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Timber composite overlay flooring

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Timber composite overlay flooring can provide many of the benefits of solid timber strip flooring when laid over a concrete or old existing floor.

Timber composite overlay flooring may be laid over most floor substrates but correct preparation and dryness of the substrate is essential.

This Bulletin describes the options for and the design and installation of timber composite overlay flooring.

1.0 INTRODUCTION

1.0.1 Solid timber strip flooring has always been a popular floor finish over a suspended floor system. It is now also frequently laid directly over a concrete floor slab (see Bulletin 506). However, as the cost and scarcity of solid timber has increased, a range of manufactured timber composite overlay flooring systems has been developed as an alternative option to the use of solid timber flooring. These may be laid over substrates of either concrete, or existing timber or particleboard flooring.

1.0.2 Timber composite overlay flooring systems can provide a floor finish of natural timber veneer or a graphic reproduction of a timber finish that gives the appearance of a solid timber floor. They are easy to lay, as most systems comprise of interlocking planks that provide a tight, mechanical joint, often without the need for gluing. They can be used in a wide range of locations including both residential and light commercial situations.

1.0.3 Unless a system is specifically recommended by the manufacturer as suitable for wet area use, timber composite overlay flooring systems must not be used in wet areas such as bathrooms, toilets, laundries and kitchens.

1.0.4 Selection of the floor finish should be made early in the design stage of a building project in order to be able to accommodate detailing requirements such as set-downs that may be required in the concrete floor slab to allow for the thickness of the floor system.

1.0.5 The most common cause of problems that occur with timber composite overlay flooring is due to moisture levels. Problems may occur as a result of:

- moisture uptake by the flooring material from a concrete slab where the moisture content is too high, or
- where the moisture content of the flooring material when laid does not match the moisture content of the space in which it is installed, or
- splashing or wet cleaning methods being used after the floor is laid.

1.0.6 This Bulletin describes the options for and the design and installation of timber composite overlay flooring. Solid timber flooring, covered in Bulletin 506 *Laying solid timber strip flooring on concrete slabs*, is outside the scope of this Bulletin.

2.0 TYPES OF TIMBER COMPOSITE OVERLAY FLOORING

2.1 MATERIALS

2.1.1 Timber composite overlay flooring systems include:

- engineered flooring
- laminated flooring
- bamboo flooring
- reconstituted wood-fibre (HDF) panels used to remediate 'poor' quality floor surfaces.

2.1.2 Engineered flooring refers to systems that have a thin timber veneer, typically over a base of timber (pine or spruce) or reconstituted wood board or plywood. They are designed to give greater dimensional stability than a solid timber floor will provide, while maintaining the look of a solid timber floor (see Section 4.1).

2.1.3 Laminated flooring consists of a high-quality photographic image covered with a protective wearing surface and laid over a core of high-density fibre board (HDF) (see Section 4.2).

2.1.4 As it grows to maturity in 5–6 years, bamboo provides a sustainable material that is manufactured as solid or reconstituted bamboo flooring (see Section 4.3).

2.1.5 Reconstituted wood-fibre or HDF may be used as overlay flooring as well as part of a suspended floor system. As an overlay flooring, it is generally used where a floor needs a refurbishment (see Section 4.4).

2.2 USES

2.2.1 Timber composite overlay flooring systems can be used for:

- residential – all areas, except for wet areas such as bathrooms, laundries, toilets and kitchens unless specifically recommended by the manufacturer as suitable for a wet area
- commercial – public spaces such as offices, restaurants, hotels and retail outlets.

2.2.2 They can be laid over clean, dry and level substrate.

2.3 PERFORMANCE

2.3.1 Timber composite overlay flooring systems:

- have excellent wearing ability – some systems exceed the performance of solid timber floors, for example, bamboo is a harder material than many timber hardwoods, and timber veneer finishes have a similar wearing to solid timber floors
- are available as easy-to-lay interlocking planks that may not require gluing and can be walked on as soon as they have been laid – edge gluing is recommended for some products
- generally have a hard-wearing, prefinished surface (anti-scratch) coating.

2.4 ADVANTAGES

2.4.1 Timber composite overlay flooring systems can match some qualities of solid timber floors and may have advantages over solid timber, for example, they:

- are generally a cheaper option
- can be durable (species- and finish-dependent) and hard-wearing
- are quick and easy to install
- can be loose laid, which facilitates lifting and future replacement
- thicker veneers (3–6 mm) can be sanded and recoated (typically once) with care
- can provide a simple solution to the refurbishment of damaged floors
- can have good acoustic properties when laid over a sound-absorbing underlay.

2.5 DRAWBACKS

2.5.1 Timber composite overlay flooring systems:

- have the moisture and thermal stability characteristics of the timber they are made from – that is, they are wood-based and will move in response to changes in relative humidity (particularly) and temperature
- for veneered flooring, there will be variations in colour across the timber
- are not suitable for use in wet areas
- some fading and denting will occur – fading will be more noticeable with darker timbers
- veneer thicknesses of 3 mm or less may not be able to be sanded and recoated, and laminate floors cannot be resanded
- are not generally suitable for refinishing once the surface coating/finish has deteriorated
- are not suitable for laying directly over a substrate that is or is likely to be damp – some systems may incorporate a membrane to provide some isolation from moisture, but the risk of failure will always be higher
- may mean it is more difficult to replace a single damaged plank because of the interlocking joints between planks
- when laid as floating floors, may not feel like solid timber when walked on.

2.6 SELECTION FACTORS

2.6.1 When considering the use of timber composite overlay flooring, a number of factors should be considered:

- What is the expected traffic and use of the space?
- What serviceability (expected life) is required?
- What is the quality of the substrate?
- What type of appearance and finish are required?
- Is it to be loose-laid (floating) or glued?
- Does the flooring carry an Environmental Choice label or an independent product certification or appraisal?

3.0 INSTALLATION GENERALLY

3.0.1 Timber composite overlay flooring systems can be laid over concrete, solid timber, plywood, particleboard, vinyl, cork and ceramic tiles. All substrates must be sound, level, clean and dry. Generally, unevenness of more than 3 mm over 1.0 m of the substrate must be filled with levelling compound (depressions) or levelled by sanding or grinding (raised areas).

3.0.2 Most flooring systems are available as planks (Table 1 gives a range of sizes). The choice of thickness of flooring will depend on a number of factors such as the height of any existing thresholds that must be accommodated. Generally, quality (stability) will increase with thickness.

3.0.3 There are three methods of installation of timber composite overlay flooring. These are:

- loose-laid or floating
- glue-fixed
- indirect.

TABLE 1: SUMMARY OF TIMBER COMPOSITE OVERLAY FLOORING PROPERTIES

Flooring type	Suitable for:			Installed over underfloor heating	Fixing method			Finishes available		Refinishable	Typical plank dimensions			Expansion gaps (mm) (see Table 2 also)	Interlocking boards	Accessories available	Good stability	Environmentally friendly
	Residential	Commercial	Wet areas		Floating	Glued	Indirect	Prefinished	Unfinished		Width (mm)	Length (mm)	Thickness (mm)					
Timber veneer	✓	✓	✗	On manufacturer's recommendation only	✓	✓	✓	✓	✓	Yes if veneer over 3 mm thick	140 for single strip 180–190 for 3 strip	1,400–2,200	7–22	8–10	✓	✗	✓	✓
Laminated	✓	✓	On manufacturer's recommendation only	✗	✓	✓	✗	✓	✗	✗	180–190	1,200–1,400	6–12	1.4 mm/ lineal metre	✓	✓	✓	Uses vinyl
Bamboo	✓	✓	✗	✓	✓	✓	✗	✓	✓	✓	92–190	920–1,900	14–15	12.5 min	✓	✓	✓	✓
Reconstituted	✓	✓	✗	✗	✓	✓	✓	✗	✓	✓	1,200–1,800	2,400–3,600	20–22	8–10	✗	✗	✓	-

3.1 LOOSE-LAID OR FLOATING

3.1.1 Loose-laid or floating flooring uses floor planks that have specially shaped interlocking profiled edges so the floor is connected by being locked together as a single unit (Figure 1) or a tongue and groove joint. This system does not require gluing, and the flooring effectively 'floats' over the substrate. It must be laid over a resilient underlay to prevent the floor from 'drumming' or vibrating when walked on.

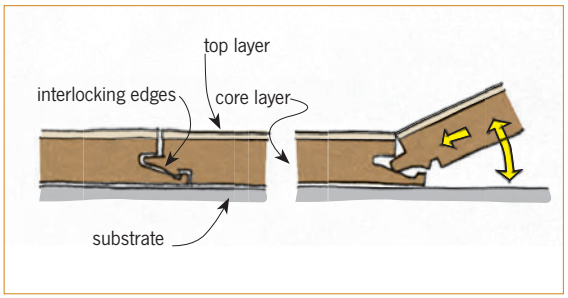

Figure 1: Interlocking flooring system.

3.2 GLUE-FIXED

3.2.1 Gluing directly to the substrate is an option for a number of the overlay flooring systems available. Glue should be spread fully across the substrate to give full contact between both surfaces and reduce the likelihood of 'drumming' in the floor.

3.3 INDIRECT

3.3.1 Indirect floor overlaying – where the flooring is laid over timber battens – is only used with HDF flooring (see Section 4.4) and allows a space for services to be installed within the underfloor cavity.

3.4 MOISTURE CONTENT

3.4.1 All flooring must be allowed to acclimatise on the job site for at least 48 hours (bamboo flooring manufacturers recommend a minimum of 3 days) before being laid to ensure that the overlay flooring is at the same temperature and moisture level as the space in which it is being laid. The space must also be at its equilibrium or usual moisture content (for example, if the space is heated or air-conditioned, then that must have been operating during the acclimatising). Packets of flooring should be opened and planks stacked off the substrate to allow full air circulation around the planks – check specific installation instructions, as opening on site is not recommended by some suppliers due to the permeable nature of the wrapping they use.

3.4.2 Generally, there should be no more than 3% difference in moisture content between the flooring and a timber substrate at laying. A concrete substrate moisture level should be a maximum 70% relative humidity (RH) – E2/AS1 requires a flooring hygrometer reading of 75%, but a 5% tolerance is recommended (see Section 5). On-site humidity levels should remain fairly stable at around 40–60% relative humidity.

3.5 EXPANSION GAPS

3.5.1 All flooring systems must have continuous, perimeter expansion gaps. The actual size of the gap depends on the type and area of the flooring. Table 1 gives recommended gap sizes – refer to the manufacturer's recommendations for specific sizes.

3.6 FINISH

3.6.1 Most overlay flooring systems, except HDF, are supplied with a prefinished surface so they can be walked on as soon as they are installed or once the glue has cured (glue-fixing method).

3.6.2 HDF flooring may have a polyurethane finish or be covered with a protective material such as vinyl, linoleum, rubber or carpet.

3.6.3 Flooring should be installed with planks laid parallel to the incoming daylight source. When installed in long narrow rooms and hallways, they should be laid parallel to the longer dimension of the room to maximise the appearance of the floor pattern.

4.0 FLOORING TYPES

4.1 TIMBER VENEER FLOORING

4.1.1 Timber veneer flooring (Figure 2) consists of:

- a top, veneer layer of real timber, generally ranging between 0.6–4.5 mm thick
- one or more core layers, generally between 8.5–11 mm thick, which may comprise of plywood, a high density wood-fibre board or a utility or lower grade hardwood timber
- a bottom layer of ply, generally 2–7 mm thick.

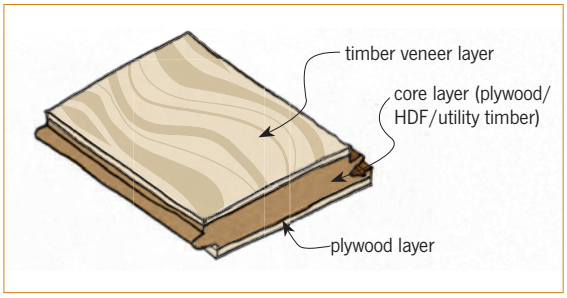

Figure 2: Timber veneer flooring.

4.1.2 Timber veneer floors have the same appearance as a solid timber floor, as the veneers are typically from the same timbers and can be manufactured from the same cuts, for example, flat or plain sawn, rotary cut, off-set rotary cut or sliced cut. Timbers typically used for veneers include birch, maple, pine, ash, beech, oak, cherry, larch, jatoba (Brazilian cherry), iroko, doussie, merbau and kempas.

4.1.3 They are supplied as planks or boards with a finished appearance that may be a full plank, two-strip or three-strip look, or a patterned effect to produce flooring similar to parquet flooring. A wide range of design patterns is possible, including combining different timber species. Some manufacturers also offer a chamfered edge to planks to give the impression of a grooved, solid timber floor. Another option offered by some manufacturers is either a knot-free, even-grained timber appearance or different levels of knots.

4.1.4 Timber veneer flooring is prefinished so it can be walked on immediately after laying. The finish may be:

- polyurethane, which has better durability and impact resistance, or
- an oiled finish, which is better for enhancing the wood grain pattern, or
- a factory-coloured or factory-stained finish.

4.1.5 The overall effect, such as the colour and grain, of any floor will be dependent on the species of timber and the type of applied finish. When choosing a finish, selection should not be made from a small sample, as the grain and colour may appear very different over a large area of floor.

4.1.6 Timber veneer overlay flooring systems can be used for residential and light commercial environments. They must not be used in wet areas such as bathrooms, laundries, toilets or kitchens.

4.1.7 As timber veneer overlay flooring has a real timber finish, the performance is similar to that of solid timber, and the floor should be treated in much the same way. For example, most timbers (including hardwoods) will suffer high impact damage (for example, from stiletto heels) so the location and expected use of the flooring should be considered before selecting a timber veneer finish.

4.1.8 They must be protected from dirt, moisture and wear in the same way as solid timber floors must be. Timber will change colour (generally darken) in high UV light conditions.

4.1.9 Timber veneer overlay flooring may be installed as a floating floor of interlocking planks (see Figure 1) or glue-fixed.

4.1.10 When laying a timber veneer floor, select adjacent planks from different packets to ensure the finishes are well mixed. Stagger the end joints of planks of adjacent rows by a minimum of 150 mm.

4.2 LAMINATED FLOORING

4.2.1 Laminated flooring (Figure 3) typically comprises:

- a top or wearing layer with a photographic image, which is usually of timber but may also be of stone or slate, that is protected by a resin coating
- a core layer, which is generally of high-density fibre board (HDF) between 8–12 mm thick
- a backing layer of impregnated kraft paper
- a sound-absorbing underlay for noise reduction (integral only on thicker flooring).

4.2.2 Laminated flooring is also available with a wood-based core, making it suitable for wet areas. (Any laminated flooring with an HDF core must not be used in wet areas such as bathrooms, laundries, toilets and kitchens.)

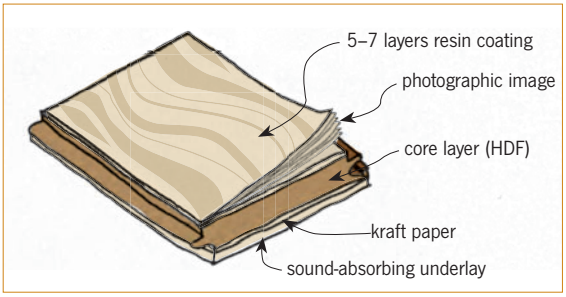

Figure 3: Laminated flooring.

4.2.3 Flooring is supplied as planks. Plank edges may be presealed or require sealing on site to protect the wood-fibre (HDF) core against liquid spills, damp cleaning and atmospheric moisture.

4.2.4 Proprietary components and trims are available for areas such as:

- level changes (for example, stairs)
- changes in floor finish (for example, laminated floor to carpet)
- end profiles for edges such as walls, skirtings, fireplaces
- expansion profiles.

4.2.5 A laminated floor can achieve the appearance of timber including a textured finish, and some products incorporate a V-groove to further enhance the impression of being timber, but they can generally be identified by the repeating pattern.

4.2.6 Laminated floors are available in a wide range of timber looks including maple, beech, oak, cherry, cedar, teak, walnut and zambesi.

4.2.7 Laminated floors are prefinished with a high-strength resin coating and supplied as interlocking planks, so once laid, no in situ finishing is required, and they can be walked on immediately.

4.2.8 Laminated floors are suitable for use in all residential and many commercial situations. Products specifically recommended by the manufacturer can be used in wet areas.

4.2.9 Laminated floors are hard wearing, durable and have high UV resistance, and their layered composition gives excellent dimensional stability in changing heat and humidity conditions.

4.2.10 Laminated flooring can be loose laid or adhered to the substrate. While thicker planks are generally supplied with an integral underlay, thinner planks do not have this and must have a proprietary resilient layer placed over the substrate (foil side up) before the flooring is laid.

4.2.11 Include expansion gaps of 1.4 mm per lineal metre, with a minimum of 8–10 mm around the perimeter and any columns, pipes and door frames. For example, a room that is 10 m x 15 m should have a 14 mm expansion gap at the edges of the 10 m length and a 21 mm expansion gap at the edges of the 15 m length (Table 2).

TABLE 2: RECOMMENDED EXPANSION GAPS FOR LAMINATED FLOOR SYSTEMS FOR GIVEN FLOOR AREAS

Floor area (m^2)	Recommended gap (mm)
30–100	10–14
100–200	14–22
200–300	22–25

4.2.12 Where a floor area is greater than 150 m², incorporate an additional expansion gap that is covered by a proprietary expansion profile.

4.2.13 Lay flooring separately between adjoining rooms, allowing a 20 mm gap, covered with a proprietary expansion profile, between the door frames of the adjoining rooms.

4.3 BAMBOO FLOORING

4.3.1 Bamboo flooring may be either:

- engineered, consisting of a thin (typically 4 mm) bamboo veneer laid over a wood, reconstituted wood board or plywood base
- solid, which has bamboo strips laminated either:
  - vertically, to give a straight-grained effect, or
  - horizontally (or flat grained), to give a light-grained 'brick' effect
- reconstituted or strand-woven, consisting of treated bamboo strands that are compressed into a solid plank under high pressure.

4.3.2 Botanically a grass, bamboo flooring products behave in a similar way to timber before and after installation – it is hygroscopic and will move (shrink/swell) as its moisture content changes. No figures are currently available that give the rate of moisture movement that occurs in bamboo.

4.3.3 Bamboo flooring is claimed to match the hardness of many hardwoods.

4.3.4 It is suitable for a wide range of dry residential and commercial situations and can be laid over existing concrete and timber floors that are uneven or damaged. Bamboo flooring must not be used in wet areas.

4.3.5 Bamboo may be used in conjunction with a radiant underfloor heating system if permitted by the supplier. Where it is allowed, the floor temperature should remain below 27°C.

4.3.6 Bamboo flooring is installed by direct laying over a substrate either using interlocking planks or glue-fixing. When laid over a concrete substrate, interlocking planks as a floating system is recommended, as this allows the floor to move as a single unit that is independent of the substrate.

4.3.7 Bamboo flooring must be laid over a waterproof membrane recommended by the manufacturer to ensure that there is no moisture transfer from the substrate into the flooring.

4.3.8 Allow a minimum expansion gap of 8–12.5 mm around the perimeter of the room. If the floor dimension in any direction is greater than 4.8 metres, allow 3 mm for each 1.2 metres of extra length. Where a floor is longer than 12 metres in one direction, additional expansion gaps must be provided using proprietary 'T' expansion joints.

4.4 RECONSTITUTED WOOD-FIBRE FLOORING

4.4.1 High-density reconstituted wood-fibre, or HDF, is manufactured from wood particles from a variety of timber species. Particles are resin-bonded under high temperature and pressure to produce a high-density fibre board. A wax emulsion may be incorporated during manufacture to provide some moisture resistance through the panel.

4.4.2 Panels are often grooved on one edge and fitted with a polypropylene tongue on the other for a secure panel fixing.

4.4.3 Reconstituted wood-fibre flooring is unfinished and typically used where an existing floor is unsuitable for vinyl or carpet. It is also frequently used where a floor needs refurbishment because the existing concrete or timber floor has become uneven or damaged.

4.4.4 Reconstituted wood-fibre flooring is durable, and the resins bonding the wood fibres mean it has a low risk of insect attack. It must, however, be protected from sustained wetting and should not be used in a long-term, high-moisture content environment. If used in a wet area, it must be fully protected by a waterproof membrane with joints sealed.

4.4.5 It must also be protected from localised heat sources such as free-standing fireplaces or space heaters, and HDF flooring is not suitable for use with underfloor heating systems.

4.4.6 HDF flooring panels can be laid using both direct and indirect overlaying systems.

4.4.7 When overlaying, the substrate should not vary by more than 3 mm over 1.0 m. Where unevenness is too great, the substrate must be filled with levelling compound (depressions) or levelled by sanding or grinding (raised areas). An existing timber substrate must be refixed and repunched as necessary to provide a level substrate.

4.4.8 When overlaying directly over a timber substrate, use a combination of nail and full-spread adhesive to eliminate any likelihood of 'drumming' in the floor. Over a concrete substrate, use a full-spread adhesive but no mechanical fixing of the overlay to the substrate.

4.4.9 Include a minimum 8 mm expansion gap around the perimeter and any columns, pipes or other fixed objects.

4.4.10 Lay panels in a 'brick bond' pattern and apply temporary, even pressure (such as sandbags) until the adhesive has cured. Place square-edged panels carefully to ensure there is no difference in surface level at adjacent panels. Do not walk on the flooring until the adhesive has cured fully according to the manufacturer's recommendation.

4.4.11 Ensure that the new joints do not occur directly over parallel joins in the timber substrate floor. Where there is an existing construction joint in the concrete substrate, a construction joint must also be formed in the overlay.

4.4.12 Indirect floor overlaying is similar to laying the flooring over joists. Floor panels are fixed to timber battens that have been fixed to a concrete or timber substrate at spacings of up to 600 mm centres according to the permitted span of the HDF panels being used.

4.4.13 Allow an air flow within the floor cavity when using the indirect floor overlay method over a concrete substrate.

5.0 CONCRETE SUBSTRATE PREPARATION

5.1 MOISTURE GENERALLY

5.1.1 The most common cause of problems to occur with timber composite overlay flooring is due to concrete substrate moisture levels that are too high when the flooring is installed.

5.1.2 As timber substrates are generally closer in composition to the flooring system, there tend to be fewer problems with moisture level differences. A timber substrate also generally does not result in moisture movement into the overlay flooring as it is able to continue to dry out from underneath. However, the subfloor should be checked to see that it is well ventilated and the soil is not wet before the overlay flooring is installed.

5.1.3 Moisture from a concrete substrate occurs from two principal sources, which are:

- moisture remaining in the concrete where it has not had sufficient time to dry
- ground moisture that is able to come through a damaged or non-existent damp-proof membrane under the slab.

5.2 MOISTURE IN THE CONCRETE

5.2.1 A considerable amount of water is used during concrete slab construction, and approximately 10–15 litres/m² of water will need to be removed from the concrete after curing is completed. (Most of the water in concrete is there to allow it to be placed and is not required for curing or hydration to take place.)

5.2.2 The concrete slab must be sufficiently dry before an overlay flooring is installed or the flooring will absorb residual moisture and move and swell accordingly. Significant failures have resulted from installing timber strip flooring over concrete floor slabs that have high moisture content.

5.3 CONCRETE FLOOR SLAB DRYING TIMES

5.3.1 Natural drying of a concrete slab takes several months. Forced drying of slabs using heaters or dehumidifiers is to be avoided as it only results in drying the surface of the slab – the moisture within the slab remains.

5.3.2 The rule of thumb under good drying conditions is to allow at least 1 month of drying for every 25 mm of slab thickness after the building is closed in. For a 100 mm thick slab, this means a minimum of 4 months' drying time will be needed. This may be longer if there is:

- high humidity
- low air temperature
- reduced ventilation because the building has been closed in and airflow across the slabe is reduced.

5.3.3 Periods of poor drying conditions must be allowed for in the construction programme.

5.4 GROUND MOISTURE

5.4.1 To prevent ground moisture from entering the slab, a continuous damp-proof membrane must be installed under the slab. Minimum permitted finished floor level-to-ground and cladding-to-ground clearances must also be maintained so that the edge of the slab or foundation is not exposed to the risk of moisture entry.

5.4.2 Existing concrete slabs that have a dampness problem may be treated with proprietary sealers, but the success of these treatments and any subsequent flooring installation will depend on the product used, and specifiers will need to be satisfied that the performance claims made have been independently verified.

5.5 MEASURING MOISTURE CONTENT

5.5.1 A simple test of a slab's moisture content can be carried out by laying a 1 m x 1 m piece of clear polythene sheet over the floor and taping down all edges. Alternatively, a rubber mat may be used. If, after 24 hours, there are condensation droplets under the polythene or rubber, the slab is too wet. This is a quick test to give a rough indication only and it does not give approval to proceed with overlaying. If there is no condensation, use a hygrometer or humidity probes to carry out a more accurate assessment of moisture content.

5.5.2 The actual moisture content of concrete can be measured:

- using a hygrometer (Edney gauge) – this is the sole method of measuring concrete moisture that is recognised in E2/AS1
- using in situ calibrated humidity probes embedded into the slab and used in accordance with ASTM F2170-02 *Standard test method for determining relative humidity in concrete floor slabs using in-situ probes* – the recent availability of affordable probes may see an increase in their use.

5.6 USING A FLOORING HYGROMETER

5.6.1 When using a flooring hygrometer, it must be sealed to the concrete and left for at least 16 hours. It measures the relative humidity of the air in contact with the surface of the concrete slab, which, in turn, provides a reading of the concrete's actual moisture level. A hygrometer cannot be used if the floor has been wetted, artificial drying has been used or surface contaminants such as curing agents are present, as this will distort the hygrometer's reading, giving an inaccurate indication of the amount of moisture.

A flooring hygrometer

5.6.2 BRANZ Bulletin 515 *Measuring moisture in timber and concrete* describes the method of determining the moisture content of concrete with a hygrometer.

5.6.3 If any form of artificial or forced drying of concrete slabs is undertaken, the flooring hygrometer reading will not be a true indication of the slab's actual moisture content.

5.7 USING FACTORY-CALIBRATED HUMIDITY PROBES

5.7.1 Factory-calibrated humidity probes are designed to be either embedded in the slab during the concrete placement or inserted into a hole drilled in the slab. Probes have the advantage that they measure the relative humidity of the concrete within the slab rather than at the surface.

5.7.2 While there are currently no specific New Zealand recommendations, Table 3 gives an adapted version of published recommendations from Finland and Sweden for timber.

TABLE 3: MAXIMUM VALUE OF RELATIVE HUMIDITY IN CONCRETE
(adapted from the Finnish SisaRYL 2000 Code of Building Practice and Swedish HusAMA83)

Max. % RH	Cover material
60%	Parquet board directly laid on concrete
80%	Wood and wood-based materials

5.7.3 Relative humidity probes will need to be installed and readings taken in accordance with the supplier's instructions. As this technology is relatively new in New Zealand, using the 60% figure in Table 3 is considered prudent.

5.7.4 The American Portland Cement Association recommends that:

... a "safety margin" of several percent (5% is used for hygrometers) should be one of the considerations in establishing RH specification limits. For example, if a flooring manufacturer believes that RH must not exceed 85% for the performance of a particular floor covering and adhesive system, then the maximum permissible RH measured in the field (and specified in the installation instructions) should not exceed 80% to 82% for the floor to be considered ready for installation.

6.0 MAINTENANCE

6.1 MAINTENANCE GENERALLY

6.1.1 Timber veneer floor finishes must be protected from dirt, moisture and wear, and generally be treated the same way as a solid timber floor.

6.1.2 Cleaning of most timber veneer composite overlay floor finishes should be by soft-bristle vacuuming or using a lightly dampened microfibre mop For a laminated floor, use a specialist cleaner from a hardware store. Marks and spills should be cleaned immediately.

6.1.3 Use water sparingly to clean, as overlay floors are not tolerant of moisture, and avoid using cleaning products such as detergents, scouring cleaners, steam mops and waxes and polishes unless specifically recommended by the manufacturer, as moisture may cause swelling of joints between boards.

6.1.4 Where timber veneer floors have an oil finish, treatment with an oil wax should be carried out according to use. Manufacturers' recommendations for recoating range from:

- 1–5 years in public areas
- 5–10 years within residential buildings.

6.2 CARE OF FLOORING

6.2.1 Recommendations for caring for timber composite overlay flooring includes:

- using door mats on both sides of exterior doors
- removing sand or other abrasive substances as soon as possible
- fitting furniture with felt pads
- distributing the weight of heavy objects and furnishings over the area of the object, not on point loadings (legs or castors)
- checking manufacturers' recommendations for maximum weight of objects
- not using wet cleaning methods – using a lightly dampened cloth or microfibre mop is generally recommended.

6.3 REPAIRS

6.3.1 If the floor is damaged:

- a timber veneer or bamboo floor may be sanded and resurfaced (polyurethane or oil)
- laminated and bamboo flooring that is scratched may be repaired by applying an appropriately colour-matched filler
- where flooring is damaged, a loose-laid board is usually easier to remove and replace than one that is glued down.

BRANZ

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HEAD OFFICE AND RESEARCH STATION
Moonshine Road, Judgeford
Postal Address – Private Bag 50 908, Porirua City 6220,
New Zealand
Telephone – (04) 237 1170, Fax – (04) 237 1171
http://www.branz.co.nz

AUSTRALIAN OFFICE – SYDNEY
Telephone – (00612) 9620 4088
Mobile 0401 447 026
Fax – (00612) 9620 4060
P O Box 783, Kings Langley, NSW 2147, Australia

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