



**BRANZ Appraised**

Appraisal No.629 [2008]

BRANZ Appraisals

Technical Assessments of products  
for building and construction

**BRANZ  
APPRAISAL  
No. 629 (2008)**

## **AQUATHERM® - LILAC PIPING SYSTEM**

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## Product

1.1 The aquatherm® - lilac Piping System consists of PPR(80) pipe and fittings. The pipes are available in diameters ranging from 20 mm to 250 mm with the fittings sized to suit. The aquatherm® - lilac Piping System is for the supply of non-drinking water, including recycled and reclaimed water.



## Scope

2.1 The aquatherm® - lilac Piping System has been appraised for use in non-drinking water supply and distribution. Non-drinking water includes recycled and reclaimed water.

2.2 The aquatherm® - lilac pipe has been appraised for cold (not heated) water distribution only.

## Building Regulations

### New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the aquatherm® - lilac Piping System, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting 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® - lilac Piping System meets these requirements. See Paragraphs 8.1, 8.2 and 9.1.

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

**Clause G12 WATER SUPPLIES:** Performance G12.3.3, G12.3.4 and G12.3.7(a) and (b). The aquatherm® - lilac Piping System meets these requirements. See Paragraphs 12.1 to 12.4.

3.2 This Appraisal assesses an **Alternative Solution** in terms of New Zealand Building Code compliance.

## Technical Specification

### Description

4.1 The aquatherm® - lilac pipes and fittings are manufactured from fusiolen polypropylene random copolymer (PP-R (80)). The aquatherm® - lilac pipe covered by this Appraisal comes in two different standard dimension ratios (SDR, diameter / wall thickness ratio), SDR 11 and SDR 7.4.

4.2 The aquatherm® - lilac pipe SDR 11 is lilac in colour and comes in diameters of 32 mm, 40 mm, 50 mm, 63 mm, 75 mm, 90 mm, 110 mm, 125 mm, 160 mm, 200 mm and 250 mm.

4.3 The aquatherm® - lilac pipe SDR 7.4 is also lilac in colour and comes in diameters of 20 mm and 25 mm.

4.4 All of the pipes listed above, i.e. both the SDR 11 and SDR 7.4, come in lengths of 4 metres. The pipes are continuously marked along their length with aquatherm, the pipe type, the pipe size, non-potable, material type, certification information and date and time of manufacture.

4.5 The fittings for use with the aquatherm® - lilac pipe are also made from fusiolen PP-R (80), with some of the fittings also incorporating dezincification-resistant brass where metallic threads are required. All fittings are green and are marked with the diameter of the pipe it is to be used for, "a" (for aquatherm) and PP-R Typ3.

### Tools

4.6 The tools specified by aquatherm NZ Ltd for installation are outside the scope of this Appraisal, however only aquatherm and brand matched tools must be used.

### Handling and Storage

5.1 The aquatherm® - lilac Piping System components must be handled and stored with care to prevent damage. The pipe must be stored flat, supported every metre and in a position 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® - lilac 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® - lilac Piping System is intended for non-drinking water (non-potable water), including recycled and reclaimed water, at ambient temperatures.

7.2 aquatherm® - lilac Piping Systems must be designed and installed in accordance with the requirements of NZBC Acceptable Solution G12/AS1. Specific design installations may be designed in accordance with AS/NZS 3500.1.

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

7.4 Cold water supply pipes must be insulated when 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 than 6 mm thickness for the full depth of the slab penetration.

7.5 Where the aquatherm® - lilac Piping System is to be used in or under concrete, the maximum working pressure is 1.0 MPa for a 50 year serviceable life.

7.6 Other non-aquatherm brands of PP-R pipes and fittings must not be used in the aquatherm® - lilac Piping System.

### Durability

8.1 The NZBC durability performance requirements for piping systems vary depending on the difficulty or ease to access.

### Service Life

8.2 The service life of aquatherm® - lilac Piping System (incorporating the fusiotherm welded fittings only) is expected to exceed 50 years for the operating pressures and temperatures given in Paragraph 9.1. The serviceable life of the aquatherm® - lilac Piping System, including all fittings, is expected to exceed 15 years.

### Working Pressure and Temperature

9.1 The permissible working pressure for the aquatherm® - lilac Piping System for a 50 year service life and at 30°C is 1.0 MPa. Higher working pressures or temperatures will decrease the expected service life.

### Maintenance

10.1 The aquatherm® - lilac Piping System 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 aquatherm® - lilac pipe passes through a fire rated element of a structure or cavity barrier, the opening must be fire-stopped in a way that will permit thermal movement of the pipe.

### Water Supplies

12.1 The aquatherm® - lilac Piping System is for use with non-drinking water. For compliance with NZBC Clause G12.3.3, when the aquatherm® - lilac Piping System is used for personal hygiene it must be protected from High and Medium hazards as defined by NZBC Clause G12/AS1 Paragraph 3.3. Where backflow protection is required it must be in accordance with Paragraphs 3.1 to 3.7 of NZBC Clause G12/AS1.

12.2 The aquatherm® - lilac Pipes are lilac in colour and marked 'non-potable' for compliance with NZBC Clause G12.3.4. NZBC Clause G12/AS1 Paragraph 4.2 requires signs to be provided at outlets for non-potable water.

12.3 The aquatherm® - lilac Piping System has adequate pipe and fitting size options for water supplies to comply with NZBC Clause G12.3.7(a).

12.4 The aquatherm® - lilac Piping System has demonstrated by test to DIN 8078 that it avoids the likelihood of leakage.

## Installation Information

### Installation Skill Level Requirements

13.1 Installation of the aquatherm® - lilac Piping System for recycled and reclaimed water must be carried out by a Registered Plumber that has undergone and passed training from aquatherm NZ Ltd on installation and connection techniques.

## General

13.2 Installation of the aquatherm® - lilac Piping System must be in accordance with NZBC Clause G12/AS1, in particular Section 7.

13.3 The aquatherm® - lilac 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.

13.4 When installing aquatherm® - lilac pipes 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.

13.5 The 32 mm diameter aquatherm® - lilac pipe SDR 11 and 20 mm diameter aquatherm® - lilac pipe SDR 7.4 may be bent with a minimum radius of 8 times the pipe diameter; however it is preferred to carry out changes in pipe direction with pipe fitting joints. Larger diameter aquatherm® - lilac pipe must not be bent. For these pipes all changes in pipe direction must be achieved through fitting joints.

### Connecting Pipes and Fittings

13.6 There are two methods of connecting the aquatherm® - lilac pipes and fittings together, either by heating the two components with a welding device and pushing them together, or through the use of fusiotherm®-electrofusion sockets.

13.7 In locations where joints between pipes that will be concealed within or beneath concrete slabs or screeds, only fusion welding must be used, mechanical joints must not be used in this situation.

## Charging and Pressure Testing

14.1 Prior to enclosing the piping system a visual check of every fitting is required to ensure all fusion welds have been properly formed.

14.2 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.

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

14.4 Piped services used for recycled and reclaimed water must not show any leakage when subjected to testing in accordance with the aquatherm NZ Ltd requirements as well as 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. Additionally, a non-potable water service must also be tested in accordance with AS/NZS 3500.1 Paragraph 9.6 to ensure that there is no cross-connection between potable and non-potable water supplies.

## Other Investigations

16.1 An assessment was made of the durability of the aquatherm® - lilac Piping System by BRANZ technical experts.

16.2 Site inspections were carried out by BRANZ to examine completed installations and installation methods.

16.3 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.

## Quality

17.1 The aquatherm® - lilac pipe is manufactured by aquatherm GmbH, under an ISO 9001 Quality Management System (TUV CERT Certificate No. 01 100 5348).

17.2 The fusiotherm® pipe (aquatherm® - lilac pipe) is certified by DVGW (registration numbers DW-8501AS2120 and DW-8501AU2224).

17.3 aquatherm NZ Limited is responsible for the quality of the product supplied.

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

## Sources of Information

- AS/NZS 3500.1:2003 Plumbing and drainage - Water services.
- DIN 8078: 1996 Types 1, 2 and 3 polypropylene (PP) pipes. General quality requirements and testing. DIN, Berlin, Germany.
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition May 2007.
- The Building Regulations 1992, up to, and including June 2007 Amendment.

## Basis of Appraisal

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

## Tests

15.1 Tests have been carried out on the fusiotherm® Piping System by SKZ (Suddeutsches Kunststoff-Zentrum) Testing Laboratory in accordance with SKZ specification HR3.10. The test results have been reviewed by BRANZ experts and found to be satisfactory.

15.2 Tests have been carried out on the fusiotherm® Piping System by TGM (Technologisches Gewerbemuseum). The test results have been reviewed by BRANZ experts and found to be satisfactory.



**BRANZ**

In the opinion of BRANZ, **aquatherm® - lilac 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.
3. 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.
4. 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**.
5. 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.
6. BRANZ provides no certification, guarantee, indemnity or warranty, to **aquatherm NZ Ltd** or any third party.

For BRANZ

P Burghout  
Chief Executive

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