INTERNATIONAL STANDARD

ISO 7511

First edition
1999-03-15

Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes and fittings — Test methods to prove the leaktightness of the wall under short-term internal pressure

Systèmes de canalisations en plastiques — Tubes et raccords en plastiques thermodurcissables renforcés de verre (PRV) — Méthode d'essai pour établir l'étanchéité de la paroi sous une pression interne à court terme

Reference number
ISO 7511:1999(E)

Contents

Page

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet iso@iso.ch

Printed in Switzerland

Foreword

ISO (the International Organization for Standardization) is a world-wide 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 3.

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 7511 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 6, *Reinforced plastics pipes and fittings for all applications,* in collaboration with CEN/TC 155, *Plastics piping systems and ducting systems*.

Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes and fittings — Test methods to prove the leaktightness of the wall under short-term internal pressure

1 Scope

This International Standard specifies two test methods, designated method A and method B, for checking the leaktightness of glass-reinforced thermosetting plastics (GRP) pipes and fittings under short-term internal pressure.

Method A is a hydraulic test applicable to a pipe under uniaxial stress.

Method B is a pneumatic test applicable to fittings.

NOTE Test methods for the leaktightness of joints or for the resistance of the pipe to long-term hydrostatic pressure are covered by other standards.

2 Term and definition

For the purposes of this International Standard, the following definition applies:

2.1
leakage
transmission of water or air through the wall of a test piece to an extent detectable visually

3 Method A

3.1 Principle

A test piece in air is subjected to an internal water pressure. The test piece is monitored for evidence of leakage through the wall of the test piece, within a specified time.

NOTE It is assumed that the following test parameters are set by the standard making reference to this standard:

a) the test pressure and the time taken to reach it (see 3.2.1 and 3.4.2);

b) the number of test pieces to be used (see 3.3);

c) the period for which pressure is applied (see 3.4.3);

d) the length L of the test piece.

3.2 Apparatus

3.2.1 Pressurizing system, capable of maintaining, for the duration of the test, a specified hydraulic pressure measured at the top of the test piece to an accuracy within – 2 % and + 5 %.

3.2.2 Pressure-measuring device, of sufficient accuracy to ensure conformity to 3.2.1.

3.2.3 End-sealing devices, such as end caps, internal stoppers or inflatable bags, depending on the diameter of the test piece. Means shall be provided to prevent movement of the sealing device under pressure. Such devices shall not transmit end thrust to the test piece.

3.2.4 Test piece support, if necessary, to minimize deformation of the test piece due to its mass and its contents.

This support shall not constrain the test piece circumferentially or longitudinally.

3.3 Test pieces

3.3.1 Each test piece shall comprise a length of pipe as specified in the referring standard.

3.3.2 The number of test pieces shall be as specified in the referring standard.

3.4 Procedure

WARNING — Attention is drawn to the dangers associated with pressure and the need to take all necessary precautions to prevent injury to personnel.

3.4.1 Attach the end-sealing devices to the test piece and fill the test piece with water, expelling all air. Attach the test piece to the pressurizing system, taking care to avoid entrapment of air.

3.4.2 Increase the hydrostatic pressure at a rate such that the specified test pressure is reached in the time specified in the referring standard.

3.4.3 Maintain the the test pressure for the time specified in the referring standard or until leakage is observed (see 2.1), whichever occurs first. Record any evidence of leakage through the wall of the test piece (see 3.1 and 3.2.1) and the period after which it was observed.

3.5 Test report

The test report shall include the following information:

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

b) all details necessary for full identification of the pipe tested;

c) the number of test pieces;

d) the method of test used, i.e. method A;

e) the test pressure, in bars[1)];

f) the duration of the test or the time to failure, in minutes;

g) the occurrence or absence of leakage;

h) any factors which may have affected the results, such as any incidents or any operating details not specified in this International Standard;

i) the date of the test.

---

1) 1 bar = 10^5 N/m^2 = 0,1 MPa

4 Method B

4.1 Principle

A test piece in either air or water is subjected to an internal air pressure. The test piece is monitored for evidence of leakage within a specified time.

NOTE It is assumed that the following test parameters are set by the standard making reference to this standard:

a) the test pressure and the time taken to reach it (see 4.2.1 and 4.4.2);

b) the number of test pieces to be used (see 4.3);

c) the period for which pressure is applied (see 4.4.3).

4.2 Apparatus

4.2.1 Pressurizing system, capable of applying and maintaining to an accuracy of within ± 2 % the internal air pressure specified in the referring standard, and fitted with an automatic pressure-limiting device.

4.2.2 Pressure-measuring device, of sufficient accuracy to ensure conformity to 4.2.1.

4.2.3 End-sealing devices, such as end caps, internal stoppers or inflatable bags, depending on the diameter of the test piece. Means shall be provided to prevent movement of the sealing device under pressure. Such devices shall not transmit end thrust to the test piece.

4.3 Test pieces

4.3.1 Each test piece shall be a fitting.

4.3.2 The number of test pieces shall be as specified in the referring standard.

4.4 Procedure

WARNING — Attention is drawn to the dangers associated with pneumatic pressure and the need to take all necessary precautions to prevent injury to personnel. For reasons of safety, it is recommended that the test pressure does not exceed 0,1 bar unless otherwise specified by the referring standard.

4.4.1 Attach the end-sealing devices to the test piece, ensuring that end thrust will not be transmitted to the test piece. Connect the test piece to the pressurizing system through one of the end-sealing devices. Either paint the outer surface of the test piece with a solution of soap or a similar agent if the test is performed in air, or immerse the test piece completely in water.

4.4.2 Pressurize the test piece to the test pressure specified by the referring standard (see 4.1).

4.4.3 Maintain the test pressure for the time specified by the referring standard (see 4.1) or until leakage is observed, whichever occurs first.

Inspect for and record any bubbling caused by air escaping through the wall of the test piece.

4.5 Test report

The test report shall include the following information:

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

b) all details necessary for full identification of the pipe or fitting tested;

c) the number of test pieces;

d) the method of test used, i.e. method B;

e) the test pressure, in bars;

f) the duration of the test or the time to failure, in minutes;

g) the occurrence or absence of leakage;

h) any factors which may have affected the results, such as any incidents or any operating details not specified in this International Standard;

i) the date of the test.

ICS 23.040.20; 23.040.45

Price based on 4 pages