

0631P DRIBOND CONSTRUCTION CHEMICALS IN CERAMIC TILING

Branded worksection

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Worksection abstract

This branded worksection *Template* is applicable to floor and wall ceramic tiling, using Dribond Construction Chemicals ceramic tile adhesives. Tiles may be specified by manufacturer's brand name or by generic type, and essential characteristics such as size, colour, surface, edge type. Bedding, grouting, fixing and jointing requirements should also be specified.

How to use this worksection

Customise this worksection *Template* for each project. See A guide to NATSPEC worksections (www.natspec.com.au) for information on *Template* structure, word styles, and completing a worksection.

Related material located elsewhere in NATSPEC

If a listed worksection is not part of your subscription package and you wish to purchase it, contact NATSPEC.

Related material may be found in other worksections. See for example:

- *0275 Paving – mortar and adhesive bed, or 0276 Paving – sand bed* for brick, stone and concrete pavers.
- *0433 Stone cladding* for interior and exterior stone cladding or facing.
- *0632 Stone and terrazzo tiling* for stone and manufactured stone tiling and terrazzo tiling.

Related branded worksections include:

- *0473p DRIBOND CONSTRUCTION CHEMICALS acoustic floor underlays.*
- *0621p DRIBOND CONSTRUCTION CHEMICALS waterproofing – wet areas.*

Material not provided by DRIBOND Construction Chemicals

This branded worksection *Template* includes generic material which may not be provided by the Product Partner including:

- Tiles and accessories.
- Mortar.
- Control joints.

Documenting this and related work

You may document this and related work as follows:

- Use *0311 Concrete formwork, 0312 Concrete reinforcement, 0314 Concrete in situ and 0315 Concrete finishes* for concrete substrates.
- Use *0383 Decking, sheet and panel flooring* for framed substrates.
- Use *0621 Waterproofing – wet areas* for waterproofing wet areas.
- Layout, set-out point, tiling pattern and control joints to your office documentation policy.
- Detail tiling systems to AS 3958.1 (2007) Section 3 Tiling systems.
- Check lead time for imported selections and consider adding a requirement, in **SUBMISSIONS**, for the builder to verify availability.

The tiling system selected should be suitable for substrate deflections as follows:

- Floors: Maximum deflection 1:360.
- Walls: Maximum deflection 1:360.

The *Normal* style text of this worksection may refer to items as being documented elsewhere in the contract documentation. Make sure they are documented.

Search acumen.architecture.com.au, the Australian Institute of Architects' practice advisory subscription service, for notes on the following:

- Guarantees and warranties.

Specifying ESD

The following may be specified by including additional text:

- Tile adhesives with low VOC emitting and/or solvent free materials.
- Recycled material content for tiles and tile adhesive.

- Tiles with programs for recycling of scraps, e.g. to be ground and reformed into new materials.
 - Tiles manufactured using processes incorporating sustainability measures, e.g. recycling of water and waste.
- Refer to NATSPEC TECHreport TR 01 on specifying ESD.

1 GENERAL

Dribond Construction Chemicals, in business since 1974, is one of the most respected manufacturers of acoustic membranes, tile adhesives, waterproofing, grouts, sealers, repair products and other solutions for the building industry in the Asia-Pacific region. A multinational, family-owned and operated business that focuses on quality and service, Dribond Construction Chemicals has factories in Australia, New Zealand and Malaysia, with locations in Adelaide, Brisbane, Melbourne, Perth, Sydney, Auckland and Kuala Lumpur.

1.1 RESPONSIBILITIES

General

Requirement: Provide tiling systems to walls, floors and other substrates, using tile adhesives by Dribond Construction Chemicals, as documented.

Documented is defined in 0171 General requirements as meaning contained in the contract documents.

Performance

Requirements:

- Consistent in colour and finish.
- Firmly bonded to substrates for the expected life of the installation.
- Set out with joints accurately aligned in both directions and wall tiling joints level and plumb.
- Direct all water flowing from supply points to drainage outlets without leakage to the substrate or adjacent areas.

Ceramic tiles should be selected to be resistant to impacts expected in use and to be slip-resistant.

1.2 COMPANY CONTACTS

Dribond technical contacts

Website: www.constructionchemicals.com.au/contact-us/.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements.*

0171 General requirements contains umbrella requirements for all building and services worksections.

List the worksections cross referenced by this worksection. 0171 General requirements references the 018 Common requirements subgroup of worksections. It is not necessary to repeat them here. However, you may also wish to direct the contractor to other worksections where there may be work that is closely associated with this work.

NATSPEC uses generic worksection titles, whether or not there are branded equivalents. If you use a branded worksection, change the cross reference here.

1.4 STANDARDS

Tiling

General: Conform to the recommendations of those parts of AS 3958.1 (2007) referenced in this worksection.

Slip resistance

Classification: To AS 4586 (2013).

See NATSPEC TECHnote DES 001 on slip resistance performance.

1.5 MANUFACTURER'S DOCUMENTS

Technical manuals

Website: www.constructionchemicals.com.au/tech-info/.

1.6 INTERPRETATION

Definitions

General: For the purposes of this worksection, the following definitions apply:

- Acoustic underlay: A resilient material laid between the subfloor and the flooring material to provide sound isolation.
- Adhesives - cementitious (C): Adhesive in which the binders are hydraulic, e.g. General purpose cement, with aggregates and organic additives.
- Adhesives - dispersion (D): Adhesives in which the binders are in the form of aqueous polymer dispersion with mineral fillers and organic additives.
- Adhesives - reaction resin (R): Adhesives in which the binders are synthetic resins with mineral fillers and organic additives. The curing occurs by chemical reaction.

The adhesive definitions are based on AS ISO 13007.1 (2020).

- Bedding: Mixtures of materials that are applied to substrates in a plastic state and which dry, cure and adhere tiles to substrates:
 - . Adhesive bedding: Paving/tiling adhered by adhesives.
 - . Mortar bedding: Paving/tiling adhered in a cementitious mortar bed.
- Fixture: Fixed or permanently attached items in a building that cannot be removed without causing damage and would remain upon a change in occupancy, such as a bath, water closet suite, stove, built-in cupboards.
- Lippage: Height deviation between adjacent units.
- Stepping: The relative surface level of adjacent paving elements within the expanse of the main pavement.
- Substrate: The surface to which a material or product is applied.
- Tile: Thin slab made from clay and/or other inorganic raw materials used generally as coverings for floors and walls and adhered to continuous supporting substrates.
- Tiles – cementitious: Cement based prefinished tiles.
- Tiles – dry-pressed: Tiles made from a finely milled body mixture and shaped in moulds at high pressure. Also known as Type B.
- Tiles – extruded: Tiles whose body is shaped in the plastic state in an extruder then cut to size. Also known as Type A.

The tile definitions are based on AS 13006 (2020). The standard tabulates shape types by four water absorption groups.

- Underlay: A non-structural layer of rubber, cork, plywood or in situ levelling compound to provide a smooth and flat surface for flooring installation. Rubber and cork underlays have acoustic sound absorbing properties.
- Wet area: An area within a building supplied with a floor waste.

Edit the **Definitions** subclause to suit the project or delete if not required. List alphabetically.

1.7 TOLERANCES

Completed tiling

Requirement: To the recommendations of AS 3958.1 (2007) clause 5.4.6.

1.8 SUBMISSIONS

Execution details

Grouting: Submit proposals for grouting methods and materials.

Margins: If it appears that minor variations in joint widths or overall dimensions will avoid cut tiles, submit a proposal.

Operation and maintenance manuals

Requirement: Submit manual to **COMPLETION, Operation and maintenance manuals**.

Products and materials

Product conformity: Submit the following:

- Tiles: Evidence of conformity to AS 13006 (2020).
- Tile adhesive: Evidence of conformity to AS ISO 13007.1 (2020).

- Acoustic underlay: Evidence of weighted normalised impact sound pressure level to AS ISO 717.2 (2004) as measured for the complete tiling system.

Type tests: Submit results, as follows:

- Slip resistance test: To AS 4586 (2013).
- Accelerated wear test: To AS 4586 (2013).

Type tests are carried out off-site. However, submission of evidence of a successful type test may be called up here for requirements specified in SELECTIONS or PRODUCTS, when there are no SELECTIONS.

Accelerated wear conditioning prior to pendulum testing is recommended in AS 4586 (2013). Slip resistance testing after wear conditioning up to 5000 cycles is available for many products.

Evidence of delivery: Submit delivery docket as evidence of delivery of specified tiles.

Delete if not required.

Samples

General: Submit labelled samples of tiles, including accessories, grout and sealants, showing the range of variation in colour and finish.

Rely on approved samples for general quality compliance. Samples of sand may be required for major works, where testing for grading is necessary. Where tiles and accessories are specified as proprietary items use this clause as a means of confirmation.

Sample panels: Prepare a sample panel of each type of tiling system as follows:

- Size: > 2 m².
- Include samples of junction details and trim.
- Preserve the panel until related work is complete.

Call for approval to suit the administrative arrangements of the project.

If the project size does not justify sample panels: Delete.

For large projects consider asking for a prototype room comprising the complete wall and floor tiling and nominate an approval process.

Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

Evidence of experience: [complete/delete]

Delete if supplier/installer details are not required.

Tests

Detail the tests required in PRODUCTS or EXECUTION, as appropriate, and list the submissions required here.

For testing ceramic tiles, except for slip resistance, see AS ISO 10545.1 (2020), AS ISO 10545.2 (2020), AS ISO 10545.3 (2020), AS ISO 10545.4 (2020), AS 4459.5 (1999), AS ISO 10545.6 (2013), AS 4459.7 (1999), AS ISO 10545.8 (2020), AS ISO 10545.9 (2020), AS 4459.10 (1999), AS 4459.11 (1997), AS 4459.12 (1999), AS 4459.13 (1999), AS 4459.14 (1999), AS 4459.15 (1999), and AS ISO 10545.16 (2013).

Site tests: Submit results, as follows:

- Slip resistance test of completed installation.

If on-site slip resistance tests are documented, include this *Optional* style text by changing to *Normal* style text.

- Impact sound insulation rating of completed installation.

If on-site impact sound insulation rating tests are documented, include this *Optional* style text by changing to *Normal* style text.

Warranties

Requirement: Submit warranties to **COMPLETION, Warranties.**

1.9 INSPECTION

Notice

Inspection: Give notice so that inspection may be made of the following:

- Substrate immediately before tiling.
- Trial set-outs before execution.
- Control joints before sealing and grouting.
- Grout and sealant colours before application.

Amend to suit the project adding critical stage inspections required.

Hold points, if required, should be inserted here.

2 PRODUCTS

2.1 GENERAL

Product substitution

Other products: Conform to **SUBSTITUTIONS** in 0171 *General requirements*.

SUBSTITUTIONS in 0171 *General requirements* sets out the submissions required if the contractor proposes alternative products. Refer also to NATSPEC TECHnote GEN 006 for more information on proprietary specification.

Storage and handling

General: Store and handle to the manufacturer's recommendations and as follows:

- Protect materials from damage.

Total VOC limits

Requirement: Conform to the following maximum TVOC content:

- General purpose adhesives: 50 g/L.

Limiting VOC levels to the above limit can earn credit points for Green Star ratings. Delete if not required.

Product identification

General: Marked to show the following:

- Manufacturer's identification.
- Product brand name.
- Product type.
- Quantity.
- Product reference code and batch number.
- Date of manufacture.

Edit the list to suit the project or delete if not required.

2.2 DRIBOND CONSTRUCTION CHEMICALS PRIMERS

Primers

General: Provide Dribond primers recommended by the manufacturer as compatible with tile adhesives and tiling system.

Consult the manufacturer.

Primax

Description: A two-component liquid and powder, water-resistant bonding primer.

Application: Used to bond with exceptional adhesion to difficult to adhere to surfaces.

Primebond

Description: An acrylic-based liquid primer.

Application: Used to eliminate the possibility of adhesion failure on dusty and porous surfaces such as concrete, cement render and gypsum building boards.

Kembond

Description: A one-pack, water-based, modified acrylic primer.

Application: Used to bond to smooth or glazed surfaces such as building boards, concrete, cement render, compressed cement sheet, lightweight blocks, smooth concrete and existing glazed ceramic tiles on floors and walls internally, in dry internal applications.

Superprime

Description: A water-based, acrylic primer.

Application: A primer for smooth/helicoptered/steel trowelled concrete floors that improves adhesion of ceramic tiles. For use internally on floor and walls, and externally on walls only.

Epecrete

Description: A multipurpose, water-based, epoxy moisture barrier.

Application: A primer for damp/immersed applications, smooth concrete and tiles.

2.3 DRIBOND CONSTRUCTION CHEMICALS TILE ADHESIVES

Refer to NATSPEC TECHnote PRO 004 on the selection of tile adhesives.

General

Standard: To AS ISO 13007.1 (2020).

Drymastic

Description: Polymer-modified, flexible, cement-based adhesive.

Application: A thick or thin bed adhesive to fix porous and non-porous tiles internally and externally on floors and walls to concrete, cement render, screeds, block and brick.

Fastflex

Description: Polymer-modified, flexible, cement-based adhesive.

Application: A fast-setting adhesive for fixing porous and non-porous tiles, porcelain tiles and natural stone to concrete.

Gripflex

Description: One part, polymer-modified, water-resistant, cement-based adhesive.

Application: A thick or thin bed adhesive for bonding ceramic, porcelain and stone tiles to porous and non-porous surfaces subject to vibration and thermal movement.

Hydralite

Description: One part, polymer-modified, flexible adhesive.

Application: A thick or thin bed adhesive to fix vitrified, porcelain, ceramic, mosaic, marble and non-moisture sensitive stone, internally, externally, immersed on floors and walls of concrete, render, screed and heated floors.

Kemgrip Floor and Wall

Description: Cement powder-based adhesive.

Application: A thick or thin bed adhesive for bedding and fixing ceramic and porcelain tiles to masonry surfaces.

Monoflex

Description: One-pack, water-resistant, flexible, rubber-based, cementitious adhesive.

Application: A thick or thin bed adhesive for fixing ceramic and stone tiles to porous and non-porous surfaces subject to vibration and thermal movement.

Rapidfix

Description: Two-pack, cement-based adhesive.

Application: A fast-setting adhesive for bonding ceramic tiles, terrazzo tiles, reconstituted stone, natural stone, granite and marble to floors and walls, externally and internally that are affected by moisture.

2.4 UNDERLAY

Fibre cement underlay

Standard: To AS/NZS 2908.2 (2000), Type B, category 2 minimum.

Thickness: 6 mm minimum.

Dribond Acoustiflor

General: Provide Dribond acoustic floor underlay membranes recommended by the manufacturer as compatible with the tiling system.

Dribond Acoustiflor is a self-levelling underlay membrane that has noise reduction properties.

Refer to NATSPEC TECHnote DES 027 on the use of impact sound insulation in floor systems.

2.5 TILES AND ACCESSORIES

Refer to NATSPEC TECHnote PRO 004 on the selection of ceramic tiles.

Tiles

Standard: To AS 13006 (2020).

Many tiles available in Australia may not conform to AS 13006 (2020). It tabulates shape types by four water absorption groups. Delete this reference and the requirement under **Materials** if you do not expect the tiles selected to conform to the standard.

Coves, nosings and skirtings: Provide matching stop-end, and internal and external angle tiles moulded for that purpose.

Exposed edges: Provide purpose-made border tiles with the exposed edge (whether round, square or cushion) glazed to match the tile face. If such tiles are not available, mitre tiles on external corners or use proprietary trim.

Accessories

General: Provide tile accessories that match the composition, colour and finish of the surrounding tiles.

Tile trim: Provide proprietary trim for wall tiles and floor tiles, as documented.

Tactile ground surface indicators

Standard: To AS/NZS 1428.4.1 (2009).

The NCC cites AS 1428.4 (1992) and AS/NZS 1428.4.1 (2009). The current edition is AS/NZS 1428.4.1 (2009).

Delete if none required.

2.6 MORTAR

Materials

Cement type to AS 3972 (2010): GP.

- White cement: Iron salts content \leq 1%.

If required, specify as a proprietary item.

- Off-white cement: Iron salts content \leq 2.5%.

Lime: To AS 1672.1 (1997).

Sand: Fine aggregate with a low clay content selected for grading, sharp and free from efflorescing salts.

Measurement of volume: Measure binders and sand by volume using buckets or boxes. Do not allow sand to bulk by absorption of water.

Bedding mortar

Mix proportion (cement:sand), by volume: Select proportions from the range 1:3 to 1:4 for satisfactory adhesion. Provide minimum water.

Terracotta tiles: Use proprietary polymer modified mortar.

Mixing: To AS 3958.1 (2007) clause 2.15.

Site gauged mixes are preferred by experienced tradesmen as it gives them the opportunity to make adjustments for moisture content.

Water

General: Clean and free from any deleterious matter.

2.7 DRIBOND CONSTRUCTION CHEMICALS GROUT

Kemgrout Flexible

Description: A dense, smooth, hard-wearing, flexible polymer-modified Portland cement floor and wall grouting compound with resistance to mould and fungi growth.

For joints 2 mm to 10 mm wide.

Kemgrout Sanded

Description: A fine-finish dense hard-wearing waterproof Portland cement, floor and wall grouting compound with resistance to mild chemical and acid attack.

For joints 2 mm to 10 mm wide.

EpegROUT

Description: A three-component, water-washable, chemical resistant, epoxy tile grout.

For joints up to 3 mm wide.

EpegROUT Trade

Description: A water-based, commercial, sanded epoxy tile grout.

For joints 2 mm to 10 mm wide.

EpegROUT Ultra

Description: A solvent-free, pool grade epoxy grout.

For joints 2 mm to 10 mm wide.

2.8 CONTROL JOINTS

Control joint materials

Control joint strip: A proprietary control joint consisting of a neoprene core sandwiched between metal plates with lugs or ribs for mechanical keying. Set flush with the finished surface.

Proprietary slide plate divider strip: An arrangement of interlocking metal plates grouted into pockets formed in the concrete joint edges.

Sealant: One-part self-levelling non-hardening mould resistant, silicone or polyurethane sealant applied over a backing rod. Finish flush with the finished surface.

- Floors: Trafficable, Shore hardness greater than 35A.

Backing rod: Compressible closed cell polyethylene foam with a bond breaking surface.

3 EXECUTION

Refer to AS 3958.1 (2007) and AS 3958.2 (1992) and also to BRANZ Good practice guide - Tiling (2015).

3.1 SUBSTRATES

Drying and shrinkage

General: Before tiling, allow at least the following times to elapse (for initial drying out and shrinkage) for these substrates:

- Concrete slabs: 42 days.
- Concrete blockwork: 28 days.
- Toppings on slabs and rendering on brick or blockwork: A further 21 days.
- Rendered swimming pool shell: A further 21 days minimum.

Wet weather may increase the drying period.

See AS 3958.1 (2007) Table E1 for minimum time intervals between successive stages in tiling swimming pools of concrete construction.

3.2 PREPARATION

Standard

Preparation: To the recommendations of AS 3958.1 (2007) Section 4.

Ambient temperature

General: If the ambient temperature is less than 5°C or greater than 35°C, do not lay tiles.

Substrates without wet area membranes

General: Make sure substrates are as follows:

- Clean and free of any deposit or finish that may impair adhesion or location of tiles.
- If framed or discontinuous, support members are in full lengths without splicing.
- If solid or continuous:
 - . Remove excessive projections.
 - . Fill voids and hollows greater than 10 mm with abrupt edges with a cement:sand mix not stronger than the substrate or weaker than the bedding.
 - . Fill depressions less than 10 mm with a latex modified cementitious product and eliminate feathering by scabbling the edges.

Absorbent substrates: If suction is excessive, control it by dampening but avoid over-wetting and do not apply mortar bedding to substrates showing surface moisture.

Dense concrete: If not sufficiently rough to provide a mechanical key, roughen by scabbling or the like to remove 3 mm of the surface and expose the aggregate; then apply a bonding treatment.

Substrates with wet area membranes

If 0621 Waterproofing – wet areas is not included, import wet area membranes and include here, as required.

General: Make sure substrates are as follows:

- Clean and free of any deposit or finish that may impair adhesion or location of tiles.
- Compatible with all components of the floor system.

If there are particular requirements for substrate preparation to suit a particular tiling system, specify them here.

Edit alternate **Substrate** clauses as appropriate. Refer to NATSPEC TECHnote DES 008 for preparation of concrete substrates.

Priming

General: Prime all surfaces to the manufacturers recommendations.

Trial set-out

General: Prepare a trial tile set-out of each area, as follows:

- Maximise the size of equal margins of cut tiles.
- Locate control joints.
- Locate fixtures on walls.
- Align floor and wall tile joints where possible.

3.3 FIXING UNDERLAY

The underlay clause and selection could be imported to 0621 Waterproofing – wet areas if it suits the project.

Installation

Requirement: Lay in staggered (brick) pattern, perpendicular to the direction of the subfloor, with joints in the underlay not coinciding with joints in the subfloor. Fix with fasteners and fastener spacing to the manufacturers recommendations. If panels are not tongue and grooved, make sure edges are fully supported.

Membranes: If sheet flooring is the substrate for a wet area membrane, fix with stainless steel countersunk head screws.

3.4 TILING GENERALLY

Sequence

General: [complete/delete]

Generally fix floor tiles first before wall tiles, or delete if sequence is not critical. Tilers can fix tiles in either sequence. Sequence may be critical for positioning of wall fixing or where floor level is not constant around room perimeter. Also if fixing walls tiles first bottom tile may be omitted and fixed after floor tiling.

Cutting and laying

Cutting: Cut tiles neatly to fit around fixtures and at margins where necessary. Drill holes without damaging tile faces. Cut recesses for fixtures such as soap holders. Rub edges smooth without chipping.

Laying: Return tiles into sills, reveals and openings. Butt up to returns, frames, fixtures, and other finishes. Strike and point up beds where exposed. Remove tile spacers before grouting.

Variations

General: Distribute variations in hue, colour, or pattern uniformly, by mixing tiles or tile batches before laying.

Protection

Floor tiles: Keep traffic off floor tiles until the bedding has set and attained its working strength.

Cleaning: Keep the work clean as it proceeds and protect finished work from damage.

Bath ventilation

General: If required, ventilate the space below fully enclosed baths with at least 2 vermin proof ventilating tiles.

3.5 SETTING OUT

Tile layout

Requirement: Set out tiles as documented, allowing for control joints, or as follows if desired layout is undocumented:

- General tiling: Provide whole or purpose-made tiles at margins where practicable, otherwise, set out to give equal margins of cut tiles. If margins less than half a tile width are unavoidable, locate the cut tiles where they are least conspicuous. Align floor and wall tile joints, where possible.

Select wall and floor tiles of appropriate size to allow wall and floor tile joints to line up.

- Feature tiling: Provide trial set out for large or complex areas and patterns.

Tile set outs and patterns should be shown on the drawings, as should locations of control joints.

Tile joints

Joint widths: Set out tiles to give uniform joint widths within the following limits:

- Floors:
 - . Dry pressed tiles: 3 mm.
 - . Extruded tiles: 6 mm.
 - . Vitrified: 3 to 5 mm.
 - . Quarry tiles: 6 to 12 mm.
 - . Chemical resistant epoxy jointed tiling: 5 to 6 mm.
- Large and/or irregular floor tiles: 6 to 12 mm.
- Mounted mosaics: To match mounting pattern.
- Walls:
 - . Dry pressed tile: 1.5 mm.
 - . Extruded tile: 6 mm.

These values are drawn from AS 3958.1 (2007) and may be varied as required to suit tiles or the effect required.

Joint alignment: Set out tiling with joints accurately aligned in both directions and wall tiling joints level and plumb.

Fixtures

General: If possible, position tiles so that holes for fixtures and other penetrations occur at the intersection of horizontal and vertical joints or on the centrelines of tiles. Continue tiling fully behind fixtures that are not built in to the tiling surface. Before tiling make sure fixtures interrupting the tile surfaces are accurately positioned in their designed or optimum locations relative to the tile layout.

3.6 FALLS AND LEVELS**Grading**

Requirement: Grade floor tiling to even and correct falls to floor wastes and elsewhere as required. Make level junctions with walls. Where falls are not required, lay level.

Fall: Conform to falls as documented and the following:

- Falls to floor wastes: 1:80 minimum.
- Continuous fall of floor plane to floor waste for NCC Classes 1, 2, 3 and 4 parts of a building: 1:50 maximum.

Document required falls on the drawings and update text above adding minimum fall to non-shower areas if required.

BCA (2022) H4D2 for Class 1 buildings and BCA (2022) F2D4 for Class 2, 3 or 4 buildings require falls for certain bathrooms or laundries to the following:

- Minimum continuous fall of the floor plane to the floor waste: 1:80.
- Maximum continuous fall of the floor plane to the floor waste: 1:50.

Refer to AS 3740 (2021) for Class 5 to 9 buildings where there are no NCC Deemed-to-Satisfy provisions. AS 3740 (2021), a referenced standard in the NCC, requires a minimum fall of 1:80 in shower areas including bathrooms with an integral shower area and a minimum fall of 1:100 to other areas with a floor waste.

For accessible areas, AS 1428.1 (2009) requires a fall between 1:60 and 1:80 in shower recesses and a fall between 1:80 and 1:100 to the remainder of the sanitary facility. The NCC cites AS 1428.1 (2001) and AS 1428.1 (2009). The current edition is AS 1428.1 (2021).

Change of finish: Maintain finished floor level across changes of floor finish including carpet.

3.7 MORTAR BEDDING**Standard**

Cement mortar: To AS 3958.1 (2007) clause 5.5.

Bedding

General: Use bedding methods and materials that are appropriate to the tile, the substrate, the conditions of service, and which leave the tile firmly and solidly bedded in the bedding material and adhered to the substrate. Form falls integral with the substrate.

Preparation of tiles

Mortar bedding: Soak porous tiles in water for half an hour and then drain until the surface water has disappeared.

Terracotta tiles: Use pre-sealed tiles or apply a breathable sealer and lay dry. If a final sealed finish is selected, use a compatible laying sealer.

[Edit these alternatives, as required.](#)

Mortar beds

For floor tiles: Either lightly dust the screeded bed surface with dry cement and trowel level until the cement is damp, or spread a thin slurry of neat cement, or cement-based thin bed adhesive, on to the tile back. Do not use mortar after initial set has occurred.

- Nominal thickness: 20 to 40 mm.

Thick reinforced beds: Place mortar bed in two layers, and incorporate the mesh reinforcement in the first layer.

Mortar beds should only be undertaken by experienced tilers. Factors that do not favour the use of this method include:

- Tiles with less than 6% water absorption (many fully vitrified tiles).
- Smooth, dense substrates (low key, low suction). Refer to AS 3958.1 (2007) Table 4.3.
- Substrates subject to a relatively large degree of thermal or shrinkage movement.

Mechanical fixing

General: Provide a proprietary system of support and fixing appropriate to the type of tile and the substrate conditions.

3.8 DRIBOND CONSTRUCTION CHEMICALS ADHESIVE BEDDING

Standard

Installation with adhesive: To AS 3958.1 (2007) clause 5.6.

Preparation of tiles

General: Fix tiles dry; do not soak.

[Refer to NATSPEC TECHnote PRO 004 on the topic of adhesive bedding.](#)

Thin adhesive beds

General: Provide only if the substrate deviation is less than 3 mm, tested with a 2 m straightedge. Cover the entire tile back with adhesive when the tile is bedded.

Application: Apply to the substrate with a notched tool.

Thickness: 3 mm when tile is bedded.

Thick adhesive beds

General: Provide on substrates with deviations up to 6 mm, tested with a 3 m straightedge, and with tiles having deep keys or frogs.

Application: Apply to the substrate with a notched tool, or use buttering application to the back of the tile.

Thickness: 3 to 12 mm when tile is bedded.

Thin bed fixing

General: Apply adhesive with notched trowel to tiles sizes as follows:

- 200 x 200 mm tile: 8 mm notched trowel.
- 250 x 250 mm tile: 10 mm notched trowel.
- 300 x 300 mm tile: 12 mm notched trowel.
- > 400 x 400 mm tile: 12 mm notched trowel and butter tile back.

Adhesive bedding application

General: Apply adhesive by notched trowel to walls and floors and direct to tiles if required, to provide evenly distributed coverage after laying as follows:

- Domestic internal walls: > 65%.
- Domestic internal floors: > 80%.
- Other walls and floors: > 90%.
- Wet areas and benchtops: 100%.

Pattern of distribution of adhesive: To the recommendations of AS 3958.1 (2007) clause 5.6.4.3. Verify by examining one tile in ten as work proceeds.

Wall tile spacers: Do not use spacer types that inhibit the distribution of adhesive.

Use of cruciform spacers can result in some adhesives failing. The sliding motion is required to break the skin and facilitate adhesion.

Curing: Allow the adhesive to cure for the period nominated by the manufacturer before grouting or allowing foot traffic.

3.9 CONTROL OF MOVEMENT

General

Requirement: Provide control joints carried through the tile and the bedding to the recommendations of AS 3958.1 (2007) clause 5.4.5 and as follows:

- Floor location:
 - . Over structural control joints.
 - . To divide complex room plans into rectangles.
 - . Around the perimeter of the floor.
 - . At junctions between different substrates.
 - . To divide large tiled areas into bays.
 - . At abutments with the building structural frame and over supporting walls or beams where flexing of the substrate is anticipated.

Show on drawings. Suggested maximum spacings are 6 x 6 m internally and 4 x 4 m externally.

Refer to AS 3958.1 (2007) and BRANZ Good practice guide - Tiling (2015) for more detail on the division of large tiled areas into smaller bays. Confirm the expected movement of structural control joints with the structural engineer and make sure the joint width is more than 4 times the anticipated movement. Take particular care in the design of a control joint layout for post-tensioned substrates to accommodate the additional anticipated movement. If floor heating is installed or if passive solar heating is a design feature, pay particular attention to the added requirements for control joints and consider flexible adhesive. BRANZ recommends that flexible adhesives are not used as a means of accommodating deflection (or movement) in a substrate.

- Wall location:
 - . Over structural control joints.
 - . At junctions with different substrate materials when the tiling is continuous.
 - . At vertical internal corners.
- Depth of joint: Right through to the substrate.
- Sealant width: 6 to 25 mm.
- Depth of elastomeric sealant: One half the joint width, or 6 mm, whichever is the greater.

3.10 GROUTED AND SEALANT JOINTS

Grouted joints

General: Commence grouting as soon as practicable after bedding has set. Clean out joints as necessary and remove any tiles spacers before grouting.

Face grouting: Fill the joints solid and tool flush. Clean off surplus grout. Wash down when the grout has set. When grout is dry, polish the tiled surface with grout film remover and a clean cloth.

Edges of tiles: Grout exposed edge joints.

Epoxy grouted joints: Make sure tile edge surfaces are free of extraneous matter such as cement films or wax, before grouting.

Mosaic tiles

Grouting mosaics: If paper faced mosaics are to be bedded in cement mortar, pre-grout the sheeted mosaics from the back before fixing. After fixing, rub grout into the surface of the joints to fill any voids left from pre-grouting. Clean off surplus grout. When grout has set, wash down. If necessary, use a proprietary cement remover.

Mosaic tile panels are supplied with a variety of backing types:

- Paper adhered to the face: After laying, the paper is wetted, peeled off and the tiling is grouted. The problem for inexperienced tilers is that the face is obscured while laying.
- Mesh or perforated paper adhered to the back: This overcomes the problem with paper facing but seriously compromises the adhesion of the tile to the background, particularly where PVA glue is used for the mesh as it can dissolve in a damp environment. The tile joint width cannot be maintained on curved surfaces as the panel of tiles hinge from the back with joints closing over concave surfaces and opening over convex surfaces.

- Dot-mounted and hot melt polyurethane glued mosaic: These overcome the problem of adhesion, but the joint width is not maintained on curved surfaces.
- Clear sticky 'peel-off' film on the face: The face is visible but the film prevents the curing of the tile adhesive.

The recommended practice particularly with glass mosaics is to use paper facing and pre-grout from the back before laying and beating. Paper facing is preferred as it gently absorbs water from the grout. This work can only be done by experienced tradesmen and specifiers should consider calling for evidence of skill in this field.

Sealant joints

Use where it is necessary to seal joints between tiles and other surfaces to keep them watertight. If movement is anticipated, use a control joint. If watertightness is not required, grouting may be sufficient.

General: Provide joints filled with sealant and finished flush with the tile surface as follows:

- Where tiling is cut around sanitary fixtures.
- At internal corners of walls.
- Around fixtures interrupting the tile surface, for example pipes, brackets, bolts and nibs.
- At junctions with elements such as window and door frames and built-in cupboards.

Material: Anti-fungal modified silicone.

Width: 5 mm.

Depth: Equal to the tile thickness.

3.11 JOINT ACCESSORIES

Describe either by proprietary item or by essential properties such as material, size (including radius of coves and nosings), pattern, colour. Specification by proprietary item (brand name and manufacturer) will usually be the most certain method of getting the right formulation for a particular purpose.

Floor finish dividers

General: Finish tiled floors at junctions with differing floor finishes with a corrosion-resistant metal dividing strip fixed to the substrate using mechanical fixings, with top edge flush with the finished floor. If changes of floor finish occur at doorways, make the junction directly below the closed door. Grout up underneath to provide continuous support.

Type: [complete/delete]

Material: [complete/delete]

e.g. Ribbed brass strip, 1 mm thick.

Stepping: Less than 3 mm.

AS 1428.1 (2009) has requirements for floor levels in accessible paths of travel. The NCC cites AS 1428.1 (2001) and AS 1428.1 (2009). The current edition is AS 1428.1 (2021).

Wall trim

General: Provide where documented. Install flush with adjacent tile surfaces and to manufacturer's recommendations.

Type: [complete/delete]

Material: [complete/delete]

Colour: [complete/delete]

e.g. Round or square nosing in aluminium, brass, stainless steel, powder coat finish or PVC.

Specify here or in the **Accessories schedule**.

Adjustments

Requirement: Check that the height of the floor finish divider is sufficient for the topping and tile thickness. Adjust as required with a matching flat bar adhesive fixed to the divider angle.

Weather bars

General: Provide corrosion-resistant metal weather bars or threshold plates under hinged external doors, located under the centres of closed doors or to manufacturer's recommendations.

Type: [complete/delete]

Material: [complete/delete]

Finish: [complete/delete]

Dimensions: [complete/delete]

Detail to minimise projections. Projections as small as 10 mm or even less could constitute a trip hazard. AS 1428.1 (2009) has requirements for floors in accessible paths of travel. The NCC cites AS 1428.1 (2001) and AS 1428.1 (2009). The current edition is AS 1428.1 (2021).

Fixing: [complete/delete]

TESTING

0171 *General requirements* defines different tests in **INTERPRETATION**, **Definitions** and calls for an inspection and testing plan in **TESTING - GENERALLY**, **Inspection and testing plan**.

Slip resistance tests

Slip resistance of completed installation: To AS 4663 (2013).

If on-site slip resistance tests are required in addition to type tests, consider including this *Optional* style text by changing to *Normal* style text. Site testing is expensive. See NATSPEC TECHnote DES 001 on slip resistance.

Impact sound insulation rating tests

Impact sound insulation rating of completed installation: To AS ISO 717.2 (2004).

Weighted standardised impact sound pressure level ($L'_{nT,w}$) is a single-number rating, expressed in decibels, of the field measurement of frequency dependent impact sound insulation between rooms in buildings.

If on-site impact sound insulation rating tests are required in addition to type tests, consider including this *Optional* style text by changing to *Normal* style text. Site testing is expensive. See NATSPEC TECHnote DES 027 for information on the options available for NCC compliance.

3.12 COMPLETION

Cleaning

General: Clean tiled surfaces using an appropriate tile cleaning agent, and polish.

Spare tiles

General: Supply spare matching tiles and accessories of each type for future replacement purposes. Store the spare materials on site.

Quantity: At least 1% of the quantity installed.

Vary the quantity if required.

Storage location: [complete/delete]

Operation and maintenance manuals

Requirement: Prepare a manual describing care and maintenance of the tiling, including procedures for maintaining the slip-resistance classification stating the expected life of the slip-resistance classification.

See NATSPEC TECHnote DES 001 on slip resistance performance.

Compliance with this clause targets the Operations and Maintenance requirement within the Minimum Expectation level of the Verification and Handover credit in Green Star Buildings (2021).

Warranties

Requirement: Submit the manufacturer's published product warranties.

Materials:

- Warranty period: 10 years.
- Warranty terms: As offered by Dribond Construction Chemicals.

4 SELECTIONS

Schedules are a tool to specify properties required for products or systems. If the principal permits documentation of the product or system by proprietary name, some of the properties may be unnecessary and can be deleted. Document the product or system's location or application here and/or on the drawings with a matching project code. Refer to NATSPEC TECHnote GEN 024 for guidance on using and editing schedules.

4.1 SCHEDULES

Wall tiling schedule

	A	B	C
Product			

	A	B	C
Tile: Type			
Tile: Size (mm)			
Tile: Colour			
Tile: Surface			
Primer: Product			
Adhesive bedding: Product			
Adhesive bedding: Thickness			
Tile pattern			
Mechanical fixing			
Grout: Product			
Grout: Colour			

The codes in the header row of the schedule designate each application or location of the item scheduled. Edit the codes to match those in other contract documents.

Product: Refer to manufacturer's range. Many of the following items in the schedule may not be required if the product identification is sufficient. Delete any items below if sufficiently covered by the product details nominated here.

Tile: Define the tile type by the manufacturer's proprietary brand name if possible.

- Type: e.g. vitrified, mosaic.
- Surface: e.g. glazed, semi-glazed.

Primer:

- Product: Select from the following:
- Primebond: For cement sheeting and gypsum plasterboard surfaces.
- Primax, Kembond: For existing tiled surfaces.

Adhesive bedding:

- Product: Select from the following: Dribond Drymastic, Fastflex, Gripflex, Hydralite, Kemgrip Floor and Wall, Monoflex, Rapidflex.
- Thickness: e.g. thick bed or thin bed.

Tile pattern: e.g. stack, stretcher.

Mechanical fixing: If required, preferably specify a proprietary system and suitable tiles. Some systems include both primary and secondary supports. Some adhesive manufacturers recommend adhesive fixing restricted to a height of 2-3 m with mechanical fixing over, particularly for external applications. External tiling may also involve Council approval.

Grout:

- Product: Select from the following: Kemgrout Flexible, Kemgrout Sanded.

Flooring underlay schedule

	A	B	C
Product			
Material			
Thickness			
Glue and nail fixing: Adhesive product			

The codes in the header row of the schedule designate each application or location of the item scheduled. Edit the codes to match those in other contract documents.

Product: Refer to manufacturer's range. Many of the following items in the schedule may not be required if the product identification is sufficient. Delete any items below if sufficiently covered by the product details nominated here.

Material: e.g. Moisture proof grade plywood, particleboard or compressed fibre cement (CFC).

Thickness: For plywood see Sections 5 of AS 1684.2 (2021), AS 1684.3 (2021) and AS 1684.4 (2010) for thickness related to joist/batten spacing and stress grade. For particleboard normally 19 mm or 22 mm for joist spacing 450 mm or 600 mm respectively, but sheets have maximum permissible spacing marked on them. See AS 1860.2 (2006). Select sheet sizes to suit joist spacing.

Adhesive product: As nominated by the underlay supplier.

Floor tiling schedule

	A	B	C
Product			
Tile: Type			
Tile: Size (mm)			
Tile: Colour			
Tile: Surface			
Tile: Edge			
Slip resistance classification			
Water absorption group to AS 13006 (2020)			
Airborne sound insulation			
Impact sound insulation			
Acoustic underlay: Product	Dribond Acoustiflor	Dribond Acoustiflor	Dribond Acoustiflor
Separation layer: Location			
Separation layer: Type			
Primer: Product			
Adhesive bedding: Product			
Adhesive bedding: Thickness			
Mortar bedding: Thickness (mm)			
Mortar bedding: Reinforcement			
Grout: Product			
Grout: Colour			

The codes in the header row of the schedule designate each application or location of the item scheduled. Edit the codes to match those in other contract documents.

Product: Refer to manufacturer's range. Many of the following items in the schedule may not be required if the product identification is sufficient. Delete any items below if sufficiently covered by the product details nominated here.

Tile: Define the tile type by the manufacturer's proprietary brand name if possible. For special purposes it may be necessary to specify other properties such as abrasion class and chemical resistance. Rely on approved samples for general quality compliance.

- Type: e.g. Quarry, vitrified, mosaic.
- Surface: e.g. glazed, semi-glazed.
- Edge: Tiles for chemical resistant floors should be machine cut to provide precision edges.

Slip resistance classification: For selections refer to NATSPEC TECHnote DES 001, SA HB 197 (1999) and SA HB 198 (2014). Select the slip resistance test and class to suit the location and application. Consider also accelerated wear tests for floor tile slip resistance.

Water absorption group to AS 13006 (2020): Refer to NATSPEC TECHnote PRO 004 for information on ceramic tile and adhesive selection.

Airborne sound insulation: State the required rating to AS/NZS ISO 717.1 (2004) for either the weighted sound reduction index (R_w) or weighted sound reduction index with spectrum adaptation ($R_w + C_{tr}$). This rating is for a building system e.g. partition wall, of which the building element is only one component. It may be better to provide the rating in the appropriate system schedule. It is advisable to obtain the advice of an acoustic consultant on the selection of an R_w or $R_w + C_{tr}$ rating for airborne sound transmission reduction. Refer to NATSPEC TECHnote DES 032 for information.

Impact sound insulation: State the required rating to AS ISO 717.2 (2004) for the weighted normalised impact sound pressure level ($L_{n,w}$). This rating is for a building system of which the building element is only one component. It may be better to provide the rating in the appropriate system schedule. It is advisable to obtain the advice of an acoustic consultant on the selection of an $L_{n,w}$ rating for impact sound transmission reduction. Refer to NATSPEC TECHnote DES 027 for information.

Separation layer:

- Type: e.g. Building paper, Polyethylene film, or Bituminous felt membrane.

Primer:

- Product: Select from the following:
- Primebond: For cement sheeting and gypsum plasterboard surfaces.
- Primax, Kembond: For existing tiled surfaces.

Adhesive bedding:

- Product: Dribond Drymastic, Fastflex, Gripflex, Hydralite, Kemgrip Floor and Wall, Monoflex, Rapidflex.
- Thickness: e.g. thick bed or thin bed.

The appearance of glass mosaic tiles is affected by the colour of the adhesive. Generally white adhesives are preferred, and dark colours or grey are to be avoided.

Mortar bedding: Traditional mortar beds are now usually confined to thick bed applications such as floor tiling where the bed thickness is varied to obtain falls, or where the bedding is over a separation layer. Edit as required. Site gauged mixes are preferred by experienced tradesmen as it gives them the opportunity to make adjustments for moisture content.

Grout:

- Product: Select from the following: Kemgrout Flexible, Kemgrout Sanded.

Accessories schedule

	A	B	C
Product			
Location			
Type			
Material			
Size (mm)			
Colour			

The codes in the header row of the schedule designate each application or location of the item scheduled. Edit the codes to match those in other contract documents.

Product: Refer to manufacturer's range. Many of the following items in the schedule may not be required if the product identification is sufficient. Delete any items below if sufficiently covered by the product details nominated here.

Type: List accessories such as glazed round edge tiles, corner and edge trim, step treads to stairs, landings, and thresholds, sills, weather bars, copings and tile vents.

Material: e.g. aluminium, brass, stainless steel, powder coat finish or PVC.

Tactile ground surface indicators schedule

	A	B	C
Product			
Type			
Edge protector			
Material			
Colour			

The codes in the header row of the schedule designate each application or location of the item scheduled. Edit the codes to match those in other contract documents.

Product: Refer to manufacturer's range. Many of the following items in the schedule may not be required if the product identification is sufficient. Delete any items below if sufficiently covered by the product details nominated here.

Type: Directional, Warning or Integrated. Both warning and directional indicators may be required.

Edge protector: Button bevelled, Button round, Bar thin or Bar thick.

Material: Porcelain, Stainless steel, Thermoplastic urethane injection moulded (TPU), Rubber. Refer to manufacturer.

Colour: A colour contrast is required, in both wet and dry conditions, between the tactile indicators and the adjacent surface and that the colour provides a luminance contrast to the surrounding surface to AS/NZS 1428.4.1 (2009) Appendix E. Refer to manufacturer's range. The NCC cites AS 1428.4 (1992) and AS/NZS 1428.4.1 (2009). The current edition is AS/NZS 1428.4.1 (2009).

Control joints schedule

	A	B	C
Product			

	A	B	C
Control joint strip: Joint side-plate material			
Control joint strip: Neoprene colour			
Control joint strip: Width			
Control joint strip: Fixing			
Proprietary slide plate: Product			
Proprietary slide plate: Material			
Proprietary slide plate: Insert colour			
Sealant: Type			
Sealant: Colour			
Sealant: Width (mm)			

The codes in the header row of the schedule designate each application or location of the item scheduled. Edit the codes to match those in other contract documents.

Refer to AS 3958.1 (2007) clause 5.4.5 for location and installation of movement joints.

Product: Refer to manufacturer's range. Many of the following items in the schedule may not be required if the product identification is sufficient. Delete any items below if sufficiently covered by the product details nominated here.

Control joint strip:

- Joint side-plate material: e.g. Perforated brass angles.
- Fixing: e.g. Mortar bed.

Proprietary slide plate:

- Material: e.g. stainless steel.
- Insert colour: Nominate colour or omit if no insert.

Sealant:

- Type: e.g. One part modified silicone or polyurethane. For major control joints a proprietary system of sliding plates may be required. For swimming pools make sure compatibility with the pool water chemistry.
- Colour: State requirement if sealant is to be specially coloured.

Edit joint strip type as required.

REFERENCED DOCUMENTS

The following documents are incorporated into this worksection by reference:

AS ISO 717		Acoustics - Rating of sound insulation in buildings and of building elements
AS ISO 717.2	2004	Impact sound insulation
AS 1428		Design for access and mobility
AS/NZS 1428.4.1	2009	Means to assist the orientation of people with vision impairment - Tactile ground surface indicators
AS 1672		Limes and limestones
AS 1672.1	1997	Limes for building
AS/NZS 2908		Cellulose-cement products
AS/NZS 2908.2	2000	Flat sheets
AS 3958		Ceramic tiles
AS 3958.1	2007	Guide to the installation of ceramic tiles
AS 3972	2010	General purpose and blended cements
AS 4586	2013	Slip resistance classification of new pedestrian surface materials
AS 4663	2013	Slip resistance measurement of existing pedestrian surfaces
AS 13006	2020	Ceramic tiles - Definitions, classification, characteristics and marking (ISO 13006:2018 (ED.3.0) MOD)
AS ISO 13007		Ceramic tiles
AS ISO 13007.1	2020	Grouts and adhesives - Terms, definitions and specifications for adhesives

The following documents are mentioned only in the Guidance text:

AS ISO 717		Acoustics - Rating of sound insulation in buildings and of building elements
AS/NZS ISO 717.1	2004	Airborne sound insulation
AS 1428		Design for access and mobility
AS 1428.1	2001	General requirements for access - New building work
AS 1428.1	2009	General requirements for access - New building work
AS 1428.1	2021	General requirements for access - New building work
AS 1428.4	1992	Tactile ground surface indicators for the orientation of people with vision impairment
AS 1684		Residential timber-framed construction
AS 1684.2	2021	Non-cyclonic areas

AS 1684.3	2021	Cyclonic areas
AS 1684.4	2010	Simplified - Non-cyclonic areas
AS 1860		Particleboard flooring
AS 1860.2	2006	Installation
AS 3740	2021	Waterproofing of domestic wet areas
AS 3958		Ceramic tiles
AS 3958.2	1992	Guide to the selection of a ceramic tiling system
AS 4459		Methods of sampling and testing ceramic tiles
AS 4459.5	1999	Determination of impact resistance by measurement of coefficient of restitution
AS 4459.7	1999	Determination of resistance to surface abrasion for glazed tiles
AS 4459.10	1999	Determination of moisture expansion
AS 4459.11	1997	Determination of crazing resistance for glazed tiles
AS 4459.12	1999	Determination of frost resistance
AS 4459.13	1999	Determination of chemical resistance
AS 4459.14	1999	Determination of resistance to stains
AS 4459.15	1999	Determination of lead and cadmium given off by glazed tiles
AS ISO 10545		Ceramic tiles
AS ISO 10545.1	2020	Sampling and basis for acceptance
AS ISO 10545.2	2020	Determination of dimensions and surface quality
AS ISO 10545.3	2020	Determination of water absorption, apparent porosity, apparent relative density and bulk density
AS ISO 10545.4	2020	Determination of modulus of rupture and breaking strength
AS ISO 10545.6	2013	Determination of resistance to deep abrasion for unglazed tiles
AS ISO 10545.8	2020	Determination of linear thermal expansion
AS ISO 10545.9	2020	Determination of resistance to thermal shock
AS ISO 10545.16	2013	Determination of small colour differences
SA HB 197	1999	An introductory guide to the slip resistance of pedestrian surface materials
SA HB 198	2014	Guide to the specification and testing of slip resistance of pedestrian surfaces
BCA F2D4	2022	Health and amenity - Wet areas and overflow protection - Floor wastes
BCA H4D2	2022	Class 1 and 10 buildings - Health and amenity - Wet areas
GBCA Buildings	2021	Green Star Buildings
NATSPEC DES 001		Slip resistance performance
NATSPEC DES 008		Preparation of concrete substrates
NATSPEC DES 027		Impact sound insulation
NATSPEC DES 032		Airborne sound insulation
NATSPEC GEN 006		Product specifying and substitution
NATSPEC GEN 024		Using NATSPEC selections schedules
NATSPEC PRO 004		Ceramic tile and adhesive selection
NATSPEC TR 01		Specifying ESD
BRANZ Tiling	2015	Good practice guide - Tiling