SLOVENSKI STANDARD
SIST EN ISO 15848-1:2006

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Industrijski ventili – Meritve, preskusi in postopki kvalificiranja pobeglih emisij – 1. del: Klasifikacijski sistem in kvalifikacijski postopki za preskušanje tipa ventilov (ISO 15848-1:2006)

Industrial valves - Measurement, test and qualification procedures for fugitive emissions - Part 1: Classification system and qualification procedures for type testing of valves (ISO 15848-1:2006)

Industriearmaturen - Mess-, Prüf- und Qualifikationsverfahren für flüchtige Emissionen - Teil 1: Klassifizierungssystem und Qualifikationsverfahren für die Bauartprüfung von Armaturen (ISO 15848-1:2006)

Robinetterie industrielle - Mesurage, essais et modes opératoires de qualification pour émissions fugitives - Partie 1: Systeme de classification et modes opératoires de qualification pour les essais de type des appareils de robinetterie (ISO 15848-1:2006)

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Industrial valves - Measurement, test and qualification procedures for fugitive emissions - Part 1: Classification system and qualification procedures for type testing of valves (ISO 15848-1:2006)

Robinetterie industrielle - Mesurage, essais et modes opératoires de qualification pour émissions fugitives - Partie 1: Système de classification et modes opératoires de qualification pour les essais de type des appareils de robinetterie (ISO 15848-1:2006)

Industriearmaturen - Mess-, Prüf- und Qualifikationsverfahren für flüchtige Emissionen - Teil 1: Klassifizierungssystem und Qualifikationsverfahren für die Bauartprüfung von Armaturen (ISO 15848-1:2006)

This European Standard was approved by CEN on 28 December 2005.

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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.

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

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Foreword

This document (EN ISO 15848-1:2006) has been prepared by Technical Committee ISO/TC 153 "Valves" in collaboration with Technical Committee CEN/TC 69 "Industrial valves", the secretariat of which is held by AFNOR.

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 July 2006, and conflicting national standards shall be withdrawn at the latest by July 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of ISO 15848-1:2006 has been approved by CEN as EN ISO 15848-1:2006 without any modifications.

INTERNATIONAL STANDARD

ISO 15848-1

First edition
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Industrial valves — Measurement, test and qualification procedures for fugitive emissions —

Part 1: Classification system and qualification procedures for type testing of valves

Robinetterie industrielle — Mesurage, essais et procédures de qualification pour émissions fugitives —

Partie 1: Système de classification et procédures de qualification pour essais de type des appareils de robinetterie

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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.

ISO 15848-1 was prepared by Technical Committee ISO/TC 153, *Valves*, Subcommittee SC 1, *Design, manufacture, marking and testing*.

ISO 15848 consists of the following parts, under the general title *Industrial valves — Measurement, test and qualification procedures for fugitive emissions*:

— *Part 1: Classification system and qualification procedures for type testing of valves*

— *Part 2: Production acceptance test of valves*

Introduction

The objective of this part of ISO 15848 is to enable classification of performance of different designs and constructions of valves to reduce fugitive emissions.

This part of ISO 15848 defines type test for evaluation and qualification of valves where fugitive emissions standards are specified.

The procedures of this part of ISO 15848 can only be used with the application of necessary precautions for testing with flammable or inert gas at temperature and under pressure.

Industrial valves — Measurement, test and qualification procedures for fugitive emissions —

Part 1: Classification system and qualification procedures for type testing of valves

1 Scope

This part of ISO 15848 specifies testing procedures, for evaluation of external leakage of valve stem seals (or shaft) and body joints of isolating valves and control valves intended for application in volatile air pollutants and hazardous fluids. End connection joints, vacuum application, effects of corrosion and radiation are excluded from this part of ISO 15848.

This part of ISO 15848 concerns classification system and qualification procedures for type testing of valves.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5208, *Industrial valves — Pressure testing of valves*

3 Terms and definitions

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

3.1
body seals
any seal in pressure containing part except stem (or shaft) seals

3.2
Class
a convenient round number used to designate pressure-temperature ratings

NOTE It is designated by the word “Class” followed by the appropriate reference number from the following series: Class 125, Class 150, Class 250, Class 300, Class 600, Class 900, Class 1 500, Class 2 500.

3.3
concentration
ratio of test fluid volume to the gas mixture volume measured at the leak source(s) of the test valve

NOTE The concentration is expressed in ppmv (parts per million volume), which is a unit deprecated by ISO (1 ppmv = 1 ml/m^3 = 1 cm^3/m^3).

3.4
control valve
power operated device which changes the fluid flow rate in a process control system and which consists of a valve connected to an actuator that is capable of changing the position of a closure member in the valve in response to a signal from the controlling system

3.5
fugitive emission
any chemical or mixture of chemicals, in any physical form, which represents an unanticipated or spurious leak from equipment on an industrial site

3.6
leakage
loss of the test fluid through the stem (or shaft) seal or body seal(s) of a test valve under the specified test conditions and which is expressed as a concentration or a leak rate

3.7
leak rate
mass flow rate of the test fluid, expressed in $mg \cdot s^{-1}$ per meter of the perimeter of the stem

3.8
local leakage
measurement of the test fluid leakage using a probe at the leak source point

3.9
mechanical cycle of control valves
for linear/rotary control valves, test cycles performed at 50 % of stroke/angle with an amplitude of ± 10 % of full stroke/angle

3.10
mechanical cycle of isolating valves
motion of a valve obturator moving from the fully closed position to the fully open position, and returning to the fully closed position

3.11
nominal size
DN
alphanumeric designation of size for components of a pipework system, which is used for reference purposes and which comprises the letters DN followed by a dimensionless whole number which is directly related to physical size, in millimetres, of the bore or outside diameter of the end connections

NOTE 1 The nominal diameter is designated by the letters DN followed by a number from the following series: 10, 15, 20, 25, 32, 40, 50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400, etc.

NOTE 2 The number following the letters DN does not represent a measurable value and should not be used for calculation purposes except where specified in the relevant standard.

3.12
nominal pressure
PN
numerical designation which is a convenient rounded number for reference purposes

NOTE 1 All equipment of the same nominal size (DN) designated by the same PN number has the compatible mating dimensions.

NOTE 2 The maximum allowable working pressure depends upon materials, design and working temperatures and should be selected from the pressure/temperature rating tables in the appropriate standards.

NOTE 3 The nominal pressure is designated by the letters PN followed by the appropriate reference number from the following series: 2,5, 6, 10, 16, 20, 25, 40, 50, etc.

3.13
isolating valve
valve intended for use principally in the closed or open position which may be power actuated or manually operated

3.14
performance class
level of the performance of a test valve defined by the criteria specified in Clause 6

3.15
room temperature
temperature in the range of − 29 °C to + 40 °C

3.16
stem
shaft
valve component extending into the valve shell to transmit the linear/rotary motion from the actuating device to the valve obturator

3.17
stem seal
shaft seal
component(s) installed around the valve stem (or shaft) to avoid leakage of internal fluids to atmosphere

3.18
test pressure

pressure used for testing the valve which, unless otherwise specified, shall be the rated pressure specified at the test temperature and the shell material of a test valve in the relevant standards

3.19
test temperature

fluid temperature selected for the test from Table 3 as measured inside the test valve

3.20
thermal cycle
change of the temperature from the room temperature to the specified test temperature and return to the room temperature

3.21
total leakage
collection of leakage of the test fluid at the leak source using an encapsulation method

3.22
type test
a test conducted to establish the performance class of a valve

4 Symbols and abbreviations

M_{alr} predicted maximum leakage

SSA stem (or shaft) seal adjustment

NOTE The abbreviation SSA corresponds to the abbreviation of “Stem Seal Adjustement”.

OD_{stem} external diameter of the stem

RT ambient temperature

5 Type test

5.1 Test conditions

5.1.1 Preparation of a valve to be tested

Only a fully assembled valve shall be used for the test.

A valve shall be selected from standard production at random. The valve shall have been tested and accepted in accordance with ISO 5208 or any other applicable standard and no subsequent protective coating shall have been applied.

Additional seal arrangements to allow the stem sealing system leakage measurement is permitted and shall not affect the sealing performance of the valve.

The test valve interior shall be dried and lubricants (if any) shall be removed. The valve and test equipment shall be clean and free of water, oil and dust and the packing may be changed prior to the test. If the valve packing is changed prior to the test, it should be done under the supervision of the valve manufacturer.

If a test valve is equipped with a manually adjustable stem (or shaft) seal(s), it shall be initially adjusted according to the manufacturer instructions, and recorded in the test report as provided in Clause 7.

The valve manufacturer shall select the appropriate actuating device.

5.1.2 Test fluid

The test fluid shall be helium gas of 97 % minimum purity or methane of 97 % minimum purity. The same test fluid shall be used throughout the test.

5.1.3 Test temperature

Valve mechanical cycling is carried out at the room temperature or in the steps of the room temperature and the selected test temperature other than the room temperature (see 5.2.4.1).

The test temperature shall be recorded for each leakage measurement.

5.1.4 Measurement of test valve temperature

The temperature of the test valve shall be measured at three locations (X, Y, Z), as shown in Figure 1, and recorded in a test report.

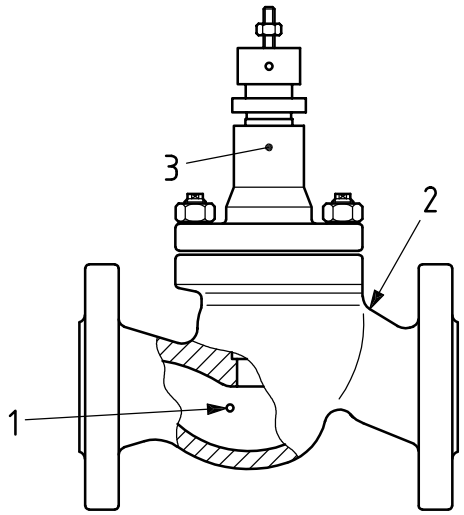
a) Measurement at location “X” shall be used to determine the test temperature.

b) Measurement at location “Z “is used to determine the external valve temperature adjacent to the stem (or shaft) seal(s) for information.

c) Measurement at location “Y” is also made for information. Any use of insulation shall be detailed in the test report.

All temperatures at location X, Y and Z shall be stabilized before leakage is measured (see Figure 2). Temperature at location “Z” shall be stabilized for minimum 10 min prior to leakage measurement.

Check if the temperature variation is within ± 5 %.



Key

1 location X: flow path (temperature T_1)

2 location Y: valve body (temperature T_2)

3 location Z: stuffing box (temperature T_3)

Figure 1 — Measurements of temperature at three locations (when the valve is internally heated or cooled)