INTERNATIONAL STANDARD

ISO 7165

First edition
1999-12-01

AMENDMENT 2
2004-05-01

Fire fighting — Portable fire extinguishers — Performance and construction

AMENDMENT 2

Lutte contre l'incendie — Extincteurs portatifs — Performances et construction

AMENDEMENT 2

Reference number
ISO 7165:1999/Amd.2:2004(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

Amendment 2 to ISO 7165:1999 was prepared by Technical Committee ISO/TC 21, *Equipment for fire protection and fire fighting*, Subcommittee SC 2, *Manually transportable fire extinguishers*.

Fire fighting — Portable fire extinguishers — Performance and construction

AMENDMENT 2

Page 2:

Definition 3.6

Replace “60 °C” *by* “55 °C”.

Page 4:

5.2 Propellants

After the existing text insert the following:

“Tracers may be added to the propellant to facilitate leakage detection, but the content shall not exceed a mass fraction of 3 % of the propellant content. Tracer percentage shall be indicated by the manufacturer and verified by the test laboratory.”

Page 5:

7.1 Operating temperatures

After the Note, insert the following text:

“For water-based extinguishers without any protection against freezing, the minimum operating temperature shall be + 5 °C”.

Page 6:

7.2.1 Class A rated extinguishers

Insert the following new clauses after the existing text:

“7.2.1.1 Requirements

When three portable fire extinguishers are tested following 7.2.1.2, the duration of operation of each extinguisher shall be within ± 3 s of the average value for powder extinguishers, and within ± 15 % of the average value for other extinguishers, but the duration value shall not be less than the minimum specified.

7.2.1.2 Test method

Testing of portable extinguishers shall be carried out within 2 min of removal of the extinguisher from the conditioning temperature. Portable fire extinguishers for testing shall be stored in a vertical position for at least 18 h at a temperature of (20 ± 5) °C before the tests are carried out, and shall be maintained within this temperature range until tested.

Weigh the extinguisher.

Hold the extinguisher in its normal working position (i.e. hand-held) and keep it immobile for the duration of the test.

For cartridge-operated extinguishers supplied with a final control valve and an independent activation system, pressurize with the final control valve closed. Open this final control valve 6 s after the commencement of pressurization of the extinguisher.

For cartridge-operated extinguishers where activation is by a simple action, the cartridge shall be pierced and the control valve closed immediately for a period of 6 s, after which the control valve shall be reopened.

For extinguishers which are activated by a single operation of the control valve, open the control valve and leave open for the duration of the test.

Measure and record the time between the opening of the final control valve and the commencement of discharge. Measure and record the effective discharge time.

Reweigh the extinguisher, calculate and record the residual charge.

All portable fire extinguishers shall operate within 5 s of the final control valve being opened."

7.2.2 Class B rated extinguishers

Insert the following new clauses after the existing text:

"7.2.2.1 Requirements

When three portable fire extinguishers are tested as follows, the duration of operation of each extinguisher shall be within ± 3 s of the average value for powder extinguishers, and within ± 15 % of the average value for other extinguishers, but the duration value shall not be less than the minimum specified.

7.2.2.2 Test method

Testing of portable extinguishers shall be carried out within 2 min of removal of the extinguisher from the conditioning temperature. Portable fire extinguishers for testing shall be stored in a vertical position for at least 18 h at a temperature of (20 ± 5) °C before the tests are carried out, and shall be maintained within this temperature range until tested.

Weigh the extinguisher.

Hold the extinguisher in its normal working position (i.e. hand-held) and keep it immobile for the duration of the test.

For cartridge-operated extinguishers supplied with a final control valve and an independent activation system, pressurize with the final control valve closed. Open this final control valve 6 s after the commencement of pressurization of the extinguisher.

For cartridge-operated extinguishers where activation is by a simple action, the cartridge shall be pierced and the control valve closed immediately for a period of 6 s, after which the control valve shall be reopened.

For extinguishers which are activated by a single operation of the control valve, open the control valve and leave open for the duration of the test.

Measure and record the time between the opening of the final control valve and the commencement of discharge. Measure and record the effective discharge time.

Reweigh the extinguisher, calculate and record the residual charge.

All portable fire extinguishers shall operate within 5 s of the final control valve being opened."

7.2.3.2 Test method

In the third sentence, replace “5 min” *by* “2 min”.

Page 7:

7.3.2 Test method

Replace the existing text by the following:

“Carry out testing on four extinguishers. Before testing, weigh each extinguisher, then subject two extinguishers to temperature cycle 1, as given in Table 2, and subject the other two extinguishers to temperature cycle 2, as given in Table 2. Storage at the temperatures given in Table 2 shall be carried out in conditioning chambers, liquid baths shall not be used, and the extinguishers shall remain upright during temperature cycling. The tolerances given in Table 2 shall be considered as nominal tolerances, with the climatic chamber empty.

Table 2 — Temperature cycles

Duration h	Cycle 1	Cycle 2
24 ± 1	Store at minimum [a] stated temperature ± 2 °C	Store at (55 ± 2) °C
24 ± 1	Store at (20 ± 5) °C	Store at (20 ± 5) °C
24 ± 1	Store at (55 ± 2) °C	Store at minimum [a] stated temperature ± 2 °C
NOTE The storage temperatures refer to the ambient temperature within the conditioning chamber. Do not use a liquid bath.		
[a] See 7.1.		

Operate the extinguisher within 2 min after its removal from the conditioning chamber. The extinguisher shall be held in its normal working position and shall remain immobile for the duration of the test.

The extinguisher shall be operated in accordance with 7.2.2.2.

Measure and record the time between the opening of the final control valve and the commencement of discharge. Reweigh the extinguisher, and calculate and record the residual charge.”

Page 8:

7.4.2.2 Test method

Replace the existing text by the following:

“This test shall be carried out with three extinguishers conditioned for 18 h at (20 ± 5) °C. All three extinguishers shall pass the test.

Operate the extinguishers and allow the medium to discharge for one-half of the measured discharge duration. For extinguishers with a (propellant) gas cartridge, open the control valve in accordance with a) or b), as applicable.

a) If the extinguisher is fitted with a pressurization device independent of the device which opens the control valve, operate the pressurization device and 3 min later open the control valve to initiate discharge.

b) If a single action pressurizes the extinguisher and releases the first emission of gas, pressurize the extinguisher initially and 3 min later open the control valve again to permit discharge of the extinguishing medium.

Then close the valve by the action intended to interrupt the emission of the extinguishing medium. Measure the internal pressure or, in the case of CO_2, the mass of the extinguisher, within 10 s after the control valve has been closed, and again after 5 min, the control valve having remained closed for the duration of this period.

Page 9:

7.5.1.1 Requirements

Add the following phrase after the existing text:

"The portable extinguishers shall be judged fit and proper if, during the course of the impact tests, there is no evidence of bursting, breakage or ejection of components which would put the safety of the user at risk."

7.5.1.2 Test method

Replace the first two paragraphs by the following:

"The test shall be carried out on two charged portable fire extinguishers. One extinguisher shall be tested horizontally and the other vertically. Condition the extinguishers, correctly charged and equipped with all the fittings which are subject to internal pressure in normal operation, for 18 h to the minimum working temperature (see 7.1) $\pm$ 2 °C. Within 2 min after the removal of the extinguisher from the conditioning chamber, it shall be subjected to the impact test described below.

For the purpose of this test, an antifreeze agent may be added to prevent freezing of the contents of water-based extinguishers. Carbon dioxide extinguishers shall be filled to 95 % of volume with water or water plus antifreeze agent, and pressurized with nitrogen to the working pressure they would reach at the test temperature if charged with CO_2."

Page 11:

7.6.1 External corrosion test

In the first sentence, delete "ISO 9227" *and substitute*:

"ISO 9227:1990 type NSS only (NSS = Neutral Salt Spray Test)."

Replace the second paragraph by the following:

"At the conclusion of the test, the following requirements shall be satisfied:

— the mechanical operation of all working parts shall be unimpaired; the force required to release the safety device shall be as specified in 9.11.1;

— the minimum effective discharge time and method of operation shall comply with requirements specified in 7.2 and 9.10;

— the pressure gauge, if one is fitted, shall remain functional and watertight; it shall conform to 9.12.2 and 9.12.7;

— there shall be no corrosion of the metal of the extinguisher body; discoloration or superficial corrosion of non-ferrous metals is acceptable, but galvanic corrosion between dissimilar metals shall not be permitted;

— when tested in accordance with 9.9.3, the burst pressure of the hose shall be as specified."

7.6.2 Internal corrosion test for extinguishers using water-based media

Replace the note by the following text:

"Allowance should be made for a change of colour that occurs naturally due to the temperature changes. It is recommended that two samples of the agent be stored in closed glass containers and one subjected to the same cycles as the extinguishers in order to establish a reference sample."

Table 3

In the 3rd column, replace "60 ± 2" *by* "55 ± 2".

Page 12:

7.7.1 Requirements

In c), insert after "discharge":

"(complete extinguisher discharge includes the medium and propellant)".

7.7.3 Test method

Add the following as a new first paragraph:

"Unless otherwise specified for this particular test, testing shall be carried out at a temperature of (20 ± 5) °C.

Portable fire extinguishers for testing shall be stored for at least 18 h at a temperature of (20 ± 5) °C before the tests are carried out, and shall be maintained within this temperature range until tested."

7.8.1

Replace the existing text by the following:

"An extinguisher conditioned at its minimum operating temperature (± 2 °C) and at 55 °C (± 2 °C) shall operate in such a manner that for the first discharge not more than 5 s elapses from the time the control valve is opened until the extinguishing media starts to discharge, and 1 s for the other discharges. Additionally, at the end of discharge, the extinguisher shall not retain more than the following percentages of its original charge:

— powder: 15 %;

— all others: 10 %.

Carry out testing on four extinguishers. Before testing, weigh each extinguisher, then subject two extinguishers to the minimum operating temperature, and subject the other two extinguishers to (55 ± 2) °C. Storage at the temperatures specified shall be carried out in conditioning chambers. Liquid baths shall not be used. Extinguishers shall remain upright during the temperature conditioning. The tolerances given shall be considered nominal tolerances, with the climatic chamber empty.

Operate the extinguisher within 2 min of its removal from the conditioning chamber. The extinguisher shall be operated in accordance with 7.8.2. For cartridge-type extinguishers where activation is by a single action, the cartridge shall be pierced and the control valve closed immediately for a period of 6 s, after which the control valve shall be reopened. For cartridge-operated extinguishers with a final control valve and an independent activation system, pressurize with the final control valve closed. Open this final control valve 6 s after the commencement of pressurization of the extinguisher.

Measure and record the time between the opening of the final control valve and the commencement of discharge. Reweigh the extinguisher and record the residual charge. All four extinguishers shall pass the test."

8.2.2 Requirements for extinguishment

Replace the second bullet point by the following:

— "Class B: all flames are extinguished and there remains a minimum heptane depth of 5 mm at any point in the tray."

Page 18:

8.2.4 Test schedule

At the end of the subclause insert the following:

"Water-based models which may be produced with or without an antifreeze agent shall be treated as separate and distinct models for the fire rating test."

Page 22:

8.4.4.2

Replace the existing text by the following:

"For water-based and clean agent extinguishers, fresh fuel and water shall be used for each test.

For CO_2 type extinguishers and powder type extinguishers, when a fire test filled with fresh fuel and water has been successfully extinguished with the tested extinguisher, then fuel shall be added once for the next test."

8.4.4.5

After the first sentence, insert the following:

"For cartridge-operated extinguishers, the operator shall pierce the cartridge and allow the pressure to build for at least 6 s prior to the end of the 60-s preburn period."

8.4.4.6

Replace the existing first sentence by the following:

"The operator shall then bring the extinguisher into use, within no more than 10 s after the 60-s preburn period, and direct the jet onto the test fire."

8.4.5 Low-temperature extinguishment test

After the existing text, insert the following new sentences:

"Before testing, weigh the extinguisher, then subject the extinguisher to the minimum operating temperature (± 2 °C) for a period of 18 h. Storage at the specified temperature shall be carried out in conditioning chambers. Liquid baths shall not be used. The extinguisher shall remain upright during temperature conditioning. The tolerances (± 2 °C) shall be considered nominal tolerances, with the climatic chamber empty.

The test shall be conducted within 5 min of removal of the extinguisher from the conditioning chamber. For cartridge-operated extinguishers, the operator shall pierce the cartridge and allow the pressure to build for at least 6 s prior to the end of the 60-s preburn period. The operator shall then bring the extinguisher into use, within no more than 10 s after the 60-s preburn period, and direct the jet onto the test fire."

Page 26:

8.6.1 Water-based extinguishers

After the existing text, insert the following new sentence:

"Water-based models which may be produced with or without an antifreeze agent shall be treated as separarate and distinct models for the electrical conductivity test."

Page 27:

9.2.2.5

After the existing text, insert the following new sentence:

"Furthermore, the break shall not occur in any body permanent marking such as stamping or engraving."

9.2.2.6

After the existing text, insert the following new sentence:

"The burst test shall not cause the valve and fitting to fragment. The break shall not originate in the valve or fitting marking area."

Page 30:

9.4.1

After the existing text, insert the following new sentence:

"Carry out the testing on one extinguisher bracket only of each model or type supplied with the extinguisher."

Page 31:

9.7.1.1

After the existing text, insert the following new sentence:

"If a cylinder that has successfully passed the crushing test fails the burst test, it shall not be considered as a failure and another one from the same batch can be utilized for the burst test."

Page 32:

9.8.2.2.1

Replace "100 °C" *by* "(100 ± 3) °C".

Page 33:

9.8.4.2

Replace the existing text by the following:

"No hazardous changes shall occur to the valve assembly, such as splinters, fractures or cracks.

The valve shall then be capable of withstanding the test pressure (p_t) for 1 min without bursting."