

DECKING SYSTEMS



FC:125

COMPRESSED SHEET

FEBRUARY 2008

cemintel™
fibre cement systems



CSR

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DESCRIPTION

Cemintel™ Compressed Sheet is a compressed, autoclaved, cellulose fibre reinforced, cement sheet.

Compressed Sheet has a smooth flat surface and a square edge finish.

It is a dense, high strength, durable building product.

APPLICATIONS

Cemintel™ Compressed Sheet provides a solid substrate for external decking, both upper and lower storey verandahs, and non saltwater pool surrounds in residential buildings.

Our substrate system combined with the required waterproofing system may then be covered with your selection of tiles, pebble finishes, synthetic turf, outdoor carpets or suitable paint.

ADVANTAGES

- Tough durable substrate.
- Immune to permanent water damage.
- Immune to termite attack.
- Will not rot, warp or burn.
- A suitable substrate for all forms of finishing.

DESIGN CONSIDERATIONS

DRAINAGE

Regardless of whether the deck is to be waterproof or not, all decking applications must have a fall of at least 1 in 100 to facilitate drainage and prevent ponding. Decks must not be constructed level.

Whenever possible avoid draining into a sump as this can often lead to water building up to a depth above flashings. If this is unavoidable, the mortar bed with separating layer system must be used.

The finished deck surface must be a minimum of 50mm below door level to enable adequate flashings to be installed to prevent water entering.

LOADS

Cemintel™ decking systems have been designed to resist a live load of 3.0kPa and a 1.8kN point load.

FRAMING

Decks may be constructed using timber joists or steel framing up to 2.0mm base metal thickness (BMT). Contact Cemintel™ Fibre Cement Systems for fixing information where steel BMT is greater than 2.0mm. Timber Joists and trimmers must have a minimum face width of 45mm. Joists must run in the direction of the fall. To reduce edge trimming, the long edge of the compressed sheets should be installed parallel to the joist direction.

Handy Hint: Wherever possible, plan joist and sheet layout to coincide with tile modules to avoid the need to cut tiles.

All compressed sheet edges must be supported by a framing member. (Where sheets are cantilevered at the outer edge of a deck, sheet edges must not extend more than 100mm beyond the frame/support.)

Sheet joints must be constructed with a 5mm minimum gap, and joist spacing must be adjusted to accommodate.

Joist spacing is to be:

Sheet Thickness	Sheet Width	Joist Centres
15mm	900	453mm
15mm	1200	402mm
18mm	1200	603mm

MOVEMENT JOINTS

All joints between compressed sheets must be constructed as movement joints to allow for differential movement in the materials and the structure.

COMPONENTS

Available in the following range of sizes for decking.

Thickness mm	Width mm	Length mm					
		1500	1800	2100	2400	2700	3000
15	900	✓	✓	✓	✓	✓	✓
	1200	✓	✓	✓	✓	✓	✓
18	900		✓		✓		✓
	1200		✓	✓	✓		✓

Cemintel™ Compressed Sheet is available cut to size from Cemintel™ Distributors.

Non standard sizes are made to order and a lead time will be required.

Unless noted, the following components are not supplied by CSR.

- **SCREWS FOR FIXING COMPRESSED SHEETS:**

For timber framing, use N°10 x 50mm hot dip galvanised steel or brass, countersunk head wood screws.



For steel framing, use N°10 x 30mm Countersunk head TEK screws.

- **SCREWS FOR FIXING DRIP MOULD:**



N°8 x 15mm hot dip galvanised steel, countersunk head, metal thread self-tapping screws.

- **NAILS FOR FIXING 4.5MM THICKNESS CLADDING SHEET:**

2.0 x 25mm hot dip galvanised nails.

- **NAILS FOR FIXING 7.5MM THICKNESS CLADDING PLANK PACKING STRIPS:**

2.8 x 40mm hot dip galvanised nails.

- **COUNTER SINKING TOOL:**

Order N°	Quantity
22116	1

- **SLIP SHEET:**

0.2mm Polyethylene (Polythene) sheet to AS2870.

- **MEMBRANE:**

A flexible sheet or liquid membrane as required for the system (may incorporate joint reinforcing).

- **MORTAR BED AND STEEL REINFORCEMENT:**

To AS3958.1.

- **SEALANT: SIKAFLEX® PRO**

Order N°	Quantity
11378	1 x 310ml Tube

- **BACKING ROD:**

Polyethylene Foam Bead 10mm diameter.

Order N°	Quantity
11177	50m Roll

- **WALL/FLOOR JOINT FLASHING:**

PVC Angle Mould 4mm x 47mm x 47mm.

- **EDGE DRIP MOULD:**

Aluminium or PVC Angle 12mm x 12mm.

- **DRIP SHEET:**

0.2mm Polyethylene (Polythene) Sheet to AS2870.

48mm reinforced aluminium foil tape (493 tape or equivalent).

- **FLASHING:**

Alcor or equivalent.

SYSTEM SELECTION

A number of systems are available for different applications, surface finishes and drainage conditions. Refer to Table 1 for details.

For upper storey decks over habitable rooms, select from the waterproof systems range. Where waterproofing is not critical, such as over non-habitable ground, the water resistant system may be used.

WATERPROOF SYSTEMS

MORTAR BED WITH SEPARATING LAYER.

The Compressed Sheets are laid directly on joists and covered with a waterproof sheet membrane. A separating layer or slip-sheet then separates the membrane from the mortar bed to accommodate minor movement.

Drainage to the deck edge may be provided by fall in the sheets or in the mortar bed, or the mortar bed may drain to a sump. Control joints in tiling need not correspond with sheet joints.

DRIP SHEET SYSTEM.

This system uses a non-structural fibre cement sheet to support a plastic sheet that drains to the edge of the deck. Cemintel™ Compressed Sheet is then laid on packing strips, over the drip sheet, to form a substrate for tiles or other trafficable surfacing. Control joints in tiling must correspond with sheet joints.

The system is suitable for decks up to 3m wide, and sheet joints remain accessible for maintenance.

TILES WITH LIQUID MEMBRANE.

This system has an applied waterproof membrane directly over the Compressed Sheet. Tiles are fixed over the membrane, and drainage is provided by fall in the sheets. Control joints in tiling must correspond with sheet joints.

TRAFFICABLE MEMBRANE.

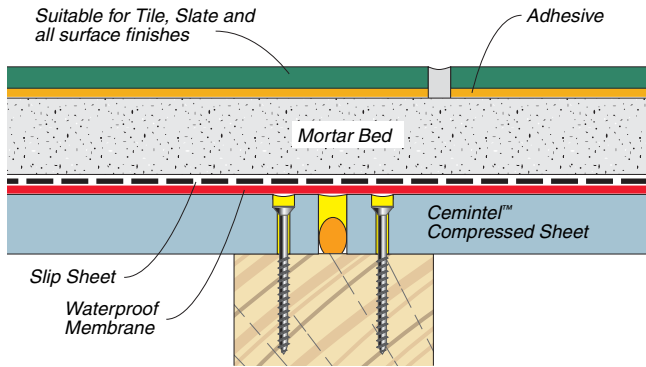
Membrane systems, laid directly over Compressed Sheet, are available that are suitable for foot traffic.

WATER RESISTANT SYSTEMS

The Compressed Sheets are laid directly on joists and protected with tiles or other surface material. Drainage is provided by fall in the sheets and control joints in tiling must correspond with sheet joints.

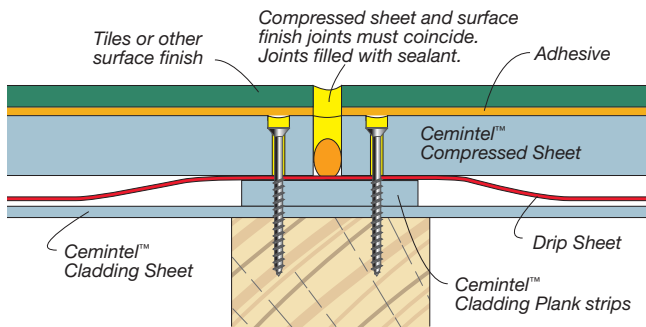
TABLE 1. DECKING SYSTEM SELECTION

MORTAR BED WITH SEPARATING LAYER.



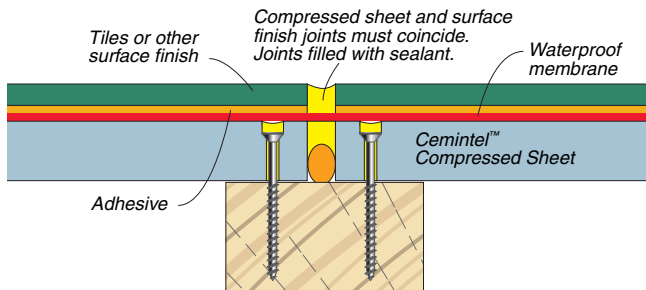
- Drain to edge of deck or sump.
- Tile control joints need not correspond with sheet joints.
- Suitable for all deck widths.

DRIP SHEET SYSTEM.



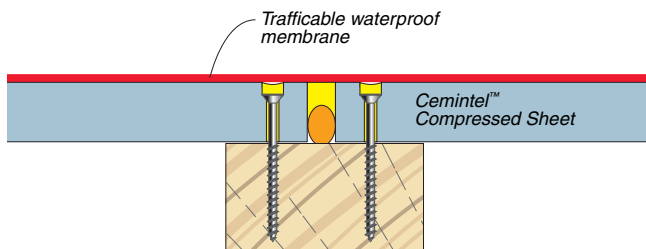
- Drain to edge of deck.
- Tile control joint must correspond with panel joints.
- Maximum 3m deck width.

TILES WITH LIQUID MEMBRANE SYSTEM.



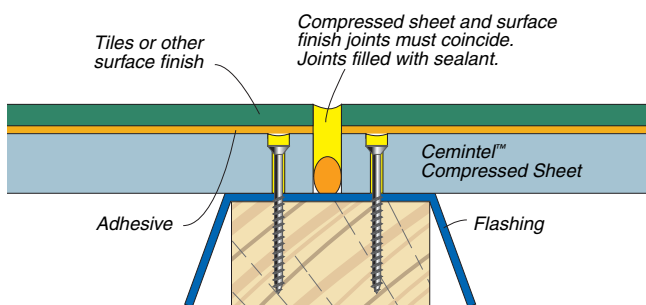
- Drain to edge of deck.
- Tile control joint must correspond with panel joints.
- Suitable for all deck widths.

TRAFFICABLE MEMBRANE SYSTEM.



- Drain to edge of deck.
- Suitable for all deck widths.

WATER RESISTANT SYSTEM.



- Drain to edge of deck.
- Tile control joint must correspond with panel joints.
- Suitable for all deck widths.
- Suitable for paint finish.

MORTAR BED WITH SEPARATING LAYER

This system has compressed sheet fixed directly to floor joists, with a flexible membrane installed on top to provide waterproofing.

The flexible membrane is covered with a separating or slip sheet, and a reinforced mortar bed is then laid to support the tiles or other finish.

This system may be used for decks that exceed 3 metres in width, and it is ideal for decks where drainage is restricted or directed to a central sump.

Control joints in the mortar bed/finish do not have to coincide with compressed sheet joints. This allows uninterrupted tile surfaces of up to 4.5m x 4.5m between control joints to suit the tile module.

INSTALLATION

FIXING AND JOINTING SHEETS

Refer to the following diagrams and to page 13 of this manual for compressed sheet fixing and jointing instructions.

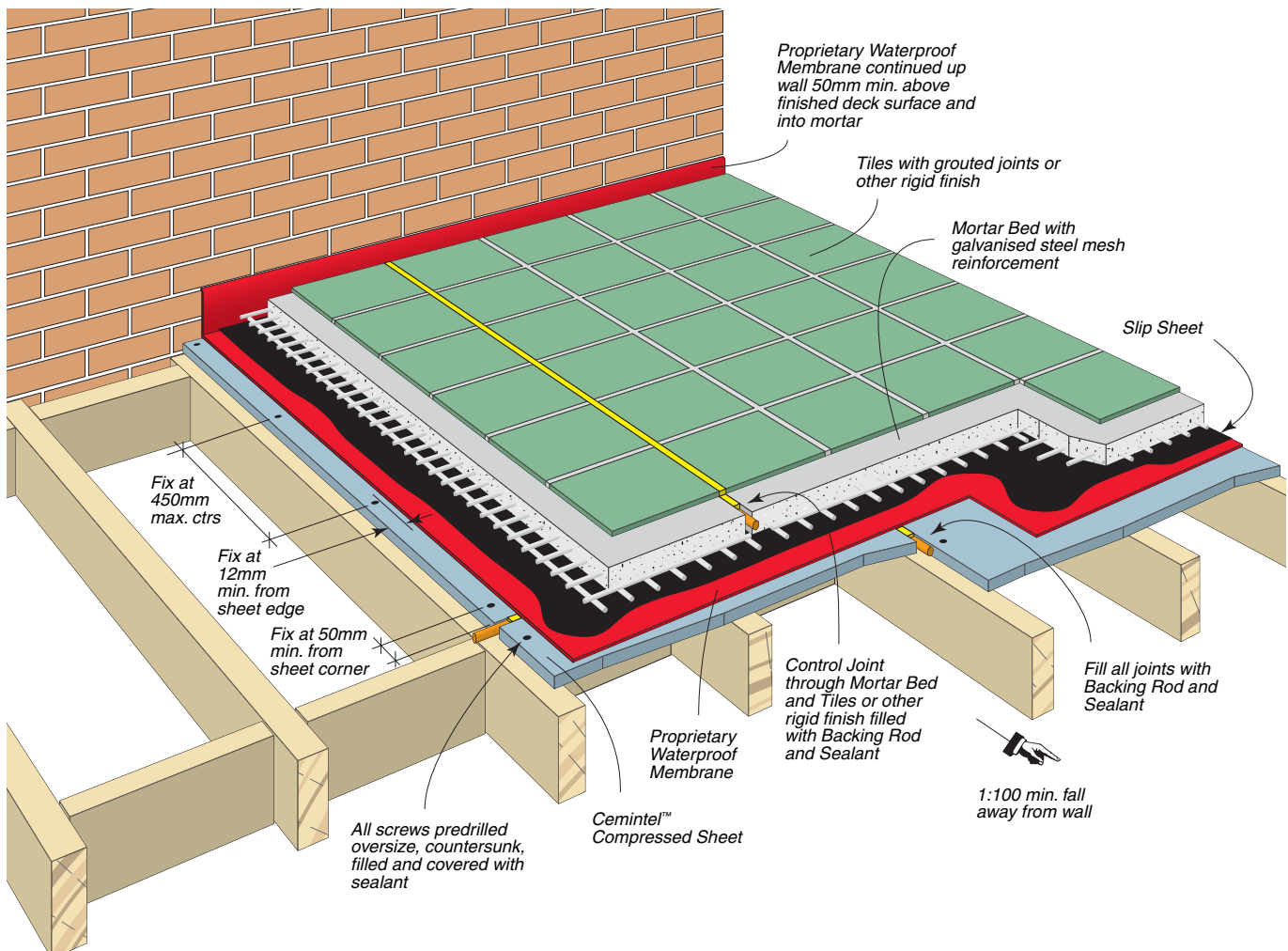
MEMBRANE.

A proprietary membrane system must be used. This should be installed by a specialist waterproofing contractor, and a waterproof guarantee provided.

SEPARATING LAYER.

To protect the membrane during tiling, and to separate the movement of the substructure and the tiled surface, a heavy duty plastic sheet must be installed over the membrane.

FIG 1. CONSTRUCTION OF MORTAR BED WITH SEPARATING LAYER.



MORTAR BED.

A mortar bed is laid over the slip sheet to provide a suitable surface for tiling.

Control joints must be installed at 4.5m maximum spacings in both directions.

The mortar bed must be approximately 30-40mm thick and reinforced with galvanised mesh.

The mortar bed should be allowed to cure for approximately 10 days before tiling commences

TILING.

Do not tile over control joints.

When selecting tiles ensure they are suitable for external use. An appropriate adhesive recommended for external use must be used.

In all cases, the tile and tile adhesive manufacturer's instructions should be followed.

For further advice, refer to Australian Standard AS3958.1 'Guide to the installation of ceramic tiles'.

FIG 2. SHEET FIXING AND JOINTING.

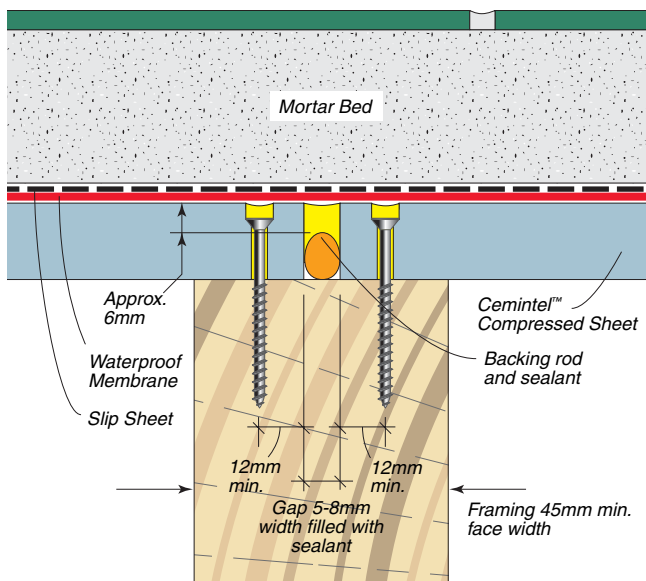


FIG 4. CONTROL JOINT THROUGH MORTAR BED AND RIGID FINISH.

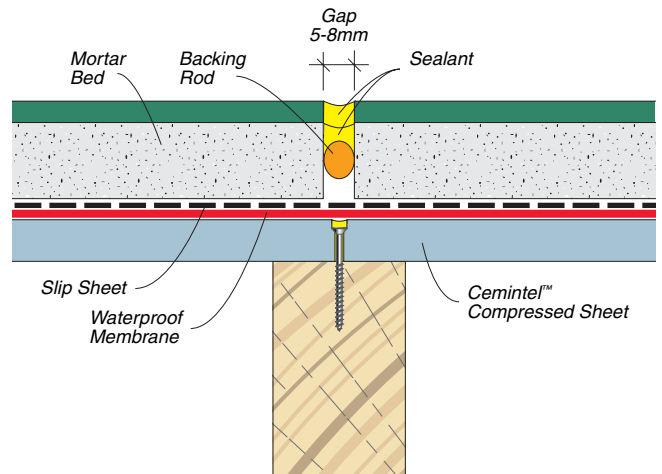


FIG 3. WALL/FLOOR JUNCTION.

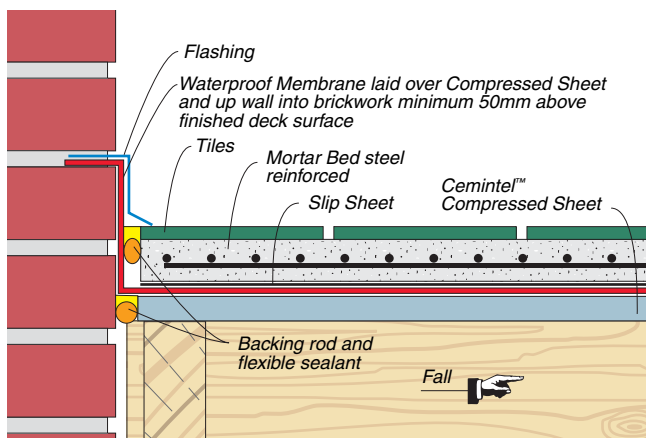
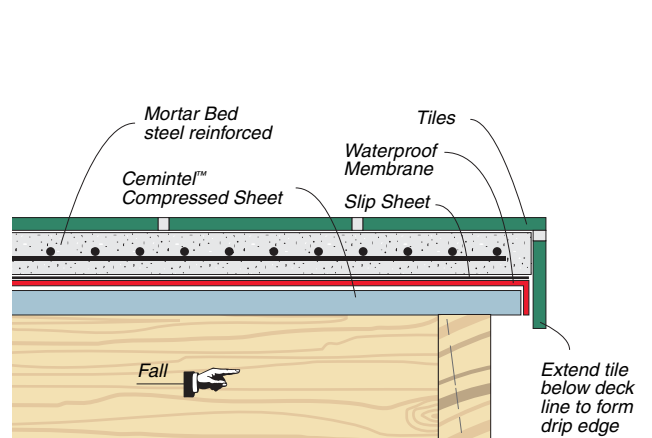


FIG 5. EDGE FINISH.



DRIP SHEET SYSTEM

The drip sheet system consists of fixing 4.5mm thick Cemintel™ Cladding Sheet to the floor joists, which is then covered with a heavy duty plastic Drip Sheet supported on packing strips.

The compressed sheet is then installed over the top. All joints and screw heads are filled with sealant. A trafficable surface is then applied.

Decks must be constructed with adequate drainage. This system is not suitable where water is directed to a central sump. The deck must not exceed 3 metres in width as joint supports interrupt drainage.

INSTALLATION

DRIP SHEET AND SUPPORT

Cemintel™ Cladding Sheet of 4.5mm thickness is fixed to floor joists to support the plastic drip sheet. Nail cladding sheet to all joists at 200mm centres maximum using 2.0 x 25mm nails. Nails must be minimum 12mm from sheet edges and 50mm from corners.

Strips of Cemintel™ Cladding Plank 7.5mm x 40mm or 50mm are positioned directly over joists and nailed into position using 2.8 x 40mm nails.

Drip sheet must be slightly dished between packing strips so it can act as a self draining chamber to dispose of condensation.

The plastic drip sheet is installed to control condensation and temporary minor leaks. Overlap all joints and seal with tape.

Allow for a minimum downturn around outside edges of 150mm, and an upturn of at least 50mm above finished floor level at walls and vertical surfaces.

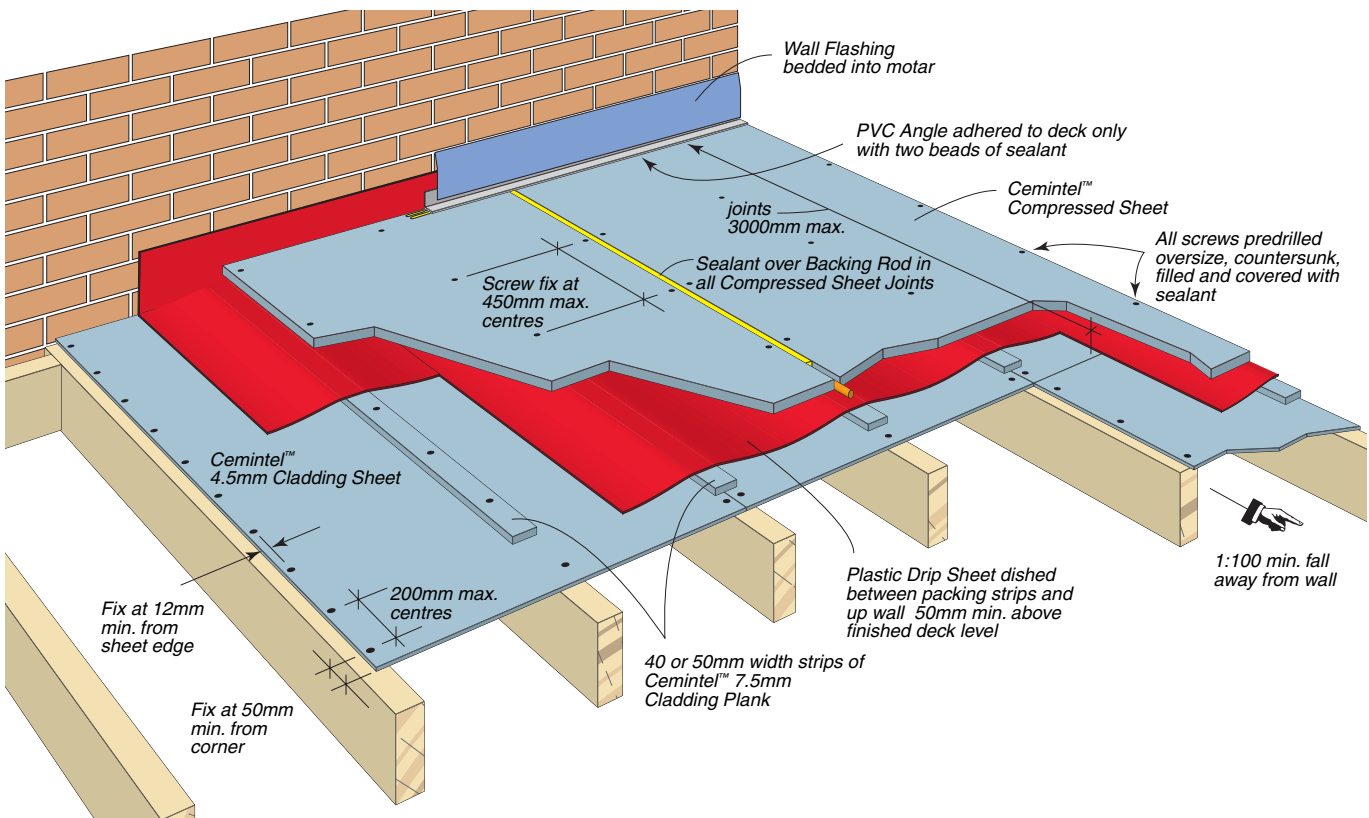
FIXING COMPRESSED SHEET

Compressed Sheets should be installed with the long edge parallel to the joists.

Sheets must be fixed to the frame leaving a 5mm minimum gap between each sheet. This gap is important to accommodate movement of the building materials and structure.

Prior to fixing, ensure that all joints will be supported by a framing member, and joist spacing allows for the 5mm joint gap.

Sheets are screw fixed at 450mm centres maximum along sheet edges and in the body of the sheet.



Screws must be kept a minimum of 12mm from edge of sheet and 50mm from corners.

Screw heads must be countersunk below sheet surface. Screw holes must be pre-drilled using a CSR Counter Sinking Tool. Screw holes must be cleaned and filled with flexible sealant. Once screws are in place, cover screw heads with flexible sealant.

Handy Hint: To prevent sealant spillage, place a strip of adhesive tape over the screw hole prior to drilling, then remove once screw is in place and covered with sealant.

JOINTING

Sheets must be fixed in position ready for joints to be completed.

Ensure joints are clean and clear of any dust that may prevent sealant adhering.

Scrub sheet edges with a wet brush and allow to dry before applying sealant.

Joints must not be covered by tiles or other rigid finishes. All joints are constructed as movement joints which must be carried through the finish layer. Failure to comply will result in cracking and water leakage.

Place a strip of masking tape along both sides of the joint to ensure a neat finish is achieved.

Place foam backing rod into joint, pressing down firmly against packing strip, and leaving approximately 6mm gap at top.

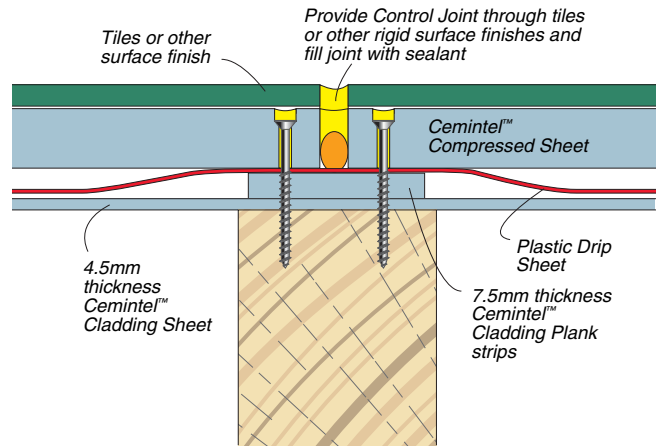
Fill remainder of joint with flexible sealant, finishing just below the sheet surface.

Remove masking tape and allow sealant to dry for approximately 24 hours. Sealant joints must remain

accessible for future maintenance.

Decks may be finished with artificial grass, outdoor carpet, pebble finishes, tiles or paint. The surface must not be left bare. It is critical that rigid finishes such as pebble finishes or tiles do not cover the sheet joints.

FIG 8. MOVEMENT JOINT THROUGH RIGID SURFACE FINISH.



WALL/FLOOR JUNCTIONS

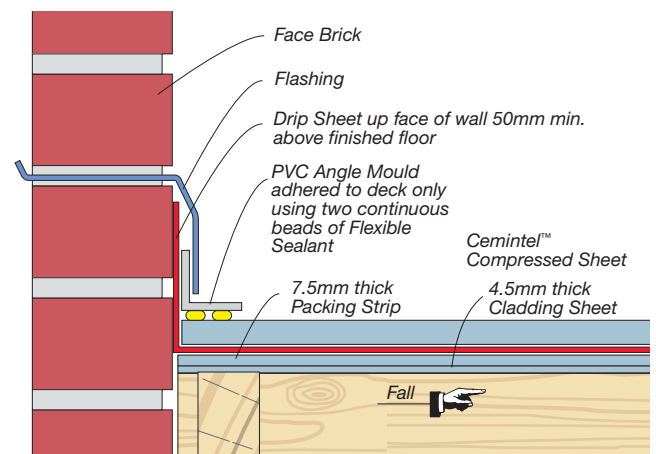
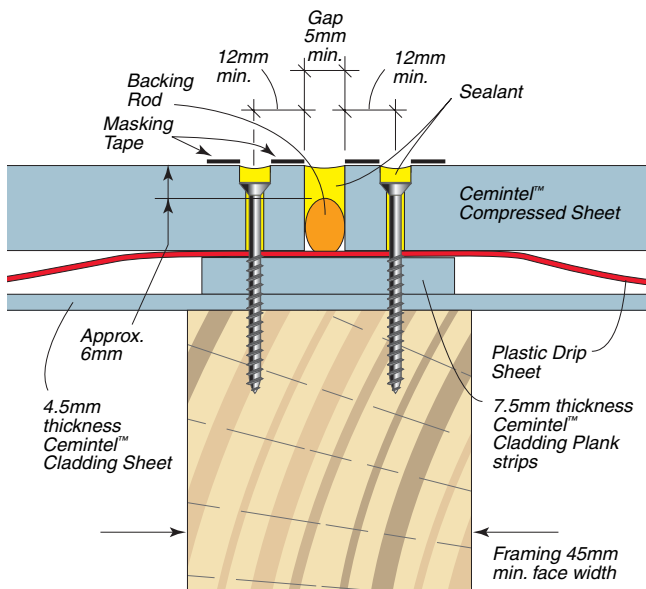
Flashing must be used at wall/floor junctions. PVC angle flashing 47 x 47mm is adhered to floor only to allow for frame movement.

Metal over-flashing such as Alcor™ or lead flashing is then installed from the wall. Tuck over-flashing up behind wall cladding or through brick work.

Ensure drip sheet upturn is not less than 50mm above finished deck surface (in high wind areas increase to 100mm).

FIG 9. WALL/FLOOR JUNCTION.

FIG 7. SHEET FIXING AND JOINTING.



EDGE FINISH

Sheet must not extend more than 100mm beyond framing/support. A drip line must be installed to the underside, near sheet edge, to prevent staining of the walls.

Fix a 12 x 12mm drip mould into place with sealant and self tapping screws at 300mm maximum centres. Alternatively, a 3 x 3mm groove may be cut into the underside of the sheet.

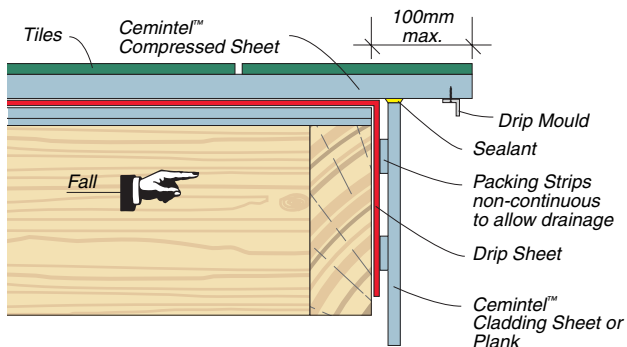
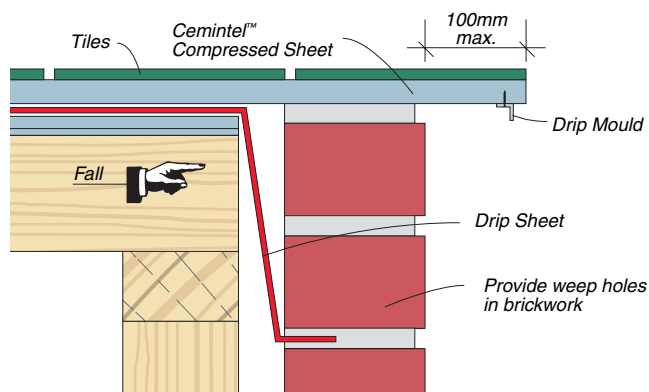


FIG 11. EDGE FINISH DETAILS.



LIQUID MEMBRANE & TRAFFICABLE MEMBRANE SYSTEMS

These systems are treated together as they have similar sheet fixing and waterproofing details. With no mortar bed, these systems are of minimum thickness, which is an advantage where threshold step height is low, and are lightweight to reduce the load on floor joists.

INSTALLATION

FIXING AND JOINTING SHEETS.

Cemintel[™] Compressed Sheets are fixed directly to the floor joists. Sheets may be laid in either direction relative to the slope and a support member is required at all sheet edges. Leave 5mm between sheet edges and 5 to 10mm at wall junctions.

Screw fix to each joists at 450mm maximum centres. Screws must be a minimum 12mm from a sheet edge and 50mm from a corner.

Screw holes must be pre-drilled and countersunk 3mm below surface. Allow 1mm clearance over diameter of screw. Screw holes must be cleaned and filled with flexible sealant before screw is placed. Once screws are in place, cover screw heads with flexible sealant. This will ensure fasteners are watertight.

Handy Hint: To prevent sealant spillage, place a strip of adhesive tape over the screw hole prior to drilling and remove once screw is in place and covered with sealant.

JOINTING.

Sheets must be fixed in position ready for joints to be completed. Ensure joints are clean and clear of any dust that may prevent sealant adhering. Place a strip of masking tape along both sides of the joint to ensure a neat finish is achieved. Press foam backing rod into joint, pressing down firmly against joist, leaving approximately 6mm gap at top. Fill remainder of joint with flexible sealant, finishing just below the sheet surface. Joints must be smoothed within 10 minutes. Remove masking tape and allow sealant to dry for approximately 24 hours.

MEMBRANE.

A proprietary membrane system must be used. This should be installed by a specialist waterproofing contractor, and a waterproof guarantee provided.

FINISHES.

Do not tile over control joints.

When selecting tiles ensure they are suitable for external use and an appropriate adhesive is selected. In all cases the tile and tile adhesive manufacturer's instructions should be followed.

For further advice, refer to Australian Standard AS3958.1 'Guide to the installation of ceramic tiles'.

FIG 12. CONSTRUCTION OF LIQUID OR TRAFFICABLE MEMBRANE SYSTEM.

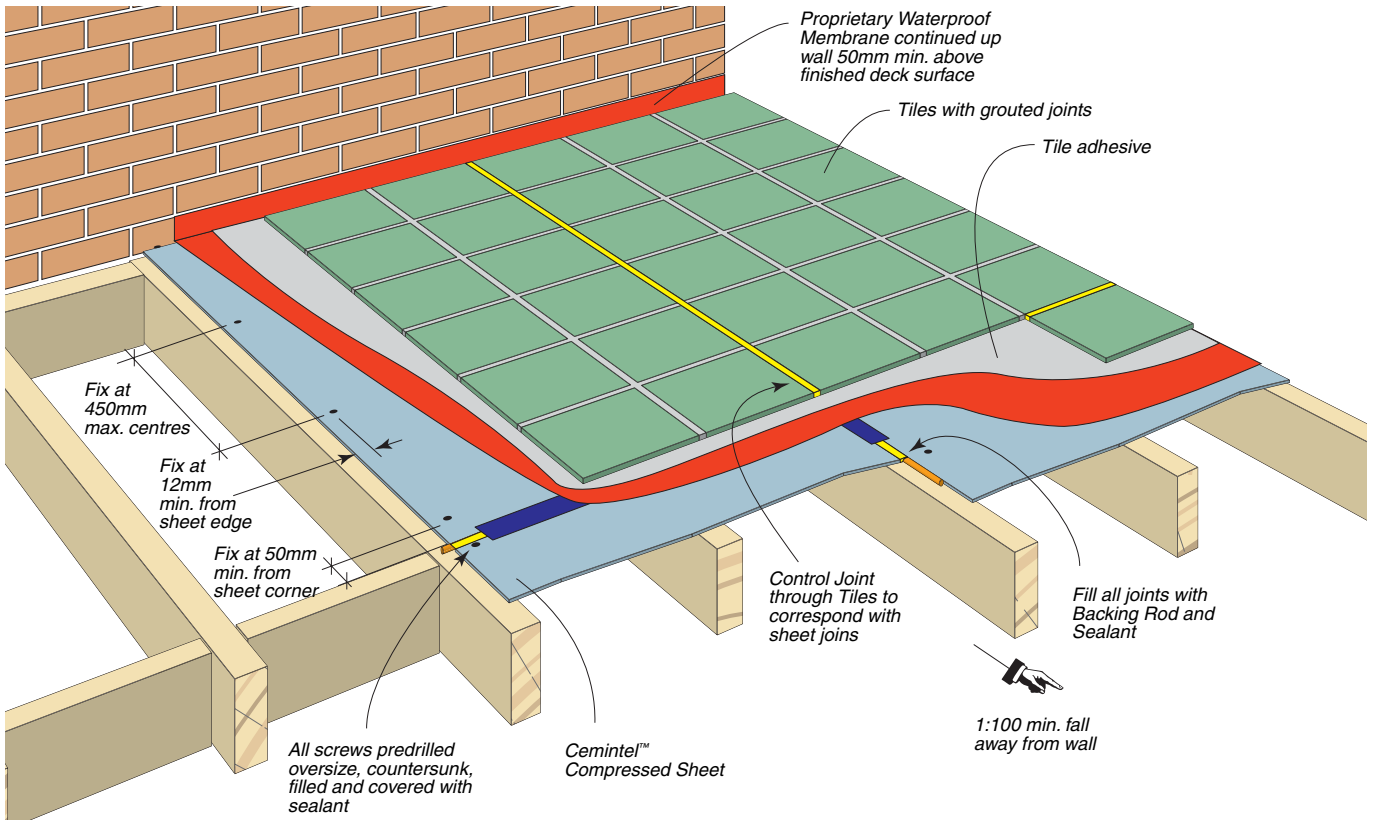


FIG 13. SHEET JOINT DETAIL.

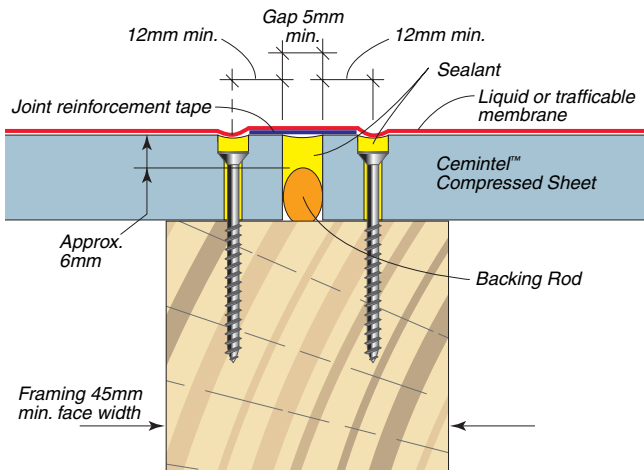


FIG 14. EDGE FINISHING DETAIL.

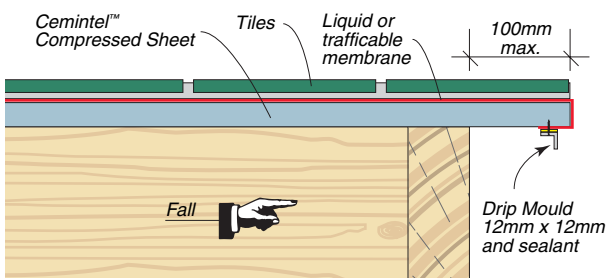


FIG 15. WALL/FLOOR JUNCTION.

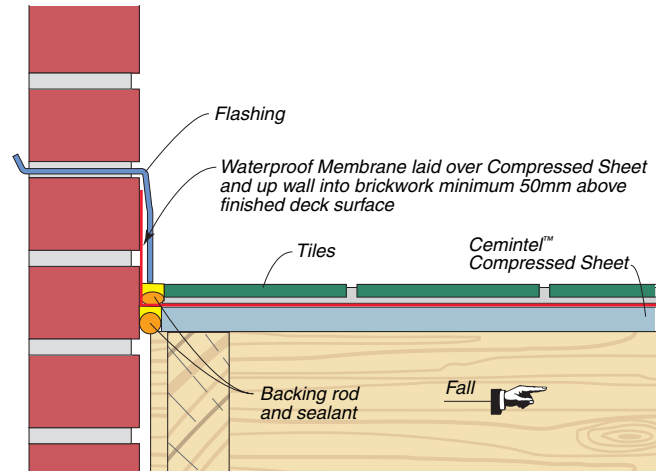
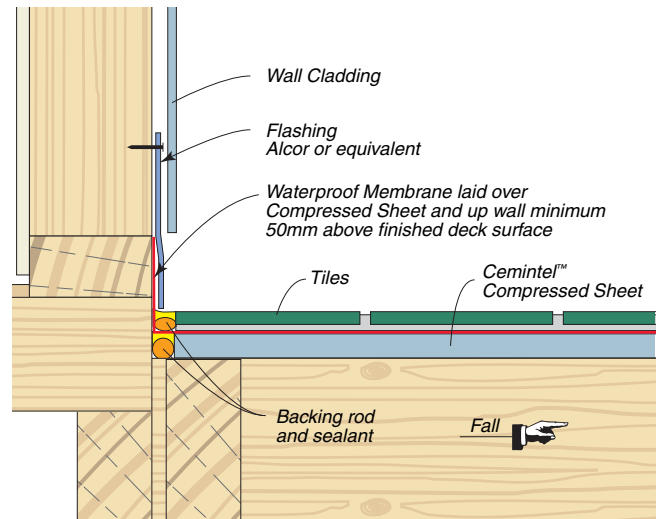


FIG 16. WALL/FLOOR JUNCTION.



WATER RESISTANT SYSTEM

Decks that are not required to be completely waterproof should be constructed to minimise the penetration of water to avoid dry rot in timber framing.

Timber and structural specifications must comply with the relevant building authority requirements.

Timber should be treated exterior grade, or where untreated timber is used, the top of the joists must be flooded with a timber preservative available from paint suppliers.

In addition, flashing must be used to protect the timber framing. Flashing must extend 50mm down the sides of the joists and trimmers.

Alcor™ flashing or equivalent is recommended.

INSTALLATION

FIXING COMPRESSED SHEETS.

Sheets may be fixed parallel to, or across joists. Prior to fixing, ensure that all joints will be fully supported by a framing member, and allow for 5mm joint gaps.

Sheets must be fixed to the frame leaving a 5mm minimum gap between each sheet. This gap is important to accommodate movement of the building materials and structure.

Sheets laid parallel to joists are screw fixed at 450mm centres maximum along sheet edges and in the body of the sheet. Screws must be a minimum of 12mm from edge of sheet and 50mm from corners.

Sheets laid across joists should be fixed with 3 screws per joist for 900mm sheets, and 4 screws per joist for 1200mm sheets.

Screw holes must be pre-drilled and head countersunk 3mm below surface. Allow 1mm clearance over diameter of screw. Screw holes must be cleaned and filled with flexible sealant before screw is placed. Once screws are in place, cover screw heads with flexible sealant. This will ensure fasteners are water tight.

Handy Hint: To prevent sealant spillage, place a strip of adhesive tape over the screw hole prior to drilling and remove once screw is in place and covered with sealant.

JOINTING.

Sheets must be fixed in position ready for joints to be completed. Ensure joints are clean and clear of any dust that may prevent sealant adhering.

Place a strip of masking tape along both sides of the joint to ensure a neat finish is achieved.

Press foam backing rod into joint pressing down firmly against joist leaving approximately 6mm gap at top. Fill remainder of joint with flexible sealant, finishing just below the sheet surface. Joints must be smoothed within 10 minutes.

Remove masking tape and allow sealant to dry for approximately 24 hours.

FINISHES.

Decks may be finished with artificial grass, outdoor carpet, pebble finishes, tiles or paint. Decks must not be left bare.

It is critical that rigid finishes such as pebble or tiles do not cover the sheet joints. Refer to FIG 8 for details.

MATERIAL PROPERTIES

Cemintel[™] Compressed Sheet conforms to the requirements of AS2908.2 : 1992 'Cellulose-cement products Part 2: Flat sheets'.

MANUFACTURING TOLERANCES.

Mass (nominal) 15mm thickness	28kg/m ²
Mass (nominal) 18mm thickness	34kg/m ²
Length	+0 to -3mm.
Width	+0 to -3mm.
Thickness	+10% to - 0%.
Diagonals Difference (max)	3mm.
Edge Straightness deviation (max)	1.5mm.

PHYSICAL PROPERTIES.

Property	Cemintel [™] Compressed Sheet at EMC* Saturated	
	Density (kg/m ³)	1700
Flexural Strength (characteristic)		
Parallel to sheet length		
- ultimate (MPa)	25	20
- yield (MPa)	20	13
Parallel to sheet width		
- ultimate (MPa)	20	16
- yield (MPa)	17	12
Modulus of Elasticity (GPa)	10	9
Thermal Expansion Coefficient	10 x 10 ⁻⁶ /K° (est. average)	
Moisture Movement		
- from EMC* to saturated	≈ 700 Microstrains (expansion)	
- from 30 to 90% RH (to ASTM C1185)	≈ 500 Microstrains (expansion)	

NOTE: * EMC (Equilibrium Moisture Content) is at nominally 23°C and 50% Relative Humidity environment conditions.

FIRE RESISTANCE

In accordance with the building code of Australia Cemintel[™] Fibre Cement sheets are deemed to be non-combustible. In addition, as defined by the BCA, sheets 12mm or thicker may be used where a fire protective covering is required.

The Fire Hazard Properties, when tested in accordance with AS1530.3 are as follows:

FIRE HAZARD INDICES.

Ignitability	0
Spread of Flame	0
Heat Evolved	0
Smoke Developed	0

HANDLING & STORAGE

All Cemintel[™] Fibre Cement sheets must be stacked flat, clear of the ground, and supported on a level platform.

Care must be taken to avoid damage to edges, ends and surfaces.

Where it is necessary to store sheets outside, they must be protected from the weather.

Sheets must be dry prior to fixing, jointing and finishing.

SHEET PREPARATION & SAFETY

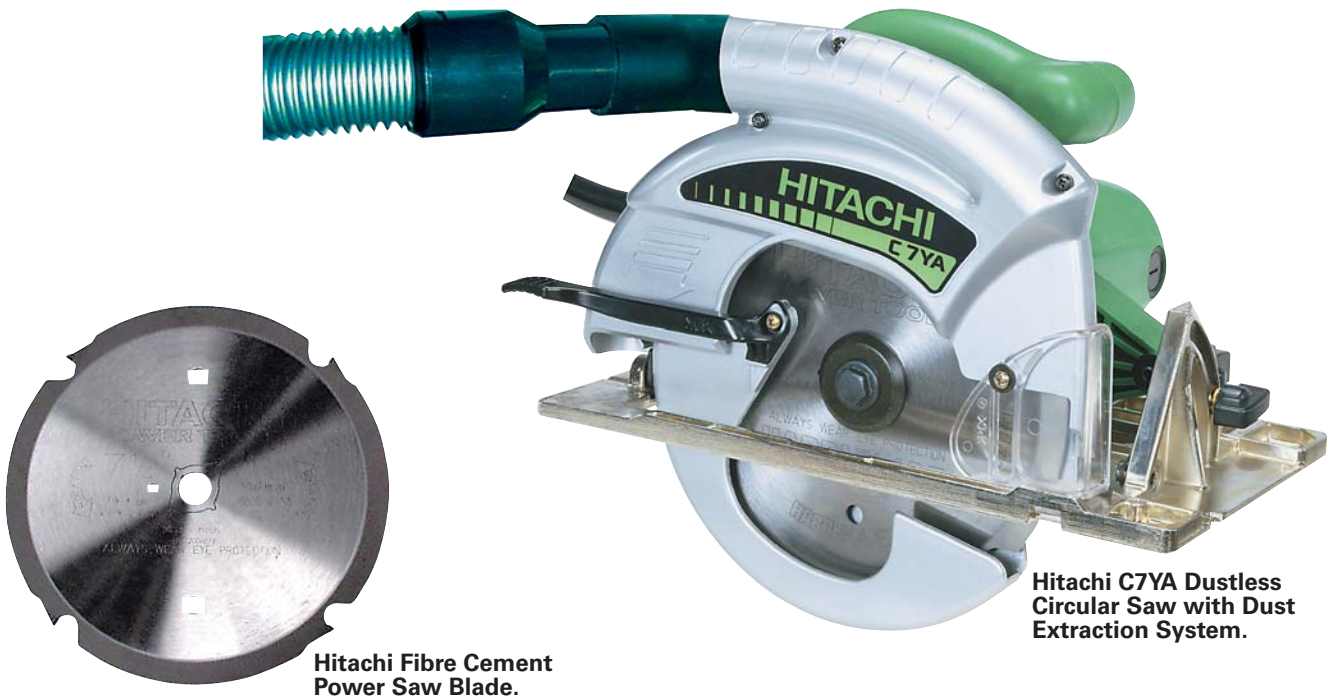
CUTTING

Cemintel™ Fibre Cement sheets may be cut on-site with a power saw. CSR recommends using the Hitachi Fibre Cement Power Saw Blade. This blade is specifically designed for use with fibre cement, and produces a superior cut compared to conventional blades.

It is ideal for use with the Hitachi C7YA dustless circular saw and other 185mm circular saws fitted with vacuum extraction systems.

SAFETY

When cutting or grinding fibre cement sheets using power tools, always ensure the work area is well ventilated. An approved dust mask (AS1715 and AS1716) and safety glasses (AS1337) must be worn. CSR recommends that hearing protection be worn where appropriate.



Hitachi Fibre Cement Power Saw Blade.

Hitachi C7YA Dustless Circular Saw with Dust Extraction System.



cemintel™
fibre cement systems

www.cemintel.com.au

HEALTH & SAFETY

WARNING

Fibre Cement products contain crystalline silica. Repeated inhalation of fibre cement dust may cause lung scarring (silicosis) or cancer. Do not breathe the dust. When cutting sheets, use the methods recommended in this brochure to minimise dust generation. If power tools are used, wear an approved dust mask (respirator). These precautions are not necessary when stacking, unloading or handling fibre cement products.

For further information and for a Material Safety Data Sheet, phone 1800 807 668.

GUARANTEE

CSR Building Products Limited warrants its Cemintel™ Fibre Cement products to be free of defects in materials and manufacture. If a CSR product does not meet our standard, we will, at our option, replace or repair it, supply an equivalent product, or pay for doing one of these.

This warranty excludes all other warranties and liability for damage or loss in connection with defects in CSR's product, other than those compulsorily imposed by legislation, notably the Trade Practices Act.

CONTACT DETAILS

Cemintel™ Fibre Cement Systems

Sales Support

Tel: 1300 CEMINTEL Fax: 1800 646 364

CSR designLINK® Technical Support Service

Tel: 1800 621 117

New South Wales and ACT

376 Victoria Street, Wetherill Park NSW 2164

Queensland

768 Boundary Road, Coopers Plains QLD 4108

Victoria

277 Whitehall Street, Yarraville VIC 3013

South Australia

Lot 100 Sharp Court, Mawson Lakes SA 5095

Western Australia

21 Sheffield Road, Welshpool WA 6106

Tasmania

PO Box 61, Glenorchy TAS 7010

Northern Territory

Cnr Stuart Hwy & Angliss St, Berrimah NT 0828

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