



# **aquatherm**

PO Box 99 393, Newmarket, Auckland  
92 Carbine Rd, Mt Wellington, Auckland  
Ph: (09) 570 7204 Fx: (09) 570 7206  
[www.aquatherm.co.nz](http://www.aquatherm.co.nz)

*This branded section has been prepared by  
**Construction Information Limited (MasterSpec) and in conjunction with aquatherm  
NZ Ltd.***

*The downloading and/or use of this section is subject to the following terms and  
conditions:*

- *Users of this section shall rely solely on their own professional judgment and skill in determining the appropriateness of using or referring to this section and to satisfy themselves as to the accuracy of the data it contains.*
- *Users acknowledge that neither Construction Information Limited nor the manufacturer of the products and systems described in the text are in any way liable in respect of any particular use or application of the material provided.*

*For further information on specifying and or other aquatherm products please  
contact.....*

## ***Upper North Island***

*Stephen Derig – 021 533340*

*Steve Starke – 021 735 414*

## ***Central North Island***

*Steve Taylor – 021 42 721*

## ***Lower North Island***

*Martin Reid – 021 421737*

## ***South Island***

*Neil Macdonald – 021 322623*

# 7101AF AQUATHERM FUSIOTHERM® HOT & COLD WATER SYSTEM

## 1. GENERAL

This section deals with **aquatherm Fusiotherm®** and piped water supply systems from the network utility supply authority water main to designated points and appliances, the installation of hot water heating appliances, distributing piped hot water to other appliances, and the installation of tapware.

### Related work

### 1.1 RELATED SECTIONS

Refer to SANITARYWARE, TAPWARE AND ACCESSORIES for tapware selections.

### Building code compliance

### 1.2 BUILDING CODE DURABILITY

Elements covered by this part of the specification, are expected to meet the following durability requirements of the NZBC clause B2 Durability.

50 years for **aquatherm Fusiotherm®**.

Refer to BRANZ Appraisal certificate 539 **aquatherm Fusiotherm®**.

SAI Global certificate SMK02437

### 1.3 BUILDING CODE COMPLIANCE

Work covered by this part of the specification is to be constructed to comply with the following NZBC clauses:

NZBC G12/AS1 Water supplies

SAI Global certificate SMK02437

BRANZ Appraisal certificate 539 **aquatherm Fusiotherm®**

### Documents

### 1.4 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC G12/AS1 Water supplies

AS/NZS 3500.1 Plumbing and drainage - Water services

AS/NZS 3500.4 Plumbing and drainage - Heated water services

AS/NZS 3500.5 Plumbing and drainage - Domestic installations

NZS 4602 Low pressure copper thermal storage electric water heaters

NZS 4606 Storage water heaters

NZS 4607 Installation of thermal storage electric water heaters: valve vented Systems

NZS 4617 Tempering (3-port mixing) valves

NZS 5261 Installation of gas burning appliances and equipment

NZS 7602 Polyethylene pipe (Type 5) for cold water services

AS 3688 Water supply – Copper and copper alloy body compression and capillary fittings and threaded-end connectors

DIN 8077 Polypropylene (PP-R) Pipe dimensions

DIN 8078 Polypropylene (PP-R) pipes types 1, 2 & 3, General quality Requirements and testing.

BRANZ Appraisal 539 **aquatherm Fusiotherm®**

Plumbers, Gasfitters and Drainlayers Act 1976

Documents listed above and cited in the clauses that follow are part of this specification. However this specification takes precedence in the event of it being at variance with the cited document.

### 1.5 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:

**Fusiotherm®** Pipe systems technical manual – For the application in sanitary and heating

Copies of the above literature are available from **aquatherm**

Web: www.aquatherm.co.nz  
Email: sales@aquatherm.co.nz  
Telephone: 0-9-570 7204  
Facsimile: 0-9-570 7206

## Requirements

- 1.6 NO SUBSTITUTIONS  
Substitutions are not permitted to any specified **aquatherm Fusiotherm®** or associated products, components or accessories.  
Systems provide performance, not products.
- 1.7 QUALIFICATIONS  
Plumbers to be certified **aquatherm Fusiotherm®** installers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a plumber registered under the Plumbers, Gasfitters and Drainlayers Act 1976.
- 1.8 PIPEWORK LAYOUTS  
~
- 1.9 INFORMATION FOR MAINTENANCE MANUAL  
Supply maintenance manual information to the requirements set out in PRELIMINARIES AND GENERAL.

## Warranties

- 1.10 WARRANTY  
Warrant this work under normal environmental and use conditions against failure of materials and execution.  
Warranty period: 2 years
- Refer to the PRELIMINARIES AND GENERAL section for the required form of warranty agreement and details of when completed warranty must be submitted.
- 1.11 MATERIAL WARRANTY  
Provide an **aquatherm** GmbH materials and installation warranty in the supplier's standard form including NZ\$5,000,000 cover for third party legal liability.  
Warranty period: 10 years  
From: Date of completion of system testing

## Performance

- 1.12 TESTING  
Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Ensure that any connected tapware is isolated before commencing testing. Test to **aquatherm Fusiotherm®** testing procedures as applicable. Provide completed test records in the **aquatherm** New Zealand Products Catalogue standard form.

## 2. PRODUCTS

### Materials

- 2.1 POLYETHYLENE PIPE  
To NZS 7602, type 5 (over 0.7 kPa) complete with fittings and accessories to the pipe manufacturer's requirements and all brand matched.
- 2.2 FUSIOTHERM POLYPROPYLENE PP-R 80 WATER PIPE  
**Fusiotherm®** pipes to DIN 8077 and DIN 8078 complete with fusion welded fittings and accessories brand-matched.
- 2.3 WATER METER  
To the requirements of the network utility operator and building operator.

- 2.4 VALVES  
Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief valve, pressure relief valve and isolating valves to NZBC G12/AS1: Water supplies.
- 2.5 TEMPERING VALVE  
Tempering valve to NZS 4617 to NZBC G12/AS1: Water supplies.
- 2.6 INSULATION  
Pre-formed pipe sections complete with bends and fittings, with fixing tape to the manufacturer's requirements.

#### **Materials - hot water heating appliances**

- 2.7 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE  
A grade to NZS 4606, part 3 ceramic-coated steel thermal storage cylinder, insulated and complete with required fittings.
- 2.8 ELECTRIC HOT WATER CYLINDER, LOW PRESSURE  
A grade to NZS 4602, copper thermal storage cylinder insulated and complete with pressure reducing valve and required fittings.
- 2.9 ELECTRIC HOT WATER CYLINDER, UNDER-SINK, LOW PRESSURE  
A grade to NZS 4602, copper thermal storage cylinder insulated and complete with required fittings.
- 2.10 ELECTRIC BOILING CYLINDER, WALL MOUNTED  
Wall-mounted boiling water heater in pre-finished cabinet, complete with tap draw off.
- 2.11 GAS HOT WATER HEATER, STORAGE TYPE  
Insulated cylinder with an integral gas burner and flue.
- 2.12 GAS HOT WATER HEATER, CONTINUOUS FLOW TYPE  
Continuous flow unit with an integral gas burner and flue.

#### **Components**

- 2.13 PIPE CLAMPS  
**Fusiotherm**<sup>®</sup> proprietary pipe clamps and clips.
- 2.14 VALVES  
**Fusiotherm**<sup>®</sup> proprietary valves and ball cocks as selected and required.

#### **Accessories**

- 2.15 FIRE RESISTANT SEALER  
Gunnable inorganic or silicone elastomer sealant, packed to maintain the specified fire resistance rating of the floor or wall.
- 2.16 FIRE RESISTANT FOAM SEALER  
Two-part silicone foam elastomer sealant, packed to maintain the specified fire resistance rating of the floor or wall.
- 2.17 FIRE RESISTANT STRIP  
Intumescent material mounted on a flexible fire retardant strip used in conjunction with the selected sealer.
- 2.18 FIRE RESISTANT COLLARS  
Corrosion resistant steel collar or canister with intumescent packing to maintain the specified fire resistant rating of the floor or wall.

### **3. EXECUTION**

## Conditions

- 3.1 **HANDLE AND STORE**  
Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover, out of direct sunlight, on a clean level area, stacked to eliminate movement and away from work in progress to **Fusiotherm**<sup>®</sup> Pipe systems technical manual, section 4 Installation principles.
- 3.2 **CORE HOLES AND SLEEVES**  
Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.
- 3.3 **FASTENING TECHNIQUE**  
Fix pipework using **Fusiotherm**<sup>®</sup> proprietary pipe brackets, spacing to **Fusiotherm**<sup>®</sup> Pipe systems technical manual, section 4 Installation principles. Ensure brackets are set out as fixed or sliding points **Fusiotherm**<sup>®</sup> Pipe systems technical manual, section 4 Installation principles.
- 3.4 **CONCEAL**  
Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.
- 3.5 **IN CONCRETE INSTALLATION**  
Install directly in concrete to **Fusiotherm**<sup>®</sup> pipe installation procedures.
- 3.6 **IN GROUND INSTALLATION**  
Install to AS/NZS 3500.5, clause 2.13.3 Under concrete slabs.
- 3.7 **THERMAL MOVEMENT**  
Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations. Install pipework to **Fusiotherm**<sup>®</sup> Pipe systems technical manual, section 4 Installation principles.
- 3.8 **PIPE SIZE**  
Flow rates to each outlet to be no less than those given in NZBC G12/AS1: Water supplies, table 3, Acceptable flow rates to sanitary fixtures, with pipe size as determined in table 4, Tempering valve and nominal pipe diameters and the **Fusiotherm**<sup>®</sup> Pipe systems technical manual.

## Application - jointing

- 3.9 **JOINTING POLYETHYLENE PIPE**  
Seal ring compression joints and electrofusion to NZBC G12/AS1: Water supplies.
- 3.10 **FUSIOTHERM POLYPROPYLENE PP-R 80 WATER SUPPLY**  
Size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Run pipes complete with all fittings, support and fixing, fusion weld joints and install to manufacturers specifications, all to NZBC G12/AS1: Water supplies. Conceal pipework and pressure test before the wall linings are fixed.

## Application - distribution systems

- 3.11 **WATER SUPPLY CONNECTION**  
Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to NZBC G12/AS1: Water supplies.
- 3.12 **COLD WATER INSTALLATION**  
From connection point, size the runs and branches to deliver the acceptable flow rate to NZBC G12/AS1: Water supplies, table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures. Lay out pipes in straight runs with support spacing to NZBC G12/AS1: Water supplies, table 7, Water

supply pipework support spacing firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with bends to **Fusiotherm**<sup>®</sup> requirements, complete with necessary valves and fittings.

- 3.13 **MAIN ISOLATING VALVE**  
Install a **Fusiotherm**<sup>®</sup> isolating ball cock in an accessible position at the point of entry to the building.
- 3.14 **IN LINE FILTER**  
Install an in line filter immediately adjacent to the isolating valve in an accessible position to allow for easy cleaning.

#### **Application - hot water systems**

- 3.15 **HOT WATER CYLINDER INSTALLATION GENERALLY**  
Install hot water cylinders complete to the manufacturer's requirements and with seismic restraint as required to storage cylinders, to NZBC G12/AS1: Water supplies, 6.10, Water heater installation. Valve-vented systems to NZS 4607.
- 3.16 **INSTALL LOW PRESSURE UNDER-SINK HOT WATER CYLINDER**  
Install hot water cylinders complete to the manufacturer's requirements and to NZBC G12/AS1: Water supplies, 6.10 Water heater installation. Connect to sink tap.
- 3.17 **INSTALL WALL-MOUNTED BOILING CYLINDER**  
Install to the cylinder manufacturer's stated requirements. Locate where shown.
- 3.18 **GAS HOT WATER HEATER INSTALLATION, STORAGE TYPE**  
Install complete with the necessary fittings to the manufacturer's requirements and in accordance with NZBC G12/AS1: Water supplies, 6.10 Water heater installation and to NZS 5261. Install flue in accordance with the manufacturer's details and requirements.
- 3.19 **GAS HOT WATER HEATER INSTALLATION, CONTINUOUS FLOW TYPE**  
Install complete with the necessary fittings to the manufacturer's requirements and in accordance with NZBC G12/AS1: Water supplies, 6.10, Water heater installation. Install flue in accordance with the manufacturer's details and requirements.
- 3.20 **HOT WATER PIPEWORK**  
Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to NZBC G12/AS1: Water supplies, table 7 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with bends to **Fusiotherm**<sup>®</sup> requirements, complete with all necessary valves and fittings.
- 3.21 **INSULATION**  
Lag all pipes with insulation to the manufacturer's requirements. Refer to SELECTIONS for type.
- 3.22 **INSTALL TEMPERING VALVE**  
Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions.

#### **Application - fire resistant work**

- 3.23 **FIRE RESISTANT SEALER**  
Thoroughly clean the penetration of the floor or wall. Pack if necessary to support the sealant. Implant the sealant to the manufacturer's requirements to ensure full penetration and to obtain the required fire resistance rating. Tool the surface flush and smooth and allow to cure.
- 3.24 **FIRE RESISTANT FOAM SEALER**  
Thoroughly clean the opening and box each side with fibreboard to contain the sealer. Mix sealer and inject into the opening to the volume and time limits in the sealer

manufacturer's requirements to obtain the required fire resistance rating. Allow to cure, remove boxing and make good any voids with sealer.

- 3.25 **FIRE RESISTANT STRIP**  
Wrap around the pipe and tape in place in the hole, caulking each side with fire resistant sealer. Tool the surface flush and smooth and allow to cure.
- 3.26 **FIRE RESISTANT COLLARS**  
Insert circular type collars into the holes provided in the concrete. Supply canister type collars and locate and fix to boxing before the concrete is placed. Comply with the manufacturer's requirement for use of these elements complete with accessories, tapes and sealants.
- 3.27 **FIRE RESISTANT PANELS**  
Secure steel frames or mullions within the openings to the panel manufacturer's details. Cut panels to suit the opening and the services and fit neatly and flush with required maximum clearances. Seal round panels and services with fire resistant foam sealer to maintain the fire resistance rating of the floor or wall.

#### **Installation - tapware**

- 3.28 **INSTALLING APPLIANCE ISOLATING VALVES - CONCEALED**  
Install isolating valves for appliances in accessible positions. Locate in adjacent cupboards and position to allow for easy connection and operation.
- 3.29 **INSTALLING TAPWARE**  
Install to manufacturer's requirements.

#### **Completion**

- 3.30 **FLUSH OUT PIPEWORK**  
Flush out pipework. Remove all filters, clean and reassemble.
- 3.31 **REPLACE**  
Replace damaged or marked elements.
- 3.32 **LEAVE**  
Leave work to the standard required by following procedures.
- 3.33 **REMOVE**  
Remove debris, unused materials and elements from the site.

### **4. SELECTIONS**

#### **Water main**

- 4.1 **POLYETHYLENE WATER MAIN**  
Size: 25 mm outside diameter
- 4.2 **FUSIOTHERM POLYPROPYLENE PP-R 80 WATER MAIN**  
Size: 25 mm outside diameter

#### **Pipework**

- 4.3 **FUSIOTHERM POLYPROPYLENE PP-R 80 PIPE WORK**  
Branch off take: 16 mm outside diameter **Fusiotherm**<sup>®</sup>  
Branch main: 20 mm outside diameter **Fusiotherm**<sup>®</sup>  
Main: 20 mm outside diameter **Fusiotherm**<sup>®</sup>
- 4.4 **HOT WATER RING MAIN FUSIOTHERM POLYPROPYLENE PP-R 80**  
Pipework: 20 mm outside diameter **Fusiotherm**<sup>®</sup> FASER pipework  
Insulation: ~  
Pump: ~

- 4.5 INSULATION  
 Brand: ~  
 Material: ~  
 Wall thickness: ~  
 Finish: ~

**Hot water systems**

- 4.6 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE  
 Brand: ~  
 Model size: ~

- 4.7 ELECTRIC HOT WATER CYLINDER, LOW PRESSURE  
 Brand: ~  
 Model size: ~

- 4.8 ELECTRIC HOT WATER CYLINDER, UNDER-SINK, LOW PRESSURE  
 Brand: ~  
 Model size: ~

- 4.9 ELECTRIC BOILING CYLINDER, WALL MOUNTED  
 Brand: ~  
 Model size: ~

- 4.10 GAS HOT WATER HEATER, STORAGE TYPE  
 Brand: ~  
 Model size: ~

- 4.11 GAS HOT WATER HEATER, CONTINUOUS FLOW TYPE  
 Brand: ~  
 Model size: ~  
 Remote controller: ~

**Valves and accessories**

- 4.12 MAIN ISOLATING VALVE  
 Location: ~  
 Brand/type: **Fusiotherm®** ball cock

- 4.13 IN LINE FILTER  
 Location: ~  
 Brand/type: ~

- 4.14 FLOOR/ZONE ISOLATING VALVES  
 Location: ~  
 Brand/type: **Fusiotherm®** ball cock

- 4.15 APPLIANCE ISOLATING VALVES - CONCEALED  
 Appliance: ~  
 Brand/type: **Fusiotherm®** ball cock or concealed valves to suit application

- 4.16 APPLIANCE ISOLATING VALVES - EXPOSED  
 Appliance: Washing machine  
 Brand/type: Refer to tapware selections

- 4.17 TEMPERING VALVE  
 Location: ~  
 Brand/type: ~

**Fire resistant sealers**

- 4.18 FIRE RESISTANT SEALER  
Location: ~  
Manufacturer: ~  
Type/number: ~
- 4.19 FIRE RESISTANT FOAM SEALER  
Location: ~  
Manufacturer: ~  
Type/number: ~
- 4.20 FIRE RESISTANT STRIP  
Location: ~  
Manufacturer: ~  
Type/number: ~
- 4.21 FIRE RESISTANT COLLARS  
Location: ~  
Manufacturer: ~  
Type/number: ~  
Pipe size: ~ mm diameter