

Evaluation of pipe suitability for hot and cold water services

Guidance for pipe specifiers and building consent authorities about piping material for hot and cold water services that complies with the Building Code, as well as evaluating the suitability of pipe material in the consenting and inspection process.

This information was confirmed as current in February 2016. It originally appeared in Codewords newsletters prior to January 2014.

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1st edition

Of interest to Building consent authorities, Master Plumbers, Gasfitters and Drainlayers NZ, Designers

Product certificates

Products with current product certificates are:

- 96/002 – JG Speedfit Ltd. Cross-linked polyethylene pipe and fittings
- 94/005A – Buteline Industries Limited. Polybutylene pipe and fittings.

Interpretation

Clearly, the materials listed in the Acceptable Solution when correctly installed will comply with the Building Code.

Additional materials are listed in the Standards cited in the Verification Method, as follows.

AS/NZS 3500.1.2: 1998 Water Services contains materials and products in Section 2. These are included in the summary of pipe and fitting materials for cold water and Standards at the end of this article. It should be noted that only Section 3 and Appendix B are cited in G12/VM1, and hence the materials listed in Section 2 are not part of the current Verification Method.

AS/NZS 3500.4.2: 1997 Heated Water contains a list of materials in Appendix C. These are included in the summary of pipe and fitting materials and Standards at the end of this article.

This means that pipes and fittings that must be accepted by a building consent authority as complying with the Building Code are those:

- contained in Table 1 of Acceptable Solution G12/AS1
- contained in AS/NZS 3500.4.2, which is referenced in Verification Method G12/VM1
- that hold current product certificates.

Pipes and fittings not covered by the paragraph above may be accepted by a building consent authority as an alternative solution, but only after a thorough investigation including the factors in the table opposite.

Amendments to G12/VM1

The reference to AS/NZS 3500.1 2003 (including Amendment 1) has been updated and includes Section 2 Materials and Products.

In addition to the pipes, there is a general requirement for cold water that all pipes and fittings must comply with AS/NZS 4020 and also have a rated working pressure of at least 1.2 MPa at 20°C.

The reference to AS/NZS 3500.4 2003 (including Amendment 1) has also been updated. This Standard contains a requirement that all pipes and fittings must comply with AS/NZS 4020 and must have rated working pressure of at least 1.0 MPa at 60°C.

Factors to consider when evaluating alternative solutions as being suitable for use with hot and cold potable water

1. Overseas approvals

Many products that are manufactured in Europe have European approvals that specifically include use with potable water (for example, the British Board of Agrément).

Similarly, some products have been approved for use in Australia (Watermarked and comply with AS/NZS 4020). These are listed in:

- AS/NZS 3500.1.2: 1998
- AS/NZS 3500.1: 2003*
- AS/NZS 3500.4: 2003*.

*It is proposed to consult on incorporating these Standards in the Compliance Document G12 Water Supplies in April 2006.

2. The manufacturing Standard including durability tests

- What Standard is the pipe manufactured and installed to?
- Does it contain tests to establish the durability of the pipe for New Zealand conditions?
- For plastic-heated water pipes, where is the stress regression curve for the plastic material to demonstrate the required level of durability to Building Code Clause B2 Durability at the operating temperature?

3. Statements/tests for not contaminating the water

- How does the manufacturer/supplier show that the pipe and fittings will not contaminate the potable water supply?
- Do they demonstrate tests for compliance with AS/NZS 4020 or BS 6920?

4. Resistance to light transmission through the pipe wall

- How does the manufacturer/supplier show the pipe will not transmit light to prevent algae growing in the pipe?

5. Resistance to ultraviolet light - for external installation

- How does the manufacturer/supplier show the pipe is resistant to ultraviolet light in any possible external location?

6. Clear identification to avoid confusion with similar products

- Is the product clearly identified with visible external marking complying with the manufacturing Standard, particularly when compared with similar-looking products intended for a different use?

7. Manufacturer's data relating to intended use

- Does the manufacturer's written recommendation for using the pipe and fittings meet the requirements of Building Code Clause G12 Water Supplies?

8. Appraisal results and accreditation

- Is there any independent supporting documentation showing compliance with the Building Code?

Summary of pipes and fittings materials and standards

Materials for cold water that must be accepted by building consent authorities are as follows:

- Copper pipes - AS 1432 (Type A, B, C)* or NZS 3501
- Galvanised steel pipes and fittings - AS 1074 or NZS/BS 1387
- Polybutylene (PB) pipes and fittings - AS/NZS 2642 Parts 2 and 3
- Polyethylene (PE) pipes and fittings - AS/NZS 4130 and AS/NZS 4129
- PVCu pipes and fittings - AS/NZS 1477
- PVCc pipes and fittings - ASTM D2846
- Stainless steel pipes and fittings - ASTM A269
- Polypropylene (PP) pipes and fittings - Pr-EN 12202

Materials for hot water that must be accepted by building consent authorities are as follows:

- Copper pipes - AS 1432 (Type A, B, C)* and NZS 3501
- Copper alloy pipes - AS 3795*
- Copper alloy fittings - AS 3688*
- Polybutylene (PB) pipes and fittings - AS/NZS 2642 Parts 2 and 3
- Cross-linked polyethylene (PE-X) pipes and fittings - AS 2492 and AS 2537
- Random polymer polypropylene (PP-R) pipes and fittings - DIN 8077
- PVCc pipes and fittings - ASTM D2846
- Stainless steel pipes and fittings - AS 1528.1

Materials for cold water that are being consulted on for inclusion in the G12 Compliance Document at the next amendment are as follows:

- ABS - AS 3518 Parts 1 and 2
- Cast iron fittings - AS/NZS 2544
- Copper alloy pipes - AS 3795*
- Copper and copper alloy fittings - AS 3688*
- Ductile iron pipes and fittings - AS/NZS 2280
- Cross-linked polyethylene (PE-X) pipes and fittings - AS 2492 and AS 2537
- Macrocomposite (PEAI/PE or PEX/Al/PEX) - AS 4176
- PVCm pipes and fittings - AS/NZS 4765
- PVCc pipes and fittings - AS 4441

Materials for hot water that are being consulted on for inclusion in the G12 Compliance Document at the next amendment are as follows:

- Macrocomposite (PE/Al/PE or PEX/Al/PEX) pipes and fittings - AS 4176

* Copper pipe and associated fittings are not dimensionally compatible with copper pipe made to NZS 3501.

All guidance related to G12 Water supplies (<https://www.building.govt.nz/building-code-compliance/g-services-and-facilities/g12-water-supplies/>)

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