INTERNATIONAL STANDARD

ISO 8659

First edition
1989-07-01

Thermoplastics valves — Fatigue strength — Test method

Robinets en matériaux thermoplastiques — Résistance à la fatigue — Méthode d'essai

Reference number
ISO 8659 : 1989 (E)

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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8659 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*.

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Printed in Switzerland

Introduction

The aim of this International Standard is to establish certain basic requirements for the endurance testing of plastics valves to ensure that uniform test methods are adopted. This International Standard must be considered in conjunction with any specific requirements in particular product standards applicable to the individual types of valves.

This page intentionally left blank

Thermoplastics valves — Fatigue strength — Test method

1 Scope

This International Standard specifies the endurance test necessary to confirm the ability of hand-operated plastics valves to withstand prolonged use, with repeated opening and closure. It does not specify the ability of valves to withstand adverse conditions, in particular those of chemically agressive fluid media and/or environments, or excessive fluid velocities and cavitation.

This International Standard includes values of the parameters necessary for the proper performance of the endurance test, with the reservation that parameters may be different in particular product standards (see 5.1).

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 listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 161-1 : 1978, *Thermoplastics pipes for the transport of fluids — Nominal outside diameters and nominal pressures — Part 1: Metric series.*

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

ISO 7005-2 : 1988, *Metallic flanges — Part 2: Cast iron flanges.*

ISO 7005-3 : 1988, *Metallic flanges — Part 3: Copper alloy and composite flanges.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 nominal pressure (PN): An alphanumerical designation of pressure, used for reference purposes, which is related to the mechanical strength of the valve. Usually it corresponds to the pressure of water at 20 °C, in bars, for which the valve is designed (see also ISO 161-1).

3.2 closing torque: Torque required to close a valve to full tightness at the nominal pressure.

3.3 fluid velocity: The velocity of a fluid in a pipe connected to a valve of nominal size equivalent to the nominal diameter of the pipe.

3.4 reference dimensions: The following are considered to be the reference dimensions:

— nominal size DN (see ISO 6708) for flanged systems (see ISO 7005-2 and ISO 7005-3);

— nominal outside diameter D for tubes (see ISO 161-1).

4 Apparatus

Test apparatus, capable of testing the whole valve assembly with its obturator mechanism. Furthermore, it shall include appropriate devices to perform each step separately, or continuously and automatically.

The test apparatus shall include appropriate means to discontinue the test cycle during the pressure period and to maintain the pressure in the closed position.

Pressure gauges shall be accurate to within ± 1 % of the full-scale reading.

Temperature sensors shall be accurate to within ± 2 °C.

NOTE — Attention is drawn to the need for adequate safety precautions when using compressed air or gas for this test.

5 Procedure

5.1 Test requirements to be taken from product standards

The following specifications shall be taken from the particular product standard.

a) any tests which shall be performed before the endurance test, and those which shall be repeated after completion of the endurance test;

b) whether tightening of the gland packing (if used) during the endurance test is allowed;

c) acceptance criteria for tests;

d) the number of specimens to be tested;

e) the number of test cycles to be performed;

f) the fluid used for the test, and its temperature, pressure and velocity;

g) the ambient temperature.

5.2 Endurance test

The endurance test, using water, air or gas as the fluid medium, at the temperature, pressure and velocity specified in the particular product standard, shall be carried out, at the ambient temperature specified in the product standard, as follows.

5.2.1 Open multiple-turn valves to the fully open position at a hand-wheel speed of 40 r/min ± 10 r/min for valves of nominal size up to DN 50 and 20 r/min ± 10 r/min for valves of nominal size greater than DN 50.

For quarter-turn valves, the opening time shall be not less than 2 s for valves of nominal size up to DN 50 and not less than 4 s for valves of nominal size greater than DN 50.

The valve shall be left in the open position for at least 5 s, but not longer than 20 s.

5.2.2 Close multiple-turn valves at a hand-wheel speed of 40 r/min ± 10 r/min.

For quarter-turn valves, the closing time shall be not less than 1 s.

5.2.3 Closing shall be performed using the torque specified in the particular product standard.

During opening and closing, there shall be no visible leakage at any seal.

5.2.4 After the valve has been closed, an internal pressure shall be applied as specified in the particular product standard. The valve shall be left in the closed position for at least 5 s, but no longer than 20 s.

5.2.5 The valve shall be opened as described in 5.2.1.

5.2.6 The test procedure described in 5.2.1 to 5.2.5 shall be repeated for as many cycles as required by the particular product standard.

6 Test report

The test report shall include at least the following information:

a) a reference to this International Standard and to the product standard;

b) a complete identification of the valve, giving the following information:

1) the material of the valve body,

2) the nominal size (DN) and the socket diameter or spigot diameter,

3) the nominal pressure (PN) of the valve,

4) the manufacturer's name or trade mark,

5) the type of pipe used,

6) if necessary, the flow direction,

7) the closing torque;

c) a description of the test conditions;

d) the number of specimens tested;

e) whether the valve complied with the test requirements [if the valve failed (leakage or fracture) indicate under what conditions it failed];

f) any operation not laid down in this International Standard, or other occurrences which may have affected the test results;

g) the date of the test.

This page intentionally left blank

UDC 621.646.2-036.073 : 620.169.1

Descriptors : thermoplastic resins, plastics products, valves, tests, fatigue tests.

Price based on 2 pages