BRANZ Appraised
Appraisal No. 708 [2017]

AQUATHERM FLEXI PIPING SYSTEM

Appraisal No. 708 (2017)

This Appraisal replaces BRANZ Appraisal No. 708 (2013)

BRANZ Appraisals

Technical Assessments of products for building and construction.

aquatherm
state of the pipe

aquatherm NZ Ltd
P O Box 99 393
Newmarket
Auckland 1149
Tel: 09 570 7204
Fax: 09 570 7206
Web: www.aquatherm.co.nz

BRANZ

BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz

Product

1.1 The aquatherm flexi Piping System consists of PE-RT (polyethylene – raised temperature) type 2 pipe and brass fittings with sliding sleeves. The pipes and fittings are available in 16 mm and 20 mm nominal diameter, and are for use in hot and cold potable water supply services.

Scope

2.1 The aquatherm flexi Piping System has been appraised for use as the piping components for potable water supply in accordance with the scope of New Zealand Building Code (NZBC) Acceptable Solution G12/AS1 and Verification Method G12/VM1.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, the aquatherm flexi Piping System, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:**

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years, and B2.3.1 (c) 5 years. The aquatherm flexi Piping System meets these requirements. See Paragraphs 8.1 – 8.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The aquatherm flexi Piping System meets this requirement and will not present a health hazard to people.

Clause G12 WATER SUPPLIES: Performance G12.3.2 (c) and G12.3.7 (a) and (b). The aquatherm flexi Piping System meets these requirements. See Paragraph 12.1.

Technical Specification

Description

4.1 The aquatherm flexi pipe is manufactured from polyethylene – raised temperature [PE-RT] type 2 and is black.

4.2 The aquatherm flexi pipes come in sizes of 16 mm and 20 mm nominal external diameter. They are supplied in coils of 100 m and lengths of 4 m.

4.3 The pipes are continuously marked along their length with aquatherm flexi, the pipe size, material type, certification information, date and time of manufacture and the distance from the end of the coil.

4.4 The fittings for use with the aquatherm flexi pipe are dezincification-resistant brass. The sliding sleeve fittings are identified by having rings around the sleeve with "aquatherm" and the pipe diameter engraved in one. All fitting bodies are marked with the diameter of the pipe it is to be used for, "a", "DR", AS3688, and Lic 2551.

4.5 Other items used with the system but outside the scope of the Appraisal are:

- Corrugated pipe for UV and mechanical protection of the aquatherm flexi PE-RT type 2 pipes.
- 90° Pipe bend brackets.
- Pipe clamps.
- Hot and cold pipe indicators.

Tools

4.6 The tools specified by aquatherm NZ Ltd for installation are outside the scope of this Appraisal.

Handling and Storage

5.1 The aquatherm flexi Piping System components must be handled and stored with care to prevent damage. The pipe must be stored where it will not be exposed to sunlight.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the aquatherm flexi Piping System. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

7.1 The aquatherm flexi Piping System must be designed and installed in accordance with the requirements of NZBC Acceptable Solution G12/AS1 or Verification Method G12/VM1. Specific design installations may be designed in accordance with AS/NZS 3500.1 and AS/NZS 3500.4.

7.2 For information on the expected serviceable life of the aquatherm flexi pipe at various temperatures and working pressures and also pipe friction factors, refer to the Technical Literature.

7.3 The aquatherm flexi Piping System must not be used where it will be subject to direct sunlight.

7.4 The aquatherm flexi pipe must not be connected directly to auxiliary heaters such as solar collection panels or wet-backs without the installation of temperature protection devices in the system. Without protection, temperatures may exceed the operating limits. Pipes and fittings must not be installed within 1 metre of an inlet or outlet of a water heater.

7.5 Cold water supply pipes must not be embedded in heated concrete slabs. Where water supply pipes must pass through concrete slabs they must do so at right angles to the surface of the slab and be lagged with an impermeable flexible plastic material of not less that 6 mm thickness for the full depth of the slab penetration.

Durability

8.1 The aquatherm flexi Piping System, when used in easy and moderately difficult areas to access, will meet the NZBC Clause B2 Durability requirements for 5 years and 15 years.

8.2 The aquatherm flexi pipe, when used in areas that are difficult to access, for example in or under concrete slabs, will meet the NZBC Clause B2 Durability requirement of not less than 50 years.

8.3 The above durability statements are based on the aquatherm flexi Piping System being exposed to the maximum working pressures and temperatures described in Paragraph 9.1 and being intermittently heated during its life. Long use at higher temperatures will reduce the serviceable life of the system.

Working Pressures and Temperatures

9.1 The maximum working pressure and temperature for the aquatherm flexi Piping System, when used as a water supply system generally, is 1 MPa and 60°C. When used in difficult to access areas, such as under concrete floors, then the maximum working pressure and temperature for the system must be limited to 1 MPa and 20°C.

Maintenance

10.1 The aquatherm flexi Piping System hot and cold water supply components do not require any special maintenance. Items such as valves and control equipment must be maintained to ensure the maximum working pressures and temperatures are not exceeded.

Spread of Fire

11.1 In all applications where the aquatherm flexi pipe passes through a fire rated element of a structure, the opening must be fire-stopped in a way that will permit thermal movement of the pipe.

Water Supplies

12.1 The aquatherm flexi Piping System has been tested to AS/NZS 4020 and is suitable for in-line and end-of-line potable water supply use in accordance with NZBC Acceptable Solution G12/AS1, Clause 2.1.2.

Energy Efficiency

13.1 Domestic type hot water distribution pipes must be insulated in accordance with the requirements of NZS 4305, Sections 3.7 and 3.8.

Installation Information

Installation Skill Level Requirements

14.1 Installation of the aquatherm flexi Piping System must be carried out by a Registered Plumber that has had instruction from aquatherm NZ Ltd on installation techniques.

General

14.2 Installation of the aquatherm flexi Piping System must be in accordance with NZBC Clause G12/AS1, in particular Section 7.

14.3 The aquatherm flexi pipes and the associated fittings must be designed and installed in accordance with the requirements of this Appraisal and installation information in the Technical Literature.

14.4 When installing aquatherm flexi pipe in framed walls, the holes must be accurately sized to allow pipework to expand and contract. In metal framework grommets must be used to protect the pipe from sharp edges.

14.5 The minimum bending radius for the aquatherm flexi pipes is 5 times the pipe diameter, i.e. 80 mm for the 16 mm pipe, and 100 mm for the 20 mm pipe. The aquatherm flexi pipes may be bent without the aid of bending tools.

Connecting Pipes and Fittings

14.6 Pipes are cut to the correct length using the aquatherm flexi pipe cutter. A sliding sleeve of the correct type and diameter for the pipe being used is slid over the end of the pipe. The end of the pipe is then expanded using the expanding tool and the required fitting inserted in the end of the pipe. The sliding sleeve is then pulled back down over the end of the pipe and the fitting using the aquatherm flexi mounting tool.

Charging and Pressure Testing

15.1 Prior to enclosing the piping system a visual check of every fitting is required to ensure all sliding sleeves are securely in place.

15.2 All circuits within the system must be flushed with fresh, clean water so that they are free from trapped air and any foreign matter that may have entered the system.

15.3 When all air has been bled from the system, it must be pressure tested.

15.4 Piped services used for potable hot and cold water supply must not show any leakage when subjected to a pressure of 1500 kPa at 20°C for a period of not less than 30 minutes, in accordance with AS/NZS 3500.1.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

16.1 A test report has been issued by the Suddeutsches Kunststoff-Zentum [SKZ] Testing Laboratory as part of the means of compliance for SKZ Certificate A403 for the flexatherm pipe for use as pressure pipes for hot and cold water supply. This test report demonstrates compliance with the requirements of ISO 22391-2 Plastics piping systems for hot and cold water installations – Polyethylene of raised temperature resistance [PE-RT] – Part 2: Pipes for Application Class 1 pipe.

16.2 Tests have been carried out on the DR brass fittings by Hayes Laboratories in accordance with AS 2345. The test results have been reviewed by BRANZ experts and found to be satisfactory.

16.3 Tests have been carried out on the aquatherm flexi pipe and DR brass fittings by ams Laboratories Pty Ltd in accordance with AS/NZS 4020. The test results have been reviewed by BRANZ experts and found to be satisfactory.

Other Investigations

17.1 An assessment was made of the durability of the aquatherm flexi PE-RT Type 2 Piping System by BRANZ technical experts.

17.2 An assessment of assembly and connection techniques was carried out by BRANZ to examine installation methods.

17.3 The Technical Literature entitled 'aquatherm flexi Sliding Sleeve Technology Technical Catalogue' has been reviewed by BRANZ and found to be satisfactory.

Quality

18.1 The aquatherm flexi PE-RT Type 2 pipe is manufactured by aquatherm GmbH, under an ISO 9001 Quality Management System.

18.2 The aquatherm flexi pipe is certified by SKZ.

18.3 The aquatherm flexi brass fittings are manufactured in China by Ningbo Spark Tapware Ltd, under licence to aquatherm GmbH. Batch testing is carried out on all connectors shipped to New Zealand.

18.4 aquatherm NZ Ltd is responsible for the quality of the product supplied.

18.5 Quality of installation on site is the responsibility of the installer.

Sources of Information

- AS 2345: 1992 Dezincification resistance of copper alloys.
- AS/NZS 3500.1: 2015 Plumbing and drainage – Water services.
- AS/NZS 3500.4: 2015 Plumbing and drainage – Heated water services.
- AS/NZS 4020: 2005 Products for use in contact with drinking water.
- NZS 4305: 1996 Energy efficiency – Domestic type hot water systems.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks
- The Building Regulations 1992.

BRANZ

In the opinion of BRANZ, the aquatherm flexi Piping System is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to aquatherm NZ Ltd, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
   c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
   d) is copyright of BRANZ.
2. aquatherm NZ Ltd:
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions;
   d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
   a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by aquatherm NZ Ltd.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to aquatherm NZ Ltd or any third party.

For BRANZ

Chelydra Percy
Chief Executive

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13 October 2017