AS/NZS 3707:2001
Reconfirmed 2017

Australian/New Zealand Standard™

Method for testing pressure cycling resistance of pipes and fittings

Standards Australia

STANDARDS NEW ZEALAND
Paerewa Aotearoa

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee PL-045, Plastics Pipe Systems Test and Calculation Methods. It was approved on behalf of the Council of Standards Australia on 8 June 2001 and on behalf of the Council of Standards New Zealand on 8 June 2001. It was published on 1 August 2001.

The following interests are represented on Committee PL-045:
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Australian Chamber of Commerce and Industry
Australian Gas Association
Australian Nuclear Science and Technology Organisation
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We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia International or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR 99524.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

RECONFIRMATION

OF

AS/NZS 3707:2001

Method for testing pressure cycling resistance of pipes and fittings

RECONFIRMATION NOTICE

Technical Committee PL-006 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

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Plastics Industry Pipe Association of Australia
Plastics New Zealand
Plumbing Products Industry Group
Water New Zealand
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NOTES

Australian/New Zealand Standard™

Method for testing pressure cycling resistance of pipes and fittings

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PREFACE

This Standard was prepared by the Standards Australia's Committee PL-045, Plastics Pipe Systems Test and Calculation Methods, to supersede AS 3707—1989.

The objective of this Standard is to provide a suitable test method for evaluating the ability of various materials to withstand pressure cycling in pipes and fittings.

When preparing this Standard, it was initially considered appropriate to arbitrarily divide the pipes and fittings into two classifications, property services and reticulation. Pipes and fittings up to DN 65 are generally located in property service installations, where they may experience quite severe cyclical conditions, mainly due to the presence of fast-acting valves. Pipes and fittings above DN 65 are generally installed in reticulation systems, where cycle regimes are generally less severe, and this is often taken into account when designing the system.

After further review it was thought appropriate that a single pressure wave cycle should be selected to provide a comparative test for all services, sizes, and piping materials.

This Standard is based on thin wall pipe theory and is, therefore, considered to be conservative for thick wall pipe. No criteria are given for acceptance of the various materials which may be subjected to the cycling test. Such information should be obtained from product Standards for different piping materials, or from regulatory authorities.

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1 SCOPE

This Standard sets out a method for determining the pressure cycling resistance properties of pipes, joints, and fittings for pressure applications. The method assesses the ability of the pipe/fitting system to perform in an environment that involves cyclical loadings. This performance is based on a combination of the effects of material properties, manufacturing techniques, and pipe, fitting and joint design. The combination of these three properties determines the ability of pipes, joints, and fittings for pressure applications, to resist the propagation of cracks from stress concentrators and other flaws that may exist within the material.

NOTES:

1 This Method is a standardized method for measuring performance, and should not be taken to represent a particular type of installation. It is an indicative test.

2 Where pipe or fittings, tested according to this Standard, are installed in a situation where fluctuations exceed the parameters specified in this test, steps may be required to reduce these fluctuations, or the design engineer should consult the pipe or fitting manufacturer for advice.

3 This Method may be unsuitable for pipe sizes above DN 100 due to equipment limitations.

2 REFERENCED DOCUMENT

The following document is referred to in this Standard:

AS
1477 PVC pipes and fittings for pressure applications

3 PRINCIPLE

The waveform required for a fluctuating pressure cycle, applicable to the material to be tested, is determined. The test specimen is subjected to a stipulated number of applications of the test pressure cycle to determine its resistance to pressure cycling.

4 APPARATUS

4.1 Pressurizing system

The pressurizing system provided shall be capable of exerting cyclic internal pressures via the pressurizing medium to the test specimens. The pressure cycling apparatus shall be capable of producing a pressure cycle within the envelope shown in Figure 1 (see Note), as determined in accordance with Clause 9. Provision may be made for one or more specimens to be connected to the hydraulic system at the one time. Each connection shall be provided with an isolating valve that operates automatically in the event of a specimen bursting.

NOTE: See Appendix A for information on testing with other waveforms.