



# Particleboard Flooring System Installation Guide



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## KOPINE® ULTRALOCK FLOORING SYSTEM

The Kopine® Ultralock flooring system is a unique approach to wood panel floors which results in a strong, quiet, floor that is cost effective, performs well and is easy and safe to lay. The patented system uses glue to fix the panel edges which bonds the panels together to form a continuous flooring membrane. The adhesive, which is supplied with the panel (and included in the price) eliminates the need for nogs or intermediate fixings, saving time and money. The glue also provides an effective seal against the ingress of moisture into the joints to significantly reduce the chance of edge peaking that requires additional sanding.



**Faster** – Ultralock now uses Gorilla Grip Express adhesive to ensure that you can walk on the floor within 2 hours.



**Water Resistant Joints** – The fully glued joint significantly reduces the risk of edge peaking. Ultralock can be laid in most conditions.



**Stronger** – Ultralock flooring joints have superior shear strength.



**No Nogs/Dwangs** – Save time and money with the ability to bypass the need for nogs or dwangs (refer Planning Considerations, page 3 for exceptions).

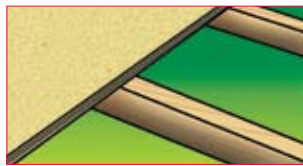


**Squeaks Less** – With Ultralock's patented glue joint the risk of a squeaking floor is substantially reduced.



**Easy and Safe** – The small sheet sizes (3600 x 1200 and 2400 x 1200) make the floor easy and safe to lay.

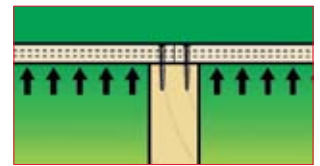
## KOPINE® ULTRALOCK FLOORING METHOD



Glued edges need no other support. Glue gives 100% efficient load-bearing bond.



No nogs needed at all. The Kopine® Ultralock floor is faster, easier & costs less to lay.



Edges lock together providing continuous fixed support – much less movement.

## STANDARD PARTICLEBOARD FLOORING METHOD



Timber nogs needed between joists to support panel edges.



Timber nogs take time to measure, cut and nail in place.



Nogs can give uneven support (drying/warping) allowing movement and squeaking.

## SYSTEM COMPONENTS

**Kopine® Ultralock Panels**  
3600 x 1200mm and 2400 x 1200mm high-density particleboard panels – long edges grooved for easier glue application and maximum bond.

**Holdfast Gorilla Grip Express Adhesive**  
Construction adhesive supplied in 310ml cartridges. Will fit any standard glue gun. Cartridges included as part of the Kopine® Ultralock Flooring System.

**Joists**  
The choice of joists will play a part in determining the performance of your flooring system. Moisture content of the joists must be less than 18%. It is highly recommended that joists be Machine Stress Graded, high temperature kiln dried timber such as Laserframe.

The benefits are a stiffer, more level floor than one laid with conventional wet, visual graded joists. This will result in reduced vibration, transmitting less sound above and below the floor.

**Note:** The Kopine® Ultralock Flooring System provides maximum performance using the specified components only combined with the installation instructions detailed in this brochure. Substitute components may not perform to the same standard and are not recommended.

The information contained in this manual relates to specific Kopine® branded particleboard products manufactured by Carter Holt Harvey Wood products and cannot be relied upon when using other particleboard products however similar they appear.

Alternative particleboard products can differ in a number of ways which may not be immediately obvious and substituting them for Kopine® products may not be appropriate and could in extreme cases lead to premature failure and/or buildings which do not meet the requirements of the New Zealand Building Code.

## HANDLING

### Exposure to Weather:

Kopine® Ultralock may be exposed to weather for up to 2 months. For best results keep exposure to a minimum.

Pre-laying – make sure the building is closed in within 2 months, preferably sooner. Post-lay if there is a risk of over-exposure.

Clear surface water from the floor quickly – do not allow it to pond. Remove the bottom plate from doorways to make clearing easier.

To allow moisture to evaporate freely, do not apply sealers, tape or other impervious sheet materials to a pre-laid floor while it is exposed.

Dimensional changes of approximately 0.3% in sheet length and width may occur in response to humidity changes.

### Safe Work Practices:

Exposure to particleboard dust and emitted formaldehyde

may irritate the eyes, respiratory system and skin.

Inhalation may lead to asthma. Repeated inhalation of dust over many years may increase the risk of nasal cancer.

Skin contact may lead to dermatitis.

Storage and work areas should be well ventilated and dust cleared regularly by vacuum or wet sweeping methods.

If skin irritation occurs, wear long-sleeved shirts, trousers and comfortable work gloves.

For respiratory protection, wear dust masks which comply with AS/NZS 1716.

For eye protection wear safety glasses which comply with AS/NZS 1337.

Holdfast Gorilla Grip Express Adhesive: Observe normal industrial hygiene measures and for further information refer to MSDS sheet available from Holdfast Manufacturing Ltd, 14 Avalon Drive, PO Box 4206, Hamilton, Auckland, New Zealand, Phone (07) 847 5540, Fax (07) 847 0324.

## PLANNING CONSIDERATIONS

### Heavy Loadings:

Additional support will be needed beneath concentrated loads such as pianos or large bookshelves. Do not stack heavy items on the pre-laid floor for long periods or it may sag permanently.

### Clear Finishing:

If clear finishing is planned, to avoid colour variation, do not mix batches of sheets. To prevent stains, avoid prolonged contact with sawdust piles, stacked timber, steel scaffolding, cement, strapping or nails especially if rusting is likely. Avoid spills of tea, coffee, paint or cement. It may be safer to post-lay. In any event, keep the period of exposure short.

### Expansion Gaps:

Regardless of the size of the floor, an 8mm expansion gap must be provided between the panel edges and any fixed elements e.g. masonry walls, bottom plates etc. This is important to allow for any linear expansion and applies whether pre or post laying.

### Large Floor Areas:

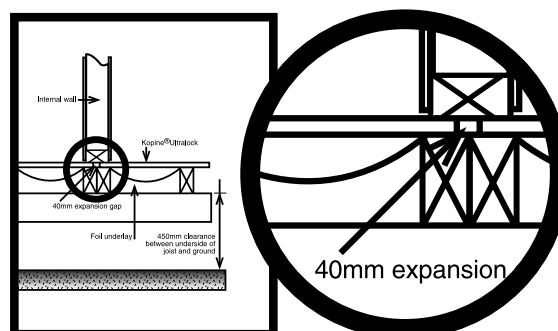
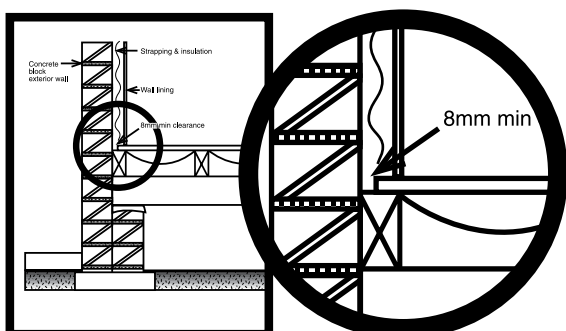
As with all wood products, particleboard floors will move with changes in moisture content of the panels. For large floor areas – i.e. floors with a span of 18 metres or greater, provision must be made for expansion of the panels.

Where the floor is 18m or more in either length or width, allow for a 40mm expansion gap per 18 metres. This should be as close as practical to the centre of the floor preferably under an internal wall.

To lay the floor, the following procedure should be followed:

- Commence from the centre of the building from a straight square line and lay the floor from the centre out in a staggered brick like pattern as described under "Installation"
- Ensure the expansion gap is placed over double thickness fixing – i.e. if required on the short edge of the panel, a double joist; if required on the long edge of the panel, fix a row of nogs.
- Close the building in (within 8 weeks) without filling expansion gaps, and allow sufficient time for the floor to dry out and become conditioned. During the exposure period, clear any surface water quickly – do not allow it to pond. Bottom plates should be removed from doorways to assist water removal.
- After drying out, fill the expansion gap with a strip of Kopine® particleboard flooring from the same batch. Glue edges with Gorilla Grip Adhesive and screw fix to joist or nogs/dwangs.

Kopine® Ultralock panels are designed to be laid across joists and glued together at the edges. This continuous glue bond eliminates the need for further edge support such as timber nogging. All end joints (short edges) must be made over a joist and glued.



## INSTALLATION

Joists should be at no more than 600mm centres. For greater strength and stiffness, set joists at 400mm centres (for 2.4m or 3.6m sheets) or 450mm centres (for 3.6m sheets only). Lay sheets in a staggered, brick-like pattern.

### Gluing:

Holdfast Gorilla Grip Express is the only adhesive recommended for use with the Kopine® Ultralock Flooring System.

### Application:

All panel edges must be square and free from dirt, grease and standing water. The glue bead should be applied in a continuous run of at least 5mm diameter. The bead size is right when glue squeezes out of the joint, top and bottom, as the panels are pushed together.

Fix panels within 15 minutes of glue being applied. If glued panels are moved apart after 15 minutes, fresh glue must be applied before the joint is made again. Panel movement during the curing of the adhesive will affect the glue bond. Keep traffic off the joints for at least 2 hours (particularly if joists are at 600mm centres or in cold climatic conditions). Direct essential traffic over joists or lay planks across the floor.

### Laying the First Row:

Establish a straight, square line from one corner of the floor. Lay the first panel down this line, across the joists. Fix to joists. Apply a generous glue bead to the short edge of the fixed panel. Push the next panel into position and nail lightly to ensure mating edges are flat. Lever the panel up tight to squeeze out glue until the joint is completely closed. Screw the panel down. Remove light nailing. Clean off excess glue.

### Laying Further Rows:

Apply a generous glue bead to mating edges of fixed panels as per step 1 and continue laying as per steps 2 and 3.

Place the panels so the "this side to joists" stamp faces down.

Allow for a linear expansion gap at a minimum of 8mm between the edge of the floor panel and any fixed components. e.g. bottom plate, see diagram page 3.

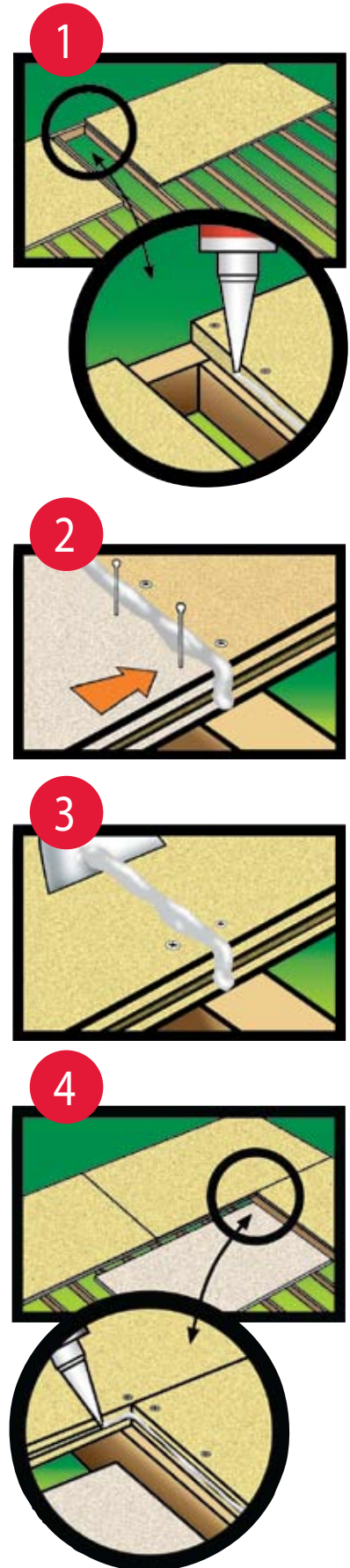
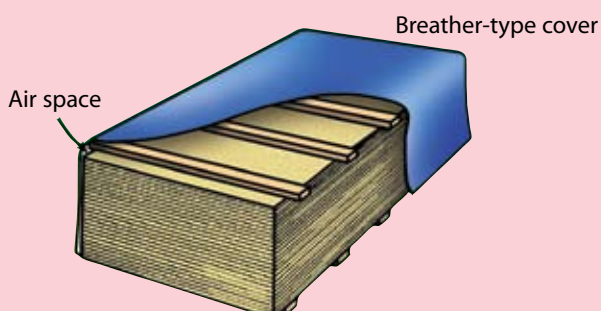
### Wet Conditions:

Holdfast Gorilla Grip Express Adhesive can be successfully applied in wet weather and temperatures down to 5°C. Ensure panel edges are free of surface water. Ensure that water is not pooling over the glue line until the adhesive has formed a skin.

## STORAGE

Protect the panels from weather and keep dry before laying. Store the pack clear of the ground on level bearers.

A breather-type cover must be supported clear of the panel surface allowing air to circulate freely around the pack.



## INSTALLATION

### Edges not Level:

If two adjacent edges are not level between the joists, push them into line and skew a light gauge finishing nail through the joint while the glue cures.

### Fixing:

The long-term performance of the floor depends almost entirely on the dryness and flatness of the subfloor and the standard of fixing.

Correct fixing achieves a tight, permanent joint between the panels and joists – after the joists have finished drying and shrinking.

We recommend adhesive fastening to the joists with Holdfast Gorilla Nail Power in addition to your preferred fixing method from the options below. Power-driven staples must not be used.

- 1 Nails or screws should be spaced at 150mm centres along the short edge of the sheets and around the perimeter of the entire floor, and at 200mm centres along intermediate joists.
- 2 Fixings must be a minimum of 10mm from the panel edge.
- 3 While all the specified fixing methods are approved, screw fastening will provide the best result.
- 4 Completely fix sheets at time of initial laying – corner fixing will not hold sheets firmly while glue cures.

### Screw Fastening:

Use 8-gauge x 50mm Sure-fast type countersunk screws (50mm minimum).

While these screws can drill their own hole, it is best to pre-drill the panels.

A lower torque setting reduces the risk of overdriving and tearing the threads loose in the timber.

Overdriven screws must be removed and set in a new position.

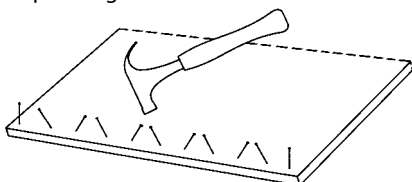
Screw fixing gives the tightest result of all the methods, but re-tightening may be needed after the joists have finished drying.

### Hand-driven Nails:

Use 60 x 2.8mm hot-dipped galvanised jolt head nails or 60 x 3.15mm hot-dipped galvanised csk annular grooved flooring nails.

Drive nails at a slight angle (alternating) and parallel to the sheet edge for improved lateral holding. Nail vertically at corners.

Nails should be hammered flush when laying then punched below the surface just before sanding. This will tighten the panels onto the joists, taking up any shrinkage, and will reduce squeaking.



### Power-driven Nails:

Use only 65 x 2.87mm hot-dipped galvanised annular grooved flooring nails. A depth adjuster attachment should be used on the nail gun and the air pressure adjusted to ensure that the nails do not penetrate more than 2mm below the surface of the panel. Do not rely on the nails to pull panels down tight on the joists – panels must be in contact with the joist before the nail is fired.

Nails must be punched below the surface just prior to sanding. This will take up any shrinkage of the timber joists and reduce the likelihood of squeaking.

### Adhesive Fastening:

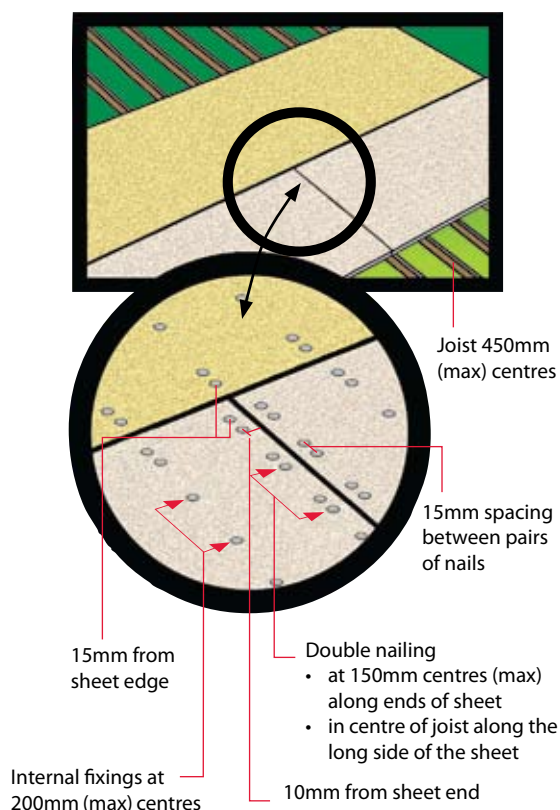
Adhesive fastening is recommended in addition to the above fixing options. We recommend adhesive fastening with Holdfast Gorilla Nail Power when gluing Kopine® Ultralock to floor joists. This will reduce the risk of squeaking in upper subfloors caused by joist shrinkage.

In ground floor applications where foil insulation is used, apply adhesive to the floor joists through 25mm square cut outs in the foil at 300mm centres. Cut outs can be made by taping two builders knives together and making two cuts along and across the top of the joist, through the foil.

For upper floors that do not require foil or similar insulation, apply a 10mm bead of Holdfast Gorilla Nail Power foam to the joists, covering the whole length of the joist. Fasten sheets fully within 15 minutes of applying the adhesive to ensure a tight bond to the joists. Refer to manufacturer's instructions for more detail.

### Floor Diaphragms:

Kopine® Ultralock is suitable for use as a floor diaphragm within the scope of NZS 3604. Joist centres must not exceed 450mm and special nailing patterns apply – see diagram below.



## FINISHING

Kopine® Ultralock panels must be sealed with polyurethane or covered with carpet or sheet vinyl before the building is occupied. Lightly sand with 40-80 grit paper before laying floor coverings or clear finishing.

Do not over-sand. Excessive sanding can reduce structural strength and lead to colour variation, visible when the floor is clear finished.

### Clear Finishing:

- 1 Punch nails then carefully sand the entire floor.
- 2 Remove dust from the floor and skirtings with a broom and vacuum cleaner.
- 3 Apply the first polyurethane coat, following manufacturer's instructions.

- 4 Fill nail holes with a filler such as DAP wood dough.
- 5 Apply further coats, lightly sanding between each coat.
- 6 Follow manufacturer's instructions to complete.

### Glue Fixed Floor Coverings:

Particular care must be taken to ensure the sub floor is dry to avoid risk of shrinkage later. Moisture content of the timber joists must not be greater than 18%.

Sand the floor.

When applying sheet vinyl or other glue fixed floor coverings, the floor panels must first be sealed to prevent absorption of the glue into the particleboard. Do not fill nail or screw holes as this can lead to telegraphing of the filling compound through the vinyl.

## SPECIFICATIONS

### Physical Composition

Panels:

Kopine® Ultralock Panels are reconstituted wood panels manufactured by bonding pine wood particles with a melamine urea formaldehyde resin using a combination of heat and pressure.

Adhesive:

Holdfast Gorilla Grip Express is a fast curing, one component, polyurethane based adhesive with high bond strength. It bonds deeply into the panel fibres, even on damp surfaces. Holdfast Gorilla Grip Express cures to a transparent glue line and gives added protection against moisture penetration into the joint significantly decreasing the risk of edge swell or peaking. The glue is temperature resistant to 100°C. For more information contact Holdfast Manufacturing on (07) 847 5540.

### Technical Advisory Service:

Technical information and advice is available through the Kopine® Technical Advisory Service,

Telephone 07-867-9899  
Facsimile 07-867-9810

Kopine® and Ultralock® are registered trade marks owned by Carter Holt Harvey Limited.

This brochure contains important information on the installation and maintenance of Kopine® Ultralock Flooring System.

The information contained in this brochure is current as at April 2007 and replaces all previous publications relating to Kopine® Ultralock Flooring.

Carter Holt Harvey reserves the right to revise this brochure without any notice.

Please check with your distributor or with Carter Holt Harvey for issues published after April 2007.

Carter Holt Harvey has used its reasonable endeavours to ensure the accuracy and reliability of the information contained in this brochure, and to the extent permitted by law, will not be liable for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.

### Kopine® Ultralock Particleboard flooring

#### Dimensions

Thickness (mm)	Size (mm)	Sheets per pack	Sheet wt (kg)
20	2400x1200	50	41
20	3600x1200	20	61

#### Board squareness:

Panels are square within 1mm per 1m.

**Thickness tolerance: +/- 0.2mm**

**Length and width: +/- 1.5mm**

**Sheet edges: 2.0mm max. deviation from line.**

#### Extractable formaldehyde:

E1: ≤1.5mg/L when tested in accordance with AS\*/N/ZS4266.16. Acceptable in buildings ventilated to NZBC\*.

### Physical Properties

Lower 5th percentile values in relation to particleboard flooring panels when tested internally (based on the procedures of AS/NZS 4266).

Density	kg/m <sup>3</sup>	690
Internal Bond	kPa	500
Modulus of Rupture	MPa	17
Modulus of Elasticity	MPa	2650
Moisture Content (at dispatch)	%	5-13
Surface Water Absorption	g/m <sup>2</sup>	210
Thickness Swell (24 hour soak)	%	14

Surface - upper surface is sanded  
- underside is sanded

Identification - installation label on the underside of each panel

Thermal Insulation - R = 0.13m<sup>2</sup>C/W

#### Abbreviations

NZS	New Zealand Standards
AS	Australian Standards
NZBC	New Zealand Building Code

## BUILDING CODE REQUIREMENTS

### Ventilation:

Cross-flow ventilation must comply with Acceptable Solution E2/AS1 paragraphs 4.1.4 and 4.1.5 or NZS 3604:1999 clause 6.14.

Ventilation openings must be evenly distributed around the entire perimeter – in the foundation and/or substructure walling.

A ground cover vapour barrier must be installed in sub-floor areas where:

- The ground will be permanently or seasonally damp.
- The airflow is obstructed by party walls, internal foundation walls or attached terraces.
- Points on the ground are greater than 7.5 metres from a ventilation opening.

Refer to Acceptable Solution E2/AS1 paragraphs 4.1.7 and 4.1.8.

### Underside Coating:

The underside of Kopine® Ultralock facing the ground must not be coated with any form of sealant and only perforated foil or other approved product is to be used as insulation, to allow the sheet to breathe.

### Insulating with Foil:

Make sure proper drainage is achieved – refer NZBC H1. Add extra holes at the bottom of each foil drape if necessary. A 100mm drape is best.

If you intend glue fixing to the joists, the foil will need to be cut to allow beads of glue to be applied.

### Heat and Fire Safety:

The floor must be protected from heat sources such as free-standing heaters, space heaters, hot air ducts and pipes containing hot water or steam. Floor temperature must not be allowed to exceed 35°C for prolonged periods. NZBC C1.3.2 specifies how the floor must be separated from fireplaces, flues, chimneys and fuel burning appliances. Consult appliance manufacturers to determine maximum clearances which will ensure the floor does not exceed 50°C for short periods or 35°C for longer.

### Spread of Fire:

Kopine® Ultralock can be used where the NZBC requires no specific fire resistance rating – including dwellings, purpose group SH. For surface finish requirements, refer Acceptable Solution C3/AS1 paragraph 8.2.

### Surfacing for Wet Areas:

In water-serviced areas such as laundries, bathrooms, toilets and showers the floor must be covered with a moisture-impervious membrane, coved at the walls, extending under toilet pans. Vinyl tiles, carpet or clear coatings must not be used in these areas. Refer Acceptable Solution E3/AS1 paragraph 2.1.1.

### Insects – Fungus:

The risk of damage from insects such as borer or termites is very low. The floor will resist fungal decay provided its moisture content does not exceed 18% for prolonged periods.

### Ground Clearance:

A minimum clearance of 450mm must be provided between the underside of the joists and the surface of the ground. Refer NZS 3604:1999 clause 6.14.4. Inspection access is also required.

### Limitations:

Kopine® Ultralock:

- May be exposed to weathering for up to 2 months. It must not be exposed for longer periods.
- Must not be installed over timber supports with moisture content over 18%.
- Is not suitable for use as a substrate for roofing or decking membranes.
- Interior surfaces must be sealed with polyurethane or covered with carpet or sheet vinyl prior to occupation of the building.
- Must have joints supported by nogs/dwangs beneath concentrated loads such as pianos or large bookshelves.

### Floor Heating Systems:

Over Floor Heating Systems

Over floor heating e.g. under carpet or tiles, may be used with Kopine® Ultralock, provided the floor surface temperature does not exceed 35°C. Care must be taken to ensure that the floor temperature is normally maintained at or less than the recommended long-term maximum of 35°C. In these applications, care must be taken to ensure that flooring is laid over dry framing and is well protected from the weather until the building is closed in. Post laying of the flooring is recommended. Any failure of the heating system is the responsibility of the floor heating system manufacturer.

Under Floor Heating Systems

Under NO CIRCUMSTANCES should any floor heating system be attached to the underside of the Kopine® Ultralock or be attached or placed between joists or any cavities of the floor framing.

### Maintenance:

Regular underfloor inspections must be made. Any sign of moisture or mould on the floors or lower parts of walls must be investigated and corrective action taken. Plumbing leaks, moisture migration or leakage from external sources must be rectified. Moisture concentration in wall cavities must be repaired and recurrence prevented.

Keep vents in the perimeter foundation walls clear of vegetation and other obstructions to allow proper subfloor ventilation at all times. Keep subfloor vapour barriers and insulation foil in a serviceable and effective condition. Floor coverings and coatings must protect the whole floor surface. In water-serviced areas the moisture-impervious floor covering or coating must be maintained so water cannot reach the particleboard.

Floor wastes must be kept unobstructed and drain to the outside of the building.

After flooding:

Dry the floor quickly. Lift carpets and slit insulation foil drapes so all water drains.

Durability:

When used in accordance with the instructions and recommendations in this brochure, Kopine® Ultralock will meet the durability performance requirements of NZBC.

# ULTRALOCK

KOPINE FLOORING SYSTEM



## Faster

Ultralock now uses Gorilla Grip Express adhesive to ensure that you can walk on the floor within 2 hours. The unique glue joint system makes laying the floor easy, saving you valuable time.



## Stronger

Ultralock flooring joints have superior shear strength.



## Squeaks Less

With Ultralock's patented glue joint the risk of a squeaking floor is substantially reduced.



## Waterproof Joints

The fully glued joint significantly reduces the risk of edge peaking. Ultralock can be laid in most conditions.



## No Nogs/Dwangs

Save time and money with the ability to bypass the need for nogs or dwangs. The patented Ultralock Flooring System means you can lay sheets straight on to the joists (refer Planning Considerations, page 3 for exceptions).



## Easy and Safe

The small sheet sizes (3600 x 1200 and 2400 x 1200) make the floor easy and safe to lay.

**FPb**

FUTURE-PROOF BUILDING



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