BEST PRACTICE GUIDELINES FOR THE NEW ZEALAND FLOORING INDUSTRY

RESILIENT FLOOR COVERINGS PLANNING AND INSTALLATION

FLOOR NZ™
SUPPORT | LEAD | EDUCATE

First edition compiled in 2019 by Floor NZ, the Flooring Association for the flooring industry

ACKNOWLEDGEMENT

The Floor NZ board would like to acknowledge the support and valuable contribution of the following sponsors for this project.

https://www.ardex.co.nz/

https://www.heritagecarpets.co.nz/

https://belgotex.co.nz/

http://jacobsens.co.nz/

https://carpetcourt.nz/

https://www.karndean.com/en-nz/floors

https://www.cavbrem.co.nz/

https://www.lookfloors.co.nz/

https://dunlopflooring.co.nz/

https://www.mapei.com/nz/en/home-page

https://www.floorspace.co.nz/

https://www.newflor.co.nz/

https://www.flooringxtra.co.nz/

http://www.ontera.com.au/ContactUs.aspx?P=NZ

https://www.giltedge.co.nz/

http://www.polyflor.co.nz/

http://www.handleyind.co.nz/

htt://www.robertmalcolm.co.nz

https://www.harrisons.nz/

https://www.sleepyhead.co.nz/

EXPLANATORY NOTE

The Best Practice Guidelines for Resilient Floor Coverings Planning and Installation set out industry recognised methods for planning and installation that supports retail, supplier, installers and apprentice training.

The purpose is to make available flooring information for everyday flooring practices that are collectively supported by the flooring industry via the Floor NZ website. Where further information is needed a link with further direction is included.

The information provided are guidelines for best practice and do not replace or are a substitute for Industry Standards, Government or local Legislative Acts, Codes or Manufacturer recommendations.

INDUSTRY STANDARDS

Floor NZ recommend that flooring companies have a copy for their own reference of:

NZS/AS 1884:2013 Floor coverings – Resilient sheet and tiles – Installation practices (AS 1884:2012, MOD)

Industry standards are held by and are available online through Standards NZ.

Standards New Zealand is a business unit within Ministry of Business, Innovation & Employment (MBIE) Consumer Protection and Standards branch.

https://www.standards.govt.nz/

INFORMATION

The writer has made every effort to ensure the information contained in this edition is reliable.

While the information covers situations in general, it is not possible for Floor NZ to guarantee the information will cover or provide solutions for every situation due to variable or unforeseen events that can occur during planning, installation or after care following installation.

Floor NZ may update the contents of this guideline at any time without notice.

TABLE OF CONTENTS

1

PLANNING FOR A RESILIENT FLOORCOVERING INSTALLATION

IN THIS SECTION

1.1 SITE CONDITIONS

Having a system or checklist at the early planning or measuring stage will help to gather and process site information accurately so everything that is needed is pre organised before the installation takes place.

Experienced installers can provide valuable input when developing a system for pre checking site conditions.

Planning for an installation or carrying out an installation involves pre checking three key areas at a work site.

1. Site conditions.
2. The condition of the floor/walls.
3. Site measurements.

Pre checking a site is about having a good look at what is happening about the site that could affect:

- The choice of floor covering.
- Safety during the job.
- Time allowed completing the job.
- The quality of the installation.

Understanding the resilient floor covering type is also important in terms of selling:

- the correct floor covering for the area;
- organising the installation; and
- any necessary installation techniques associated for the floor covering type.

1.2 ACCESS TO THE FLOORING SITE

Flooring materials and equipment can be heavy or awkward to move around when unloading from vehicles or getting gear to the flooring site.

Examples to identify and plan for.

- A clear pathway is needed to avoid injury or damage to materials and equipment. Diggers/machinery operating on site and open drains, trenches are situations that are dangerous.
- Scaffolding used by other trades that may be in the way.
- The stairs are in place to move gear safely to different levels.
- Houses built on hills with steep drives and steps.
- Parking for vehicles.

1.3 HEAVY OR AWKWARD MANUAL LIFTING

The type and amount of materials and equipment to get to the work area.

Examples to identify and plan for.

- Compressors, grinding/sanding machinery.
- Bags of resurfacing compounds, adhesives, board underlayment, roller, tools.
- The length sizes, weight and amount of vinyl floor coverings.

1.4 THE WORK AREA

Needs to be clear and safe for flooring work.

Examples to identify and plan for.

- The flooring space should be clear of other people or workers about at the time of an installation.
- The customer's children and pets are kept away from the flooring workers.
- Areas are cleared out and cleaned up at the time of installation.
- Appliances such as stoves, fridges, freezers, dishwashers need to be cleared from the area. Professional trades organised to disconnect and reconnect after the installation is complete.
- Installing floor coverings into toilet areas will involve consideration and planning for. This may involve planning the installation before the toilet is fitted or arranging a plumber to remove the toilet before the time of installation.
- Often doors will need to be removed as part of the installation process. Trimming or adjusting door heights may need to be part of the discussion with the customer along with paint touch ups.
- Baths with footings or vanity units where plumbing is exposed. Arrangement for removal might need to be planned for, along with preparation around any plumbing at the floor or wall junctions.

What to look for–the plumbing is above the floor surface.

What to do–the pipe needs to be removed and lowered, the surface made smooth, flat and sound with an appropriate compound so the vinyl can be fitted neatly around the plumbing.

- Arrangements made for smoke alarms that can be easily activated with any heat or dust created from the flooring work.
- The flooring work should be planned so it does not clash with other trades affecting the work area such as dust, flammable/toxic fumes, wet paint or noise.

New paint needs sufficient time to set to help mitigate paint damage. As part of the installation process, sheet vinyl will brush against the skirting board, wall/ door /architrave as it is trimmed or placed in.

1.5 FINISHING TO THE EDGES AND DOORWAYS

The condition at the edges of a room.

Examples to identify and plan for.

- The skirting edge should be touching the floor and be square at the floor junction.
- If the existing floor covering is to be removed and is thicker than the new covering, the skirting may need to be painted or replaced.
- If it is to be coved, the wall surface will need to be smooth, straight and solid enough at the bottom for the type of coving system to be used.
- Is the capping appropriate or is new capping needed.
- How the capping can be fixed to the wall.

.

- The type of transition bar identified if joining to a different floor covering.
- Floor window sills/door frames are finished neatly to the floor so the floor covering can be cut and fitted neatly to it. See the photo below.

A gap between the concrete and door sill will not allow the vinyl floor covering to finish neatly against it.

1.6 NATURAL LIGHT AND TEMPERATURE

Possible cause of problems at the time of the installation and also after the installation.

Examples to identify and plan for.

- A high amount of window light may influence the decision on material/quality or type to be used. For example, plan for a wider width of sheet vinyl rather than a 2 metre width to eliminate seams.

  Ceramic tiles may be more suited to the situation–areas in holiday homes that are exposed to high temperatures/natural light and lack appropriate ventilation/UV protection when locked up for long periods.

- Temperature at the time of installation, either too low or high will affect the setting process of adhesives and resurfacing compounds.

- Windows that will need covering during the installation.

- Temperature brought up to the manufacturer guideline at the time of installation.

- Appropriate recommended adhesive used for the situation.

- Identifying if there is underfloor heating; including the type of heating system.

- The underfloor heating should be off during the installation.

Refer to the floor covering instructions regarding underfloor heating before specifying/recommending and installing the floor covering.

1.7 MOISTURE ISSUES

Be on the lookout for any signs of moisture that could affect the installation at the time or the future. Bringing moisture related problems to the client's attention allows the time for these problems to be fixed before the installer arrives to the site.

Examples to identify and plan for.

- Leaks around dishwashers, washing machines or shower doors.

- Swollen skirting boards or toe kicks.

- Signs of any bubbling, staining, rippling or swelling beneath existing vinyl floor coverings.

- Discolouration of concrete.

- Mould present on substrate surface.

- Efflorescent forming on a concrete surface.

1.8 FLAMMABLE OR HAZARDOUS CHEMICALS

Any products used in the installation that have the potential to cause fire or harm to people at the flooring site.

Examples to identify and plan for.

- Substitutions for these products or equipment.
- The client and people on the worksite are informed on the safety procedures to be taken if flammable adhesives, solvents, gas bottles are to be used.
- Pilot lights or sources of ignition and ventilation are identified that could be a concern.

See section 2.10 for procedures to follow for using flammable or hazardous chemicals. 2.10

1.9 EQUIPMENT TO BE USED

The types of equipment used in an installation that need discussion with the client.

Examples to identify and plan for.

- Power on and water available at the time of installation.
- Information for the client and people at the worksite on safety procedures regarding the work, any noise or dust created.

1.10 FITTING TO WALLS AND VERTICAL SURFACES

The types of equipment used in an installation that need discussion with the client.

Examples to identify and plan for.

- Timing with any plumbing or electrical services i.e. taps and plugs.
- Scaffolding for reaching heights.
- Finishing to edges and ceiling.

1.11 THE CONDITION OF THE FLOORING SURFACE

When organising an installation for a vinyl floor covering, or preparing a surface for an installation, the five key areas below can be used to work through and identify what is needed to appropriately prepare the flooring surface.

1) Clean	The floor surface needs to be clean of any existing floor coverings (including existing cork tiles), all surface contaminants–old asbestos-backed floor coverings, dust, paint, wax, adhesive, oil or grease residue, rubber underlay residue etc.
Reason	Anything that will affect the adhesive bond between the vinyl and the floor; or anything that may cause a reaction between the properties that make up the vinyl (plasticisers) and any residue of latex/rubber, oil, paint etc. Reactions of this type can cause discoloration, swelling or softening of the vinyl and/or vinyl adhesive.
2) Sound	The floor needs to be firm in that it will not crumble, move (springiness), crack or break up.
Reason	A surface that is not firm may result in the vinyl lifting, bubbles, bulges or pimples showing through the finished surface.
3) Flat (Plane)	The floor surface needs to be flat/or level.
Reason	Uneven surfaces may not allow furniture, tables, chairs and whiteware to sit flat on the floor. Vinyl tile corners can also step out. The flatness of a surface can be determined with a metal straightedge. The tolerance for how flat or plane a surface should be is governed by the tolerance specified by the floor covering manufacturer. The general rule in New Zealand for resilient floor coverings where no tolerance is given is the U3 finish provided which are no gaps greater that 3mm beneath a three metre straightedge and the surface.
4) Smooth	The floor surface must be smooth with no roughness or lipping when you run your hand across it.
Reason	Similar to a surface for a painted finish, any surface imperfections will show through a finished vinyl floorcovering. Natural light cast across a floor can also emphasize any imperfections of a substrate. Measurement: the general rule in New Zealand is no gaps beneath a 200mm straightedge.
5) Dry	Apart from being no visible signs of any surface moisture, the floor substrate must be dry enough to install vinyl on.
Reason	Moisture can affect the adhesive bond resulting in the floor covering swelling or bubbling. Board underlayment or surface repairing compounds may also swell up. New concrete that has not had sufficient time to dry can also have high pH levels that break down the adhesive bond. Problems caused through high pH levels may not be apparent until several months later. Measurement–with concrete floors the acceptable level is 75% RH or less when measured with a hygrometer using either the drill and plug or surface mount method. With timber floors, 16% MC or less is the measurement when measured with a pin (resistance) test.

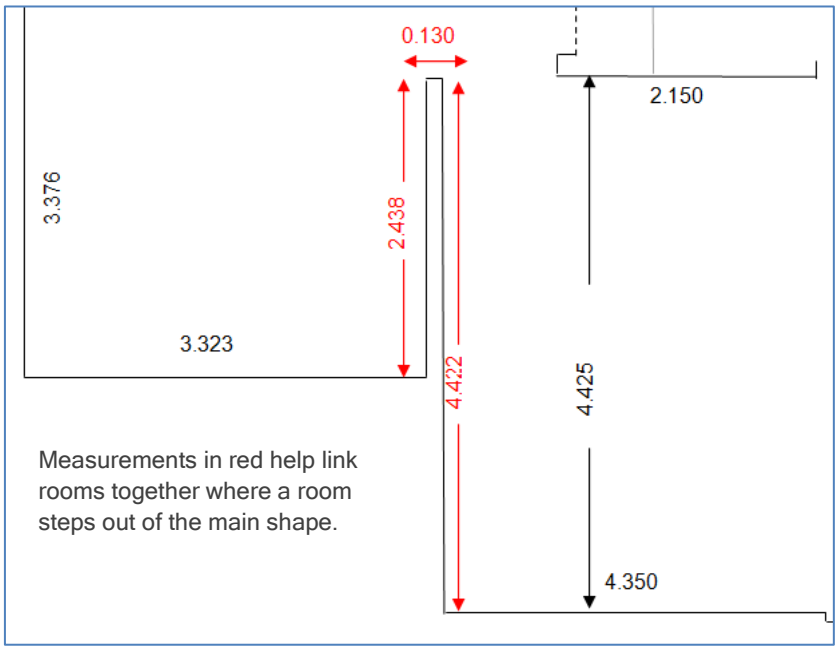
1.12 SITE MEASUREMENTS

Accuracy when confirming measurements or taking measurements to produce a scale plan is a critical part of the process.

Lack of attention or accuracy in this area can result in losing the job with over quoting or losing money with under quantifying.

As well as overall measurements of areas, incremental measurements along walls and door openings are also important to allow accuracy in quantifying floor coverings, transition bars, plus coving when required.

Measurements that run along walls into adjacent rooms are also important to accurately link rooms together, particularly with digital software where rooms are formed in blocks then merged together.



VERIFYING A PLAN'S SITE MEASUREMENTS

Before ordering materials, measurements should be checked on site to verify the plan's accuracy.

Before starting an installation, the plan's measurements should also be verified before cutting any material.

With installations that require multiple rolls, the cutting sequence should be checked before cutting into any material.

Plans received digitally or by fax need verification that the scale is correct.

2

LEGISLATION

IN THIS SECTION

2.1 THE HEALTH AND SAFETY AT WORKPLACE ACT 2015

All flooring businesses (including contractors) are required by law to have, and put into practice their own health and safety manual of procedures.

- The person conducting a business or undertaking (PCBU) is often the flooring business who first measures and prices the job. The person representing the flooring business has a responsibility to assess and gather information around safety for the purposes of planning a possible installation.
- If the job goes ahead any concerns around safety that can be sorted before the job begins should be communicated with the client and taken care of before the job begins.
- For building areas a Site-Specific Safety Plan may be needed. The SSSP is an agreement between businesses working on a specific site that determines how health and safety will be managed.
- Before the job is started, the flooring contractor (also a PCBU) or the flooring company's waged worker (not a PCBU) also has responsibilities.

2.2 ARRIVING TO A FLOORING WORKSITE

- Report to the client/site foreman if onsite.
- Assess the worksite and be satisfied it is safe before starting any work.
- Complete a site assessment form (hard copy or electronic) to document that the assessment has been completed and anything that needs attending to has been done. **Digital apps available** can make this process very easy. https://clockit.co.nz
- Communicate with other tradespeople onsite about anything that may not be safe.

2.3 RISK ASSESSING OVERVIEW

Two key changes in the Act that affects the flooring industry are around chemicals and dust; also monitoring workers' health. As an overview, the following procedure is a guiding framework to manage work risks.

Plan	Identify and assess anything that is dangerous.
Do	Use the following control system below to eliminate or minimise the risk.
Check	Monitor the control process, any forms, paper work completed to support the processes, keep a regular check that everything is going okay, including monitoring workers' health.
Act	Review for continuous improvement.

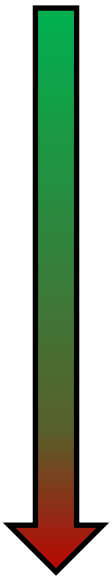
Adapted from the WorkSafe Model of Risk Assessing Overview

2.4 GENERAL RISK ASSESSING PROCEDURE

Adapted from the WorkSafe Model of Assessment Procedure

‘If it is not possible to eliminate a risk then you must work down the process of minimising the risks’

	1. Eliminate	Completely removing from the work place, something that could be dangerous e.g. removing rubbish from a work area.
	2. Minimize	If eliminating is not possible then work down the minimize controls.
Most Effective	Substitute	Substitutions of products e.g. change from a flammable/high toxic product to water-base/less toxic product.
	Isolate	Isolate the worksite e.g. barrier off, prevent people from coming into contact with a hazard; switch off pilot lights where necessary.
	Engineering	Physical controls such as modify tools or equipment e.g. protection guards on equipment, use vacuum systems for dust, ventilation systems for fumes, set up signage etc.
	Administrative controls	Organizing a job differently, make a change in a way a task is done, documentation, training, following company policies, hazard site assessment, plans and procedures for work e.g. cleaning machines/filters etc.
Least Effective	Use personal protective equipment (PPE)	This is the last method for controlling hazardous situations after all of the other options are put in to place.



A risk assessing procedure will also need to be carried out where an unfinished jobsite is left over night and the customer/occupier is living in the dwelling.

The area must be made safe and the occupier consulted with on the controls that are put into place, plus any responsibilities the occupier needs to be aware of.

2.5 HEALTH AND SAFETY AT WORK (asbestos) REGULATIONS 2016

Asbestos in flooring can be found in older vinyl backings, vinyl tiles or old adhesives. The era of assuming asbestos in buildings or refurbishments is prior 1 January 2000 (**Duty 19** of the Health and Safety at Work (Asbestos) regulations 2016).

While the asbestos is bonded throughout the floorcoverings (Non Friable) it is in a safe state. When broken, or the vinyl wear layer is separated from the backing exposing the fibres it is in an unsafe state (Friable).

Photo 1 the area and tools used could be now contaminated with asbestos fibres. This situation requires the immediate advice and services of an accredited asbestos-specialist.

Photo 2 is a close-up view of an asbestos-backed vinyl.

Photo 3 is vinyl tile that has asbestos as part of the whole tile.

Photo 1 Vinyl wear layer separated from its backing

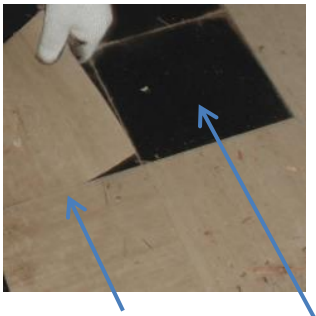


Photo 3 Vinyl asbestos tiles

Bitumen adhesive with asbestos fibres

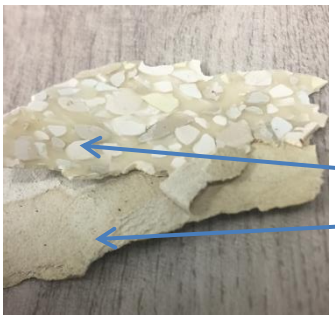


Photo 2

Vinyl wear layer

Cardboard type backing with asbestos fibres as part of the make-up.

See Worksafe Issues Inspectors Find on site presentation–
https://www.youtube.com/watch?v=G4XvNPPzdQY

For further information on Asbestos visit–
https://worksafe.govt.nz/topic-and-industry/asbestos/

https://worksafe.govt.nz/topic-and-industry/asbestos/management-and-removal-of-asbestos/

2.6 DUTY TO PREPARE AN ASBESTOS MANAGEMENT PLAN (AM)

Due to previous floorcoverings installed containing asbestos, flooring businesses are required to have an Asbestos Management Plan (AMP) in the workplace (**Duty 13** of the Health and Safety at Work (Asbestos) regulations 2016).

An Asbestos Management Plan sets out where any suspected asbestos or Asbestos-containing Material (ACM) is, plus the next steps to take (**Duty 10**).

Even if a flooring company that has no intended involvement with removing or encapsulating floorcoverings, an asbestos management plan is still needed to cover situations of providing advice to customers plus flooring contractors/workers that discover asbestos flooring materials hidden beneath floor covings (**Duty 26**).

It is advisable to use the assistance of an accredited asbestos professional to develop an AMP that complies with the Asbestos regulations.

2.7 DUTY TO ENSURE ASBESTOS IS IDENTIFIED IN THE WORKPLACE

As part of the plan, a flooring business must provide **training in asbestos awareness** for their staff that provide flooring advice to potential customers, visit homes or buildings as part of their flooring work (**Duty 10**, **Duty 17**, **Duty 25**).

It is not recommended by **Worksafe** or the **Ministry of Health** that a home owner/occupier removes asbestos containing flooring material. While home owner/occupier is not legislated by the Health and Safety at Work Act, there is a risk to:

- their own health;
- others in the house; also
- the flooring people who will be preparing the surface or installing the new floorcoverings.

The clean-up of a house that is contaminated with asbestos fibres is extremely expensive as all contaminated soft furnishings may need to be replaced.

Advice to the customer should be to engage the services of a **specialist in asbestos testing**.

2.8 DUTY TO CARRY OUT AIR MONITORING

Any work involving the removing of friable asbestos needs the services of a **Class A licenced operator** (**Duty 27**). On completion a clearance inspection is required by an **independent asbestos assessor,** who will supply a clearance certificate (**Duty 41**). A clearance certificate that validates an asbestos removal activity can only be issued by a licenced assessor to a licenced removal contractor.

No future flooring work should start until the flooring company has been supplied with a copy of the clearance certificate (**Duty 42**).

For a private homeowner that has chosen to the asbestos themselves, (not recommended) the private homeowner will need to provide evidence that an area is free of asbestos materials or airborne contamination. They will need to engage the services of an asbestos consultant/surveyor or accredited laboratory to produce a survey/inspection report.

The asbestos consultant will be able to visually identify any materials still present in an area/premise and also undertake air monitoring to quantify the level of any airborne asbestos fibres. The inspection report will not relate to any historical activities that have occurred, the report will simply be stating any observed materials or contamination on the day of the inspection.

Flooring businesses (Person conducting a business or undertaking–PCBU) must ensure, so far as is reasonably practicable, that the health and safety of their workers or contractors are not put at risk from work carried out as part of the conduct of the business or undertaking (**Duty 36** Health and Safety at Work Act 2015).

Confirming that any asbestos is present can only be identified by an **accredited asbestos laboratory** (**Duty 11**). Using any other means of testing is subject to a fine up to $10,000.

2.9 ENCAPSULATING ASBESTOS BACKED FLOOR COVERINGS

For situations where it is not feasible or is difficult to remove the asbestos backed floor coverings, a procedure will need to be devised and included as part of the flooring companies Asbestos Management Plan. The procedure will need to comply with the Asbestos regulations. This will include identifying if the work is demolition, refurbishment or maintenance.

While **Duty27** (**2,3**) makes provision for unlicensed work as Minor contamination, the criteria of trained by a 'Competent person' applies and follows the **Worksafe** 'Approved Management and Removal Code of Practice'.

Examples that need a procedure as part of the Asbestos Management Plan.

Encapsulation –a timber substrate where the option is taken to overlay an asbestos contained vinyl floorcovering with board underlay.

Because the asbestos will remain in place beneath the new floorcoverings, a warning notice for people doing future flooring work is also recommended. This can be:

- placed on the existing floor covering; or
- a warning written in pencil on the board underlay. Pen or ink should not be used as it may show through a new vinyl floor covering at a later stage.

Sealing–where carpet is to be replaced or refitted over a suspected asbestos-backed floor covering and an installer finds an exposed damaged edge/doorway of the asbestos-backed vinyl. Asbestos-contaminated Dust or Debris (ACD) procedures should be put into place (from the Asbestos Management Plan) if sealing with an appropriate liquid is a feasible safe option for providing a protective coating to an exposed edge (**Duty 27** (**3**) along with **Duty 17**).

Applying a cementitious compound as an underlayment over an exposed asbestos backing is **not** a safe option. This will disguise the problem and endanger any people that are involved with the future uplift or grinding of the cementitious surface.

2.10 HAZARDOUS PRODUCTS USED IN THE FLOORING INDUSTRY

Hazardous products used in the flooring industry contain hazard substances as part of their makeup.

WHAT IS A HAZARDOUS SUBSTANCE

The hazardous substance criteria in the Health and Safety at Work Act 2015 is any substance that has the following properties: 'Explosiveness, Flammability, Capacity to oxidise, Corrosiveness, Toxicity or Eco Toxicity'.

WHAT IS A VOLATILE ORGANIC COMPOUND?

Most solvents used in flooring are Volatile Organic Compounds (VOC) that are refined from oil which is extracted from the earth. This type of oil originates from dead organisms deep beneath the earth's surface that have been subject to heat and pressure over many years.

ORGANIC SOLVENTS

Organic solvent-based adhesives have been one of the most common types of hazardous products used in the New Zealand flooring industry. Their main advantage over water-based adhesives is the solvent liquid that keeps the adhesive in a liquid state. This liquid evaporates quickly helping to speed up the installation. Solvents can evaporate in colder temperatures which is an advantage over water-based technology.

The main concern with solvent-based products is their potential to cause harm and damage to property. The immediate dangers of serious harm can be caused through high concentrations of fume inhalation or fire, plus the long term effects which can have adverse effects on the body's organs. The brain is most likely to be affected by long term exposure. Symptoms can range with mood changes, memory problems, concentration difficulties, tiredness and weakness.

Solvent vapour is heavier than air so it stays low to the floor.

The solvent carbon properties are also not helpful to the environment.

MONITORING WORKER'S HEALTH

Safety around dust and chemicals is a key part of the Health and Safety at Work Act 2015. The health monitoring of flooring workers that use solvent-based products or create dust in the work place is one control intended to keep workers safe. More information on this process can be found at Worksafe.
https://worksafe.govt.nz/topic-and-industry/work-related-health/monitoring/health-monitoring-fs/

An awareness of hazardous products used as part of the installation process is needed at both the initial pricing/planning stage and the installation stage.

All parties involved with the process of planning and installation have a duty of care to recognize whether any intended hazardous products to be used are suitable for the floor covering; plus any impacts their use may have on the associated warranties for the floor covering.

Examples to identify and plan for when working with flammable or hazardous products

- Create a workplace procedure to put into place at the initial pricing and planning stage of an installation where flammable or hazardous products are intended to be used.

- Consider if the hazardous products can be substituted (Wholly or Partly) with non-Volatile Organic Products (VOC)

- All people in the flooring business who are part of the process that are involved with planning, pricing, storage and installation should be familiar with the appropriate Safety Data Sheet of the Flammable or Hazardous product information.

- A site assessment will need to be carried out to identify:
  - any possible sources of ignition during the installation; e.g. electrical appliances/equipment, pilot lights, heat guns, gas bottles;
  - areas with confined spaces or areas with lack of ventilation;
  - how the area will be ventilated; and
  - how to notify and keep people/pets away from the affected areas until it is safe to return to the area.

Using the gathered site assessment information, a plan will need to be formulated and put into place to carry out the work.

HEADS UP ARTICLE FROM A FIRE RESAEARCH & INVESTIGSATION

Issue 16 - Vapour explosions during flooring preparation
Released 10th January 2014

Fire Research & Investigation Unit

Heads Up

PRODUCT WARNINGS

All warnings on appliances and the adhesive containers need to be read and understood prior to opening the adhesive.

Warning label on gas heated hot water cylinder.

WARNING This material may be harmful if swallowed or inhaled and may cause skin or eye irritation.
PRECAUTIONS Avoid breathing vapour. Use with adequate ventilation. Avoid contact with skin or eyes. Do not contaminate any water supply. Dispose of empty containers safely. Store in a cool, dry, well ventilated area.

FIRST AID
Get medical attention immediately.
SWALLOWED Give sips of water to clean the mouth. Do not cause vomiting.
SKIN Remove contaminated clothing. Wash skin thoroughly with soap and water.
EYES Hold open and flood with water for at least 15 minutes.
INHALATION Remove to fresh air.
FIRE Use foam, Carbon Dioxide, or Dry Chemical Powder.
SPILLS Use appropriate protective clothing. Absorb with sand or earth. Collect and seal in properly labelled containers. Do not allow to enter drains or run off into waterways.
For full product information see Technical Data Sheet.

USE: SYNTHETIC GRASS ADHESIVE

TRANSPORT
PROPER SHIPPING NAME **ADHESIVE** UN NO: 1133
HAZARD CLASS: 1133 HAZCHEM: 3[Y]E PACKAGING GROUP: III

CONTAINS: HYDROCARBON LIQUIDS 237ml/l

For further information contact or
The Poisons Information Centre 0800 764 766

Typical warning label on drum of adhesive.

Use extreme caution when using naked flames.

LESSONS LEARNED/RECOMMENDATIONS

- prior to opening any container of adhesive with a red 'diamond label' users should ensure that there are no flames or other likely ignition sources in the vicinity
- ask the client if there are any gas fuelled appliances in cupboards or near the room. Remember, some gas appliances have pilot flames while other use electrical ignition. Both systems may ignite flammable vapours. Walk around the building to see if there is a gas meter
- do not operate electrical appliances or flame producing equipment or restore power to the room until the area is adequately ventilated.

2.11 RISK ASSESSING PROCEDURE FOR USING AN ORGANIC-SOLVENT

Adapted from the WorkSafe Model of Assessment Procedure

'Before starting work using organic solvents, PCBUs must complete a risk assessment and review their controls'

	1. Eliminate	Plan work so no flammable or hazardous substance is used as part of the installation.
	2. Minimize	'If eliminating is not possible then work the minimizing controls'
Most Effective	**Substitute**	Substitutions (wholly or partly) of products/equipment. Two common flooring industry examples could be changing from a flammable/high toxic product to water-base/less toxic product, or substitute gas bottles with heat guns where it is appropriate. 'If risk remains'
	Isolate	Isolate the worksite e.g. barrier/close off areas to prevent people from coming into contact with hazardous fumes. Investigate any source of ignition. Examples being gas bottles, heat guns, vacuum cleaners (tools/equipment with an electric motor) and pilot lights/electronic devices that are used for gas fuelled appliances i.e. water heaters.
	Engineering	Physical or mechanical controls e.g. ventilation, purpose designed extraction fans (that are not a source of ignition) to remove fumes, open doors and windows.
	Administrative controls	Before starting work, carry out a site assessment. Identify work to be done in confined spaces or large spaces with lack of ventilation, identify pilot lights or possible sources of ignition (including gas bottles and heat guns). Other people/pets are cleared from the workspace until it is safe to re-enter. Organise the job appropriate to the situation. For example, make a change in a way a task is done, plan for two people to work on the job, set up signage. Companies are required to have policies in place for this type work. Flooring staff and contractors should be familiar with, and follow company policies. SDS information needs to be readily available and the users/handlers are familiar with the information that is appropriate to the situation.
Least Effective	**Use personal protective equipment (PPE)**	This is the last method to use as part of controlling hazardous situations after the above controls have been applied. Respiratory masks should be suitable for the substance and situation. They need to be regularly cleaned; filters changed and are stored in a closed container. The face needs to be clean shaven to provide a seal with the mask that prevents fumes entering through the side.

2.12 CONSUMERS GUARANTEES ACT 1993

To provide consumers with realistic expectations, floorcoverings or associated products sold to the consumer must be appropriate to the situation. Both customer and site information gathered in the planning process should be used to match both an appropriate floor covering and the installation materials for the environment it is going in to.

In areas where the likes of heat, ultra violet light (UV), water or moisture will affect the performance of a floor covering, the appropriate adhesive, moisture treatment type and any surface preparation systems should be used in accordance to manufacturer's specifications.

The Consumer Guarantees Act gives consumers rights if the floorcoverings (products) or installation (service) does not meet guarantees that are set out in the Act.

Floor coverings should be of acceptable quality (durable, safe, fit for purpose, free from defects, acceptable in look or finish) and the installation carried out with reasonable care and skill.

More advice
https://www.consumerprotection.govt.nz/contact-us/

2.13 CONTRACTING OUT OF THE CGA

A retailer or supplier cannot state the CGA does not apply (contracting out of their obligations). The only exception to this is where products or services are acquired for a business purpose and:

- you as the buyer and the seller are in trade and agree to this;
- the agreement is in writing; and
- it is fair and reasonable to do so.

A business who tries to contract out of the Act in any other circumstances commits an offence under the Fair Trading Act.

More advice
https://www.consumerprotection.govt.nz/contact-us/

3

MEETING THE CUSTOMER EXPECTATIONS OF A RESILENT FLOOR COVERING

IN THIS SECTION

3.1 THE STARTING POINT

What does the customer expect from their floor?

Providing the customer with realistic expectations starts with the sales person.

While colour, design and price are at the forefront of a customer's mind, there are also three other key areas that need to be taken into account at the point of sale or specification.

1. The environment the floor covering is going in to.

   →The sales person has a duty of care to propose a floor covering that is fit for purpose to the environment, plus the usage requirements.

2. The installation process.

   →The installer has a duty of care to carry out the installation in accordance to manufacturers' recommendations and Industry Standards; including manufacturers' recommendations for materials that are part of the installation process.

3. The ongoing care and maintenance for the floor covering.

   →The customer or end-user has a duty of care to carry out the recommended ongoing care and maintenance procedures for the floor covering so the floor covering remains fit for purpose over its life span.

   →To allow the customer to take the appropriate actions the reseller either wholesaler or retailer has a responsibility to pass on the information and ensure it is understood.

3.2 THE SITE ENVIRONMENT

Examples of situations to consider when choosing floor coverings and providing care and maintenance information.

- Changes in temperature.
- Extreme heat, UV light through windows or opened doors.
- Holiday homes locked up for periods of time without adequate ventilation.
- Pets–claws, water splash from pet bowls.
- Water splash from taps, bath and shower.
- Type of floor or wheel traffic–staining from rubber.
- The condition of the substrate.
- Site conditions at the time of installation.

See the previous section on **Site conditions** 1.1 → 1.2

Planning of the installation so the site environment, (particularly temperature) meets the installation criteria for vinyl planks/tiles

Room temperature–is relative to the specifications for the planks/tiles which will be from the acclimatisation stage through to the adhesive setting time frame.

Starting point– the area or part of a room that the installation will start from will be determined by the plank/tile set up. The starting point should not be compromised or influenced by other trades that need to work in the area. The installer should be totally satisfied that the start point will give the best standard of finish.

Clear areas–during the installation the areas should be clear of other people until the adhesive sets. Any scaffolding or ladder work should be completed before the tiles are installed.

See section on **Site conditions.**

3.3 FUTURE CARE AND MAINTENANCE

Future care and maintenance falls into three categories.

1. Preventative maintenance–measures taken to avoid damage.
2. Regular maintenance–regular vacuuming, spot cleaning and washing.
3. Periodic maintenance–involves a more in-depth clean over a longer period.

Good care and maintenance guidelines are available on manufacturer and retail outlets websites.

1. PREVENTATIVE MAINTENANCE

Providing the owner/occupier with care and maintenance information is an essential part of the process. It helps to prevent unnecessary damage after installation.

For examples information provided on chair protector pads, not dragging furniture across the floor; walk off mats outside of the area to prevent fade marks or staining on the floor covering, cleaning up water spillage seeping under pet bowls on a tile/plank floorcovering.

Any other finishing trades that need to work on the vinyl after the installation should be made aware of keeping the new floor clean of their tools, chemicals or nails/screws. Anything hard or sharp left on a vinyl can damage the vinyl it if it is walked on.

UV protection–windows with no UV protection or doors left open at the heat of the day for long periods will expose vinyl directly to the UV rays (direct sunlight). Overtime this can result in fading or shrinkage to the tiles/planks.

Examples of preventative measures used in areas that are exposed to direct sunlight are curtains, blinds, window tinting, awnings, keeping outside doors closed at the heat of the day.

Lift furniture when moving it about; do not drag it over a resilient floorcovering. For heavy furniture or whiteware place a board and carefully walk or wheel over.

Plane the bottom of doors if they are touching the surface. Opening and closing doors will scratch a resilient floor covering surface.

Humidity control–regularly airing or humidity control is essential to prevent mould growth or moisture-related issues or shrinkage where a house is locked up creating an extremely dry environment (low humidity).

2. REGULAR MAINTENANCE

Cleaning products used should be taken from the maintenance recommendations specific for the floor covering. Using cleaning products with high pH levels, oil or solvent based cleaners may damage the surface of the vinyl.

Any cleaning residue must be washed off with clean water. If it is not removed the residue will build up over time creating a soiled appearance.

Steam mops are generally not recommended, particularly for tiles/planks as the stream may cause damage if it protrudes the wear layer at the tile/plank edge.

2. PERIODIC MAINTENANCE

Vinyls that have a slightly textured surface for slip resistance or the pattern may imitate a timber or tile surface might involve a periodic scrub with a soft brush to remove any soiling that may start to build up.

Stripping agents, sealers, dressings or polish should only be used if recommended in the Care and Maintenance Information supplied by the floorcovering manufacturer.

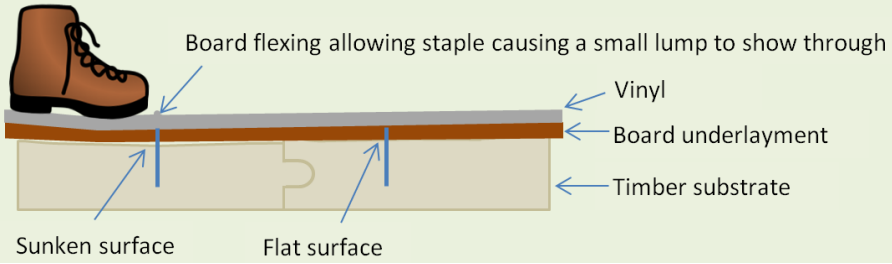
4

TIMBER FLOOR PREPARATION

IN THIS SECTION

4.1 TONGUE AND GROOVE SUBSTRATE

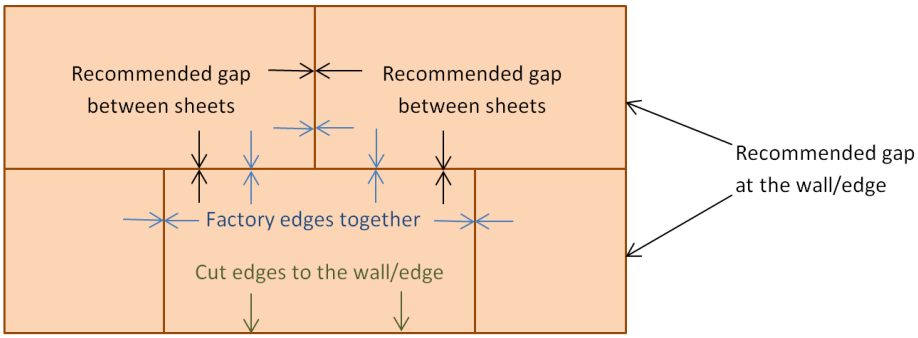
When organising or preparing a tongue and groove substrate for a vinyl floor covering, the five key areas below can be used to work through and identify what is needed to appropriately prepare the surface.

1) Clean	Any adhesive or tacky adhesive residue should be mechanically removed to prevent any clicking noises that may be heard when the finished floor is walked across.
2) Sound	Any loose, rotten, springy boards repaired so the board stays securely fixed and any staples will not work loose and show throw through the finished floor. Any soft cushioned back vinyl should be removed to prevent the board flexing and working loose around the staples.
3) Flat (Plane)	Sand/grind flat to prevent movement that would cause the board to flex and work loose around the staples. If this happens the staple causes a pimple affect that shows through the vinyl surface. See the following illustration. 
4) Smooth	To help the board to remain securely fixed and prevent staple popping.
5) Dry	A moisture content reading that is in excess of 15% may indicate a moisture problem beneath the floor. For example, there may be problems around lack of effective subfloor ventilation, blocked vents, leaking pipes, irrigation systems, water from drainage or hill run off. If there are any concerns around the dampness of a timber subfloor the client must be notified so the problem can be looked at and fixed by the appropriate trade.  When the problem is fixed, no work should start until moisture tests have been taken to make sure any new or existing timber is sufficiently dry. Timber takes a considerable amount of time to dry when flooded or it has been dampened by moisture. The meter type used to provide an acceptable test before a board underlayment is installed is a resistance meter; also known as a pin test.

4.2 BOARD UNDERLAYMENT

Board underlayment used for flooring must be fit for purpose in both type and thickness as recommended by the board manufacturer or supplier. Oil tempered hard board is not a suitable option for a board underlayment as it may react with the adhesive or the vinyl backing causing the adhesive to fail or staining in the vinyl.

- Expansion gaps between board sheets and skirting/edges should be as recommended for the board underlayment type to allow any movement with climatic changes.
- The factory edges are used at the board underlayment joins.
- Sheet join position in terms of staggering should be followed to provide stability at the joint ends



- A stapling test area should be first carried out so the air pressure can be adjusted. The staple/nail heads should go in just below the surface of the underlayment; as a guide the thickness of a utility knife blade.
- If a staple has not gone in securely or has gone in too far then another staple should be placed close to the insecure staple.
- While stapling sequence is relevant to the board type, consideration to the tongue and groove substrate condition is also important. If the installer's judgement is that more staples are needed then the sequence of 100 mm centres, 25mm spacing at the board edges and 10mm in from the board edge can be applied.
- On completion staples should be checked that they do not protrude or have gone too far into the board.
- Staples used are coating (corrosion) protected 22mm resin coated staples, or 25mm x 2.5mm head ring grooved buttress type underlay nails.
- Using adhesive with stapling is appropriate to the situation and should be in accordance with the board supplier specifications. If adhesive is not used the flooring business must be totally satisfied that the installation will be fit for purpose and provide the necessary warranty.

4.3 WET AREAS

The building code (*E3 Internal moisture*) identifies a bathroom, laundry, toilet or a kitchen (areas with taps) as a 'wet area' where moisture may accumulate or be generated.

Any board underlayment with timber content is affected by moisture or changes in climatic conditions. When used in areas of humidity or bathroom areas, only recommended flooring grade board underlayment for these areas should be used.

While vinyl floor coverings provide an impervious surface, there are steps needed to be taken as part of the installation process to provide the board underlayment with protection from any **water splash** and/or **accidental water overflow**.

- Sheet vinyl requires welded seams and coved or sealed at the edges.
- A manufacturer approved adhesive system used that is able to provide protection to a board underlayment from water or moisture that may seep through the joins/edges of vinyl planks/tiles at bath and shower entry areas.
- In commercial or high use situations manufacturers may specify a polyurethane/epoxy type adhesive.
- The flooring business must be satisfied and be able to provide warranties that the adhesive system used for the particular installation meets the fit for purpose criteria of the Consumer Guarantees Act.
- If installers are not familiar with the adhesive system specified then they should contact the supplier for further information. This may involve training if the system requires it for warranty purposes.
- Where loose-lay (no adhesive) planks or tiles are installed into a water splash or accidental overflow area, the plank manufacturer installation guidelines should provide instruction for a system to use that provides protection for the board underlayment from any accidental overflow situation.

  This may require the board underlayment surface to be first sealed with a manufacturer approved coating.
- Where loose-lay planks are installed using a pressure sensitive adhesive system into a water splash or accidental overflow area, the adhesive system should incorporate protection for the board underlayment surface from any accidental overflow situation.
- For future reference and warranties, records should be kept of the adhesive system type and brand that is used for any plank installation. This could be included in the quotation to the customer.

4.4 STRUCTUAL SHEET SUBFLOORS

Structural sheet board used for a timber subfloor are a make of chips, flakes or plies of dried timber that are compressed and bonded together with a mixture of resins, waxes and or adhesives.

Particleboard

Strandboard

Plywood

Because structural sheets are made up of timber, the rules of movement caused through high or low moisture content still apply. How much movement will be dependent on the levels of moisture exposure and also the construction method of the structural sheet.

4.5 NEW STRUCTUAL SHEET SUBFLOORS

'Best practice techniques to prepare new structural sheet boards for resilient floor coverings'.

- Fit an approved board underlayment (minimum 4.75mm) by fixing with adhesive and staple.

- An approved cementitious reinforced fibre type applied compound. Minimum thickness specified by the manufacturer.

  The flooring business must be totally satisfied that the structural sheet is soundly fixed and within the moisture content tolerance of the manufacturer's specifications before proceeding.

  Part of the process should include information provided from the builder regarding drying time allowance and any moisture readings for the joists pre-structural sheet installation.

When organising or preparing a new structural sheet substrate for a vinyl floor covering, the five key areas on the following page can be used to work through and identify what is needed to appropriately prepare the surface.

1) Clean	Mechanically clean the surface to remove all surface contaminants–any weathering or paint residue; anything that would affect the bond of an adhesive or an applied cementitious compound.
2) Sound	If there are obvious signs of any squeaking or movement of the structural sheet, the screws or nails may need retightening if the joists/structural sheet have shrunk while drying out.  This is part of the building process so should be raised with the builder/client. Before a builder fixes the structural sheet board, the joists should have a moisture content of less than 18% MC. If a structural sheet is fitted on joists with raised moisture content then any shrinkage that occurs as it dries may cause movement at the joins and fixings of the structural sheet. Structural sheet board nail/screw fixings showing through a vinyl that has been installed directly to a structural sheet board. Two common reasons for fixings showing through are: 1. Joists drying out over time. 2. More shrinkage of the structural sheet than the filler used over the fixings. 
3) Flat (Plane)	A straightedge can be used to identify any sagging in the centre of a structural sheet. The preparation method chosen should provide a surface that is within the tolerance for the floor covering.
4) Smooth	The sanding or grinding process leaves the surface in a smooth condition to ensure the board can be securely fixed or is suitable for the applied compound option.
5) Dry	Moisture testing structural sheet boards provides an indicator of moisture content (MC), not a true MC. The pin test works on moisture resistance between the pins. The resin or adhesive that is part of the board construction can interfere with the accuracy of the result; therefore is not the exact true MC. Readings up to and over 15% MC would indicate issues and further investigation will be needed to identify the problem to avoid floor covering issues that may occur at a later date. For example a building that will be locked up for long periods without ventilation and is exposed to high temperatures can dry the board down to 10% MC causing timber shrinkage/movement. In this situation more time for the sheet board to acclimatise and dry will be needed before installing the floor coverings.

4.6 EXISTING STRUCTUAL SHEET SUBFLOORS

Best practice techniques to prepare existing structural sheet boards for resilient floor coverings are the same for new structural board.

- Fit an approved board underlayment (minimum 4.75mm) by fixing with adhesive and staple.
- An approved cementitious reinforced fibre type applied compound. Minimum thickness specified by manufacturer.

  The flooring business must be totally satisfied that the structural sheet is soundly fixed and within the moisture content tolerance of the manufacturer's specifications before proceeding.

'Alternative solution for installing over existing structural sheet board'

The option to install directly to an existing structural board would involve the flooring contractor being totally satisfied that system used is fit for purpose and therefore warrantable. For example, small domestic areas kitchens, toilets and bathrooms where the house has stabilised over years and the temperature will remain relatively constant.

When organising or preparing a new structural sheet substrate for a vinyl floor covering, the five key areas below can be used to work through and identify what is needed to appropriately prepare the surface.

1) Clean	Mechanically clean the surface to remove all surface contaminants–any weathering or existing adhesive; anything that would affect the bond of an adhesive or an applied cementitious compound. A thorough examination to make sure there are no traces of oil or old rubber underlay residue. Any oil or rubber residue in a board can migrate to the surface and react with the PVC backing and result in adhesive breakdown or yellow staining. Heat or sunlight will accelerate this process.
2) Sound	The screws and nails tightened or new screws inserted where needed. Any areas of the board repaired that may have been affected by moisture.
3) Flat (Plane)	A straightedge can be used to identify any sagging in the centre of a structural sheet. The preparation method chosen should provide a surface that is within the tolerance for the floor covering.
4) Smooth	The sanding or grinding process leaves the surface in a smooth condition. Sealing the surface is a critical part of the process as structural sheet board is often made up of wax and resins or treatment chemicals. A fine smoothing cementitious compound fit for purpose is applied over the surface to act as a sealer and smooth out any grinding or sanding marks. The installer must be totally satisfied the sealer whether liquid or cementitious is appropriate to the situation. **'If in doubt check it out' contact the supplier and trial an area first.** In some circumstances manufacturers may recommend priming the surface prior to applying the smoothing compound, or mix with a specified emulsion instead of water. 
5) Dry	Refer to 5) Dry in previous section 4.6

4.7 REPAIRS TO WATER DAMAGED TIMBER SUBFLOORS

Any repairs to a timber subfloor as a result of a flood or water damage will need the joists to be moisture tested; including new joists. Moisture in timber takes considerable time to dry. If the joists are not sufficiently dry, shrinkage will cause movement of the structural sheet. Screw/nail holes may protrude and show through the resilient floor covering.

Recommended procedure for repairing flood damaged timber subfloors

- ✓ Engage a builder to check the structure and joists for saturation and carry out a moisture pin test.
- ✓ The customer should be made aware of the time needed to allow for drying. Being a natural product timber can take a very long time to dry due to its cell/wall structure.
- ✓ Remove the existing floor covering and allow time to dry. A builder may need to remove some of the subfloor to allow airflow to dry out the structure.
- ✓ Before any structural sheet board or floor boards are refitted or replaced, a moisture pin test should be recorded of the timber structure by the builder.
- ✓ Before organising the installation carry out a moisture pin test to verify the timber is sufficiently dry. The reading should not only be beneath 16% MC, it should read within 2% MC of the dry areas close by to the affected area.

5

CONCRETE FLOOR PREPARTION

IN THIS SECTION

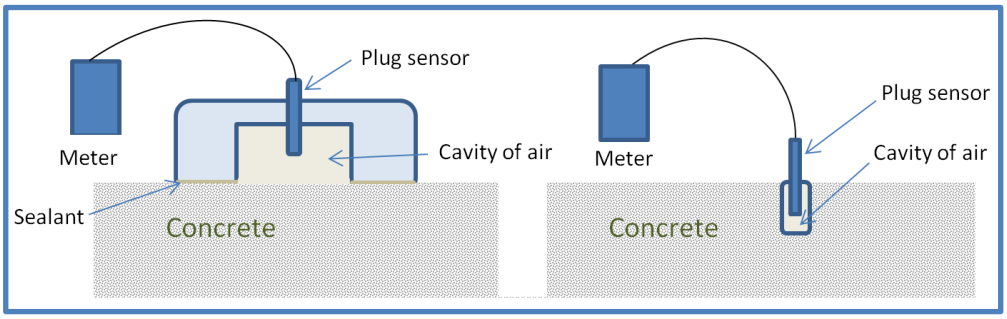
5.1 PREPARATION FOR CONCRETE SURFACES

When organising or preparing a concrete surface for a vinyl floor covering, the five key areas below can be used to work through and identify what is needed to appropriately prepare the surface.

1) Clean	The surface mechanically cleaned to remove all surface contaminants–traces of existing adhesive, dust, paint, wax, oil, old rubber underlay residue or grease residue, bond breakers or curing compounds. Any oil or rubber residue that migrates to the surface can react with the PVC backing and result in adhesive breakdown or yellow staining. Heat or sunlight will accelerate this process.
2) Sound	The surface should be solid, not loose, powdery or efflorescent emerging.
3) Flat (Plane)	The flatness of a surface can be determined with a metal straightedge. The tolerance for how flat or plane a surface should be is governed by the tolerance specified by the floor covering manufacturer. If there is no reference given for the floor covering then refer to tolerances set in NZS AS 1884:2013.
For the concrete industry NZS 3114:1987 Finishing Concrete Surfaces governs the finishing tolerance for a concrete placer who finishes the concrete surface. The finish is generally specified as an unformed (U) finish using a steel trowel blade (U3). A formed finished is created in a mould. The concrete surface finish tolerance set for a U3 finish are gaps no more than 5mm beneath a 3m straightedge that has been placed on the surface. Where the floor has a thin sheet or tile flooring specified, a 3mm over 3m maximum applies. The 3mm over 3m tolerance is extremely difficult to consistently achieve from a practical sense when placing concrete. In most cases further remedial work will be required to meet the acceptable tolerance for the floor covering. Recommendations and accurate pricing for remedial work is best achieved at a site inspection prior to the installation.	
4) Smooth	The surface should be smooth with no ridges that can be felt when a hand is run over it. A new concrete surface finished to the concrete standard NZS 3114:1987 U3 finish is 0mm over a 200mm straightedge. As preparation, a new concrete surface will need to be mechanically abraded to open the pores. A steel trowelled finish can produce a very smooth shiny surface that has little porosity. This can affect the bond of flooring water-based adhesives which need a level of porosity to allow the water to move out of the adhesive.
5) Dry	As well as no visible signs of dampness on the surface, the slab should also be dry in terms of any excess moisture that is in the slab which may cause a flooring failure.
Some of the typical signs of flooring failures caused by excess moisture are vinyl bubbling, swelling, adhesive breakdown, vinyl surface discolouring, resurfacing compound swelling or breaking down, toe spaces/skirting swelling causing vinyl to bubble at the edges. High moisture levels in concrete can also relate to high pH levels in concrete which can also cause adhesive failure. This type of failure may not occur until several months or more after the installation. In flooring terms the measurement of dryness for a concrete floor is taken as the partial pressure of invisible water vapour (humidity) that is rising to the surface of a concrete floor; not how much moisture is in the concrete (moisture content) these are two different things. The humidity is measured as a mixture of moisture vapour and air and is also relative to the temperature as water vapour condenses when the temperature lowers. It is recorded in a percentage form as relative humidity (RH).	

5.2 ACCEPTABLE METHODS OF MOISTURE TESTING CONCRETE

Acceptable tests are either a Hood test (surface mount) or a drill and plug test. Other devices such as the electrical capacitor test may provide an instant result, however it is not a recognised test. It is useful as an indicative test to find a place to take a hygrometer test. A good example is a Ribraft concrete floor where the depth of concrete varies throughout the concrete floor slab.



1. **Hood test**–a casing sealed to the concrete surface. A plug inserted into a cavity of air that is readable by a digital meter.

2. **Drill and plug**–a sleeve inserted into the concrete surface. A plug inserted into a cavity of air in a sleeve that is readable by a digital meter.

Both Hygrometer tests are a process of measuring moisture vapour in a small parcel of air. While both methods are acceptable they may vary by a few percentage points. The drill in plug reading below the surface will provide a slightly higher reading due to lower temperature deeper in the concrete. The procedure for moisture testing is set out in NZS AS 1884:2013.

The acceptable reading of a hygrometer test is no higher than 75% Relative Humidity for installing resilient floor coverings. This limit is specified in:

- E2 Clause 10.2 of the Building code;
- NZS AS 1884:2013; also
- Worldwide Resilient floor covering manufacturers' specifications that recognise 75% RH as the limit for resilient floor coverings.

See section 5.3 for alternate solutions using moisture treatment systems. 5.3

With the development of adhesives that are rated over 75%RH it is important to fully understand the limitations and conditions of use for these adhesives. For example, considerations around approval from the floor covering manufacturer, the cementitious patching or levelling compound manufacturer and the pH levels of the concrete which are often high in relation with high RH in new concrete substrates.

'Common reasons for a concrete floor to exceed 75% RH.'

- The moisture has not had sufficient time to leave the slab. Not enough time allowed between the close in stage of a building and the timing of the flooring installation.
- Moisture penetrating through the concrete slab from another source. For example, water run-off from a hill into the side of the concrete foundation (hydrostatic pressure), water from gardens next to a concrete foundation.
- A damaged plastic vapour membrane that is beneath the concrete slab.
- An older slab that may have no plastic vapour membrane beneath the concrete slab.
- Leaking heating pipes in a concrete floor.

At the initial planning stage of any resilient flooring installation the client/builder should be made aware of any concerns and potential problems associated with high moisture readings by the flooring company.

UNACCEPTABLE METHODS OF MOISTURE TESTING CONCRETE

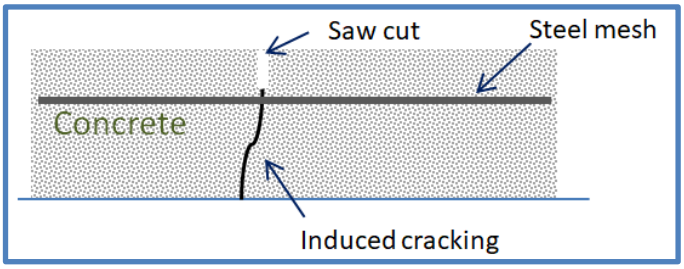
It is a very high risk to rely on the belief that a concrete slab will be dry after allowing 25mm per month (from building has been closed in), or a plastic sheet taped to the floor.

These **are not** recognised tests and **do not** produce definitive results. Likewise the curing time of the concrete (time taken to harden) is not an indication that the concrete is dry enough for the safe installation of resilient floor coverings.

5.3 ALTERNATE SOLUTIONS USING MOISTURE TREATMENT SYSTEMS

Moisture treatment systems used as a solution to install floor coverings over a concrete floor reading above 75% RH come with associated risks. They must be strictly used in accordance to manufacturer's specifications for the chosen treatment system.

Moisture will always find its way to the easiest path of least resistance. Consideration should also be given to moisture treatment systems regarding their effectiveness at the contraction joints that control concrete shrinkage as the water evaporates during the curing process.



The flooring business pricing and planning the installation must be satisfied the treatment is fit for the situation. Information from the moisture treatment supplier regarding the system should be followed strictly, particularly with any additional products that are needed to treat contraction joints before the moisture system is applied.

The flooring business must be satisfied that the system will allow for warranties to be provided to the client that the installation will meet the fit for purpose criteria; including any associated resurfacing compounds and adhesives used for the installation process.

Where a client or builder is organising the application of a moisture treatment system, the flooring business should be supplied with proof in writing that the system has been applied by an approved applicator under the conditions set out by the manufacturer or supplier of the system; plus it is compatible with the floor covering to be installed and the associated resurfacing compounds and adhesives used.

For future reference should it be needed, the flooring contractor and system provider should have clear easily available records of the products used and job information; including where necessary the training details provided for the applicator.

The moisture treatment system that is to be used should be included in a quotation for the work along with the warranties which meet the fit for purpose criteria in a domestic situation and any contractual agreements for a commercial installation.

6

PREPARATION FOR A JOINT CONCRETE/TIMBER SUBSTRATES

IN THIS SECTION

6.1 JOINT CONCRETE/TIMBER SUBSTRATE SITE ASSESSMENT

Two substrates that are made up of different compositions will react differently to heat, moisture (climatic conditions) or seismic movement. This joint will more often than not be noticeable through a resilient floor covering even if it is covered with a board underlayment or a cementitious resurfacing compound.

These situations are better suited to a floating floorcovering that will allow movement beneath it.

1) Clean	Remove all surface contaminants–any adhesive or tacky adhesive residue must be mechanically removed to prevent any clicking noises that may be heard when the finished floor is walked across
2) Sound	Along with any loose, rotten, springy boards, check for flexing and secureness along the joint between the timber and concrete. This is the weakest point which can move under load, heat, moisture or seismic movement.
3) Flat (Plane)	The flatness of a surface can be measured with a metal straight edge. The tolerance for how flat or plane a surface should be is governed by the tolerance specified by the floor covering manufacturer. If there is no reference given for the floor covering then refer to tolerances set in NZS AS 1884:2013.
4) Smooth	The surface should be smooth with no ridges that can be felt when a hand is run over it.
5) Dry	These types of substrates can be deceptive. While the surface of these substrates may appear dry, it is after installation of resilient floor coverings when any potential moisture can be drawn to surface causing swelling and bubbling of the floor covering. This can be caused by the concrete slab blocking off the cross flow ventilation. The result creating moisture build-up beneath the building. Also, if the concrete slab section does not have a vapour membrane then ground moisture may also be absorbed through the slab. Both substrates should be moisture tested at the early planning stages of an installation. If there are any concerns advise the client to engage a builder or engineer with expertise in this area to report on the timber substrate ventilation and if needed provide adequate subfloor ventilation.

7

INSTALLING VINYL TILES AND PLANKS

IN THIS SECTION

7.1 INSTALLATION GUIDELINES FOR VINYL TILES/PLANKS

Best practice for planning an installation or carrying out the installation is to become familiar with:

- ✓ The manufacturer's installation guidelines of the product; and
- ✓ NZS AS 1884:2013 Floor coverings – Resilient sheet and tiles – Installation practices

7.2 ACCLIMATISING TILES/PLANKS

Vinyl floor coverings by nature of the ingredients are known to expand and shrink slightly with changes of temperature. While different manufacturers have varying methods for creating tile dimensional stability, the installation practices used are also an important part of the process to control any movement after installation.

Vinyl tiles and planks designed to be adhesive fixed (dry back) require the correct type and amount of adhesive applied for the situation; along with appropriate rolling after installation to provide a strong bond.

The reason for acclimatisation is to allow the planks/tiles to move and adjust to its new environment before the installation starts. Manufacturer's installation guidelines set out the procedures and time planks should be delivered to site. Typically this involves storing planks/tiles on site for 24 hours before the installation on a flat surface, in straight piles, out of direct sunlight and at a recommended temperature range.

Tiles and planks rarely shrink to less than their manufactured size so the cooler side of the recommended temperature range is often more suitable to the New Zealand environment.

It is important to inspect the batch numbers. These should be the same. If they are not then shade variation may occur.

'Always check that the colour number is correct for the job.'

Always be on the lookout for any damage to tiles or tile edges. If these tiles are unable to be used for cutting, contact the supplier to make sure there will be enough planks/tiles of the same batch available to complete the job.

While vinyl planks/tiles may look similar, the recipe, ingredients and technology used will vary with each manufacturer. Because of these differences, the procedures for acclimatising vinyl tiles/planks may vary.

When it comes to acclimatising the vinyl planks/tiles to the area, both the person pricing the work and the installer have a duty of care to make themselves familiar with acclimatising instructions that are specific to the make of the vinyl plank/tile.

7.3 SHUFFLING TILES/PLANKS

- ➢ Make stock piles of planks from different packets. This helps to vary the patterns/grains and avoids blocks of similar shades.
- ➢ Check with the client or homeowner whenever possible to ensure they are happy with the pattern/grain layout before installing.
- ➢ Be on the lookout for any heavily grained patterns so they can be strategically placed throughout the installation.
- ➢ Check with the installation guidelines for any arrows on the back of the planks/tiles and if there is a direction they are to be installed to.

7.4 UNDERFLOOR HEATING

Underfloor heating in a new building should first be run for a period of time to remove any surplus subfloor moisture that will rise when the heating is first turned on. This should be organised at the initial planning stage; well in advance of the installation.

Always refer to the instructions for the planks/tiles to be installed. Underfloor heating should be turned off at least 48 hours in advance of the installation and remain off until 72 hours after the installation. When the heating is turned on gradually day by day, the temperature can be increased in small 5 degree amounts until the desired temperature (that is within specified range) has been achieved.

Exceeding the maximum recommended temperature after installation can damage the new floor.

At the point of sale the underfloor heating should be discussed including what the maximum temperature is for the product.

As part of vinyl tile/plank care and maintenance, information should be passed on to the user to make sure they understand and can take responsibility for using the underfloor heating correctly.

7.5 TEMPERATURE FOR THE INSTALLATION PROCESS

The temperature must be stable from pre-installation through to the recommended adhesive setting time after the installation. This includes the floor temperature where it has or will be exposed to the sun. Windows must be covered throughout the installation process through to time for the adhesive to set.

Similarly, in winter conditions the room must be brought up to temperature in advance to the installation.

The manufacturer of the plank/tile will have a room temperature range for the installation in their guidelines. These ranges are often set by the limitations of the products and also overseas conditions where heating systems and building designs allow for more stable conditions.

Tiles and planks rarely shrink to less than their manufactured size so the cooler side of the temperature range is often more suitable to the New Zealand environment.

New Zealand's building designs allowing in more natural light and have heating systems that are often turned on when needed so room temperatures are prone to fluctuate.

The planning part of an installation is where stabilised heating to the areas are discussed with the client/builder. The conditions need to be suitable for the entire installation process. This includes prior acclimatisation through to a period after the installation that allows the adhesive sufficient time to set.

It is too late to discuss issues around temperature conditions at the time of an installation. Any installation that is carried out in conditions that are not suitable to the planks/tiles or adhesives will not meet the fit for purpose criteria in the Consumers Guarantees Act (CGA). It is important to note also that contracting out of warranties is not an option under the CGA.

New Zealand technical advisors for the manufacturers should be contacted to clarify any areas of guidelines that may not be clear for New Zealand conditions. All planks vary in design and product make up. Often there are critical criteria around the recommended temperature.

Adhesives have a minimum temperature needed for a correct set up (including a minimum surface temperature). Adhesives that

contain water as the carrier are limited through physics by low temperature or high humidity. The water will simply not move out of the adhesive. Chemical reactions that are part of the setting process for two part adhesives can also be affected at low temperatures.

The tolerance of movement in temperature over a day with the areas is throughout the entire installation process. For example this may vary from 2-5 degrees over a day depending on the plank/tile type and manufacturer.

7.6 VINYL PLANK SET OUT

Time spent planning can save time spent with tricky cutting. Setting out where to place the main gridline will vary with the complexity and size of the area/s.

Discussing the set out and limitations caused by walls out of square with the customer allows for any adjustments before the installation. There are a number of things that need careful thought about at the set out stage.

- Planks that will run through different rooms; also where planks re-join around island benches, rooms or passageways.
- Staying parallel with the longest obvious walls.
- Avoiding where possible, very small pieces along main skirting edges in passageways.
- Allowing for the widest possible even sized planks at the edges in small areas or entrance ways.
- Working away from the adhesive where possible when using wet adhesives, particularly polyurethane/epoxy type adhesives.
- Setting out small areas or entrance ways to achieve the widest possible edge plank will not always work by starting at the exact centre of the room. This is due to the width size of the plank and its mathematical relationship with the width size of the area.
- Moving the set out across a half plank as shown in **Illustration 2** will allow for a wider fill plank at the edges.

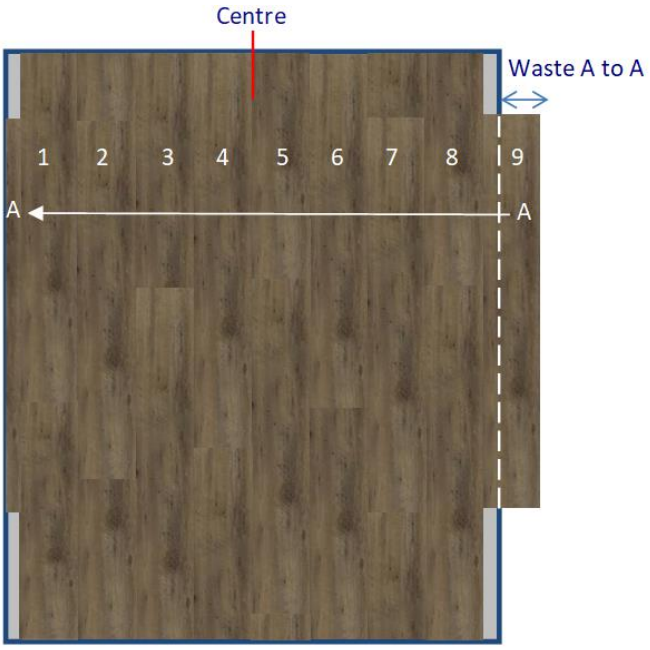


Illustration 1 is a plank set out from the center. Because of the relationship of the width of the area and plank width, a thin strip is needed to be cut in at both edges.

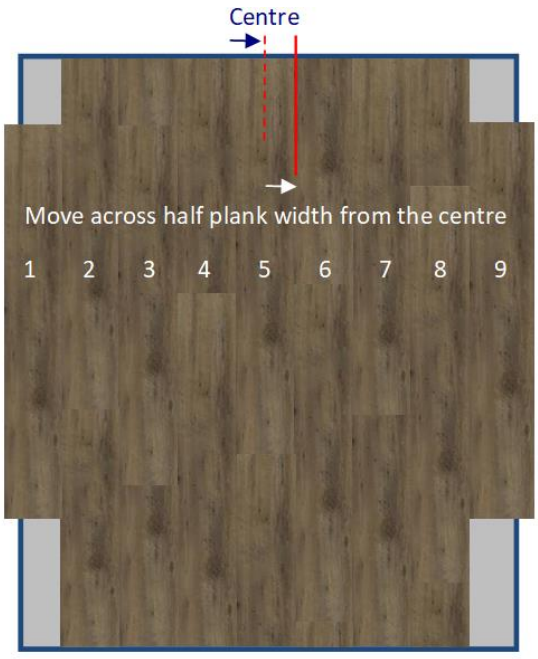


Illustration 2 is moving a plank set out across from the center by half a plank width. Using the same amount of planks create a wider strip to be cut in at both edges.

- Having larger cut planks at the edges makes cutting easier and in some situations can help disguise a plank edge that might not be parallel to an out of square wall.

7.7 VINYL TILE SET OUT

Similarly to a plank set out, time spent planning can save time spent with tricky cutting. Discussing the set out and limitations caused by walls out of square with the customer allows for any adjustments before the installation.

There are a lot of factors to consider at the set out stage so not all set-outs and starting points will be the same. Setting out where to place the main gridline will vary with the complexity and size of the area/s. Tiles that will run through different rooms; also where tiles re-join around island benches, rooms or passageways.'

- Staying parallel with the longest obvious walls.
- Avoiding where possible, very small pieces along main skirting edges in passageways.
- Allowing for the widest possible even sized tile at the edges in small areas or entrance ways.
- Working away from the adhesive where possible when using wet adhesives, particularly polyurethane/epoxy type adhesives.
- Setting out small areas or entrance ways to achieve the widest possible edge tile will not always work by starting at the exact centre of the room. This is due to the size of the tile width and its mathematical relationship with the area width.
- The tile/pattern direction chosen for the installation.
- Moving the set out across a half tile as shown in **Illustration 4** will allow for a wider fill tile at the edges.
- The starting point should be controlled by the installer not through job conditions because of other trades working in the same area.

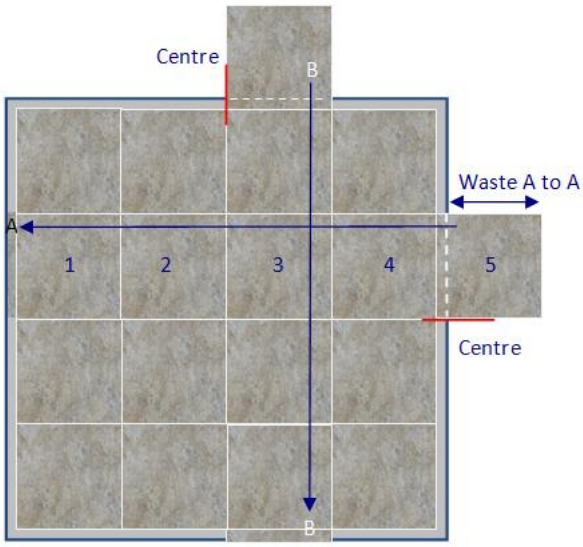


Illustration 3 is a tile set out from the centre providing a balance at each edge. See **Illustration 4** for the solution that provides a larger cut tile at the edge.

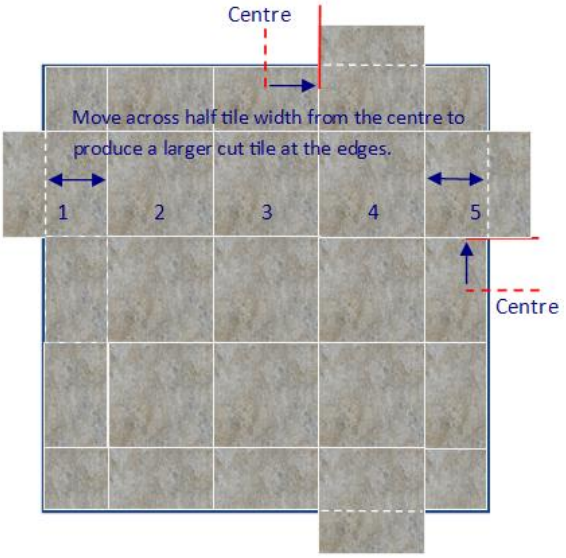


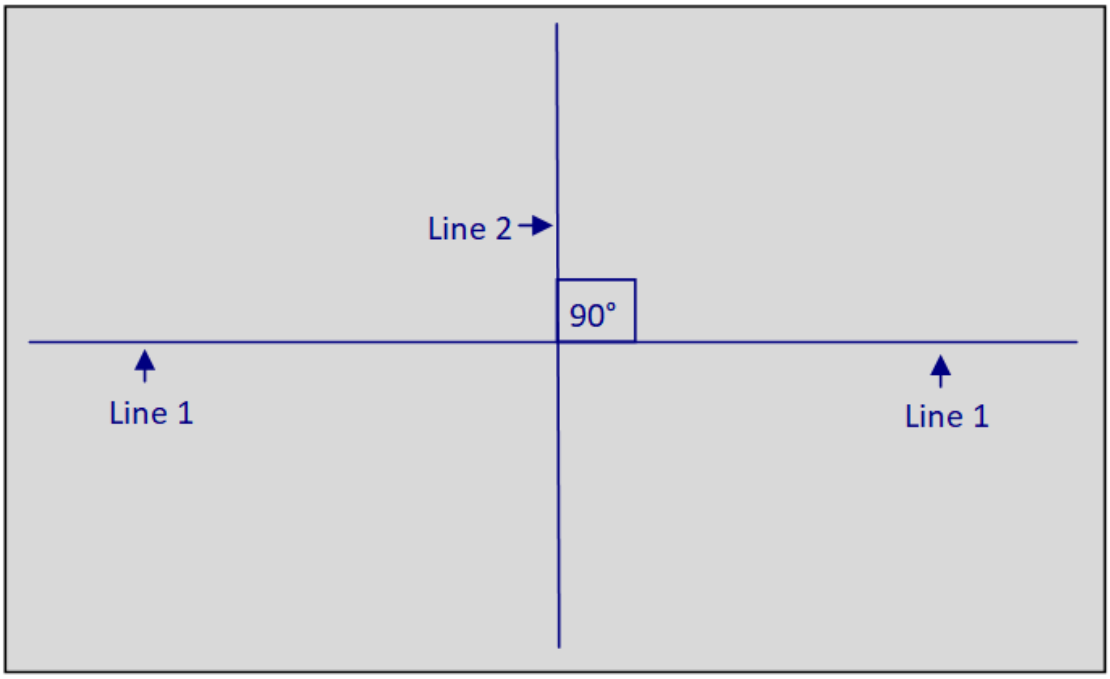
Illustration 4 shows how moving a tile set out across from the centre by half a tile width increases the size of edge cut tile. The same amount of tiles are used but with a wider edge tile.

- Having larger cut tiles at the edges makes cutting easier and in some situations can help disguise a tile edge that might not be parallel to an out of square wall.
- Set out off long walls. Setting out off shorter walls and areas then working into larger areas can increase the risk of the tiles not staying parallel with longer walls.

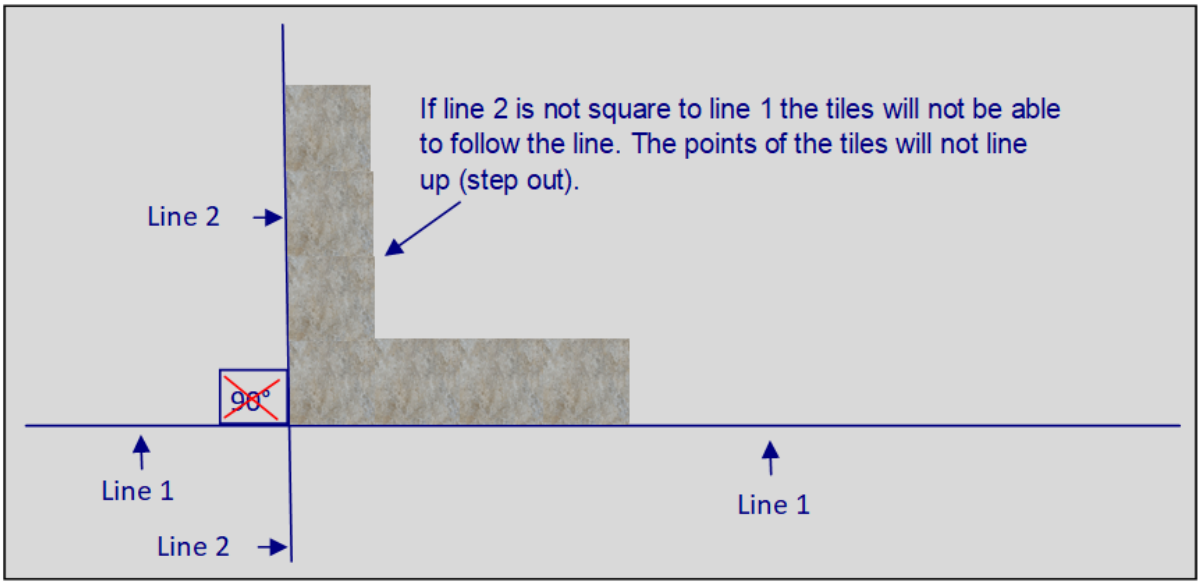
7.8 FORMING A SET OUT LINE

A square gridline must be formed on the floor surface to work from.

- Line 1 is formed parallel with the longest wall.



- Line 2 must cross Line 1 at exactly 90 degrees (perpendicular). It must be created from Line 1; not measured back parallel to the wall.

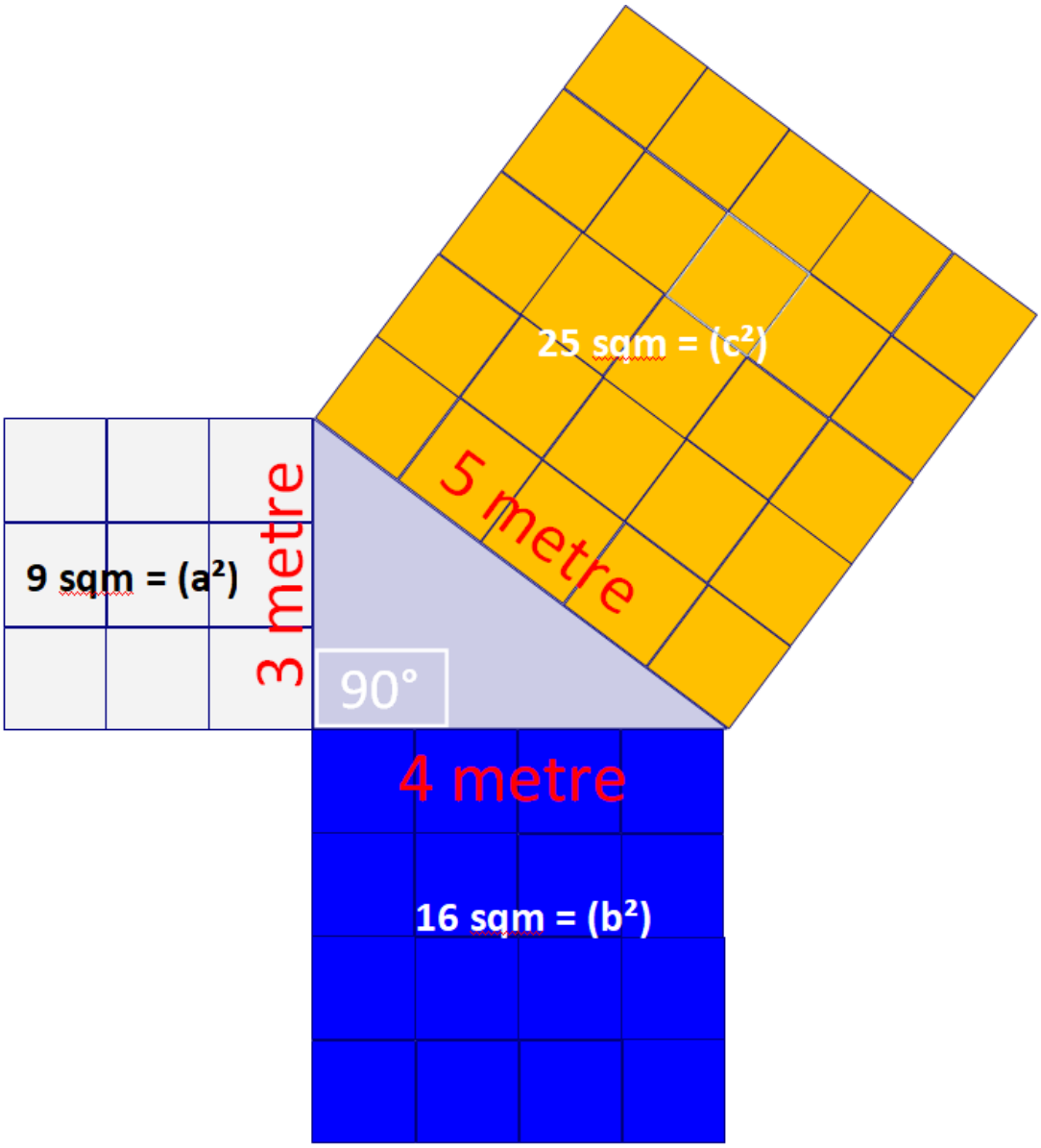


- Creating Line 2 by measuring off the wall does not guarantee an exact 90 degree right angle line to work from. Relying on the building to be exactly square is not recommended as it will cause tiles to step out.

7.9 FORMING A RIGHT ANGLE LINE

A square gridline must be formed on the floor surface to work from.

- While a builder's square is useful in small areas and laser technology for large areas, a method still used in construction today and has been around pre 500BC for creating a right angle line is the 3-4-5 rule. Mathematically known as Pythagoras's theorem a ² + b ² = c ².



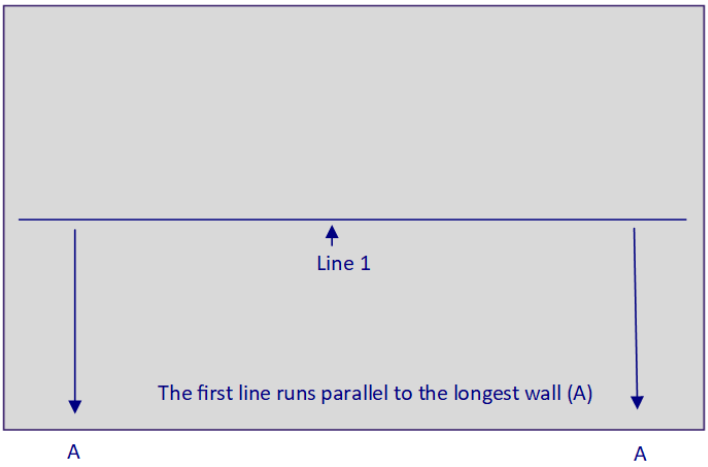
A simple way of applying this to flooring is to think of the 3-4-5 rule in metres. The 3 metre and 4 metre measurements are the right angle and the 5 metre measurement is always the longest side.

- If the area is bigger–double the measurements to 6 metre, 8 metre and 10 metre.

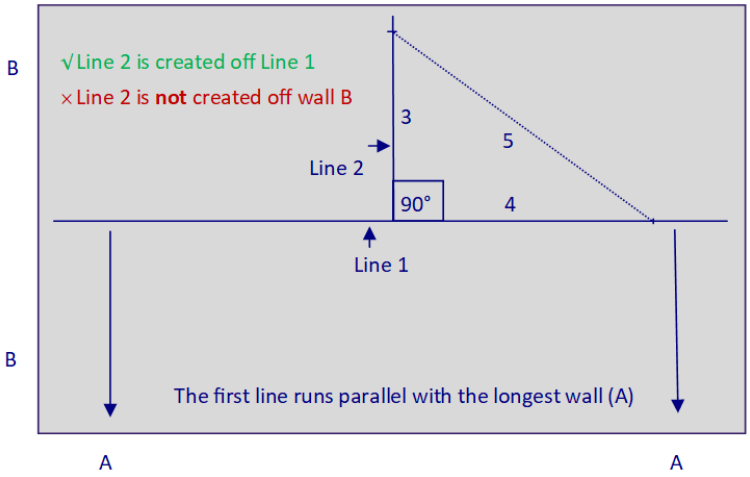
- If the area is smaller–half the measurements to 1.5 metre, 2 metre and 2.5 metres.

7.10 FORMING A SQUARE SET OUT LINE ON THE FLOOR

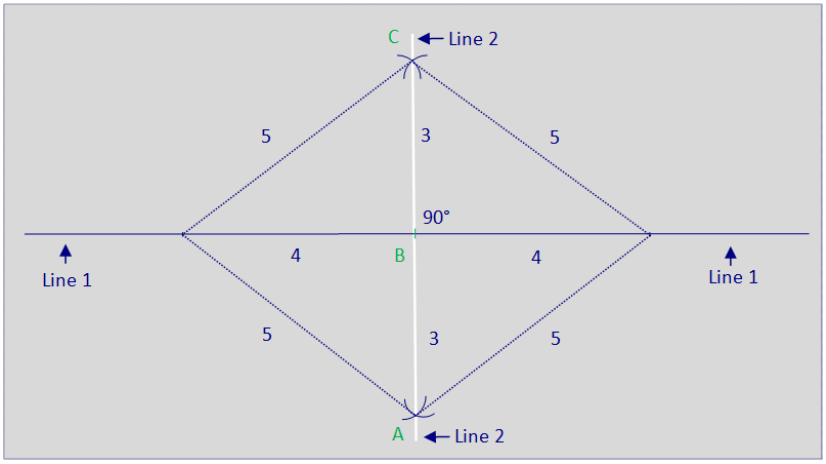
Step 1–measure off the longest wall at each end to create Line 1. When the line is marked on the floor, check sections along the line that the line is parallel to wall A.



Step 2–measure along Line 1 and mark the chosen start point. This may be the centre of the area or will be offset from the centre mark by half a tile width. Create Line 2 off line 1 using the 3-4-5 rule.



Step 3 - Repeating the 3-4-5 rule on the opposite of Line 1 side helps with accuracy when setting out larger areas. Points A, B, C should line exactly together when a string line is laid over them.



7.11 TILE STEP OUT

One of the challenges of a tile installation is keeping the corner points of tiles meeting up. Tile step out or tile creep is where the points of the tiles do not stay in line. This can happen gradually during and installation and is often a combination of a number of reasons.

Illustration 5: Tile points not lining up

Four key reasons that contribute for tiles to gradually step out are:

1. Surface
2. Set out
3. Installation
4. Tiles

1. Surface–humps and hollows in the surface will cause tiles to step out. Illustration 6 provides an example of the distance covered of a tile on a flat surface and a hollow (undulated) surface.

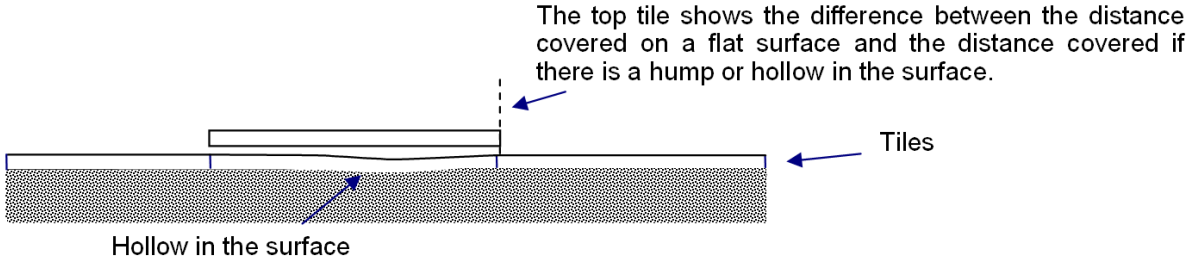


Illustration 6: Variations in surface causing tiles to step out.

- Manufacturers will have a recommended tolerance for the flatness of a surface for their tiles. They may also have a set measurement that an amount of tiles should fit into.

- The method used to identify an acceptable tolerance for how flat a surface is will involve placing a metal straightedge on the floor and checking for any gaps between the straightedge and the surface.

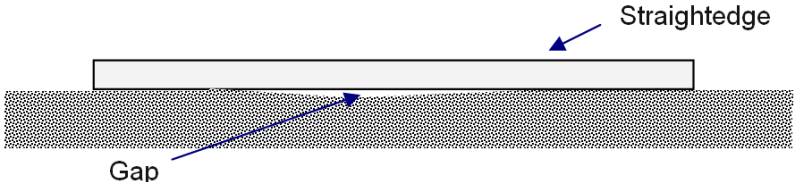


Illustration 7: Checking for gaps beneath a straight edge.

New concrete surfaces–there are 11 classes of concrete finishes for a new concrete surface. Formed finishes are moulded or cast finishes. An unformed finish needs a method to finish a concrete surface before it hardens. Where floor coverings are to be installed, the finish used by the concrete industry is U3 (unformed) which is set out in NZS 3114:1987.

The U3 finish class is a metal trowel finish with gradual changes specified as within 5mm over a 3m straightedge or where thin sheet or tiles are to be installed 3mm over a 3m straightedge

- A finished concrete surface might meet the concrete standard but may not meet the level of flatness specified for the tile. Both the person pricing the work and the installer have a duty of care to make themselves familiar with instructions for the tiles that are to be installed regarding the tolerance for flatness using a straightedge.

2. Tile set out–must involve a grid that is square (90°) to the main line. The tiles must be installed to the lines and not allowed to wander off. Installing to a line that is not square will eventually cause tiles to step out.

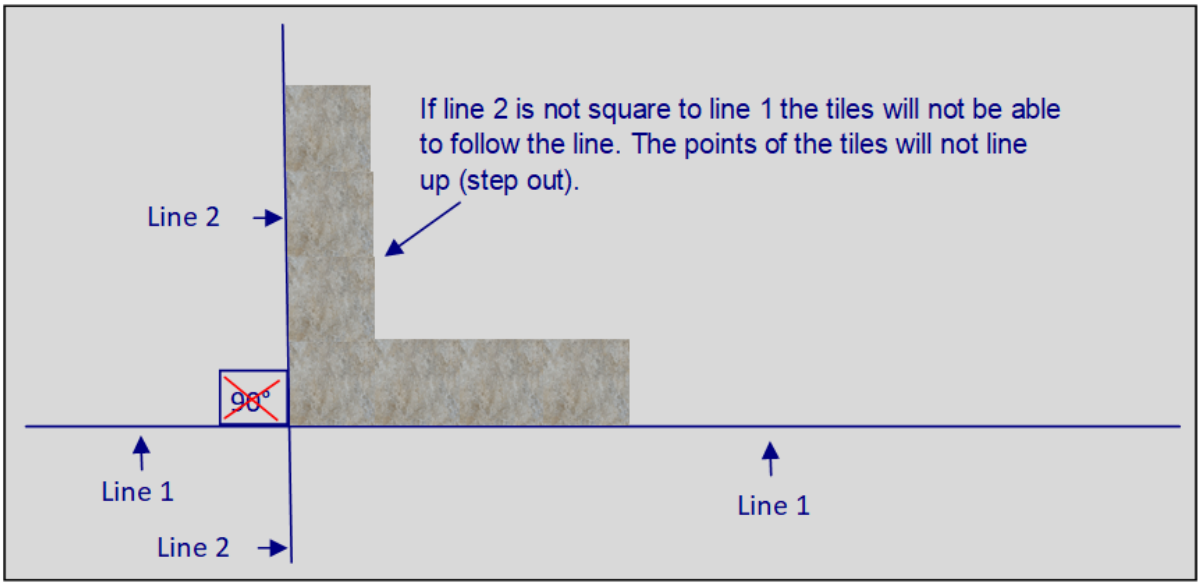


Illustration 8: Out of square line that will cause stepping.

3. Installation technique–work out the best start point for the area; this may be from the edge of a room or the centre. If possible in larger areas, starting from the centre if the area allows it halves the problems that can contribute to tiles stepping out.

- Different people involved in the same installation may have different hand pressure or have left handed verses right handed strengths. This can also contribute to stepping out over a large area.

- The standard laying tile technique is to install the field of tiles in a stepped formation. This method helps to keep the tiles on the right angle gridlines. At regular stages during the installation placing a tile that allows two edges to line together and running fingers across the joins will indicate at the early stages if tiles are starting to step out. See **Illustration 9** below.

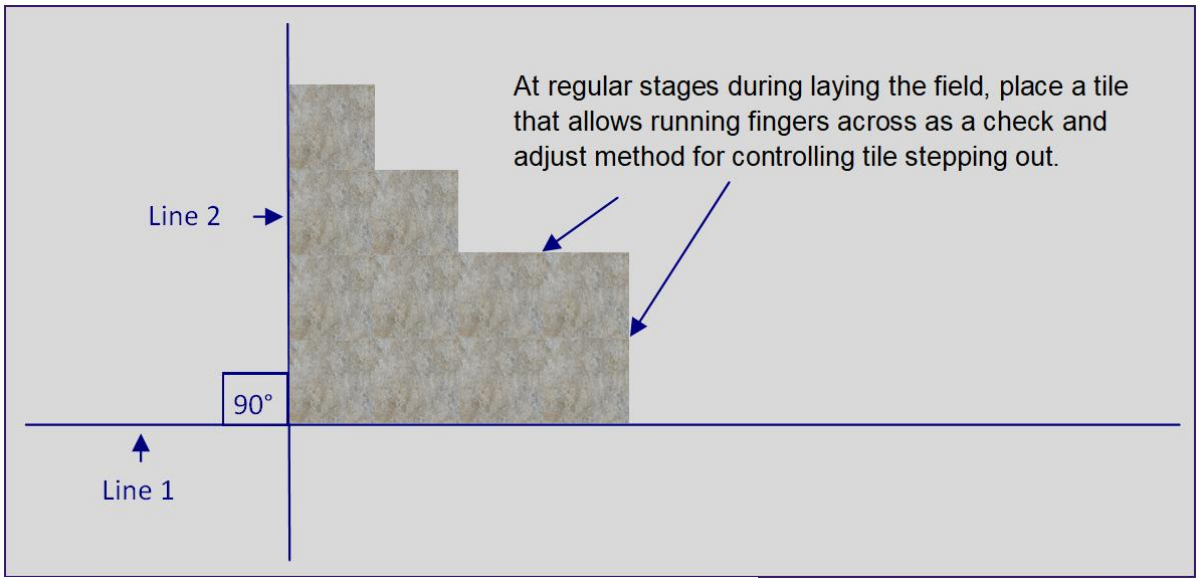
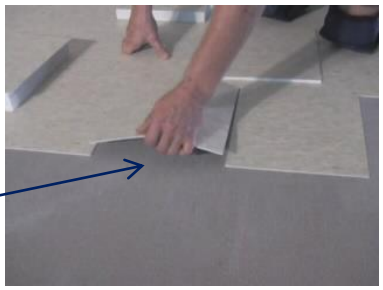


Illustration 9: Installing tiles in a step form.

Vinyl Composite Tile (VCT)–vinyl tiles that have no stabilising carrier are able to compress on themselves. In large areas where step out is starting, installing around the stepping tile and compressing a tile inside the stepped out tile can help bring the stepping back under control.



4. Tiles–manufacturers have a tolerance for slight size variation for the tiles. With advances in cutting technology and tile/plank construction, the accuracy of vinyl tiles is extremely precise.

- Over a large area a very small variance in size can also contribute to stepping.
- When inspecting tiles at the unpacking stage if there is any concern or visual signs that tiles are not square or vary in size, then the supplier should be notified before the installation starts.
- Similarly if there are any issues during the installation with tile size then the installation should stop and the supplier notified.

8

ADHESIVE FOR VINYL FLOOR COVERINGS

IN THIS SECTION

8.1 ADHESIVE TYPES

Flooring businesses planning or installing tiles/planks have a duty of care to familiarise themselves with the ability and limitation of the adhesive that is going to be used.

The choice of adhesive is influenced by the makeup of luxury tiles/planks plus the temperature range and stability of the areas that they are going into.

- **Dry back planks/tiles–** need an adhesive system that is suitable in the New Zealand environment. While some dry back planks/tiles may have the capabilities of being installed with a pressure sensitive adhesive, a hard set adhesive is often more stable and suited for New Zealand conditions.

  With advancements in adhesive technology fibre reinforced adhesives add to the sheer strength of the adhesive bond.

- **Water-based (acrylic) adhesives**–are the most common type of adhesives recommended for tiles/planks and sheet vinyl. Vinyl floorcovering manufacturers do not recommend or warranty solvent/latex contact adhesives as they are not always compatible with plasticisers that are part of a flexible vinyl make up.

Not recommended–while general solvent contact adhesives have high instant strength and work in lower temperatures, there is a risk that over time the bond may fail.

A reaction between the property make-up of both the adhesive and backing can cause both the adhesive and vinyl backing to soften and breakdown; this is often accelerated with an increase of temperature.

Using solvent adhesives where they are not recommended can void manufacturer warranties.

- Water-based (dispersed) adhesives need the water to disperse (dissolve) out of the adhesive to work, therefore:
  - The flooring surface must be able to absorb the water out of the adhesive. If there is nowhere for the water to go it will remain wet and not set up properly.
  - The temperature and humidity needs to be within the recommended ranges so the water can move out of the adhesive and setup. If the environment is too cold and/or the humidity too high, the adhesive will not work or work effectively.

- All adhesives have benefits and limitations as they set up differently. It is not always a one size that fits all scenarios.
  - Hard set–set to a hard non tacky state giving the adhesive strong sheer resistance (sideways movement);
  - Pressure sensitive–set to a soft tacky state; or
  - Pressure sensitive–remain tacky for a long period of time before setting firm.

- Adhesives modified with fibre reinforced have increased sheer strength (sideways movement). While these adhesives perform well in higher temperature environments they should not be used outside of the manufacturer recommendations.

  In high sun/heat situations a strong sheer strength polyurethane or epoxy based adhesive will be recommended.

8.2 TIPS WHEN CHANGING FROM SOLVENT-BASE TO WATER-BASE ADHESIVE TECHNOLOGY

Water-base technology has made huge advances over recent years and more and more NZ flooring companies are making the change.

'Overcoming the barrier of change'

- Change often puts people outside of their comfort zone so initial resistance to change is a normal human trait.
- When making change, focus your energy on how to make it work rather than comparing to what you are changing from.
- When we get used to things, we get back into our comfort zone and the change becomes easier and normal.
- When pricing work, allow any extra costs for the adhesive and any extra time needed for the installation. After completion of a number of jobs carry out a back-cost analysis. Include compliance costs as in health monitoring, record keeping, training, safety gear, mask filters, planning/managing labour resources.
- Talk to other companies who have made the change.
- Flooring companies who have made the change find that when the process is normalised, the increased costs are not as much as was first thought.

INSTALLING VINYL TO COVING/CORNERS/WALLS

- One of the key reasons flooring installers develop a liking to their favourite adhesive is they get used to the time it takes to develop a tack (open time) and how long they have to work with the material before the adhesive sets firm; losing its tack properties (working time).
- Knowing the tack up time helps an installer set the pace of the installation. When the adhesive is at a tacky stage the bond should be strong enough to wrap vinyl around corners and coving up the wall/toe space.
- Also applying adhesive with a roller to the back of the vinyl where it will wrap around corners/coving can also help at these pressure points.

Illustration 1: Initially the adhesive when first spread will have no initial tack.

Illustration 2: Depending on temperature and humidity, the adhesive will soon start to develop a tack. Sometimes referred to as 'growing legs'

- If applying the adhesive to both surfaces like a contact adhesive, always make sure there is a **wet contact**. Letting both surfaces dry will not allow the adhesive bond to set.
- Warmer temperature will help the water evaporate out of the adhesive faster.
- Humidity (the amount of water vapour in air) will affect the tack up rate. If it is warm, humid day the tack up rate will take longer as it will if the temperature is lower.
- Air flow–fans or heat pumps will move air across the adhesive allowing the water to move out of the adhesive (similar to drying the washing, a windy day will dry the washing faster).

Pre plan tasks to do in situations where a little tack up time is needed rather than waiting for adhesive to start tacking up. Watching adhesive tack up is comparable to the saying 'a watched pot never boils'

8.3 LOOSE LAY LUXURY PLANKS/TILES

Loose lay luxury planks/tiles installed without any adhesive generally require near perfect conditions where the temperature remains consistent and stays within the products maximum temperature range. With the New Zealand landscape and building designs these types of environments are rarely achievable.

- For the products to be fit for purpose in New Zealand conditions, the supplier may recommend that at a minimum application of pressure sensitive adhesive is used; along with any appropriate allowances for expansion.

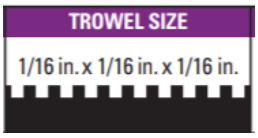
- In high heat or bathroom (E3 water splash) areas, a specific adhesive system that is suited for these conditions may also be recommended.

- Before selling, planning or installing luxury tiles/planks that have loose lay capabilities, flooring businesses have a duty of care to source and make themselves familiar with the adhesive and expansion information that is product specific.

  Customers should be made aware of the benefits and limitations including any tolerances for tile/plank shrinkage for both dry back fully adhered and loose lay installed with a pressure adhesive system.

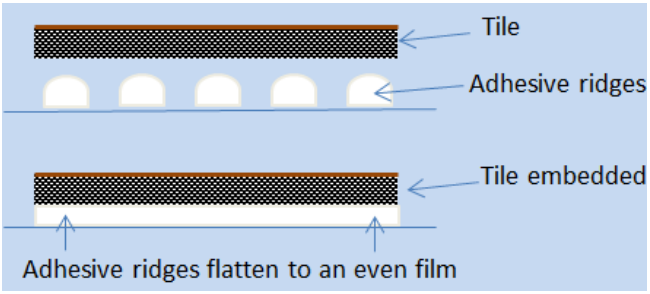
8.4 APPLYING ADHESIVE

Adhesive transfer is absolutely critical to ensure a strong bond between the floor covering and the floor. In particular dry back planks/tiles will need more adhesive applied than residential sheet vinyl.



- The trowel notch size and configuration is a crucial part of the system. The common trowel notch sizes are:
  - 1/16 x1/16 x1/16 - Imperial measurement.
  - 1.6 mm x 1.6mm x 1.6mm - Metric measurement.
  - Manufacturers may also specify the spread rate by grams per sqm.

- The gap between the notches is important. When the planks/tiles are rolled, the adhesive should flatten out to an even film of adhesive.



  - If the notches are too wide and do not flatten, the trowel marks can become visible over time.
  - If the notches are too big the adhesive will show through as lumps.
  - If the notches are too small, the bond will be weak and will allow plank/tile shrinkage.

- The open time of the adhesive which is the time allowed for the adhesive to start becoming tacky before laying the tile/plank will vary between adhesives and also the temperature when the adhesive is applied.

- If the open time is left too long then the adhesive will not flatten out which may cause the trowel marks to become visible through the tiles/planks.

'Temperature is important for an adhesive to work correctly'.

- The flooring installer should make them-self familiar with the technical information provided on the adhesive pale, particularly the temperature range, open time and recommended spread rate.

- If the temperature is too low or the humidity too high the water will not move out of the adhesive which will affect adhesives ability to set up correctly. When the building temperature is increased the tiles/planks may grow and peak.

- In lower temperatures air movement with fans may help the adhesive set up and move the water out of the adhesive. A similar scenario to hanging out the washing in a breeze.

- Higher temperatures can also cause problems. If the subfloor has been exposed to the sun it should be allowed to cool before installation begins.

'All windows should be covered to keep the sun out'

- A consistent ambient temperature will allow the adhesive to set correctly and securely bond the tiles/planks to the floor.

- Keeping the trowel clean during the day is also crucial to prevent the notches from clogging up and reducing the adhesive spread rate.

- This can be achieved by soaking the trowel in water when not in use. Using a plastic bag and bucket, the water can be easily disposed of at the end of the day by tying a knot in the plastic bag and removing it from the job site.

- If using a wire brush to remove dried adhesive, check thoroughly that the entire adhesive residue is removed from the notches.

'Effective rolling is a critical part of the process'

- Rolling the floor, plus the timing of the rolling is another essential part of the process. Regular rolling during the installation (in both directions) will help to secure a strong bond between the tile backing and the substrate.

- The application of a pressure sensitive adhesive may require a different technique depending on the manufacturer's specifications. These may need a specific roller nap application or back rolled with a roller after applying adhesive with a notched trowel.

- The installer should make them-self familiar with the application technique specific to the tiles/planks that are to be installed.

8.5 INSTALLING TILE/PLANKS TO WET AREAS

The building code (*E3 Internal moisture*) identifies a bathroom, laundry, toilet or a kitchen as a 'wet area' where moisture may accumulate or be generated (taps)'.

To avoid structural damage to the subfloor and meet conditions for health and safety, internal areas that accumulate moisture are to be constructed in a way to prevent moisture build up and fungal growth.

Finished surfaces must be impervious, maintain the integrity of the system, and use materials and finishes suitable for wet areas.

- Two key areas that affect floor coverings are water splash or leaked water. These are referred to in E3 as:
  1. Containing accidental water overflow (flood, leak).
  2. Water Splash (e.g. outside area of a shower or bath)

- Any sanitary fitting in a room has the potential of water overflow or create splashback. To comply with the E3 2.1, containing accidental water overflow may be achieved by using impervious floor coverings which are continuous and coved or joints sealed where they meet the edges/wall.

- Adhesive systems used in wet areas must be able to provide assurance when applied correctly that timber substrates will not be damaged by any moisture or water that may seep through joins or at the edges of the area/room.

- These adhesives have been typically of polyurethane or epoxy type in nature, however with advances in adhesive technology there may be other alternatives recommended by adhesive suppliers.

- The adhesive should be an approved fit for purpose system that is compatible with the floor covering.

  If installers are not familiar with the adhesive system specified then they should contact the supplier for further information. This may involve training if the system requires it for warranty purposes.

- Adhesive systems used in a residential kitchen and laundry should be able to sustain an accidental overflow situation.

- Where loose-lay planks or tiles with no impervious joining system are installed into a kitchen and laundry area over a timber board underlayment or structural sheet:
  - The surface should be first sealed with an approved coating that would make the board surface impervious to any water penetration or accidental overflow situation.

- For future reference and warranties, the identity of the manufacturer for any adhesive system used should be recorded in the customer file or included in the quotation to the customer.

8.6 SEALING EDGES IN WET AREAS

- Sealing the tile/plank floor walls/upstands joints involves applying a thin bead of an appropriate type and colour/clear silicone then smoothing off with a profiled tool.

  The intention is to seal the joint; not to cover up inaccurate cutting.

  For a new build, a council inspector may look for sealed edges as part of the code of compliance.

- Creating a consistent fine bead can be achieved by setting the width with masking tape. This process helps control the size of the bead width.

Photo 1 - Setting the bead width.

Photo 2 - Finished transparent bead.

- Another option is to apply a fine bead of silicone before installing the floorcovering (Photo 3). This method allows sealing from the bottom up and leaves a finish without having a bead of silicone on the surface. (Photo 4).

Photo 3 Silicone to the shower/floor junction.

Photo 4 - After vinyl is fitted any excess silicone that squeezes up is removed.

9

INSTALLING SHEET VINYL

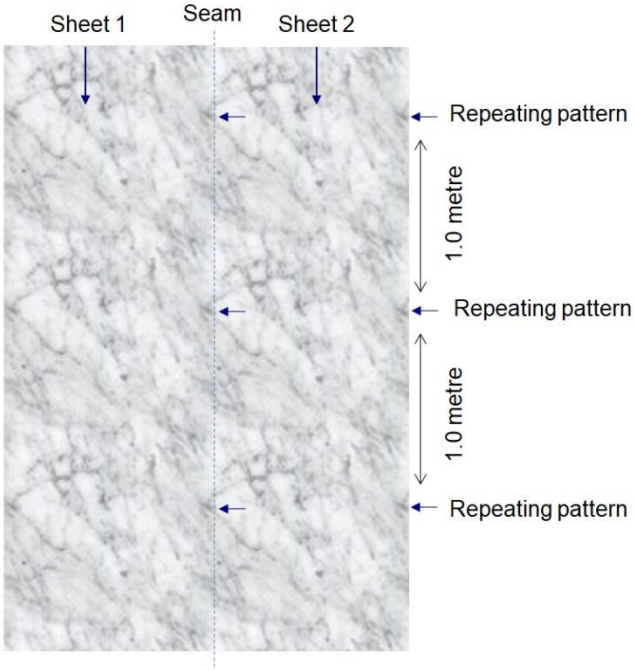
IN THIS SECTION

9.1 PATTERN MATCHING

- Where possible minimise or avoid joins by using a wider vinyl e.g. 3.0 metre wide in place of 2.0 metre wide vinyl.

- Be mindful that seams on light coloured/plain or diamond patterned vinyl tend to be more visible than dark or tile patterns where joins are made on an imitation tile grout line.

- Residential vinyl with printed patterns need an allowance made to match the pattern where it repeats; that also includes light textured, speckled/marbleised designs which will also repeat.



Plain or slightly textured, speckled patterns can be deceiving. If they are not matched correctly a shade variation may occur at the join.

- Where the design has a printed pattern that repeats the sheet direction is the same way. ↑↑

  If the sheet is to be reversed, there should be two arrows opposing each other on the back of the sheet indicating to reverse the sheet direction. ↑↓

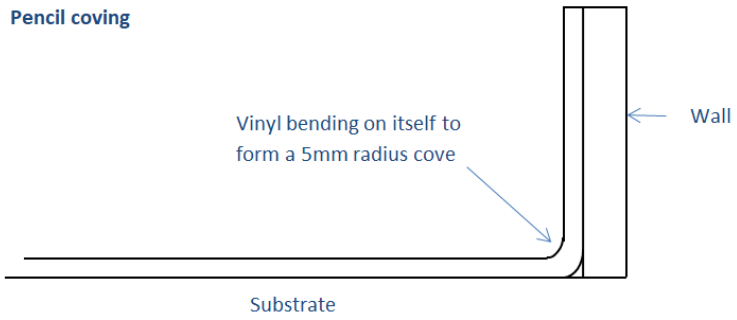
- The retailer has a care of duty to supply the installer with directions around reversing sheets.

- If the vinyl does not have a sufficient manufactured selvedge allowance needed for accurately pattern matching, a perfect match is not always possible.

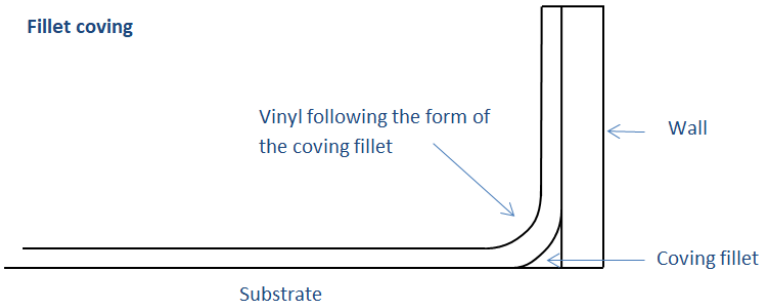
- If there are any aspects of pattern matching that are unclear, the retailer should get clarification from the product supplier before proceeding.

9.2 COVING

- **Pencil cove**–the choice of coving method used is based on the recommendation from the vinyl manufacturer and whether the vinyl type is able to bend on itself without creasing.



- **Cove fillet**–for vinyl that is not able to bend on itself without creasing, a plastic coving fillet can be fitted at the base to support the vinyl and gradually increase the radius.



9.3 SEAM WELDING

Sheet vinyl is a product that by its make-up can be prone to shrink slightly at the seams; particularly with increases in temperature and heavy foot traffic. A slight opening in the seams will attract dirt and grit, eventually breaking down the seam over time.

To help prevent the seam from breaking down the manufacturers will often recommend that the seams are chemically welded together.

Welding seams together with a chemical weld helps prevent shrinkage at the seams. Joins welded together helps prevent any slight shrinkage of both sheets that could over time allow dirt and grit to gradually break down the seam.

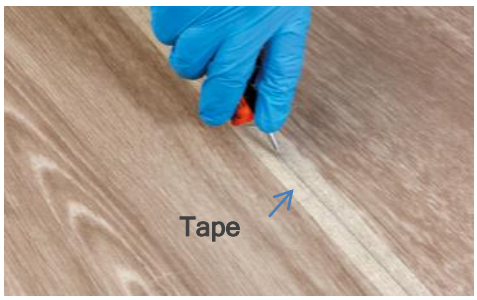


Photo 1: Applying a clear liquid chemical into the seam that side bonds the seam together (polyflor).

Some residential sheet vinyls have an easy clean surface. This is often a polyurethane type coating over the clear PVC wear layer.

Applying the liquid weld slowly to an easy clean surface allows the liquid to run into the seam and bond the sides together.

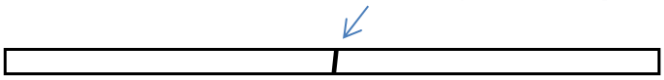
Applying the liquid weld too fast will not allow time for the liquid to run into the seam and securely bond the sides together. Over time the chemical weld will peel off the easy clean surface.

Before applying the chemical weld, the seams should be first masked with tape to slow down the application process. This will allow time for the chemical to run into the seam and bond the sides together. The tape should then be removed before the chemical dries.

'When working with a new vinyl that you are not familiar with, cut and seam weld a piece together as a trial'

Before welding, the seam must be cut so joins are just touching; not cut too tight. The seam should be flush and clean of any adhesive residue.

√ Cut the seam flush and clean ready for welding.



If the seam is cut too tight it may bubble, or the join will not have a finish that is flush at the surface.

× If a seam is cut slightly too tight, one wear layer can become trapped under the other wear layer. This seam could appear caved in if welded together.

It is more likely than unlikely that vinyl seams will be visible when finished; this is normal. How visible depends on the pattern, colour and the amount of natural light that is cast across the floor.

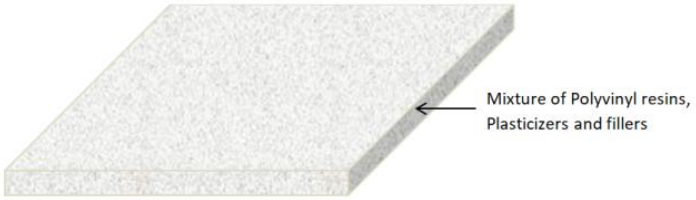
9.4 VINYL TYPES

Best practice for planning an installation or carrying out the installation is to become familiar with:

- ✓ The manufacturer's installation guidelines of the product; and
- ✓ NZS AS 1884:2013 Floor coverings - Resilient sheet and tiles - Installation practices

Commercial vinyl is produced in both homogeneous form (one solid layer) and heterogeneous (more than one layer).

Homogeneous vinyl–one solid layer from top to bottom. It is generally produced in two types.

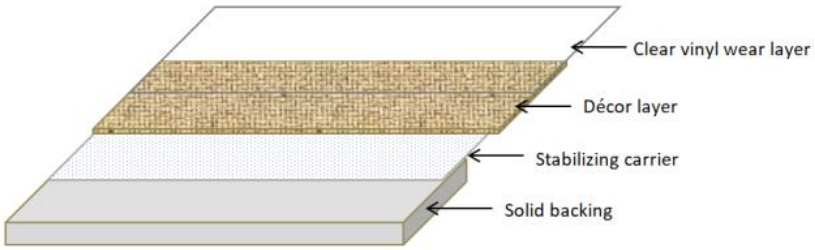


2mm Homogeneous vinyl make up

Marble

Chip

Heterogeneous vinyl–more than one layer



Heterogeneous vinyl layer make up

- **Vinyl safety flooring**–a slip resistance surface produced on both homogeneous and heterogeneous vinyl. These are more specific to building entries (access routes), commercial areas where the likes of slopes, stairs, water, oil or fat increases the chance of slipping

- The Building code provides direction and acceptable solutions with slip resistance in **Access Routes D1 2.1 Slip resistance**.

  While D1 references *AS/NZS 3661.1:1993 Slip resistance of pedestrian surfaces* this standard has been superseded with *AS 4586-2013 Slip resistance classification of new pedestrian surface materials (Ref: BRANZ Bulletin 626)*

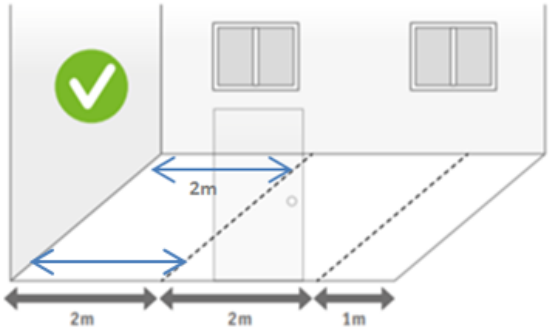
Interpretations of D1 from council authorities may vary regarding slip resistance rating options.

More information on slip resistance vinyl options for specific situations is available via the representatives or websites of the **NZ vinyl distributors.**

9.5 SEAM PLACEMENT

A little thought with seam planning before the installation can save time and enhance the overall appearance of the installation.

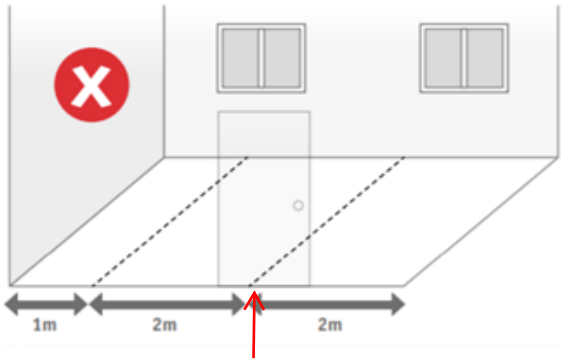
✓ Joins are parallel with the walls



✓ Plan joins so they do not run into doorways.

✓ Lengths run with the light.

✓ If possible with the length of the room.

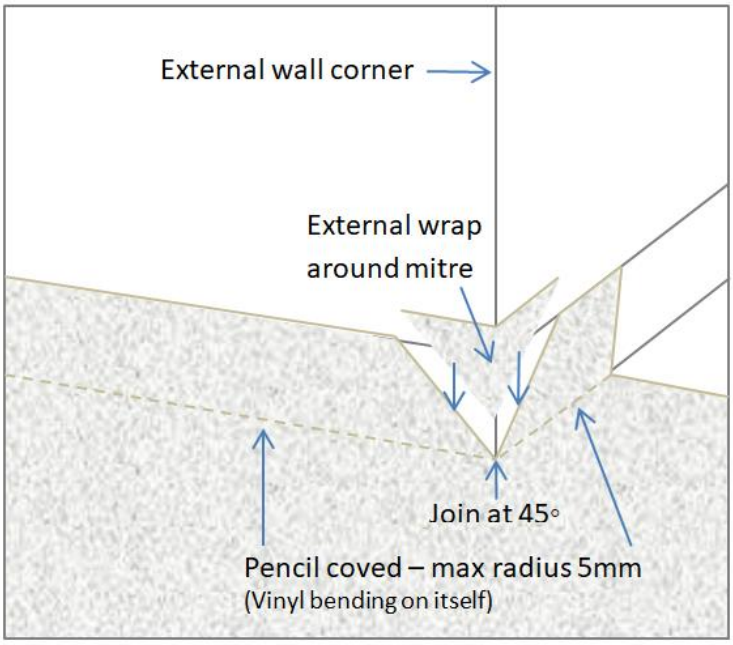


X Avoid joins running into the doorway

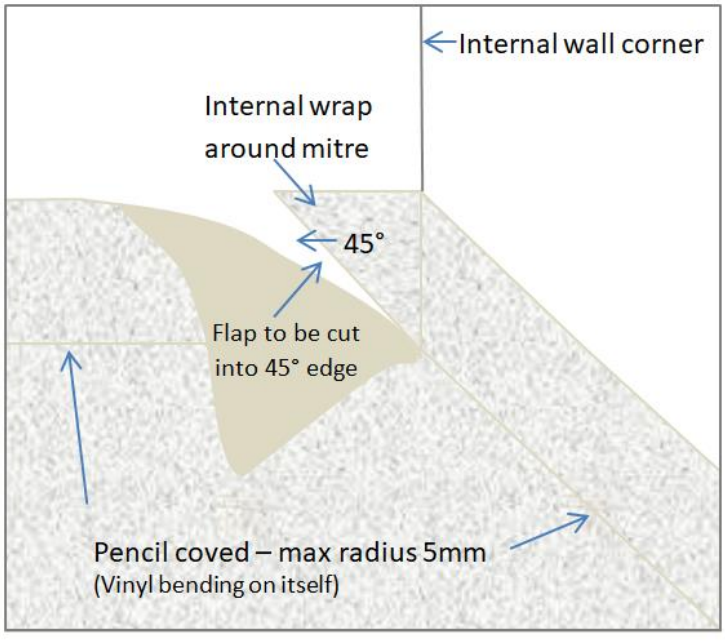
9.6 COVED MITRE TYPES

Pencil cove–Tarkett Specification (Jacobsen Creative Surfaces)

- **External** pencil coved wrap around mitre



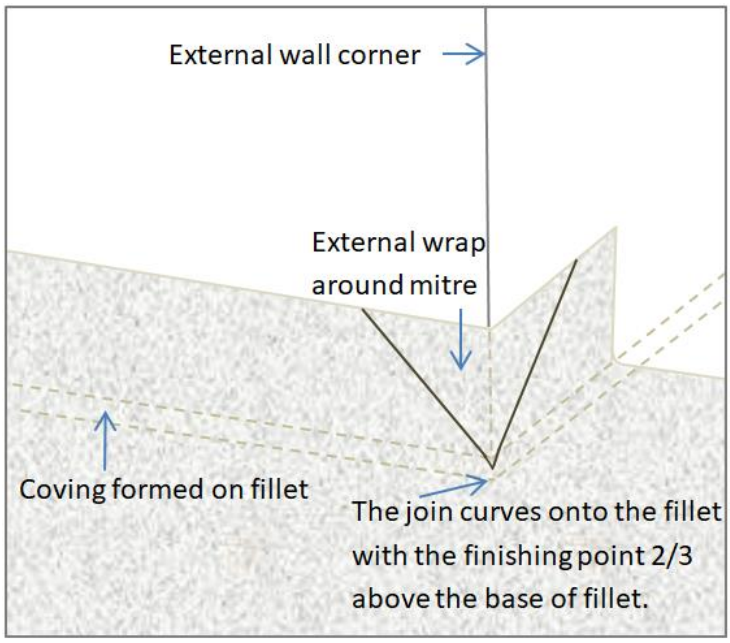
- **Internal** pencil coved wrap around mitre



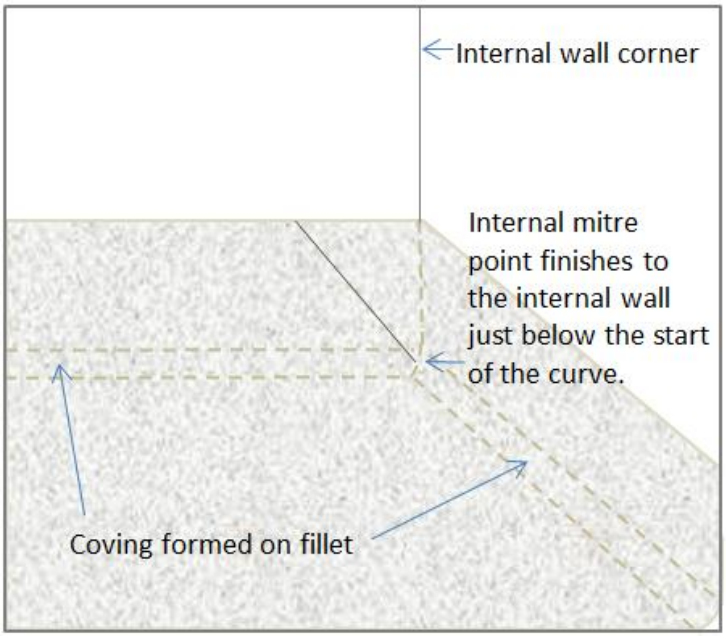
Pencil coving is based on a recommendation from the vinyl manufacturer and also whether the vinyl type is able to bend on itself without creasing.

Wrap around on fillet–Allnex and Armstrong specification

- **External** fillet coved wrap around mitre



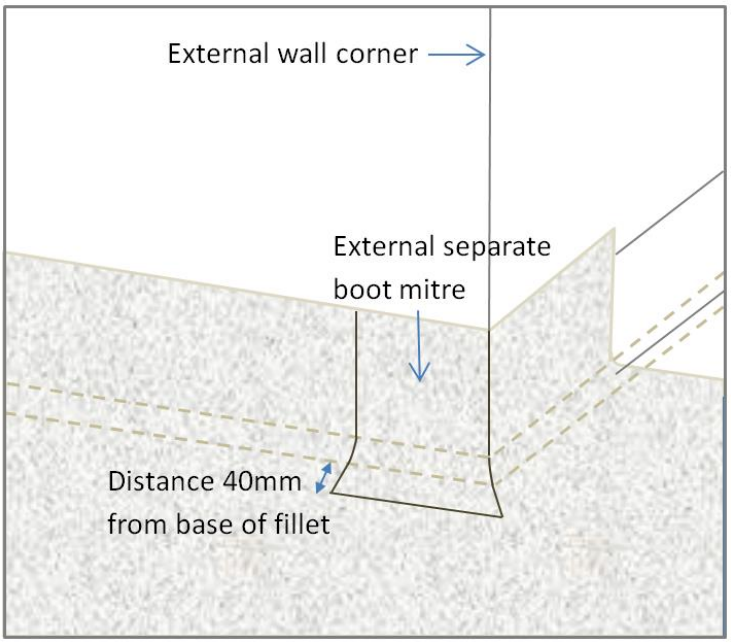
- **Internal** fillet coved wrap around mitre



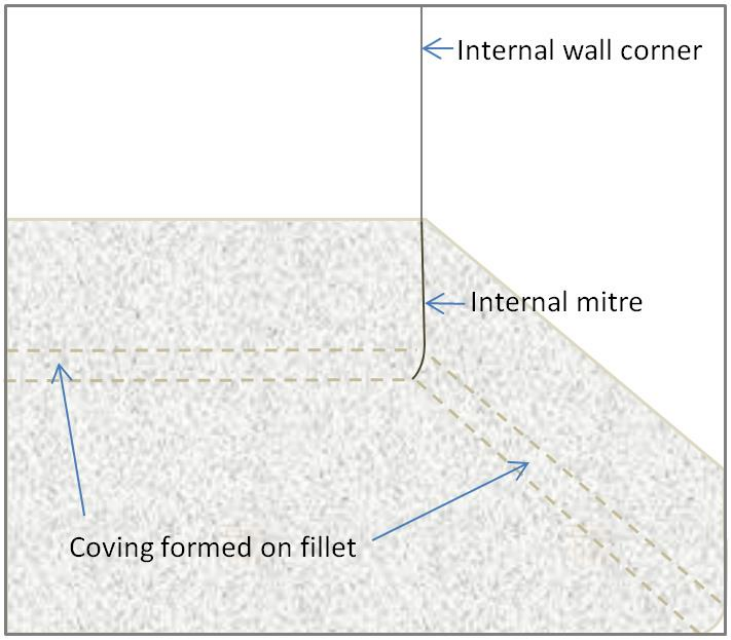
The finishing points should be no lower than 10mm above the floor

Conventional mitre on fillet–Polyflor specification

- **External** fillet coved boot mitre



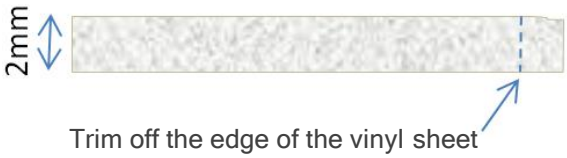
- **Internal** fillet coved mitre



9.7 SEAMING HOMOGENEOUS VINYL

Whether seams are to be cut tight or are to be thermo-welded, the preparation process will play a key role in the finished appearance and strength of the seam.

Selvedge trimming–trimming off the edge using an edge trimming tool or a knife with a straightedge is a recommended practice to ensure the seams finish flush along the join.



Trim off the edge of the vinyl sheet

- While edges may appear acceptable for seaming, there may be a very slight thickness variation at the edge caused during machining, or the sheer weight of the vinyl standing on its end during storage/transportation that may cause some inconsistence with thickness at the edge of the roll.

Joining–the gap or no gap allowed is specific to each manufacturer. Generally for hand or machine grooving the gap is typically less than .8mm (approximately credit card thickness). A fine gap will allow a guide for a 'V' hand groove or machine groove.

Up to .8mm gap (credit card)

- Set the recess scribe to a tight or slight gap.

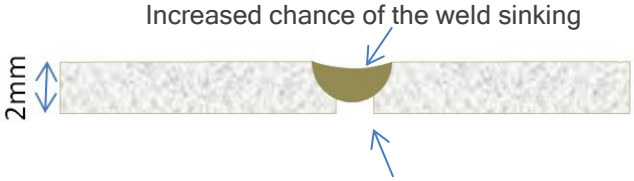
- To avoid damage to the recess scribe pin, safety flooring can be pre-cut or trace cut with a concave blade.

Pre-cut one edge

Trace cut

- Allowing too wider gap will result in the weld bonding to the sides reducing the bond and base support.

Increased chance of the weld sinking



✕ Bond to sides only

- A finer gap will provide support for the weld

Weld rod finished flush

√ Good bond to sides and base

9.8 THERMO-WELD GROOVING

Before starting the welding process the adhesive will need time to set firm. If not, it will bleed into the weld causing the bond to fail.

- Grooving that is consistent in depth, width and cleanly cut is key preparation for a successful weld.

- **Homogeneous vinyl**–groove to at least 2/3's depth.
- **Heterogeneous vinyl**–will be dependent on the wear layer. Refer to the vinyl manufacturer for the recommended setting.

Hand grooving is best performed with a 'U' or 'V' hand grooving tool that cuts with the bladed edge. The cutting blade cuts through the vinyl producing a clean cut edge to weld to. Used alongside a metal rule will help keep the groove straight.

- Triangular tools that are branded as **corner scrapers** are an aggressive gouging tool rather than a cutting tool. If used for grooving they can be difficult to control particularly on a homogenous chip vinyl.

The risk of the blade slipping out of the groove and damaging the surface of the vinyl is increased with these tools. If used with a metal rule, the blade will damage the edge of the rule.

The finished edge of a groove created with a gouging blade will not be as clean and straight as a groove created with a cutting blade.

- The electric groover provides speed and consistency when grooving large areas.

9.9 WELDING NOZZLES

Welding is a fusing process where both the vinyl and weld rod need heat applied. The weld nozzle should be appropriate to the type of vinyl being welded along with a suitable temperature.

- Before welding the type of vinyl should be identified. Manufacturers may specify a specific nozzle to be used on commercial heterogeneous vinyl or high quality homogeneous vinyl.

- Nozzles are available with a fine or wide hot air stream.

Wide hot air stream

Fine hot air stream

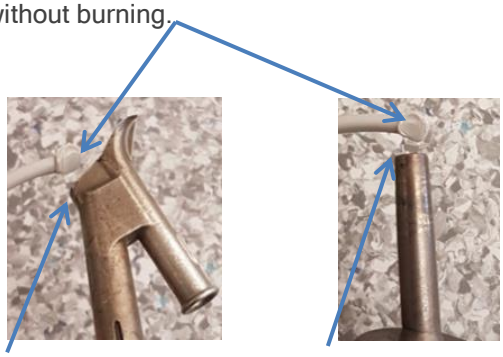
- Fine airflow nozzles concentrate the heated airflow directly to the groove, not the surface of the vinyl. This is to prevent any damage occurring to:
  - The clear PVC clear wear-layer of heterogeneous vinyl;
  - Polyurethane or lacquers applied to surface of homogeneous vinyl;
  - Safety vinyl that have metal filings added for slip resistance.

Hot air stream directed into the groove

9.10 SETTING THE WELDING GUN TEMPERATURE

Weld rods produced by different manufacturers will melt at different temperatures. Also, welding guns over time can vary with the temperature settings.

- Finding the appropriate temperature can be achieved by placing the weld rod under the tip of the gun and adjusting the temperature until the weld rod melts without burning.



Melting rod under tip Melting rod without tip

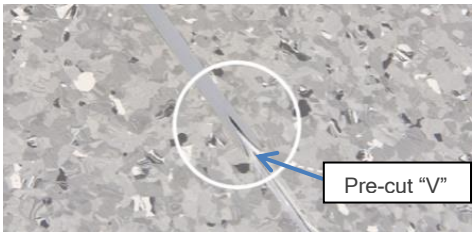
- The speed of the welding process should be gauged by the slight wash of melted weld rod that rises at the edge of the weld.

A slight **wash** of melted weld rod rising at the edge of the weld

Any visible burning would indicate the heat needs to be reduced. Setting the temperature too high can result in burning, discolouring the vinyl or visible wide claw marks appearing at the edge of the weld after trimming.

- When welding coves and mitres, a lower temperature will allow more time and help with accuracy.

- When joining welds, pre-cut a 'V' to help bond the two welds together



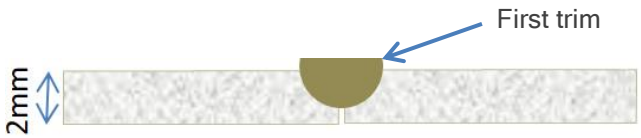
9.11 WELD ROD TRIMMING

Before trimming allow to cool to room temperature. Applying a cool damp rag can speed up this process and lubricate to prevent scratching.

- Always trim in two passes to prevent the weld sinking. The first pass trims off the excess weld.

1st pass with a moon knife with a spatula

1st pass with a Mozart knife with a spacer



2nd pass with a moon knife without a spatula

2nd pass with a Mozart knife without the spacer

9.12 CLEANING UP

From both a professional image and safety perspective the best practise for keeping a worksite tidy is removing rubbish and adhesive residue during the installation process rather than the end of the installation.

- Water based adhesives are soluble with water before they set. Any residue that is on the vinyl or a painted surface is easiest removed during the installation while it is still soluble.

- The more time the adhesive has been allowed to set the more difficult it is to remove. The consequence being:
  - The need for stronger chemicals or solvents; which increases exposure for the installer.
  - Damage to the vinyl or painted surface.
  - More time spent on the job.
  - Unprofessional appearance to the customer.

- Flooring businesses are required to provide a safe workplace for their workers and contractors.

- As part of workplace health and safety is the obligation for flooring businesses and their workers/contractors to be familiar with the Safety Data Sheet (SDS) of any chemicals or solvents used as part of a flooring installation.

  Exposure controls/personal protection and toxicological information are specific sections in all Safety Data Sheets.
  - Examples for products to be aware of are organic solvents, floor polish strippers, paint stripper, mineral turpentine, alcohol/ethanol based cleaners/wipes.

Glove up is a website set up to provide basic information on the dangers of using organic solvents. As well as inhalation, chemicals also enter the body through skin contact.

While chemical/organic solvent products used for breaking down adhesives may be seen to be non-toxic in the short term (acute toxicity). It is the long term exposure that may cause serious harm.

https://www.gloveup.co.nz/