



BRANZ Appraised

Appraisal No. 1293 [2025]

SPARTAN CYLINDER RESTRAINT KITS



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BRANZ Appraisals

Technical Assessments of products for building and construction.

SPARTAN

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Product

- 1.1 The Spartan Cylinder Restraint Kits are for seismically restraining water storage cylinders.

Scope

- 2.1 The Spartan Cylinder Restraint Kits are used for seismically restraining water storage cylinders up to 360 litres.
- 2.2 The Spartan Cylinder Restraint Kits incorporating galvanised components are for use with timber-framed buildings in dry interior environments.
- 2.3 The Spartan Cylinder Restraint Kits incorporating stainless steel components are for use with timber-framed buildings in dry interior or in external environments.
- 2.4 Spartan Cylinder Restraint Kits are for use in timber-framed buildings designed and built in accordance with NZS 3604.

Building Regulations

New Zealand Building Code [NZBC]

- 3.1 In the opinion of BRANZ, Spartan Cylinder Restraint Kits, if designed, used, 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 B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. The Spartan Cylinder Restraint Kits meet the requirements for loads arising from earthquake [i.e. B1.3.3 (f)]. See Paragraphs 8.1 and 8.2.

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years. The Spartan Cylinder Restraint Kits meet this requirement. See Paragraphs 9.1 and 9.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Spartan Cylinder Restraint Kits meet this requirement.

Technical Specification

- 4.1 The galvanised Spartan Cylinder Restraint Kit components and accessories supplied by Aqualine Trading Limited are:
- Galvanised strap, 25 x 1 mm, G250 steel. These have 3.5 mm and 6.5 mm diameter holes.
 - Galvanised L-brackets, 90 mm long, 25 mm wide, 2 mm thick, with four 5.1 mm diameter holes drilled along the long leg.
 - Galvanised tensioning device.
 - Galvanised 14 g x 65 mm T17 Tek screws.
 - Galvanised M5 bolts, nuts and washers for connecting the straps to the brackets.
- 4.2 The stainless steel Spartan Cylinder Restraint Kit components and accessories supplied by Aqualine Trading Limited are:
- Grade 304 stainless steel strap, 25 x 1 mm, G250 steel. These have 3.5 mm and 6.5 mm diameter holes.
 - Grade 304 stainless steel L-brackets, 90 mm long, 25 mm wide, 2 mm thick, with four 5.1 mm diameter holes drilled along the long leg.
 - Grade 304 stainless steel tensioning device.
 - Grade 304 stainless steel 14 g x 65 mm T17 Tek screws.
 - Grade 304 stainless steel M5 bolts, nuts and washers for connecting the straps to the brackets.
- 4.3 The cylinder restraint kits are also available branded as TIVA Cylinder Restraint Kits, with identical components.

Handling and Storage

- 5.1 The Spartan Cylinder Restraint Kits are reasonably robust, but must be kept dry and in their original packaging prior to installation.

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
- Spartan Cylinder Restraint Kit Instructions, v25.4.9; or,
 - TIVA Cylinder Restraint Kit Instructions, v25.4.9.
- 6.2 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 Galvanised Spartan Cylinder Restraint Kits are for use in dry, internal environments. Stainless steel Spartan Cylinder Restraint Kits are for use in interior or exterior environments.
- 7.2 Spartan Cylinder Restraint Kits are an Acceptable Solution in accordance with NZBC Acceptable Solution G12/AS1 Paragraph 6.11.4.
- 7.3 Floor framing, flooring and platforms must be designed to support the water storage cylinder.

Structure

- 8.1 For water cylinders up to 200 litres, a 2-strap Spartan Cylinder Restraint Kit may be used. For water cylinders from 200 to 360 litres, a 3-strap Spartan Cylinder Restraint Kit must be used.
- 8.2 The Spartan Cylinder Restraint Kits must not be used for restraining cylinders in the attic space of two-storey dwellings within structures in NZS 3604 Seismic Zone 4.

Durability

Serviceable Life

- 9.1 The components of galvanised Spartan Cylinder Restraint Kits are all steel. As long as they are kept dry in service they are expected to have the same serviceable life as the cylinders that they restrain.
- 9.2 The components of stainless steel Spartan Cylinder Restraint Kits are all Grade 304 stainless steel. They are expected to have the same serviceable life as the cylinders that they restrain.

Maintenance

- 10.1 The galvanised Spartan Cylinder Restraint Kits will require little maintenance as long as they are kept dry. Any damaged straps or fixings must be replaced.
- 10.2 The stainless steel Spartan Cylinder Restraint Kits will require little maintenance. Any damaged straps or fixings must be replaced.

Installation Information

Installation Skill Level Requirement

- 11.1 All design and building work must be carried out in accordance with the Spartan (or TIVA) Cylinder Restraint Kits Technical Literature and this Appraisal. All building work must be undertaken by competent and experienced tradespeople conversant with the Spartan Cylinder Restraint Kits.

Spartan Cylinder Restraint Kits Installation

- 12.1 Timber vertical blocking as described in NZBC Acceptable Solution G12/AS1 Paragraph 6.11.4 and Figure 14 must be installed. For external installations, suitably treated timber and fixings must be used. Additional timber framing may be required in retrofit situations to ensure adequate strap fixing is available. Separation between any treated timber and the water cylinder may be necessary.
- 12.2 Galvanised and stainless steel Spartan Cylinder Restraint Kits are installed in accordance with the Technical Literature. The brackets are screwed to the framing using the supplied screws. A suitable length of strap is then cut from the supplied reel. This is fixed to the brackets with the M5 bolts and nuts. The tensioner is then used to take up the slack in the strap.
- 12.3 Straps must not be installed where they clash with the water heater inlet, outlet or controls. Where the 100 mm maximum strap clearance from the top or bottom of the cylinder cannot be achieved, straps may be placed within the top and bottom 25%, and one or two additional straps may be required. 1 additional strap placed centrally for water heaters up to 200 litres and 2 additional evenly spaced straps for cylinders 200-360 litres.

Basis of Appraisal

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

Tests

- 13.1 Tensile tests were carried out to determine the strength and holding of different components of the system. These test results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

- 14.1 Structural calculations have been carried out. These have been reviewed by BRANZ and found to be satisfactory.
- 14.2 The Technical Literature has been examined by BRANZ and found to be satisfactory.



Quality

- 15.1 Details of the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 15.2 Aqualine Trading Limited is responsible for the quality of the product supplied.
- 15.3 The quality of installation, in accordance with the instructions of Aqualine Trading Limited, is the responsibility of the installer.
- 15.4 Building owners are responsible for the maintenance of Spartan Cylinder Restraint Kits in accordance with the instructions of Aqualine Trading Limited.

Sources of Information

- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



In the opinion of BRANZ, **Spartan Cylinder Restraint Kits** are 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 **Aqualine Trading Limited**, 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. **Aqualine Trading Limited:**
 - 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 quality of work;
 - 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 **Aqualine Trading Limited**.
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 **Aqualine Trading Limited** or any third party.

For BRANZ



Claire Falck

Chief Executive

Date of Issue:

14 August 2025