SLOVENSKI STANDARD
SIST ISO 10497:2000

01-september-2000

Preskušanje ventilov - Zahteve za protipožarno preskušanje

Testing of valves -- Fire type-testing requirements

Essais des appareils de robinetterie -- Caractéristiques de l'essai au feu

Ta slovenski standard je istoveten z: **ISO 10497:1992**

ICS:

13.220.40	Sposobnost vžiga in obnašanje materialov in proizvodov pri gorenju	Ignitability and burning behaviour of materials and products
23.060.01	Ventili na splošno	Valves in general

SIST ISO 10497:2000 **en**

INTERNATIONAL STANDARD

ISO 10497

First edition
1992-10-01

Testing of valves — Fire type-testing requirements

Essais des appareils de robinetterie — Caractéristiques de l'essai au feu

Reference number
ISO 10497:1992(E)

Contents

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland
Printed 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.

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.

International Standard ISO 10497 was prepared by Technical Committee ISO/TC 153, *Valves*, Sub-Committee SC 1, *Design, manufacture, marking and testing*.

Introduction

This International Standard covers the requirements and method for evaluating the performance of valves when exposed to defined fire conditions. The performance requirements establish limits of acceptability of a valve, regardless of size or nominal pressure (PN). The burn period has been established to represent the maximum time required to extinguish most fires. Fires of longer duration are considered to be of major magnitude with consequences greater than those anticipated in the test.

The method for carrying out the fire test is given in section 3 and the representative sizes and pressure ranges of the valve tested are given in section 5.

This International Standard assumes that the execution of its provisions will be entrusted to appropriately qualified and experienced personnel, because it calls for procedures that may be injurious to health if adequate precautions are not taken. This International Standard refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage of the procedure.

This page intentionally left blank

Testing of valves — Fire type-testing requirements

Section 1: General

1.1 Scope

This International Standard specifies fire type-testing requirements and in section 3 describes the fire type-test method for confirming the pressure-containing capability of a valve under pressure during and after the fire test[1)].

This International Standard does not cover the testing requirements for valve actuators other than manually operated gear boxes or other like mechanisms when these form part of the normal valve assembly. Other types of valve actuators (for example electrical, pneumatic or hydraulic) may need special protection to operate in the environment considered in this valve test, and the fire testing of such actuators is outside the scope of this standard.

NOTE 1 It is anticipated that other test methods may be required for specific applications, e.g. valves for gaseous fuels in domestic applications.

1.2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7-1:1982, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Designation, dimensions and tolerances.*

ISO 6708:1980, *Pipe components — Definition of nominal size.*

ISO 7268:1983, *Pipe components — Definition of nominal pressure.*

IEC 584-2:1982, *Thermocouples — Part 2: Tolerances*

1.3 Definitions

For the purposes of this International Standard, the definitions given in ISO 6708 for nominal size (DN) and in ISO 7268 for nominal pressure (PN) and the following definitions apply.

1.3.1 test pressure: Internal pressure to which the valve under test is subjected.

1.3.2 symmetric valve: Valve having identical internal construction either side of the centre line of the obturator along the axis running through the body ends.

1.3.3 asymmetric valve: Valve having non-identical internal construction either side of the centre line of the obturator along the axis running through the body ends.

1) For the purposes of this International Standard, the terms "fire type-test" and "fire test" are synonymous.

Section 2: Test conditions

2.1 Direction and conditions for valves to be tested

2.1.1 Symmetric valves intended by the manufacturer for bidirectional installation shall be tested in one direction only.

2.1.2 Asymmetric valves intended by the manufacturer for bidirectional installation shall be tested by carrying out the test procedure twice, once in each direction of the potential installation.

NOTE 2 The same valve may be refurbished and retested, or another identical valve may be tested in the other direction.

2.1.3 Valves intended solely for unidirectional installation shall be marked accordingly and tested in the direction of recommended installation.

2.1.4 If the valve being tested is fitted with a gearbox or other such manual device, then only that particular assembly will qualify.

NOTE 3 If a valve can be supplied with or without a gearbox, testing with a gearbox fitted will qualify valves without a gearbox but not the converse.

2.1.5 Valves (and gearboxes) shall not be protected with insulation material of any form during testing, except where such protection is part of the design of the component(s).

2.2 Pressure relief provision

If the valve under test incorporates a pressure relief device as part of its design and if this device activates during the fire test, then the test shall be continued and any leakage through the device shall be counted as external leakage (see 3.6.9 and 3.6.10).

However, the test shall be stopped if the system pressure relief device described in 3.3.2.8 activates.

Section 3: Fire test method

3.1 General warning

Fire testing of valves is potentially very hazardous and it is essential that the safety of personnel be given prime consideration. Because of the possible design of the test valve and test equipment and the nature of the fire test, hazardous rupture of the pressure boundary components may occur. Adequate shields in the area of the test enclosure and other appropriate means for the protection of personnel are necessary.

3.2 Principle

A valve is exposed in the closed position, filled with water under pressure, to flames with an environmental temperature in the region of the valve of 750 °C to 1 000 °C for a period of 30 min and the internal and external leakage during this period is recorded. After cool-down from the fire test, the valve is hydrostatically tested to assess the pressure-containing capability of the valve shell and valve seats.

3.3 Apparatus

3.3.1 General

The test equipment shall not subject the valve to externally applied stress affecting the results of the test.

NOTES

4 Schematic diagrams of recommended systems for fire type-testing of valves are given in figure 1.

5 Potential pipework-to-valve end connection joint leakage is not evaluated as part of the test and is not included in the allowable external leakage (see 4.3, 4.5 and 4.7). For the purposes of this test, it may be necessary to modify these joints to eliminate leakage.

The test equipment shall be designed so that if the nominal diameter of the pipework situated immediately upstream of the test valve is larger than DN 25 or one-half the DN of the test valve, the pipework shall be enveloped in flames for a minimum distance of 150 mm from the test valve.

The pipework downstream of the test valve shall be between DN 15 and DN 25 and shall be inclined so that any fluid will run out of the equipment without the possiblity of entrapment.

The enclosure containing the valve shall provide a horizontal clearance of a minimum of 150 mm between any part of the test valve and the enclosure, and the minimum height of the enclosure above the top of the test valve shall be 150 mm.

3.3.2 Specific apparatus

NOTE 6 Suitable apparatus is depicted in figure 1.

3.3.2.1 Vapour trap, to minimize the cooling effect of the upstream liquid.

See figure 1, item 8.

3.3.2.2 Industrial pressure gauges, having a full-scale reading of between 1,5 and 4 times the test pressure.

See figure 1, items 7 and 14.

The accuracy of each test gauge used shall be within 3 % of the maximum scale value, for readings taken both up and down the scale with either increasing or decreasing pressure, at any point on the scale.

3.3.2.3 Calorimeter cubes, made of carbon steel, of design and dimensions shown in figure 2, with a thermocouple located in the centre of each cube.

NOTE 7 Calorimeter cubes should be scale-free before exposure to the fire environment.

3.3.2.4 Flame environment thermocouples, of accuracy at least equal to tolerance class 2 for type B or tolerance class 3 for other types as specified in IEC 584-2.

See figure 1, item 13.

3.3.2.5 Containers, of a size suitable for collecting the water leaked from the valve under test.

See figure 1, item 18.