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Vgrajeni gasilni sistemi - Sestavni deli sistemov za gašenje s plinom - 11. del: Zahteve in preskusne metode za mehanske naprave za tehtanje

Fixed firefighting systems - Components for gas extinguishing systems - Part 11: Requirements and test methods for mechanical weighing devices

Ortsfeste Brandbekämpfungsanlagen - Bauteile für Löschanlagen mit gasförmigen Löschmitteln - Teil 11: Anforderungen und Prüfverfahren für mechanische Wägeeinrichtungen

Installations fixes de lutte contre l'incendie - Éléments constitutifs des installations d'extinction à gaz - Partie 11 : Exigences et méthodes d'essai pour dispositifs de pesée mécaniques

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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.

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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.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 12094-11:2016) has been prepared by Technical Committee CEN/TC 191 “Fixed firefighting system”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

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 EU Regulation (EU) 305/2011.

For relationship with EU 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 CO_2 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 CO_2 low pressure systems*

Introduction

It has been assumed in the preparation of this European 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 N m^{-2} = 100 kPa.

1 Scope

This European Standard specifies requirements and test methods for mechanical weighing devices for continuous monitoring of containers of CO_2-, Inert Gas- or Halocarbon Gas-Fire Extinguishing Installations.

This European Standard does not cover weighing devices for non-transportable containers which are filled and refilled on site, e.g. CO_2-low-pressure containers.

2 Terms and definitions

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

2.1
CO_2-high-pressure installation
fire extinguishing installation in which the CO_2 is stored at ambient temperature

Note 1 to entry: For example, the pressure of the CO_2 in storage is p_{abs} = 58,6 bar at 21 °C.

2.2
CO_2-low-pressure installation
fire extinguishing installation in which the CO_2 is stored at low temperature, normally – 19 °C to –21 °C

2.3
gross load
mass of a container filled with extinguishing medium including valve and actuator

2.4
fill ratio
mass of extinguishing medium related to the nominal internal volume of a container expressed in kilograms per litre

2.5
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

2.6
halocarbon gas installation
fire extinguishing installation in which the halocarbon gas is stored at ambient temperature

2.7
inert gas
non liquefied gas or mixture of gases which extinguish the fire mainly by reducing the oxygen-concentration in the protected zone

Note 1 to entry: E.g. Argon, Nitrogen or CO_2 or mixtures of these gases.

2.8
inert gas installation
fire extinguishing installation in which the inert gas is stored at ambient temperature

2.9
net load
mass of the extinguishing medium in a container

3 Product characteristics

3.1 General

3.1.1 Design

A weighing device may be designed for monitoring containers of various sizes, with various fill ratios or with various gases.

NOTE Different combinations of size, fill ratio (where applicable) and type of gas result in different values for gross and net load.

For each combination of gross load and net load, which the weighing device is used for, the manufacturer shall specify:

a) type of gas;

b) nominal internal volume of the container;

c) net load;

d) gross load;

e) fill ratio, if applicable.

A weighing device shall be adjustable to give a loss indication when a mass loss between 5 % and 10 % of the net load occurs. The loss indication shall be maintained until corrective action is taken.

Normal building movement should not generate a false loss indication.

3.1.2 Object of the test

The test sample shall comply with the documentation (drawings, parts lists, description of functions, operating and installation instructions) when assessed in accordance with 4.1.2.

3.2 Operational reliability

3.2.1 Function at normal temperature

A weighing device shall respond to a mass loss of between 5 % and 10 % of the net load, when tested in accordance with 4.2.1.

3.2.2 Function at high and low temperature

A weighing device shall respond to a mass loss of between 5 % and 10 % of the net load, when tested at – 20 °C and + 50 °C in accordance with 4.2.2.

3.2.3 Overload

A weighing device shall respond to a mass loss of between 5 % and 10 % of the net load, when tested in accordance with 4.2.1.2, after being loaded with twice the maximum gross load in accordance with 4.2.3.

3.3 Durability of operational reliability

3.3.1 Corrosion

A weighing device shall respond to a mass loss of between 5 % and 10 % of the net load, when tested in accordance with 4.2.1.2, after being subjected to the corrosive atmosphere in accordance with 4.3.1.

4 Testing, assessment and sampling methods

4.1 General

4.1.1 Test conditions

The component shall be assembled for test as specified in the documentation. The tests shall be carried out at a temperature of (25 ± 10) °C, except when otherwise specified for a particular test.

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

4.1.2 Object of the test

This test relates to the requirements of 3.1.2.

A visual and measurement check shall be made to determine that the test sample corresponds to the description in the drawings, parts lists, description of functions, operating and installation instructions.

4.1.3 Test samples and order of tests

For the tests one sample is needed. The order of tests is shown in Table 1.

Table 1 — Order of tests

Order of test	Test
1	4.1.2 Object of the test
2	4.2.1 Function at normal temperature
3	4.2.2 Function at high and low temperature
4	4.2.3 Overload
5	4.2.1.2 Function at normal temperature
6	4.3.1 Corrosion
7	4.2.1.2 Function at normal temperature

4.2 Operational reliability

4.2.1 Function at normal temperature

4.2.1.1 This test relates to the requirements of 3.2.1.

If a weighing device is specified by the manufacturer for one combination of gross load and net load, the following sequence a) to d) shall be conducted with the specified gross load and net load.

If a weighing device is specified by the manufacturer for several combinations of gross load and net load, the following sequence a) to d) shall be conducted with the following combinations of gross load and net load:

— maximum gross load, maximum net load;

— maximum gross load, minimum net load;

— medium gross load, medium net load;

— minimum gross load, maximum net load;

— minimum gross load, minimum net load.

a) Load the test sample with the gross load including an amount of water. The mass of the water shall be at least 15 % of the net load;

b) Adjust the test sample in accordance with the installation instructions of the manufacturer to correspond to the actual test load applied;

c) Carry out the following steps:

1) decrease the test load corresponding to a loss of 5 % of the net load by draining water in a period of 2 min to 5 min into a collecting container;

2) stop when loss is indicated;

3) measure and record the mass or the volume of the water collected (permissible error ± 0,5 % of the net load; 1 l water = 1 kg);

4) add the water to the load again and repeat steps c) 1) to c) 3) twice.

d) If one or more of the three values is not in the range between 5 % and 10 % of the net load, repeat steps b) and c), carrying out step c) five times (all five values shall be in the range between 5 % and 10 % of the net load).

4.2.1.2 This test relates to the requirements of 3.2.2, 3.2.3 and 3.3.1.

If a weighing device is specified by the manufacturer for one combination of gross load and net load, the sequence a) to d) of 4.2.1.1 shall be conducted with the specified gross load and net load.

If a weighing device is specified by the manufacturer for several combinations of gross load and net load, the sequence a) to d) of 4.2.1.1 shall be conducted with the following combinations of gross load and net load:

— maximum gross load, minimum net load;

— minimum gross load, minimum net load.

4.2.2 Function at high and low temperature

This test relates to the requirements of 3.2.2.

Condition the test sample for at least 4 h at the intended test temperature, i.e. at:

a) (-20^{0}_{-2}) °C for low temperature;

b) $(+50^{+3}_{0})$ °C for high temperature.

Conduct the test described in 4.2.1.2 at both test temperatures.

For the low test temperature a suitable liquid for use at this temperature shall be used instead of water.

4.2.3 Overload

This test relates to the requirements of 3.2.3.

The test sample shall be statically loaded with twice the maximum gross load for 15 min.

The force shall be applied in any way which represents the intended normal use.

Conduct the test as described in 4.2.1.2.

4.3 Durability of operational reliability

4.3.1 Corrosion

This test relates to the requirements specified in 3.3.1.

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

The test set-up comprises a container of 5 l volume, made of heat-resistant glass and with a corrosion-resistant cover which is shaped to prevent condensate dripping onto the specimen. (If a container 10 l in 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 shall flow fast enough that its temperature at the discharge point is below 30 °C.

The combination of heating and cooling is designed to ensure that vapours will condense on the surface of the specimen. The sulphur dioxide atmosphere is generated in the 5 l container with a solution of 20 g of sodium thiosulphate ($Na_2S_2O_3 * 5H_20$) 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 specimens 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 days, the specimen is removed from the container and allowed to dry for seven days at a temperature of (20 ± 5) °C at maximum relative humidity of 70 %.

Conduct the test as described in 4.2.1.2.

5 Marking and documentation

5.1 Marking

A weighing device shall be marked with:

a) model designation (type / environment category, i.e. indoor/outdoor);

b) some mark(s) or code(s) (e.g. serial number or batch code), by which, at least, the date or batch and place of manufacture (if several places of manufacture) can be identified by the manufacturer;

c) supplier's name or trademark;

d) maximum gross load.

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

5.2 Documentation

5.2.1 The manufacturer shall prepare and maintain documentation.