



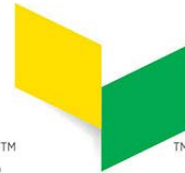
BRANZ Appraised

Appraisal No. 955 [2017]

USG BORAL WET AREA SYSTEMS

USG BORAL

INNOVATION INSPIRED BY YOU.™



Appraisal No. 955 [2017]

BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 USG Boral Wet Area Systems are for the interior lining of timber and steel framed walls and ceilings in wet areas such as bathrooms, laundries, kitchens and toilets where a water-resistant lining material is desirable.
- 1.2 USG Boral Wet Area Systems are based on USG Boral MultiStop™ 4 and USG Fiberock® Aqua-Tough™ water resistant plasterboards.

Scope

- 2.1 USG Boral Wet Area Systems have been appraised for use as a wet area wall and ceiling lining in buildings within the following scope:
 - on framed walls and ceilings within the scope limitations on NZS 3604; and,
 - on timber and light gauge steel framed walls and ceilings subject to specific design.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, USG Boral Wet Area Systems, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. USG Boral Wet Area Systems meet the requirements for loads arising from self-weight and impact [i.e. B1.3.3 (a) and (j)]. See Paragraphs 9.1 - 9.3.

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years and B2.3.1 (c) 5 years. USG Boral Wet Area Systems meet these requirements. See Paragraphs 10.1 - 10.5.

Clause E3 INTERNAL MOISTURE: Performance E3.3.4, E3.3.5 and E3.3.6. USG Boral Wet Area Systems meet these requirements. See Paragraphs 13.1 - 13.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. USG Boral Wet Area Systems meet this requirement and will not present a health hazard to people.

Technical Specification

4.1 The USG Boral plasterboards and accessories used in the USG Boral Wet Area System and supplied by USG Boral Building Products NZ are as follows:

USG Boral Plasterboards

- **USG Boral MultiStop™ 4** is a paper-bound, modified water-resistant gypsum-plaster core sheet lining material. Sheets are available in various edge profiles and lengths from 2400 mm to 4800 mm. Refer to Table 1. The nominal sheet weight of USG Boral MultiStop™ 4 is 9.7 kg/m² for 10 mm thick sheets and 11.8 kg/m² for 13 mm thick sheets. USG Boral MultiStop face paper is light green in colour.
- **USG Fiberock® Aqua-Tough™** is a paper-less, gypsum-plasterboard reinforced with cellulose fibre. It is available in 13 mm and 16 mm sheet thicknesses and a sheet width of 1200 mm. Sheets are available with a recessed edge profile and lengths of 2400 mm, 2700 mm and 3000 mm. The nominal sheet weight is 12 kg/m² for 13 mm thick sheets and 15 kg/m² for 16 mm thick sheets. USG Fiberock® Aqua-Tough™ is off white in colour.
- **Corner Support Angle** - USG Boral DJ4040 - 40 x 40 mm galvanised steel angle available in a length of 3.0 m.
- **USG Boral Accessories and USG Boral Jointing Compounds** - As specified in the Technical Literature.

4.2 System components and accessories for USG Boral Bracing Systems, which are supplied by the building contractor are:

Fasteners

- Minimum screw sizes are as follows:
 - **25 mm x 6 g drywall**, gold passivated, bugle head, coarse thread screw with an 8 mm head for fixing to timber framing.
 - **30 mm x 6 g drywall**, gold passivated, bugle head, coarse thread screw with an 8 mm head for fixing to timber framing.
 - **45 mm x 6 g drywall**, gold passivated, bugle head, coarse thread screw with an 8 mm head for fixing to timber framing.
 - **25 mm x 6 g drywall**, gold passivated, bugle head, fine thread screw with an 8 mm head for fixing to steel framing.

Adhesive

- Adhesive must comply with AS 2753 for adhering plasterboard to timber framing (for non tiled areas only).

Waterproofing

- A waterproofing system complying with AS/NZS 4858.

Finishes

4.3 Finishes such as tiling, flexible sheet vinyl, paints and wallpapers have not been assessed and are outside the scope of this Appraisal.

Table 1: USG Boral Wet Area Plasterboards Available Sheet Sizes

Plasterboard Type	Sheet Thickness [mm]	Sheet Edge Profile	Sheet Width [mm]	Sheet Length [mm]					
				2400	2700	3000	3600	4200	4800
MultiStop™ 4	10	RE/RE	1200	✓	✓		✓		✓
		RE/SE	1350				✓		✓
	13	RE/RE	1200		✓		✓		✓
Fiberock® Aqua-Tough™	13	RE/RE	1200			✓			
	16	RE/RE	1200			✓			

Handling and Storage

- 5.1 The best results are achieved when USG Boral plasterboards are treated as a finishing material and protected from damage. Sheets must be stacked flat and kept dry at all times. For limits on stack heights see the Technical Literature. Sheets must be carried on edge and not dragged.
- 5.2 All accessories must be kept dry.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for USG Boral Wet Area Systems. 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

Framing

- 7.1 Timber wall framing behind USG Boral Wet Area Systems must be treated as required by NZBC Acceptable Solution B2/AS1.
- 7.2 Supporting framing must comprise one of the following subject to the minimum sizes, dwang centres and all other frame requirements of the USG Boral Wet Area Systems Technical Literature:
- Timber framing must be designed and constructed in accordance with NZS 3604, or to a specific design using NZS 3603 and AS/NZS 1170.
 - Steel framing must be to a specific engineering design meeting the requirements of the NZBC.
- 7.3 Refer to Paragraph 15.2 regarding recommended moisture content of timber framing.

General

- 8.1 USG Boral Wet Area Systems provide a water-resistant lining as a base for finishing systems in wet areas such as bathrooms, laundries, kitchens and toilets. The typical finishes are ceramic tiles and flexible sheet vinyl to walls, and paint and wallpaper to walls and ceilings.
- 8.2 USG Boral Wet Area Systems must not be used in the following situations:
- For bracing applications in shower areas or adjacent baths [See Paragraphs 8.4 and 9.2].
 - In areas of high humidity [above 90% RH] or continually wet areas such as group showers, steam rooms, or swimming pools.
 - Installed over a vapour barrier.
 - Applied directly to masonry, concrete or solid plaster.
 - Applied over other sheet lining materials.
 - Used externally of the building envelope.
 - Exposed to temperatures of 52°C or greater for prolonged periods. [Refer to appliance and fitting manufacturers for installation details.]
- 8.3 USG Boral plasterboards may be substituted for some other USG Boral plasterboards in specific USG Boral plasterboard Bracing Systems. Refer to the relevant systems technical literature for details.

Wet Areas

- 8.4 Wet areas are spaces where sanitary fixture and sanitary appliances are located such as bathrooms, laundries, kitchens and toilets. There are two general categories of wet areas as follows:
1. **Water Splash** – These are areas subject to intermittent splashing of water such as around baths, vanities, tubs and sinks.
 2. **Shower Areas** – These are areas subject to frequent and heavy water splash such as enclosed showers, unenclosed shower zones and showers over baths.

- 8.5 Both the above wet area categories must be finished with surfaces and joints that are impervious and easily cleaned. In addition, shower areas must be waterproofed. This can be achieved using proprietary rigid shower lining systems, flexible vinyl shower wall finish, or tiling. Tiled shower areas must include a wet area waterproofing membrane system under the tiles.

Tiling

- 8.6 USG Boral plasterboards are suitable as a substrate for tiling up to the following weights:

- 10 and 13 mm USG Boral MultiStop™ 4 up to 32 kg/m²
- 13 and 16 mm USG Fiberock® Aqua-Tough™ up to 50 kg/m².

Note: Most ceramic and porcelain wall tiles weigh less than 20kg/m². For further information on tiling consult the BRANZ Good Practice Guide – Tiling.

Structure

Bracing

- 9.1 USG Boral MultiStop™ 4 and USG Fiberock® Aqua-Tough™ can be used in USG Boral plasterboard bracing elements. Refer to BRANZ Appraisal No. 899 [2015].
- 9.2 USG Boral MultiStop™ 4 and USG Fiberock® Aqua-Tough™ must not be used for bracing in shower areas or behind baths.

Impact Resistance

- 9.3 USG Boral MultiStop™ 4 and USG Fiberock® Aqua-Tough™ plasterboards provide adequate resistance to soft body impact, based upon experience of use in domestic and light commercial applications. USG Fiberock® Aqua-Tough™ is recommended by USG Boral where high impact resistance is desired.

Durability

Serviceable Life

- 10.1 USG Boral Wet Area Systems have a serviceable life of at least 15 years as a fully protected shower or water splash lining. As a general wall and ceiling lining USG Boral Wet Area Systems will have a serviceable life in excess of 50 years. The ability of USG Boral plasterboards to remain durable is dependent on them being protected and remaining dry in service, and being maintained in accordance with this Appraisal.

Maintenance

- 10.2 The building must be maintained weathertight and all lining systems protected from internal and external moisture.
- 10.3 Finishes to water splash and shower areas, including tiles, grout, waterproof membranes, shower liners, sealants and flexible sheet vinyl must be checked to ensure the integrity of the system is maintained. They must be repaired or replaced if necessary. When repairing or replacing finishes, the USG Boral plasterboard substrate must be checked for defects and repaired or replaced, as required.
- 10.4 For flexible sheet vinyl, particular attention must be paid to joints especially at corners. Checks should be made to ensure the vinyl has not been punctured. Where damage has occurred, repairs must be made immediately.
- 10.5 Impact damage to USG Boral plasterboard, resulting in small holes and cracks, may be patched, stopped and finished. For larger areas of damage, expert advice on repair must be sought from USG Boral Building Products NZ.

Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to USG Boral Wet Area Systems from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

Fire Affecting Areas Beyond the Fire Source

Internal Surface Finishes

- 12.1 The Material Group Number for USG Boral MultiStop™ 4 and USG Fiberock® Aqua-Tough™ without applied paint, tile or wallpaper finishes is 1-S. When an applied finish is applied over USG Boral Wet Area Systems, the Material Group Number must be obtained from the manufacturer or supplier of the finish product or system, for the complete lining system. USG Boral Wet Area Systems can be used as internal surface linings where permitted by NZBC Performance Clause C3.4 [a].
- 12.2 In all Risk Groups, where foamed plastics building materials or combustible insulating materials form part of a wall system, the complete system including the internal lining and finishes must achieve a Group Number of not more than three.
- 12.3 In buildings with a SH Risk Group classification, there are no internal surface finish requirements for USG Boral Wet Area Systems (with or without an applied finish) unless foamed plastics building materials or combustible insulating materials form part of the wall system.

Internal Moisture

- 13.1 When installed in accordance with this Appraisal, USG Boral Wet Area Systems will provide wall surfaces adjacent to sanitary fixtures and sanitary appliances that are impervious and easily cleaned.
- 13.2 The construction methods meet with the internal moisture requirements of the NZBC Acceptable Solution E3/AS1.
- 13.3 To minimise internal condensation, adequate levels of ventilation and thermal resistance must be provided to all spaces where moisture may be generated.

Installation Information

Installation Skill Level Requirement

- 14.1 Installation of USG Boral Wet Area Systems must be completed by, or under the supervision of, a Licenced Building Practitioner with the relevant Licence Class, in accordance with the Technical Literature and this Appraisal.

General

- 15.1 USG Boral Wet Area Systems must be installed in accordance with the Technical Literature. For inspection, reference must be made to the Technical Literature.

Framing

- 15.2 To achieve an acceptable decorative finish, the walls must not be lined unless the moisture content of timber framing is less than 18%. USG Boral Building Products NZ recommend a moisture content of 8–12% where buildings are to be air conditioned or centrally heated.

Cutting

- 15.3 USG Boral plasterboards are easily cut by scoring the face paper with a sharp short-bladed trimming knife, and then snapping the plasterboard away from the cut face and cutting the back paper, or by sawing. Use of a metal straightedge facilitates clean straight cuts. Cut edges can be tidied up by using a knife. Paper dags should be removed.
- 15.4 USG Fiberock® Aqua-Tough™ is stronger than paper-faced plasterboard, but can still be cut by scoring and snapping. The sheets may also be cut with a hand saw or a power saw fitted with a dust extraction system. Cut edges may be smoothed with a sanding block or rasp.

Fixing Sheets

Non-Tiled Areas

- 16.1 USG Boral MultiStop™ 4 and USG Fiberock® Aqua-Tough™ sheets may be installed vertically or horizontally. Sheets are fixed with drywall screws at 300 mm centres around the perimeter of the sheet, and with adhesive on all intermediate studs and dwangs. Adhesive must not be used under fasteners. A 5-10 mm gap must be left between the floor and the bottom of the sheet.

Tiled Areas

- 16.2 Control joints must be provided at maximum 4 m centres. Internal corners in shower areas must be reinforced with a USG Boral DJ4040 40 x 40 mm galvanised steel angle prior to lining the walls.
- 16.3 USG Boral MultiStop™ 4 and USG Fiberock® Aqua-Tough™ sheets may be installed vertically or horizontally. Sheets are fixed with drywall screws at 100 mm centres to the perimeter of the wall and to all intermediate studs. Adhesive must not be used in place of screws.

Ceilings

- 16.4 Supports of timber or steel battens or ceiling joists must be provided at maximum 450 mm centres for 10 mm thick USG Boral MultiStop™ 4. The maximum span for 13 mm thick USG Boral MultiStop™ 4 and USG Fiberock® Aqua-Tough™, and 16 mm USG Fiberock® Aqua-Tough™ is 600 mm centres.
- 16.5 USG Boral plasterboard sheets are fixed with screws at the sheet edges and along the centreline. Daubs of adhesive are placed at maximum 200 mm centres between the screws.

Penetrations and Sealants

- 17.1 All cut-outs for penetrations must be made neatly using a hole saw. Cut-outs should be made approximately 12 mm diameter greater than the penetrations.
- 17.2 A bead of sealant must be placed to the full thickness of the plasterboard sheet around all penetrations, at bath rims and preformed shower bases and where an impervious junction is required at the floor/wall line.
- 17.3 In tiled areas, a bead of sealant 6 mm wide must also be placed to the full thickness of the tiles where the above situation occurs. The sealant manufacturer's technical literature must be followed for installation.

Jointing and Finishing

- 18.1 Jointing must be carried out in accordance with the Technical Literature.
- 18.2 Tiled shower areas must incorporate a waterproofing membrane over USG Boral Wet Area Systems. Waterproofing membranes are outside the scope of this Appraisal and must otherwise be specified and approved.

Health and Safety

- 19.1 Dust resulting from the sanding of stopping and finishing compounds may be a respiratory irritant, and the use of a suitable facemask is recommended.

Basis of Appraisal

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

Tests

- 20.1 USG Boral plasterboards have been assessed for the following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, edge hardness, hard and soft body impact tests and humidified deflection.
- 20.2 Cone calorimeter tests to ISO 5660 have been carried out by BRANZ.

Investigations

- 21.1 The USG Boral Wet Area Systems Technical Literature has been examined by BRANZ and found to be satisfactory.
- 21.2 Site visits were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.
- 21.3 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.

Quality

- 22.1 USG Boral Plasterboard Pty Ltd's manufacturing process and details of the quality and composition of the materials, have been examined by BRANZ and found to be satisfactory.
- 22.2 The quality management systems of USG Boral Plasterboard Pty Ltd have been assessed and registered by SAI Global as meeting the requirements of ISO 9001, Registration No. QEC6235.
- 22.3 The manufacture of USG Fiberock® Aqua-Tough™ has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ has taken note of product certification covering quality aspects associated with the product. BRANZ also undertakes an ongoing review of product quality on an inwards goods basis.
- 22.4 USG Boral Building Products NZ is responsible for the quality of the product supplied.
- 22.5 The quality of the application and finish on-site is the responsibility of the installation, stopping and finishing contractors.
- 22.6 Designers are responsible for the design of buildings.
- 22.7 Building owners are responsible for the maintenance in accordance with the instructions of USG Boral Building Products NZ.

Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2588: 1998 Gypsum Plasterboard.
- AS/NZS 4858: 2004 Wet area membranes
- ISO 5660: 2002 Reaction-to-fire tests -- heat release, smoke production and mass loss rate -- Part 1: Heat release rate [cone calorimeter method] and Part 2: Smoke production rate [dynamic measurement].
- NZS 3603: 1993 Timber structures standard.
- NZS 3604: 2011 Timber-framed buildings.
- BRANZ Good Practice Guide Tiling, April 2015.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



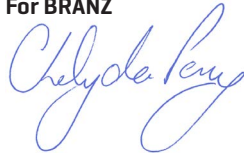
In the opinion of BRANZ, **USG Boral Wet Area Systems** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **USG Boral Building Products NZ**, 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. **USG Boral Building Products NZ**:
 - 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 **USG Boral Building Products NZ**.
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 **USG Boral Building Products NZ** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

10 November 2017