - Sestavni deli sistemov za gašenje s plinom - 13. del:
Zahteve in preskusne metode za kontrolne ventile in nepovratne ventile**

Fixed firefighting systems - Components for gas extinguishing systems - Part 13:
Requirements and test methods for check valves and non-return valves

Ortsfeste Brandbekämpfungsanlagen - Bauteile für Löschanlagen mit gasförmigen
Löschmitteln - Teil 13: Anforderungen und Prüfverfahren für Rückflussverhinderer und
Rückschlagventile

(standards.iteh.ai)

Installations fixes de lutte contre l'incendie - Éléments d'installation d'extinction à gaz -
Partie 13 : Exigences et méthodes d'essai pour clapets anti-retour

Ta slovenski standard je istoveten z: prEN 12094-13

ICS:

13.220.10 Gašenje požara Fire-fighting

oSIST prEN 12094-13:2016 **en,fr,de**

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN 12094-13:2016](https://standards.iteh.ai/catalog/standards/sist/fdb2ae74-b1c5-4d04-b819-2ea974708d5c/osist-pren-12094-13-2016)

<https://standards.iteh.ai/catalog/standards/sist/fdb2ae74-b1c5-4d04-b819-2ea974708d5c/osist-pren-12094-13-2016>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 12094-13

May 2016

ICS 13.220.20

Will supersede EN 12094-13:2001

English Version

**Fixed firefighting systems - Components for gas
extinguishing systems - Part 13: Requirements and test
methods for check valves and non-return valves**

Installations fixes de lutte contre l'incendie - Éléments
d'installation d'extinction à gaz - Partie 13 : Exigences
et méthodes d'essai pour clapets anti-retour

Ortsfeste Brandbekämpfungsanlagen - Bauteile für
Löschanlagen mit gasförmigen Löschmitteln - Teil 13:
Anforderungen und Prüfverfahren für
Rückflussverhinderer und Rückschlagventile

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 191.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword.....	4
1 Scope	5
2 Terms and definitions	5
3 Product characteristics	6
3.1 General.....	6
3.1.1 Compliance	6
3.1.2 Connection threads	6
3.2 Distribution of extinguishing media and Operational reliability.....	6
3.2.1 Working pressure	6
3.2.2 Free cross-sectional area	7
3.3 Durability of distribution of extinguishing media and operational reliability	7
3.3.1 Material specification	7
3.3.2 Impact.....	7
3.3.3 Corrosion.....	8
3.3.4 Stress corrosion	8
3.3.5 Vibration resistance.....	8
4 Testing, assessment and sampling methods	8
4.1 General.....	8
4.1.1 Test conditions.....	8
4.1.2 Test samples and order of tests	8
4.2 Test for distribution of extinguishing media and operational reliability	9
4.2.1 Working pressure	9
4.2.2 Free cross-sectional area	10
4.3 Test for durability of distribution of extinguishing media and operational reliability	10
4.3.1 Material specification	10
4.3.2 Impact.....	10
4.3.3 Corrosion.....	10
4.3.4 Stress corrosion	11
4.3.5 Vibration resistance.....	11
5 Marking and documentation.....	11
5.1 Marking.....	11
5.2 Documentation.....	12
6 Assessment and verification of constancy of performance (AVCP)	12
6.1 General.....	12
6.2 Type testing.....	13
6.2.1 General.....	13
6.2.2 Test samples, testing and compliance criteria	13
6.2.3 Test reports.....	14
6.2.4 Shared other party results.....	14
6.3 Factory production control (FPC)	14
6.3.1 General.....	14
6.3.2 Requirements.....	15
6.3.3 Product specific requirements.....	17
6.3.4 Initial inspection of factory and FPC	18
6.3.5 Continuous surveillance of FPC.....	18

6.3.6	Procedure for modifications.....	18
6.3.7	Pre-production products (e.g. prototypes).....	19
Annex ZA (informative) Relationship of this European Standard with Regulation (EU)		
No. 305/2011	20

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

[oSIST prEN 12094-13:2016](https://standards.iteh.ai/catalog/standards/sist/fdb2ae74-b1c5-4d04-b819-2ea974708d5c/osist-pren-12094-13-2016)

<https://standards.iteh.ai/catalog/standards/sist/fdb2ae74-b1c5-4d04-b819-2ea974708d5c/osist-pren-12094-13-2016>

prEN 12094-13:2016 (E)**European foreword**

This document (prEN 12094-13:2016) has been prepared by Technical Committee CEN/TC 191 “Fixed firefighting systems”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12094-13:2001.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of Regulation (EU) 305/2011.

For relationship with Regulation (EU) 305/2011, see informative Annex ZA which is an integral part of this document.

EN 12094, *Fixed firefighting systems - Components for gas extinguishing systems*, consists 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 triggering and stop devices*
- *Part 4: Requirements and test methods for container valve assemblies and their actuators*
- *Part 5: Requirements and test methods for high and low pressure selector valves and their actuators*
- *Part 6: Requirements and test methods for non-electrical disable devices*
- *Part 7: Requirements and test methods for nozzles for CO₂ systems*
- *Part 8: Requirements and test methods for connectors*
- *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 mechanical weighing devices*
- *Part 12: Requirements and test methods for pneumatic 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 CO₂ low pressure systems*

NOTE This list includes standards that are in preparation and other standards may be added. For current status of published standards, refer to www.cen.eu.

1 Scope

This European Standard specifies requirements and describes test methods for check and non-return valves intended to be used in gas extinguishing systems (i.e. CO₂, inert gas or halocarbon gas) installed in buildings as a part of a complete operating system.

This European Standard is applicable to check valves installed between container valve and manifold and non-return valves installed in pilot lines, except those valves which are tested in combination with non-electrical control devices.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

check valve

component intended for installation between container valve and manifold, which permits flow only in one direction

2.2

CO₂-high-pressure installation

fire extinguishing installation in which the CO₂ is stored at ambient temperature

EXAMPLE The pressure of the CO₂ in storage is $p_{\text{abs}} = 58,6$ bar at 21 °C.

2.3

CO₂-low-pressure installation

fire extinguishing installation in which the CO₂ is stored at low temperature

Note 1 to entry: Normally at a temperature of -19 °C to 21 °C.

2.4

fill ratio

mass of extinguishing medium related to the net capacity of a container expressed as kg/l

2.5

gas extinguishing installation

system installed to provide fire protection

2.6

halocarbon gas

extinguishing agent that contains as primary components one or more organic compounds containing one or more of the elements fluorine, chlorine, bromine or iodine

2.7

halocarbon gas installation

fire extinguishing installation in which the halocarbon gas is stored at ambient temperature

2.8

inert gas

non-liquefied gas or mixture of gases which extinguish the fire mainly by reducing the oxygen concentration in the protected zone

EXAMPLE Argon, nitrogen or mixtures of these gases with CO₂.

prEN 12094-13:2016 (E)**2.9****inert gas installation**

fire extinguishing installation in which the inert gas is stored at ambient temperature

2.10**manifold**

special pipe to collect the medium flow of two or more containers

2.11**non-return valve**

component intended for installation in pilot lines, which permits flow only in one direction

2.12**resistance coefficient**

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

2.13**two phase flow**

partial change of phase of a fluid from liquid to vapour under flowing conditions

2.14**working pressure**

pressure at which the component is used in the system

3 Product characteristics

STANDARD PREVIEW
(standards.iteh.ai)

3.1 General**3.1.1 Compliance**

oSIST prEN 12094-13:2016

<https://standards.iteh.ai/catalog/standards/sist/fdb2ae74-b1c5-4d04-b819-2ca774708d9c/o-sist-pr-en-12094-13-2016>

In order to comply with this standard, check valves and non-return valves, shall meet the provisions of Clause 4, which shall be verified by visual inspection or engineering assessment as described in Clause 5 and shall meet the requirements of the tests.

3.1.2 Connection threads

Connection threads shall conform to National Standards, European Standards or International Standards.

3.2 Distribution of extinguishing media and Operational reliability**3.2.1 Working pressure****3.2.1.1 Function**

Non-return and check valves shall be specified by the manufacturer for working pressure according to Table 1.

Table 1 — Working pressure

Type	CO ₂ high pressure component bar	CO ₂ low pressure component bar	Inert gas component bar	Halocarbon gas component bar
Check valve	140	Not applicable.	^a	^a
Non-return valve	As specified by the manufacturer.			
^a This value is given as the developed pressure in the container at 50 °C with the highest fill ratio/superpressurization, where applicable.				

When tested in accordance with 4.2.1.1:

- check valves shall have reached their fully open position at a differential pressure of 3 bar maximum; and
- non-return valves shall have reached their fully open position at a differential pressure of not greater than 10 % of the minimum system pressure in the pilot system;
- non-return and check valves shall operate as intended.

Non-return and check valves shall meet these requirements and the requirements of 4.2.1.2 to 4.2.1.5.

The performance shall be expressed as the working pressure in bar.

3.2.1.2 Function at high and low temperature

When tested in accordance with 4.2.1.2.1 and 4.2.1.2.2, non-return and check valves shall operate in an ambient temperature range encompassing -20 °C to +50 °C.

3.2.1.3 Internal pressure

When tested in accordance with 4.2.1.3, non-return and check valves shall not show any sign of deterioration which could impair proper function, when pressurized up to 1,5 times the working pressure listed in Table 1.

3.2.1.4 Strength

Non-return and check valves shall not show any sign of deterioration which could impair proper function, when pressurized up to three times the working pressure listed in Table 1 and tested in accordance with 4.2.1.4.

3.2.1.5 Leakage

Non-return and check valves shall be sufficiently tight for the purpose they are constructed for, when tested in accordance with 4.2.1.5.

3.2.2 Free cross-sectional area

The manufacturer shall specify the free cross-sectional area of the minimum flow way of check valves and non-return valves.

The free cross-sectional area of the minimum flow way of check valves and non-return valves shall be within ± 10 % of the value specified by the manufacturer, when verified by the measurement check described in 4.2.2.

The performance shall be expressed as the free cross-sectional area in mm².

3.3 Durability of distribution of extinguishing media and operational reliability

3.3.1 Material specification

Metal parts of non-return and check valves shall be made of stainless steel, copper, copper alloy or corrosion-protected steel (e.g. galvanized steel, cadmium-plated steel, etc.) or other metal which has been proved to be equally suitable (regarding e.g. corrosion resistance, ductile strength).

The performance shall be declared as description of the metal.

3.3.2 Impact

Check valves shall not be damaged, when tested in accordance with 4.3.2.

prEN 12094-13:2016 (E)

This test only applies to check valves.

The performance shall be declared as “No damage”.

3.3.3 Corrosion

The test sample shall operate satisfactorily when tested in accordance with 4.2.1.1, after being subjected to the corrosion test in accordance with 4.3.3.

The performance shall be declared as “No adverse effect”.

3.3.4 Stress corrosion

Any copper alloy part used in the component shall not crack, when tested in accordance with 4.3.4.

The performance shall be declared as “No cracks”.

3.3.5 Vibration resistance

The component shall not be damaged, when tested in accordance with 4.3.5.

The performance shall be declared as “No damage”.

4 Testing, assessment and sampling methods**4.1 General****4.1.1 Test conditions**

The components shall be tested assembled as recommended for installation by the manufacturer. The tests shall be carried out at a temperature of $(25 \pm 10) ^\circ\text{C}$, except when otherwise stated.

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

4.1.2 Test samples and order of tests

The specimens shall be tested according to the following test schedule (see Table 2).

Table 2 — Order of tests

Test method	Test order for		
	Sample A/B	Sample C	Sample D
4.2.2 Free cross-sectional area	1	1	1
4.2.1.3 Internal pressure	3		
4.2.1.4 Strength	8		
4.2.1.5 Leakage		2	3
4.3.2 Impact ^a			2
4.2.1.1 Function	2/7	3	
4.2.1.2 Function at high and low temperature	4		
4.3.3 Corrosion	6		
4.3.4 Stress corrosion			4
4.3.5 Vibration	5		
^a For check valves only.			

4.2 Test for distribution of extinguishing media and operational reliability

4.2.1 Working pressure

4.2.1.1 Function

4.2.1.1.1 The non-return or check valve shall be mounted in the position specified by the manufacturer or, if not specified, in the position where maximum force is required. A force gauge shall be connected to the centre of the sealing device. The sealing device shall be moved by increasing the force to the fully open position. The force to the fully open position of the valve shall be measured. The necessary pressure to operate the valve to the fully open position shall be calculated.

4.2.1.1.2 For check valves the test unit consists of a manifold with two connections for air or nitrogen containers. The outlet shall be connected via a ball valve to a pipe with a length of $(0,5 \pm 0,1)$ m and a diameter of the nominal diameter of the valve. A nozzle of at least 5 mm diameter is connected to this pipe. Install check valves at both inlets of the manifold. One air or Nitrogen container of at least 40 litres at the pressure developed in the system at 20 °C shall be installed and the ball valve at the outlet of the manifold shall be closed. The container valve shall be opened and the function of the check valve at the connection without a container shall be checked. After (5 ± 1) min the valve in the outlet shall be opened and the function of both test samples shall be checked.

4.2.1.1.3 The non-return valve shall be connected to an air or Nitrogen supply at the pressure developed in the system at 20 °C. A nozzle shall be fitted downstream of the valve with a cross-section of half the cross-section $\pm 10\%$ of the non-return valve and the gas shall flow for (60 ± 5) s through the valve.

4.2.1.2 Function at high and low temperature

4.2.1.2.1 The test sample shall be conditioned at high temperature (50 ± 3) °C for $(2 \pm 0,5)$ h. The test shall be repeated in accordance with 4.2.1.1.2 for check valves and 4.2.1.1.3 for non-return valves at the pressure developed in the system at 50 °C.

4.2.1.2.2 The test sample shall be conditioned at low temperature (-20 ± 3) °C for $(2 \pm 0,5)$ h. The test shall be repeated in accordance with 4.2.1.1.2 for check valves and 4.2.1.1.3 for non-return valves at the pressure developed in the system at -20 °C.

4.2.1.3 Internal pressure

This test relates to the requirements specified in 3.2.1.3.

The non-return or check valve shall be connected via the outlet to a suitable hydraulic pressure supply. Provision for venting shall be available.

The system of air shall be vented and the pressure shall be increased to 1,5 times the working pressure and shall be maintained for 5 min.

The systems shall be depressurized and the function test shall be carried out in accordance with 4.2.1.1.2 or 4.2.1.1.3 respectively.

4.2.1.4 Strength

The inlet of the test sample shall be connected to a suitable hydraulic pressure supply and the outlet shall be blocked. The system shall be vented and the pressure shall be increased to 3 times the working pressure.

This pressure shall be maintained for a period of 10 min. At the end of this period the hydraulic pressure shall be released.