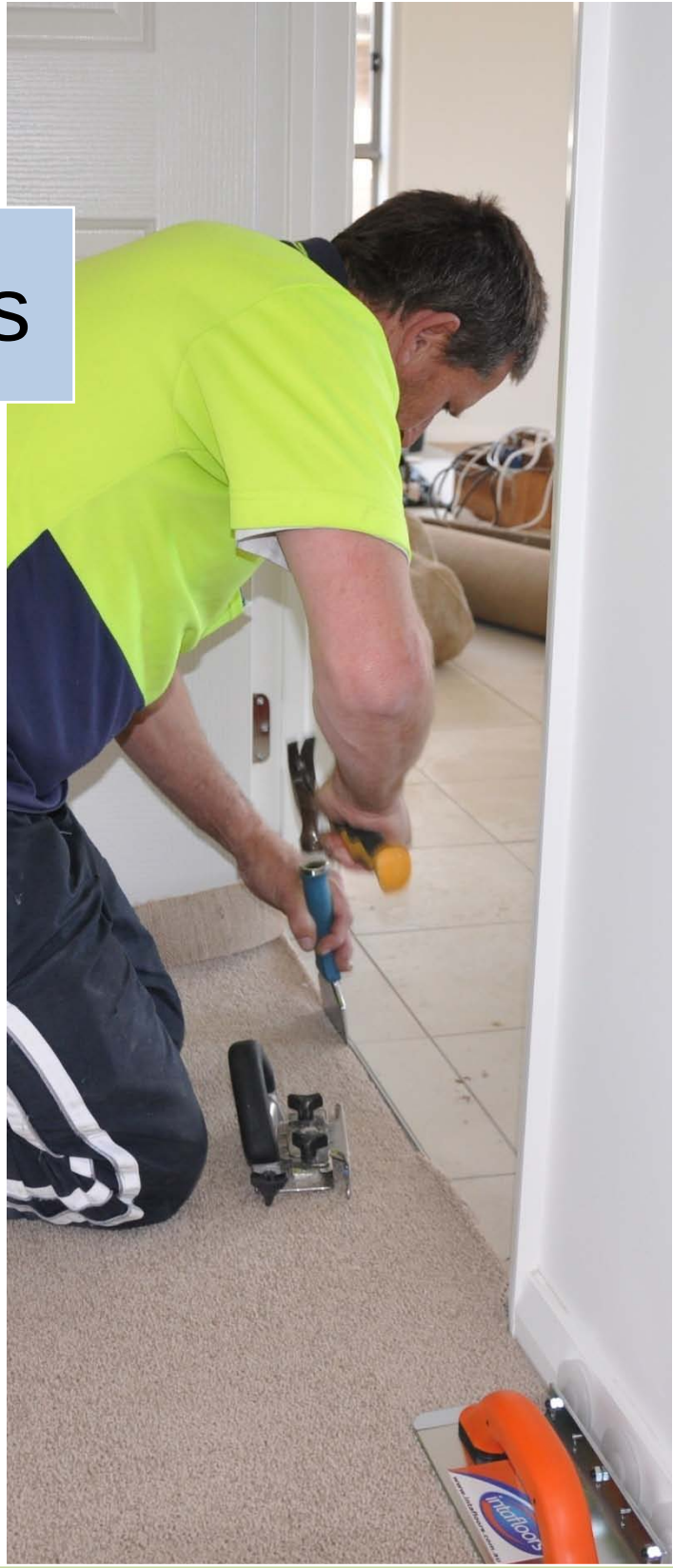
Carpet basics



Supporting:

MSFFL2017: Install carpet cushion underlays and gripper accessories

MSFFL2018: Install unpatterned tufted and bonded carpet floor coverings

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INDUSTRY NETWORK TRAINING & ASSESSMENT RESOURCES

Learner guide

FLOORING TECHNOLOGY

INTAR Flooring Technology Project 2016

Carpet basics

Learner guide

This Learner guide is part of a suite of resources developed for learners undertaking the *Certificate III in Flooring Technology* (MSF30813).

Its purpose is to help apprentice floor layers, sales staff and other workers to acquire the background knowledge needed to satisfy the theoretical components of the competencies covered.

It is not designed to replace the practical training necessary to develop the hands-on skills required.

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In all cases, users should consult the original source documents before relying on any information presented in the resource. These source documents include manufacturers' installation guides, Australian Standards, codes of practice and other materials produced by specialist industry bodies and government agencies.

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Table of contents

Introduction

Tufted carpet is one of the most widely used types of carpet in the world, especially for domestic applications. The term ‘tufting’ refers to the manufacturing process of inserting tufts of yarn into a backing cloth.

Bonded carpet is also a popular and cost-effective type of carpet. The bonding process relies on a layer of adhesive to hold the pile material in position on the backing cloth.

In this unit, we will examine these two types of carpet and discuss the procedures used to install them over a **cushion underlay** using the **carpet gripper** system.

The skills needed to carry out this type of carpet installation are fundamental to every carpet layer.

Once you have mastered these basic techniques and are able to install unpatterned carpet using the gripper system, you will be able to apply your skills and knowledge to variety of more advanced applications. These will be covered in other units that focus on patterned carpets, custom designs, decorative finishes and stairs.

Working through this unit

There are four sections in this unit:

- *Preparing for installation*
- *Carpet grippers and mouldings*
- *Carpet cushion underlays*
- *Tufted and bonded carpets*

Each section contains an *Overview*, an *Assignment* and *Lessons* which cover the content material.

Assignments

Your trainer may ask you to submit the assignments as part of your assessment evidence for the unit. You will find templates for these assignments in the separate workbook.

Learning activities

Each of the lessons has a learning activity at the end. The Workbook for this unit contains all of the learning activities together with spaces for written answers.

Practical demonstrations

Your final assessment of competency in this unit will include various practical demonstrations. To help you get ready for these hands-on assessment activities, see the sample checklists shown in the *Practical demonstrations* section at the back of this Learner guide.

Section 1

Preparing for installation

Overview

There's a lot to think about when you carry out an on-site installation.

Sometimes you can get so preoccupied with the specifics of the job that you forget about other important issues.

These include the arrangements that must be made in advance, the documentation you need to take, and the inspections you should carry out before you start the job.

In this section, we'll talk about these general issues that apply to working on-site and preparing for the installation.

Completing this section

The assignment for this section will test your understanding of the sorts of preparations and site inspections that must be carried out before you can begin an installation.

Have a look at the *Assignment* on page 18 to see what you'll need to do to complete it.

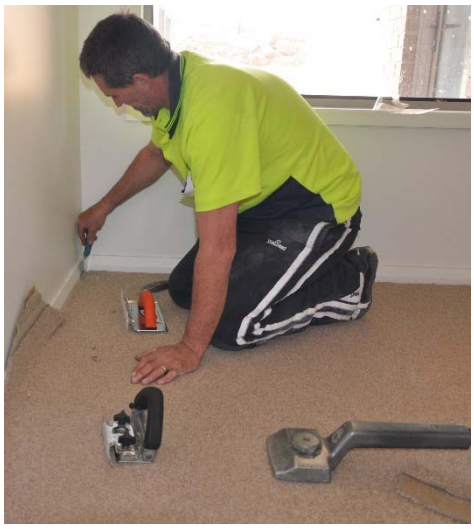
There are five lessons in this section:

- *Tools and equipment*
- *Dealing with the client*
- *Health and safety*
- *Documentation*
- *Assessing the subfloor.*

These lessons will provide you with background information relevant to the assignment.

Tools and equipment

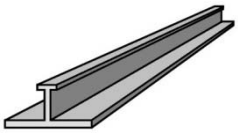
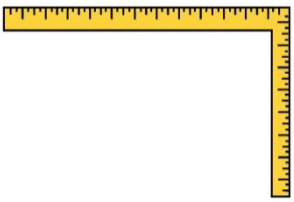
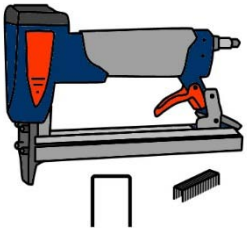
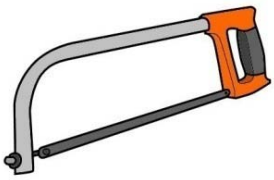
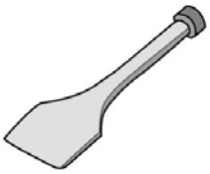
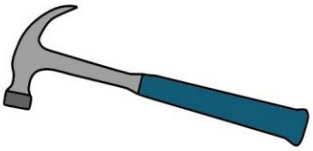
Carpet installers use a wide variety of tools. Some of them are common to many trades, such as hammer, chalk line, trowel and tape measure. Others are specialised, and designed specifically for particular carpet laying tasks.

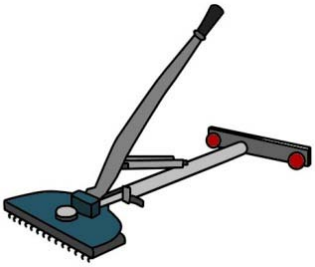
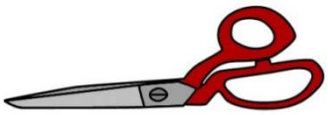
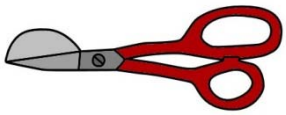
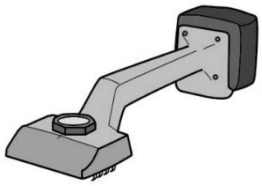
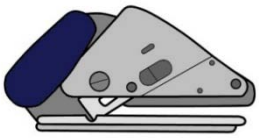


Remember that for every tool to perform properly and not let you down when it's needed, it has to be treated properly and kept in good working order.

Always look after your tools, and don't lend them to other people unless you know they'll look after them too.

Set out below are the main hand-operated tools used to set out and install cushion underlay, gripper strips and tufted carpet.

 utility knife	 straight edge	 square
 underlay stapler	 tape measure	 hacksaw
 stair tool	 hammer	 awl

 power stretcher	 flat seam roller	 porcupine roller
 carpet shears	 duckbill napping shears	 hot melt iron
 knee kicker	 loop pile cutter	 induction seaming tool

Learning activity

You'll notice that one of the tools illustrated above uses air as a power source, rather than body muscles or mains electricity. Which tool is it?

Compressed air and gas powered tools are becoming increasingly popular on-site, not just for flooring installers but also for carpenters, concreters, roofers and other tradespeople.

Write a list of the air or gas powered tools that a flooring installer might use on-site to prepare a subfloor and install carpet over a gripper system. For each tool you name, indicate exactly what it would be used for.

Dealing with the client

Depending on the size of the project you're working on, your client might be the owner of the property, or on larger installations, the builder or site manager.

Whatever their role is in the overall project, they need to have the confidence that you'll do a high quality job and will act professionally at all times.

It's a very responsible position to be in when the client puts their trust in your abilities. If you repay that trust with an installation that meets their expectations and satisfies the standards, everyone will be happy at the end of the job.

They'll be happy because they'll get a finished floor that represents good value for their money. And you'll be happy because you'll get paid without any quibbles.

But in addition to these immediate pay-offs, you'll have left behind an installation that demonstrates your commitment to a quality job. And as every good installer knows – there is no stronger advertisement than a happy customer's personal recommendation!

Presenting a professional image

Here are some hints on how to present a professional image to the client when you show up on-site to carry out the installation:

- arrive on time, or if you're running late, phone the client to apologise and tell them what time you expect to be there
- when you arrive, introduce yourself by name and be courteous
- look at the project together and show them a floor covering plan that includes details on seam directions
- answer any questions they might have about specific aspects of the job

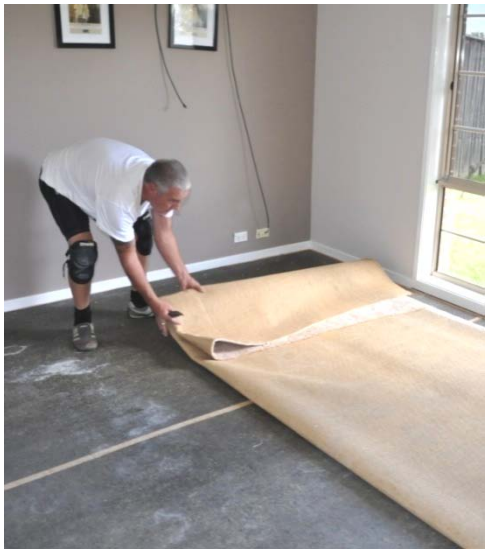
- tell them how long you expect to be working on-site
- carry in tools and materials carefully to avoid damaging doors, walls or other items
- be flexible, and try to work in with the client to avoid disruptions or inconvenience.

Making arrangements with the client

If you work for a company with a supervisor or manager who organises the installations, everything should be ready for you when you arrive on-site. But if you're self-employed or work in a very small team, you may have to talk to the client yourself about any advance arrangements or preparations they are responsible for.

These include:

- making sure the job site is accessible on the date you've agreed to do the installation
- making sure no other trade work will be going on that would hold up your progress
- keeping pets and children out of the way and having as few other people on-site as possible.



There are some advance arrangements that you need to be particularly careful about, because they're the sorts of things you could each think the other party is going to organise. These include:

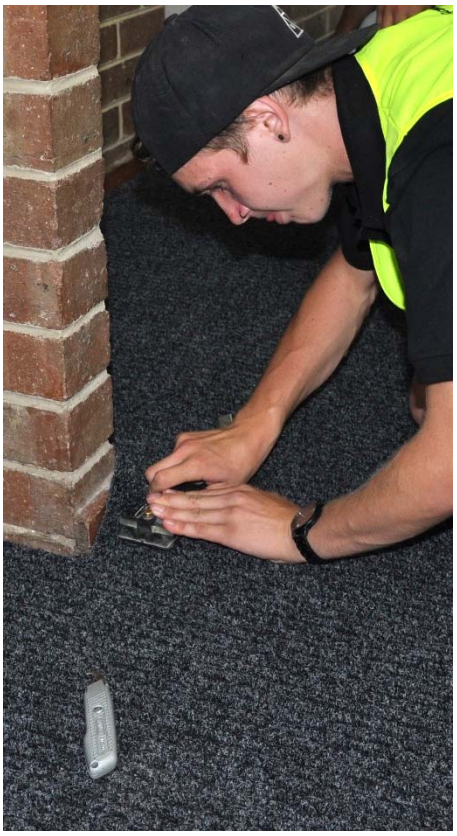
- who will move the furniture, appliances and any other items that are in the way
- who is responsible for disconnecting appliances, especially when an electrician or plumber is required
- who will remove and dispose of existing floor coverings and other fixtures.

Learning activity

The arrangements listed above are just some of the preparations and cross-checks you need to make before you show up on-site to carry out the installation.

Can you think of any others?

Health and safety



It sometimes seems that there are lots of rules and regulations when it comes to safety on-site.

But the basic formula for staying healthy and avoiding injures is really quite simple:

- use safe work practices at all times
- look for hazards before you start any new job and take actions to control them
- keep the workplace tidy
- maintain a professional attitude and don't take shortcuts.

Many of the specific safety issues that you need to be aware of when you're installing carpet over a gripper system are covered in other units in this Flooring Technology resource.

Here they are in summary, together with the units they are discussed in:

- **Manual handling** – including how to lift and carry heavy rolls of flooring – see: *Safety at work*
- **Knee problems** – including injuries and chronic conditions caused by working on your knees – see: *Safety at work*
- **Dust and fumes** – including dust from subfloor preparations and fumes from primers and adhesives – see: *Subfloor coatings and toppings*
- **Skin contact** with hazardous substances – including cement-based products and solvents – see: *Subfloor coatings and toppings*
- **Personal protective equipment** – including eye protection, ear protection and other items of PPE needed on-site – see: *Safety at work.*

One issue that is not discussed in the above units is how to use a knife safely.

Knives are potentially hazardous – but if you always follow good work practices, you can easily avoid cut injuries, and the job won't take any longer.

Below are some hints on knife safety.

Knife safety

- **Keep the blade sharp** – and change it whenever it starts to get blunt
- **Keep your free hand clear** – if you need to hold the material or a straight edge, make sure it's not in the direct line of the cut
- **Don't over-reach while you're cutting** – this will help you maintain maximum control
- **Don't bend the blade sideways** – they will snap easily if they' bent or twisted in the cut

Learning activity

In addition to a carpet knife or utility knife, you will also use other cutting tools for trimming carpet and cushion underlay. Some of these are shown in the first lesson in this section – *Tools and equipment*.

It's very important to keep the cutting edges sharp while you're working – either by replacing disposable blades or by sharpening the dulled edge on an oilstone.

Why is it often said that you're less likely to suffer a cut injury from a sharp blade than from a blunt blade? How does its sharpness affect your cutting action, and the likelihood of an injury?

Documentation

In the unit *Planning and costing* we talked about the sorts of documents you need to take with you when you go out to the site on installation day.

The main document is the **floor covering plan**, which sets out the details relating to how the flooring will be installed.

You should always show the client the floor covering plan before you start a new project. This gives them the opportunity to identify any issues that they may not be happy with, or weren't expecting, before it's too late to make any changes.

Some companies require the client to formally approve the plan by signing a copy.

Job sheet

It's normal practice for the installer to be given a **job sheet** by the contracting company. A lot of the information is the same as in the floor covering plan, but there are also details relating to the specific products used and arrangements that have been made with the client.

The job sheet should include:

- jobsite address and contact details of the person in charge
- brand names and descriptions of the floor coverings to be laid
- details of other products to be used, including underlay, adhesive and trims
- seam placement and other installation details
- subfloor preparation required
- furniture and appliances to be moved
- unusual site conditions or potential problems.

Warranties and maintenance advice

Most flooring installation companies provide their clients with a written **warranty** as part of the contract documentation.

The warranty sets out the conditions under which the company will come back and fix problems that have occurred due to poor quality workmanship or faulty materials.

Hand in hand with the warranty conditions is the maintenance advice. This includes instructions on how to protect the floor immediately after installation, as well as general care and cleaning advice. It often comes in the form of a brochure produced by the flooring manufacturer.

The reason these two documents go together is because the warranty needs to be clear about who is 'liable' – or legally responsible – for particular types of problems. For example, it is the client's responsibility to follow the manufacturer's advice on how to maintain the floor and keep it in good condition.

Australian Standards

Although you may not carry copies of particular Australian Standards with you while on the job, they are still extremely important documents, and are likely to form part of the contract between the client and your company.

The two Australian Standards we will refer to throughout this learner guide are:

AS/NZS 2455.1-2007 – Textile floor coverings: Installation practice

AS 4288-2003 – Soft underlays for textile floor coverings.

Learning activity

You'll notice that the first Australian Standard listed above has the prefix: 'AS/NZS'.

'AS' stands for Australian Standard. What does NZS stand for, and why is it included in this title?

Assessing the subfloor

There's a variety of subfloors you're likely to encounter when laying carpet. We discussed the main subfloor types and typical preparations in the following two Learner guides:

- *Inspecting and testing subfloors*
- *Subfloor coatings and toppings.*

So in this lesson we'll summarise these issues by putting them into a set of questions that you should ask yourself before you begin the job.

Remember, as the flooring installer it's your responsibility to decide whether the subfloor is suitable and has been adequately prepared.

If you're worried that the substrate isn't suitable, or that there is an underlying problem that might cause trouble later on, don't ignore it. Check with your supervisor or manager before going ahead. Everyone will be thankful in the long run, even if it means that there'll be a delay while the problem is fixed.

Questions to ask yourself

General issues

- *Is the substrate smooth and flat?*

  AS/NZS 2455 has minimum standards for 'planeness' and smoothness'.

  The **planeness** standard says that when a 3 metre long straight edge is placed on the surface at any position, no part of the surface is allowed to be more than 5 mm below the straight edge.

  The **smoothness** standard says that when a 150 mm long straightedge is placed on the surface at any position, no part of the surface is allowed to be more than 1 mm below the straightedge.

Indentations, ridges and dents can sometimes show through to the surface of carpet. Ridges also tend to create wear points in areas where there is regular foot traffic or movement of furniture.

- *Is the surface free from dirt, oil, adhesive residues and all other contaminants?*

  Dust and other substances on the surface will interfere with the strength of adhesive bonds in stick-down installations. Some contaminants will also degrade the carpet over time.

Concrete subfloors

- *Are the relative humidity (RH) and alkalinity (pH) levels within the allowable limits?*

  Excessive moisture in the concrete subfloor can cause the carpet to change shape over time, and also allow fungal spores to develop.

  There are limits set for RH and pH, both in the Australian Standards and in the flooring manufacturers' own installation instructions.

  The only time you should over-ride these specifications is when an approved moisture barrier is being installed.

- *Is the substrate sound and free from loose, powdery or scaly material?*

  If the substrate is concrete and you are planning to use adhesives, the surface must be sound and sufficiently porous to allow the adhesive to bond properly. If you're using nails to secure grippers, the substrate needs to be able to hold the nails without crumbling or cracking.

  If it's not in good condition, the affected layer will need to be removed and resurfaced.

- *Are there expansion joints in the floor?*

  Expansion joints need to be in good condition and free from dirt or obstructions. You'll need to keep them clear and finish them off with approved cover strips.

  Don't get mixed up with relief cuts that have been put into the concrete to stop it from cracking during the curing process. These will be a 5 mm wide saw cut, and can be filled with a suitable compound.

- *Have heating elements been installed in the floor?*

  Flooring manufacturers provide recommended limits for the temperature of the subfloor. Make sure the heating elements will not exceed this temperature, and follow the specific instructions relating to substrate preparation for heated floors.

Wooden subfloors

- *Is the existing floor properly supported and well secured?*

  Any structural problems or loose boards should be fixed before the installation begins, especially squeaky floorboards or springiness in the floor surface.

- *Are there gaps between boards, protruding nail heads or other surface defects?*

  Gaps, ridges, cupped boards, protruding nails, and other defects will ‘telegraph’ through to the surface of the floor covering.

  In general, structural floors made from plywood and strip flooring need to have a hard underlay placed on top to provide a flat smooth surface.

- *Is the subfloor ventilation adequate and in compliance with the relevant standards?*

  Check that the air vents provide sufficient ventilation and that the subfloor cavity meets the minimum requirements for clearance between the floor and the ground.

- *Has the moisture content (MC) been checked and is it within the allowable limits?*

  The moisture content of structural members and floor boards or sheets must all be within the allowable MC range.

  There must also be no evidence of plumbing or stormwater leaks that might have a long-term effect on the MC.

Old resilient floor coverings

It is permissible to lay carpet over the top of old resilient coverings, as long as the original surface is in good condition and free from defects such as cracks and bumps.

It is best to avoid using adhesives over an old resilient floor. One reason is that you would be depending on the old adhesive under the resilient covering to remain sound and not separate from the subfloor.

Another reason is that the new adhesive may not stick well to the top of the resilient covering, especially if it has old polish or ingrained contaminants on the surface.

Learning activity

One of the problems you may come across in old floors is asbestos-based products. These need to be removed and disposed of in an approved way.

If you know what to look for, you can often recognise these products by their appearance.

The link below will take you to a website page called ‘History and components of asbestos-containing flooring’. It shows many photos of old lino, vinyl and asphalt floor coverings that contain asbestos.

http://inspectapedia.com/interiors/Floor_Tile_History.htm

Have a look at the specific examples of asbestos-based products. Then answer the following questions.

- Have you had to deal with old floor coverings that contained asbestos?
- How did you handle the problem – did you remove the old floor covering first, or cover it with new underlay or flooring?
- What precautions did you take while you were working with the old materials?

If you haven’t been personally involved in dealing with asbestos-based products, ask your supervisor or another installer about their experiences.

Assignment 1

Go to the Workbook for this unit to write your answers to the questions shown below.

---

1. There are many advance arrangements that need to be made with the client prior to installation day, over and above the specific details of the floor covering itself. List six of these arrangements that relate to general on-site conditions and preparations.

2. (a) You are going to install tufted carpet over a gripper system in a person's home. The subfloor has already been prepared. What items of personal protective equipment (PPE) will you need to take?

   (b) Now you are going to do the same installation in a large retirement village still under construction. What extra items of PPE should you have with you – that is, what might the site manager want to see before you are allowed on-site?

3. Who takes final responsibility for deciding whether a subfloor is in a suitable condition for a floor covering installation?

4. Name two things you should assess in a concrete subfloor before you begin an installation. For each issue, describe one possible problem that might result if the conditions did not meet the required standards.

5. Name two things you should assess in a timber subfloor before you begin an installation. For each issue, describe one possible problem that might result if the conditions did not meet the required standards.

Section 2

Carpet grippers and mouldings

Overview

In this section, we'll look at the main types of carpet grippers and metal mouldings that are used to secure carpet and finish the edges.

The most common method for fixing them into position is with nails.

But that isn't always possible, especially if the subfloor is in poor condition. So we'll also discuss various techniques that can be used to fasten gripper strips and mouldings to problem subfloors.

Completing this section

The assignment for this section will test your knoweldge of the Australian Standard requirements for installing carpet gripper systems.

Have a look at the *Assignment* on page 29 to see what you'll need to do to complete it.

There are three lessons in this section:

- *Carpet grippers*
- *Metal mouldings*
- *Dealing with problem subfloors*

These lessons will provide you with background information relevant to the assignment.

Carpet grippers

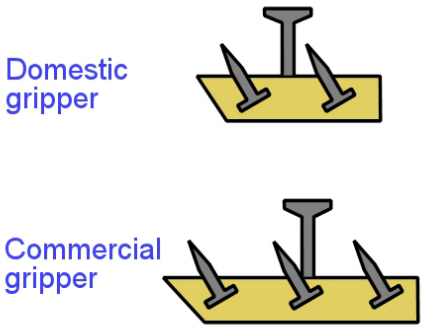
Carpet grippers are narrow strips of plywood with rows of sharp pins that face upwards.

The pins are angled at 65 degrees to the horizontal, and are designed to grip the carpet quickly and firmly when it is stretched into position and placed on top.

There are two main types of carpet gripper:

- **domestic carpet gripper** – which has two rows of pins
- **commercial carpet gripper** – which has three rows of pins and provides a more secure hold on stiffer carpets.

The carpet gripper is installed before you lay the carpet, with the pins facing towards the wall or outside edge of the carpet. The most common length is 1.220 metres (4 feet).



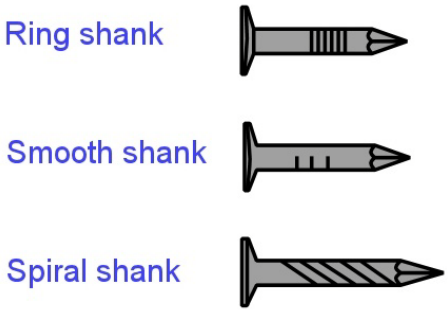
You can cut these pieces into shorter lengths when finishing against a wall or going around corners. The lengths can be cut using gripper strip cutters.

Fixing to the subfloor

Most grippers have steel nails positioned at regular intervals along the length of the plywood. When you put the gripper in position on the floor, you can then simply hammer the nails in to secure the strip.

There are different types of nails used for different subfloor materials:

- **ring shank nails** are designed for timber or plywood subfloors
- **smooth shank nails** are designed for higher density (harder) concrete subfloors
- **spiral shank nails** are for lower density concrete, which tends to crumble more around the nail hole.

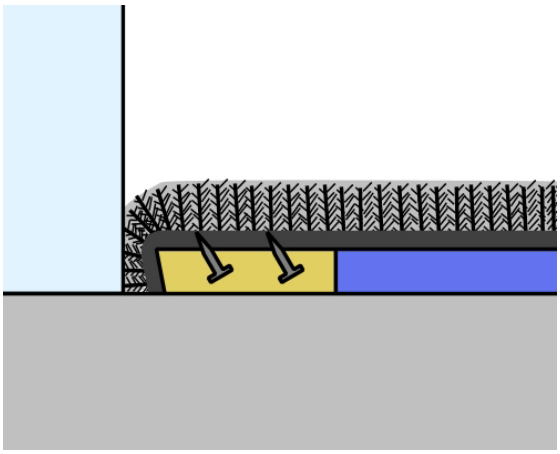


In areas where it is too difficult to use the pre-nailed gripper, '**no nail**' or '**standard**' carpet gripper is used. In this case, the gripper strip can be fixed to the floor surface using contact or construction adhesive. For surfaces such as ceramic tiles, it can be fixed using plugs and screws. If the subfloor is metal, you can use self-tapping screws.

Also note that on thinner carpets you can use a '**short pin**' **gripper**, which helps to avoid the problem of the pins penetrating too far into the carpet and being felt by bare feet walking over the top.

The gully

The gripper strip has an undercut bevel on one side which is placed facing the wall. This gives you a space, or **gully**, to tuck the edge of the carpet into.



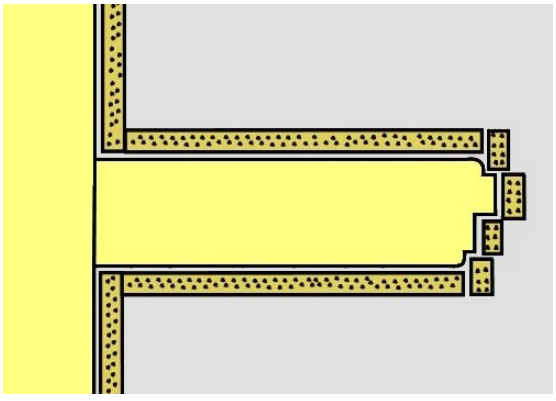
The width of the gully should be about 60% of the thickness of the carpet.

Don't make the gully too wide, because that will cause the carpet to droop at the edge. Over time, the carpet could also unhook from the pins and loose its tension

Also don't make the gully too narrow, because then you won't be able to tuck in the edge of the carpet. If you try to wedge or force the carpet into position, you might end up cracking the skirting board.

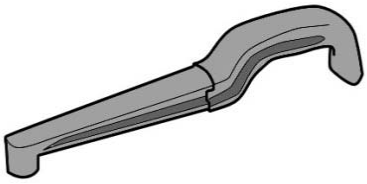
Curves and corners

When you're working around curves, doorways and other odd shapes, you still need to maintain an even gully width.



Make sure you secure each piece with at least two nails. This will stop the piece from spinning or turning when you push the carpet edge into the gully.

If you need to get under kickboards or into other awkward places, you can use a **drive bar** and heavy hammer to drive the nails into the subfloor.



Calculating quantities

The most obvious way to calculate the amount of gripper strip needed for an installation is to measure around the perimeter walls, not including doorways and other openings (unless the carpet is butting up against a different floor covering).

However, carpet layers sometimes use a simple rule of thumb to estimate the quantity needed:

For residential installations: allow 0.81 lineal metres for every square metre of carpet

For commercial installations: allow 0.65 lineal metres for every square metre of carpet.

Learning activity

Do a measure up of the room you're in right now and estimate the quantity of gripper strip needed for the installation.

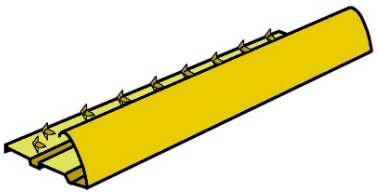
Use both techniques described above – measuring the perimeter of the area and using the rule of thumb for residential installations.

Compare the two results.

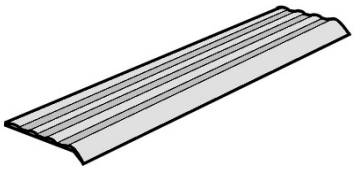
Refer to 'Making measurements' if you need more information on the calculation techniques.

Metal mouldings

Metal mouldings are used to finish off a carpet edge across a doorway or in other places where it butts up against another flooring surface, such as vinyl or timber.

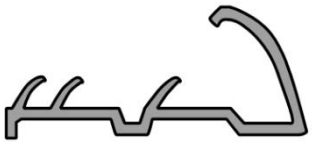


Most metal mouldings are made of anodised aluminium. They come in a range of colours and finishes, designed to match or complement the floor covering.



There are three basic types of mouldings:

Border bars are often referred to by the brand name ‘naplocks’. They are used to protect the edge of the carpet when the adjoining subfloor surfaces are at the same level, or a very similar level.



Cover strips are designed to be fixed over the top of the carpet, particularly where it transitions to a different floor covering.

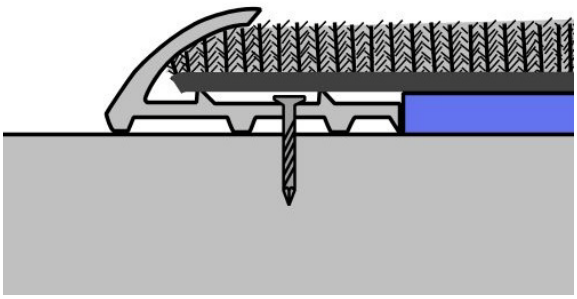
Multipurpose bars allow different types of floor covering material to be placed either side, such as carpet and vinyl.

Fitting border bars

The installation methods described below relate specifically to border bars. However, you can use the same techniques for most other types of metal mouldings, with minor alterations to suit the specific products.

To fit the border bar in a doorway:

- cut the bar to the exact length – leaving a tiny gap between the jamb and edge of the bar
- fix the bar into position using nails or screws, making sure there is a fixing within about 20 mm of each end
- install the carpet into the bar and close the fold over the top – using a block of wood to protect the fold as you tap it with a hammer.



If you are replacing old carpet and want to keep the existing bar, you should open it carefully using the following technique:

- insert a flathead screwdriver under the fold at one end and gently lift it up
- work along the bar until there is enough gap to insert a stair tool
- use the stair tool to finish opening the bar, and then make any repairs to the pins in the bar by bending them back into shape.

Learning activity

The cover strip shown at right is covering a join between the carpet and a timber parquetry floor.

It has been fastened with screws to the concrete subfloor.

The installation process involved drilling holes into the concrete, plugging the holes, and then fixing the cover strip into position with Phillips head screws.

Name all of the tools, accessories and hardware items you would have brought with you to the jobsite to complete this cover strip installation.

Dealing with problem subfloors

Some concrete subfloors can present particular problems when you are trying to fix the carpet grippers and mouldings to the surface with nails. Below are some of the most common problems and suggested solutions.

Drummy surfaces

Drummy surfaces have a hollow or drum-like sound when you tap the surface with your finger.

Because of the lack of support under this top layer, a concrete nail is likely to break up the surface concrete and not hold properly.

If the problem is not too extensive, you may be able to use hardboard nails on the soft sections. Alternatively, you can fix the carpet gripper into place with adhesive.

If the whole surface is drummy, you may have to remove it completely and apply a levelling compound to replace the surface layer. In this case, the gripper should be stuck down with adhesive.

Aggregate surfaces

Poorly finished concrete sometimes shows the aggregate (or ‘screenings’) protruding above the surface. This makes it hard to achieve a firm base for the gripper to sit on.

One solution is to grind the surface flat with a grinder. Another is to chip out the exposed aggregate and apply a filler or levelling compound. If you do need to use a levelling compound, the gripper should fixed with an adhesive.

Sandy surfaces

Sandy surfaces are often found in renovated houses, especially where a fireplace has been removed and the surface is filled with a mortar mix rather than concrete.

Hardboard nails are better than concrete nails in this type of surface material, although you may need to use a longer length nail, such as 50 mm. Alternatively, you can prime the surface and then apply an adhesive.

A similar problem with crumbing subfloor material can occur in aerated concrete floors. One example of an aerated concrete product is Hebel Powerfloor, which is installed in 75 mm thick panels and generally laid over floor joists. To ensure that the gripper is soundly fixed, prime the subfloor surface first, apply adhesive, and then fasten the gripper strip with 50 mm spiral shank nails.

Uneven surfaces

Ridges and hollows cause problems when the carpet gripper is unable to sit flat, which often shows up in the completed installation.

In these instances, you will need to grind down the high spots and you may also have to fill in the holes and low spots with a suitable filler.

Again, this will affect the fasteners you use to fix the gripper into place.

Magnesite

Magnesite is a levelling compound that was once commonly used in commercial buildings.

Hardboard nails hold better in this material, but make sure the nail length does not exceed the thickness of the magnesite. Adhesive can also be used, although the surface should be primed first.

Learning activity

You will have covered the topic of patching and levelling in the unit *Subfloor coatings and toppings*.

Give a brand name product that you would use to patch and fill any hollows in a concrete subfloor after chipping out aggregate screenings with a cold chisel.

Assignment 2

Go to the Workbook for this unit to write your answers to the questions shown below.

AS/NZS 2455 has a section that deals specifically with the installation of textile floor coverings using the gripper system. You should get a copy of this Standard so you can look up the answers to the following questions.

1. The carpet gripper system may be used with most types of textile floor coverings. But the Standard lists three exceptions. What are these exceptions?

2. If the wall length is longer than 7 metres, what is the minimum requirement in terms of the type and quantity of gripper strips you must use?

3. There are three methods listed for fixing hardened steel nails to a concrete subfloor. What are these methods?

4. What is the maximum gully size specified in the Standard between the gripper and the wall, expressed in terms of the carpet thickness?

5. How close together should fixings be from the gripper strip into the subfloor?

6. What is the maximum distance from each end that you should place the fixings?

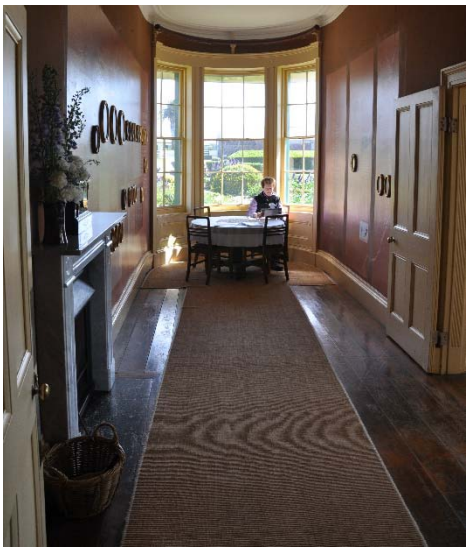
7. If a gripper strip is less than 7 cm long, can you fasten it with one nail in the centre? If not, what is the minimum number of fixings permissible?

8. You may put a gripper strip across a door opening, but only under certain conditions. What are these conditions?

Section 3

Carpet cushion underlays

Overview



The idea of using a cushioned layer underneath carpet came from the days when cushioning was put under floor rugs to make them feel softer underfoot.

As wall-to-wall carpet became more popular in the 20th century, it became standard practice to put cushioning underneath the carpet.

Underlay provides several benefits to a carpet installation. In addition to the added comfort, it also improves sound dampening, insulation against heat and cold, and the carpet's resistance wear and tear.

In this section, we'll look at the different types of cushion underlay that are available on the market and the way they are classified. We'll also discuss the installation techniques used to lay the most common types.

Completing this section

The assignment for this section covers some of the details relating to the practical demonstration installations you will be asked to carry out.

Have a look at the *Assignment* on page 41 to see what you'll need to do to complete it.

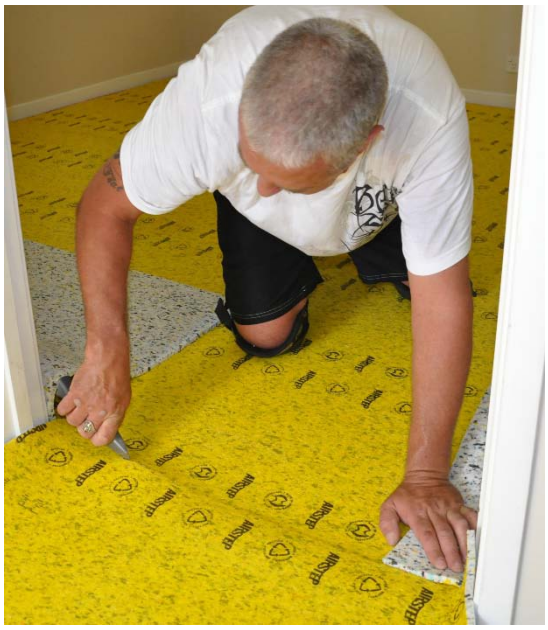
There are three lessons in this section:

- *Properties and classifications*
- *Types of cushion underlays*
- *Laying techniques.*

These lessons will provide you with background information relevant to the assignment.

Properties and classifications

Carpet cushion underlay improves a carpet installation in several ways.



The cushioning layer helps to:

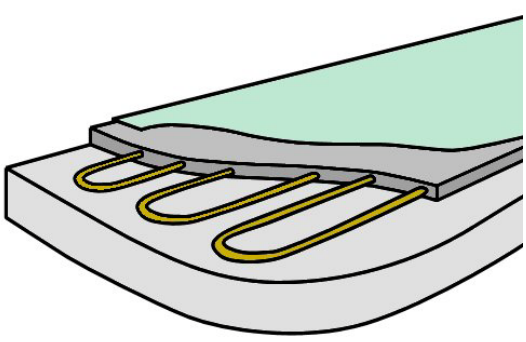
- protect the carpet pile from being crushed under furniture and heavy objects
- maintain the carpet's texture
- provide an extra layer of insulation from the cold or heat
- improve the sound absorption of the carpet
- give the carpet a softer feel underfoot

Some people think that if you increase the pile weight of the carpet, you can get away with not using a cushion underlay at all. But that doesn't take into account the fact that cushioning improves the carpet's resilience and resistance to pressure. This will reduce the loss in pile height thickness as the carpet wears over time.

So in practice, a carpet installation that includes a cushion underlay is often more economical over time than one without a cushioning, because the carpet will retain its appearance and softness underfoot for longer.

Thermal insulation

All cushions provide some level of **thermal resistance** – that is, resistance to the transfer of heat and cold through the floor. This is measured as an 'R' value. The higher the R value, the better the material is as a thermal insulator. Normally, this is directly related to the density and thickness of the underlay.



Although higher R values are generally a desirable characteristic, it's not always the case. If your customer has installed an **underfloor heating system** (also called 'radiant heating'), you will actually want to use an underlay that lets the heat through.

This means you will need to choose a thinner cushion, such as flat cellular sponge rubber or synthetic fibre cushion.

Before you decide on the most appropriate underlay to use, always check to see whether the rooms you'll be laying carpet in have an underfloor heating system.

Classification

There is an Australian Standard classification for the different types of cushion underlay, categorised according to their intended use or application. This is set out in Table 1 in *AS 4288-2003 Soft underlays for textile floor coverings.*

The classification is based on the cushion's performance in compression and deflection after **dynamic loading**. A 'dynamic' load (also called 'live' load) is one that is not constant, and includes foot and wheeled traffic.

Note that a particular classification for a cushion does not mean it can't be used in a different application. For example, an underlay classified as 'luxury' could be used in a commercial application where extra comfort or firmness is required.

Below is a summary of Table 1 from *AS 4288-2003.*

Designation	Description of intended use or application
LR	Light residential use, not suitable for stairs
GR	General residential use
L	Luxury use, domestic/commercial where high energy absorption is desirable
GC	General commercial use, suitable for normal foot and wheel traffic
HC	Heavy commercial use, suitable for heavy foot and wheel traffic and castor chairs

Learning activity

Choose a specific cushion underlay that you have installed at one of your jobsites. Look up its specifications in the manufacturer's datasheet or on their website.

Write down the brand name of the product, the manufacturer, and any other technical details that relate to its properties and classification.

Types of cushion underlays

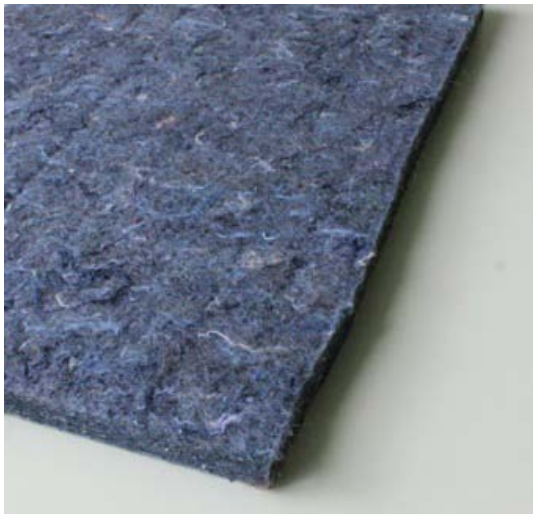
There are three basic types of carpet cushion underlay:

- **fibre** – also called ‘felted fibre’
- **rubber** – also called ‘sponge rubber’
- **foam** – also called ‘polyurethane foam’.

Let’s have a look at each of these in turn.

Fibre

Fibre underlay is generally made by needle punching natural or synthetic fibres into an interlocked sheet of felt.



Natural fibres include animal hair and jute (a vegetable fibre commonly used to make hessian bags).

Synthetic fibres include nylon, polyester, polypropylene and acrylic.

Most fibre underlays are dense and firm, and have excellent thermal and sound insulation.

They are also environmentally friendly, and can be made from 100% recycled fibres.

However, they are not as resilient as the more-popular rubber or foam underlays, and they tend to take longer to install – so they are rarely used these days in residential jobs. Nonetheless, they are still used in commercial projects that require a hard-wearing, firm underlay.

Rubber

Sponge rubber is made by combining rubber with blowing agents.

The manufacturing processes vary, depending on the density required and whether the raw materials are natural or synthetic.

Natural rubber comes from rubber trees. It has anti-microbial properties, meaning it resists the growth of bacteria, mould and mildew. Sponge rubber underlay allows heat to transfer easily, and is suitable for use over underfloor heating systems.

Waffled rubber is mostly used in domestic applications. The waffles allow air to circulate between the underlay and the subfloor, which helps to reduce dampness.

Flat sponge rubber is firmer and denser, and is generally used in large scale commercial installations.

Foam

Polyurethane foam is made from 'polymers' that are derived from crude oil. In an underlay, it has an open cellular structure that enables it to feel soft underfoot but still be very durable.

There are three different types of foam underlay:

Prime foam is similar to the foam used in upholstered cushions, but somewhat denser. It is made from non-recycled materials.

Bonded foam is also called 're-bond' or 'chip foam', because it is made from chopped bits of scrap foam which typically gives it a multi-coloured appearance.

Frothed foam generally has a higher density than the other foams, and includes 'memory foam', which is able to compress and return to its original shape.

Australian Standard 4288

Although cushion underlays are often categorised as fibre, rubber or foam, the Australian Standards use a slightly different system for grouping the different types of cushioning materials. In *AS 4288,* underlays are categorised as 'fibrous', 'non-fibrous' or 'combination'.

Fibrous underlay includes:

- **Impregnated fibrous underlay**, made of fibrous material impregnated with a binding agent
- **Needlefelt underlay**, made wholly of fibres matted together by needling of a fibre batt.

Non-fibrous underlay includes the following materials, with or without a backing material:

- **Cellular plastics (polymeric) underlay**, formed from a polymeric foam such as polyurethane
- **Cellular rubber underlay**, formed from vulcanized rubber foam
- **Rubber crumb underlay**, formed from new or recycled crumb vulcanized rubber.

Combination underlay is composed of one or more layers of any fibrous material combined with one or more layers of any non-fibrous material.

Learning activity

The sample photos in this lesson show examples of products made by Airstep and Dunlop.

Do some research of your own and come up with one brand name and manufacturer for each of the three main types of cushion underlay: fibre, rubber and foam.

The products you name may be underlays that you have used yourself in installations, or they may be products that you have seen in brochures or found on the web.

Laying techniques

Every manufacturer publishes installation guides for their underlay products.

You should always follow these recommendations, because they'll not only help you to do the job properly, they may also form part of the warranty conditions.

This means that if there is ever a complaint at some time in the future relating to the underlay, the manufacturer will be on your side as you negotiate a solution with the customer.

Below are some general techniques used to install cushion underlays. Note that if any of these practices differ from the specific guidelines issued by the manufacturer, you should always follow the manufacturer's advice.

Planning and preparing

The first step in deciding which way to roll out the cushion is to figure out where the seams will fall in the carpet. Then lay the cushion so that the seams are at 90 degrees to the carpet seams. If that's not possible and the seams need to run in the same direction, try to keep them at least 300 mm away from the carpet seams.

Make allowance in the width and length of the cushion for trimming it flush with the gripper strip.

If you start by cutting it to the room size, you will have enough allowance for trimming.

Don't forget to include door drops in your measurements.

Manufacturers often specify that the cushion should be unrolled and left to **acclimatise** in the area where it will be laid. This allows it to 'relax' as its moisture content adjusts to the humidity of the surrounding air.

Depending on the product and the manufacturer's recommendations, the acclimatisation period might be three hours or even overnight.

Using staples

On wood floors, use stapes to fix the cushion to the floor. Start with a straight wall and butt the underlay up against the gripper. If there is no straight wall, lap the cushion over the gripper, staple it in position, and use a knife to trim it.

Smooth out the cushion before you staple it. You can do this by hand for most materials, but for felted cushion you may find it easier to use a knee kicker.

Use a cushion tape or vinyl-coated cloth tape to cover the seams (other than for fibre underlay).

This will stop any dirt from coming up through the seam and showing as a line on the surface of the carpet.

Using adhesive

On floors where staples are not appropriate, such as concrete, you can use a latex cushion adhesive to fix the material in position. We will talk more about adhesives in later carpet units in this series.

Calculating quantities

In theory, the amount of underlay you'll need will be the same as the total carpet metreage. In practice, though, many carpet layers like to estimate the underlay quantity by taking the carpet metreage and subtracting 10%. This is because you are able to re-use waste pieces without them showing. However, using small pieces can cause its own problems, so you should still try to keep all pieces as large as possible.

Learning activity

Some manufacturers make a carpet cushion with the underside already coated with pre-applied adhesive, covered with a release film.

Have you used this type of cushion before? If so, what brand was it and who made it? If you haven't used one before, do some research and find a brand name product. Write down its name and manufacturer.

Assignment 3

This assignment should be completed once you have carried out the carpet installations that have been set for the practical assessment events. See the back of this learner guide for details on the practical demonstration requirements.

You may undertake the various components of this assignment at the most appropriate times – which could be before, during or after the practical demonstration event.

Note that the first task involves the development of a separate floor covering plan. The remaining questions can be answered in the Workbook for this unit.

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1. Draw up a simple floor covering plan of the installation you will undertake as one of your practical demonstration events. If your company had already prepared a floor covering plan, you may submit a copy of it as your plan.

   The plan should show the following details:

   - floor covering and cushion underlay to be installed
   - positioning of seams and joins
   - direction of the carpet pile
   - types of trims and accessories to be used
   - subfloor preparations required
   - any special features of the job.

2. Provide details on the following aspects of the installation:

(a) Subfloor preparation:

- type of subfloor and brief description of its original condition
- work required to prepare it for the carpet installation
- brand names of any preparation products used, such as patching and levelling compounds, primers, etc.

(b) Carpet grippers:

- description of gripper strips, including type and total quantity
- method (or methods) used to fix the gripper strips to the subfloor

(c) Cushion underlay:

- brand name and manufacturer of underlay
- brief summary of its technical specifications, including type, classification and thickness
- method used to secure it to the subfloor, including details of the fasteners used.

Section 4

Tufted and bonded carpets

Overview

The types of carpets that are normally laid over a cushion underlay and fixed using carpet grippers fall into three broad categories:

- woven carpet
- tufted carpet
- fusion bonded carpet.

In this unit, we are focussing on the techniques used to install tufted and fusion bonded carpets.

You will study woven carpet in other units in this course.

Completing this section

The assignment for this section follows on from Assignment 3, and covers more of the details relating to the practical installations you will be asked to carry out.

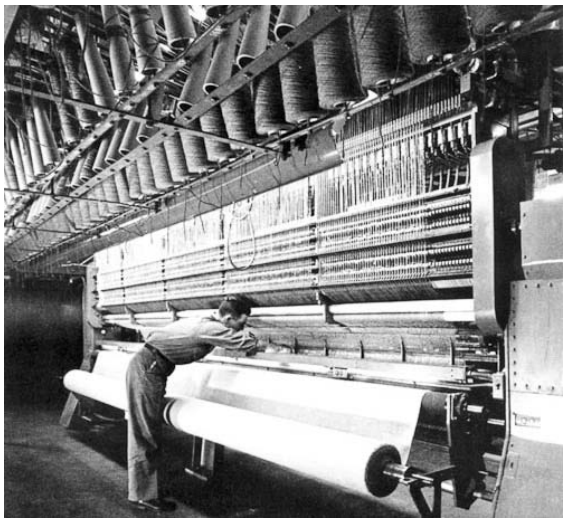
Have a look at the *Assignment* on page 62 to see what you'll need to do to complete it.

There are seven lessons in this section:

- *Carpet construction*
- *Setting out the installation*
- *Seam trimming*
- *Seaming the carpet*
- *Stretching carpet*
- *Trimming in*
- *Finishing the installation.*

These lessons will provide you with background information relevant to the assignment.

Carpet construction



Early **tufted carpets** were made by hand, with the yarn being hand sewn into a base fabric.

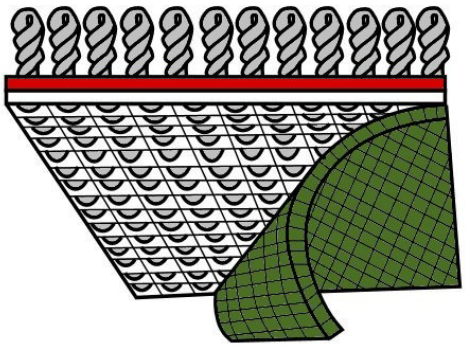
By the 1920s, factory machines began to take over the process, and the first **broadloom** tufted carpet machine (12 foot wide, or 3660 mm) was built in the 1950s.

These days, tufted carpets have come to dominate the market in domestic installations.

Fusion bonded carpets have been around since the 1970s. This manufacturing method is most commonly used to make carpet tiles, but it can also be used to produce rolls.

Let's look briefly at the techniques used to make these two types of carpet, and the effects they have on the way the carpet looks and performs.

Tufted carpet

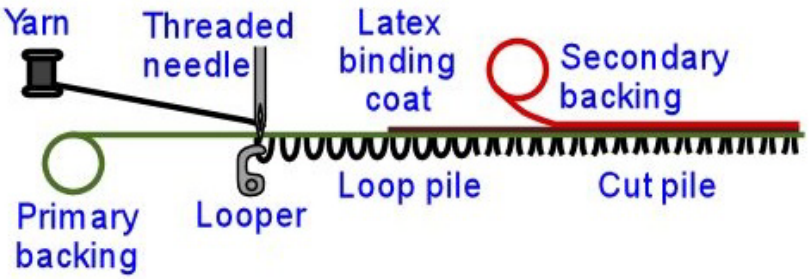


'Tufting' refers to the process of inserting tufts of yarn into a backing cloth with a needle.

The tufting loom has hundreds of needles that work like a sewing machine.

After the tufts have been anchored into the primary backing with a latex adhesive, a secondary backing is added to give the carpet better dimensional stability.

This extra stability helps when the carpet is stretched into place during installation.



The diagram immediately above (on the previous page) shows the main parts of a tufting loom. Here are some more details on the terms used in the diagram:

Pile: formed from the yarn, which can be either coloured before manufacture, or dyed or printed after manufacture

Primary backing: the cloth that holds the tufts in place until the secondary backing is applied

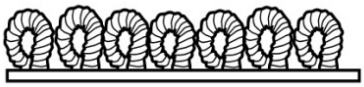
Latex Adhesive: the adhesive that seals the fibres in position and bonds the secondary backing

Secondary backing: an extra backing layer that stabilises the material and helps it to stretch but stay in shape.

A **loop pile** carpet leaves the loops intact on the surface of the carpet. A **cut pile** carpet has the loops cut off at the top.

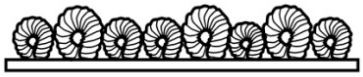
By combining these two principles in various combinations, you can create a wide range of textures, such as:

1. Level loop



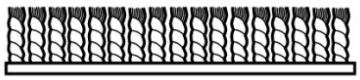
2. Multi-level loop

3. Berber



4. Velvet/plush

5. Saxony

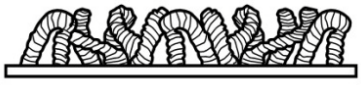


6. Frieze

7. Tip sheared

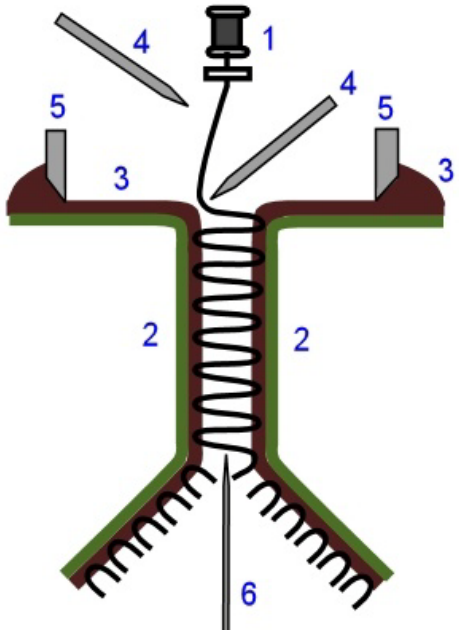
8. Random sheared

9. Shag



Fusion bonded carpet

The main difference between bonded carpet and tufted carpet is that fusion bonding relies entirely on the adhesive layer to hold the pile material in position – the yarn does not penetrate the backing fabric at all.

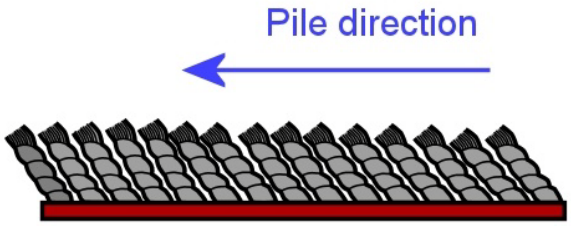


Bonded carpet is made by lapping the pile yarn (shown as 1 in the drawing at right) backwards and forwards between two backing materials (2) coated with adhesive (3).

The yarn is implanted into the adhesive with pleating blades (4), and the adhesive thickness is controlled by a glue scraper (5).

Once the adhesive has set, the 'sandwich' is then split down the centre with a knife (6) to form two separate carpets.

Pile direction



The pile of a carpet tends to lay in a particular direction.

If it's laying towards you, it will look darker because you're looking 'into' the pile.

If it lays away from you, it will look lighter because you're looking 'over' the pile.

Whenever you put two pieces of carpet side by side, you need to make sure that the pile direction is the same on both pieces. Manufacturers generally put a coloured thread on the backing on one side to indicate the pile direction.

The pile direction will influence your decision in how you lay the carpet. A pile that faces towards the traffic flow will tend to wear better than one that faces crossways. It will also look darker – so you need to check with the customer on whether that is an important consideration.

Backing materials

Jute is the traditional fibre used in tufted carpet backing materials. It has good dimensional stability and is able to stretch. However, if it gets wet it will shrink, and

sometimes leave a brown or yellow stain on the pile surface. It is also an imported material and not always reliable in terms of availability. These days, jute is not commonly used for primary backing, but is still the preferred material for secondary backing.

Synthetic materials, especially **polypropylene**, are becoming much more popular for primary backing. They are economical, waterproof and stretchable.

However, they are heat-sensitive, which can cause problems with some manufacturing techniques, as well as installations that involve hot-melt seams.

They also tend to fray when they're being cut or seamed during installation.

Fusion bonded carpets use layered vinyl or plastic backing materials, with a fiberglass scrim for dimensional stability.

Carpet fibre

There are several types of fibre used in carpet. Each has its advantages and disadvantages as a raw material, but when the varying characteristics are taken into account during the manufacturing and installation processes, they all perform well on the floor.

In Australia, the three most commonly used fibres are:

- nylon
- polypropylene (also called 'olefin')
- wool.

Some carpets are made of fibre blends, such as 80% wool and 20% nylon.

Learning activity

Do your own research on tufted and bonded carpets and come up with one brand name and manufacturer for each of the following three types of fibres: nylon, polypropylene and wool. Also identify one fibre blend.

For each one, provide the following details: pile texture, backing materials, and construction method (i.e. tufted or fusion bonded).

Setting out the installation

By the time you're ready to lay the carpet, you will already have prepared the subfloor and installed the gripper strips and underlay material.

You should also have brought the carpet into the area where it is to be laid and allowed it to reach the same ambient temperature as the surrounding air.

AS 2455 says that the preferred ambient temperature at the time of installation is between 10° C and 35° C. If the temperature is outside these limits, you should check the manufacturer's recommendations before proceeding.

AS 2455 (Section 3.1) sets out a list of considerations that you should take into account when you're planning the layout and deciding where to start. These are summarised below.

Where possible:

1. Run seams the length of the area, with the traffic going in the direction of the seams, rather than across the seams
2. Run seams towards windows, so that the outside light doesn't strike across the seams
3. Face the pile direction away from the main source of light, and towards the main entry point to the area
4. On stairs, have the pile direction facing towards the leading stair edge
5. Put the full width of the roll on the door side and align the selvedge (side edge) seams accurately throughout the installation
6. If there is a different floor covering on the other side of the doorway, join the two coverings underneath the closed door.
7. Put fill-outs (part widths) on the opposite side of the room from the door, and avoid having a fill-out in between full widths, unless the situation is unusual.

Note, however, that most of these decisions should already have been made and agreed on with the customer. The floor covering plan should show you the placements of seams and cross joins, direction of pile lay and other details, and it is likely that the customer will have seen the plan and signed off against it.

So if there are any last minute changes that you need to make, be sure to get the customer's approval before you go ahead.

The last thing you want is a disagreement at the end of the installation, when you should both be standing back and admiring a job well done.

While you're looking at the floor covering plan, you should also do a final check on the carpet specifications, including type, brand and colour, just to make sure that the material you've brought to the jobsite matches the customer's order.

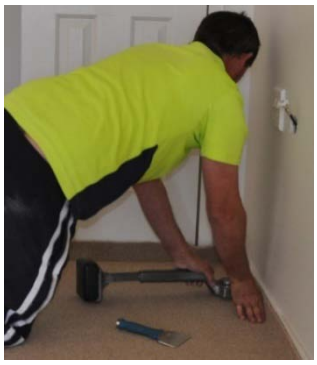
Learning activity

Why do you think that AS 2455 specifies a preferred ambient temperature of between 10° C and 35° C?

What problems might occur if the temperature was too cold? What might occur if it was too hot?

Seam trimming

To prepare the carpet for seam trimming, bring the rolls into the room and lay them out in accordance with the floor covering plan.



Try to achieve a turn up at the walls of 50 mm, and an overlap at the seams of 50 to 75 mm.

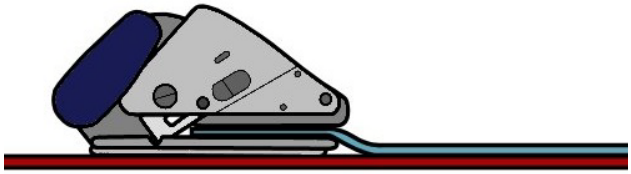
You can use a knee kicker to help position the carpet.

Adjust the teeth on the knee kicker so that they reach through to the secondary backing.

Trimming by row cutting

1. Insert a row finder between the tuft rows and run it along the carpet to separate the rows and form a line in the face pile. Alternative ‘row finder’ tools include a flat-head screwdriver or an awl with a dull point.

2. Slide the throat of the loop pile cutter in between the separated pile rows and then push the cutter along the line.



   Keep the base gently touching the top of the cushion underlay, without pushing down too hard, to stop it from getting caught on the underlay.

   If the cutter is digging into the cushion, put a thin piece of plywood or masonite under the carpet seam and on top of the cushion. Use a piece about 200 mm wide and 2 m long, and re-position it along the length of the seam as you go.

Trimming by trace cutting

1. Trim the seam edge on one piece with a loop pile cutter, as described above.

2. Lap the trimmed edge over the factory edge of the adjoining piece by 25 to 35 mm.

3. Use a cushion back cutter to trim the second edge, holding the cutter against the first edge.

You can also put a plywood or masonite board under the cut to make the job easier.

By row cutting the first edge and trace cutting the second edge, you will generally be able to achieve a better quality seam than trying to join two row cut edges, especially if the rows aren't aligning perfectly.

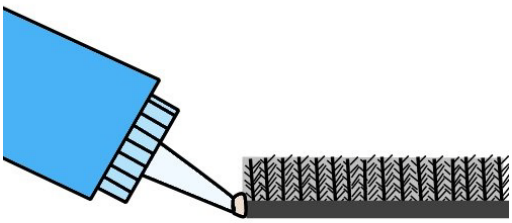
Trimming the selvedge

For most tufted carpets, it's best to trim off the selvedge (factory edge) if you are going to seam that edge. This will help to avoid any problems with distortion in the tuft rows or a poorly bonded secondary backing.

On cut pile carpets, it will also allow you to achieve a uniform pile height on both sides of the seam, since the face yarn has a tendency to lie towards the outside of the edge. Depending on the pile height, you should come in between 25 to 35 mm from the selvedge for your cut.

Applying seam sealer

Before the trimmed edges can be joined in a seam, the yarn should be sealed along the cut edge to stop it from unravelling.



Apply a bead of seam sealer along the base of the pile, where the face yarn enters the primary backing. Then use your finger or thumb to smooth it in along the raw edge.

However, you need to be careful not to apply too much to the edge, or apply it too high on the pile, because you don't want any of the sealer to show on the surface. For the same reason, make sure the carpet is lying face up so that it can only drip downwards if there is too much on the edge.

Learning activity

You'll see that the trace cutting technique described above uses both a loop pile cutter and cushion back cutter.

Are you familiar with both of these tools?

Briefly describe what the difference is between them, and what their normal usages are (other than for trace cutting).

Seaming the carpet

Set out below is the standard procedure for seaming tufted and bonded carpets with hot melt tape.

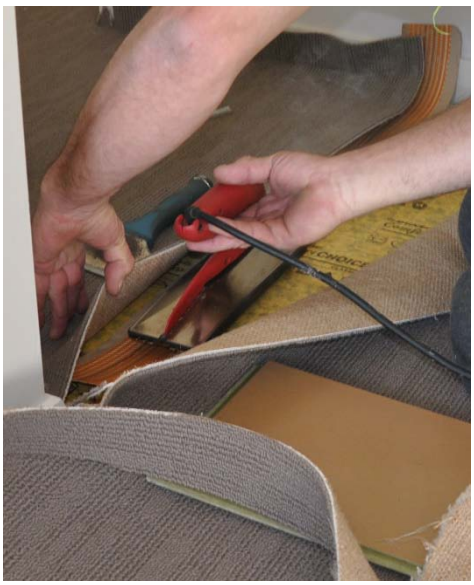
Note that tufted carpet must be pre-stretched before the edges are seamed.

This helps to ensure that when you finish the seams and do the final stretch, the carpet will take up evenly and stay that way over time.

See the next chapter – *Stretching* – for more details on the process.

Once the carpet has been pre-stretched, you can then seam the joins. Make sure you re-straighten the seam edges with a knee kicker before seaming. Cross seams should be done before the lengthwise seams.

Using hot melt tape



Hot melt tape is a 'thermoplastic' tape impregnated with adhesive. When it is heated with a seaming iron, the adhesive becomes sticky and bonds to the carpet backing. The adhesive sets within a couple of minutes as it cools.

The general process is as follows.

1. Set the heat regulator on the seaming iron to the lowest temperature that will achieve a full melt of the adhesive.
2. Stretch the carpet lengthwise to remove buckles and slackness, and put in 'stay tacks' to hold the tension.
3. Position the tape under the centre of the two edges of the seam. Put the iron under the carpet and on the tape. Make sure the heat shield is in place.
4. Move the iron slowly in the direction of the pile lay, at about 600 mm per minute. Adjust the carpet seam immediately behind the iron as you go, before the adhesive cools.

5. Press the two edges into the adhesive using a board. This will also help to flatten out the seam.

6. Trim the loose yarns from the seam and remove the stay tacks.

7. Roll the seam with a spiky roller if the carpet is loose pile construction. If it is cut pile carpet, you will need to use a cut pile roller so that you don't damage the yarn.

Once you power stretch the seams, there may be some degree of peaking. Level loop pile carpet tends to show seams more than cut pile carpet, and heavier carpets peak more than lighter ones. However, you can reduce the peaking by stretching the carpet tighter parallel to the seams and lightly across the seams.

Using an induction heating system

A new method for heating seaming tape is to use an 'induction' heating tool. This system was pioneered by Kool Glide, which brought the first induction seaming tool onto the market in 2004.

The tool works by 'inducing' an electric current in the hot melt tape by passing a magnetic field through the carpet and into the electrically conductive tape. This melts the adhesive embedded in the tape without needing to apply any external heat.

One of the main advantages of this system is that there is no smoke and minimal vapours given off by the process, since the induction tool never comes into contact with the adhesive. Another advantage is the ability to undo or repair a bond by re-heating the adhesive after it has already set.

Learning activity

Have you used a seaming tool? If so, answer the questions below in relation to the tools you have used. If not, do some research and answers the questions on the basis of your findings.

- Give the brand name and manufacturer of the hot melt tape.
- Give the brand name and manufacturer of the tool used to melt the tape.
- Indicate which types of carpet these products have been designed for.

Stretching carpet

The overall objective in stretching carpet is to make sure that it remains flat and wrinkle free during the course of its lifetime, and is not affected by changes in humidity.

Tufted carpet needs to be stretched between about 1% to 1½ % in both directions.

For example, if the length of the carpet is 8 metres, the stretch should be between 80 to 120 mm.

Some carpets will stretch more easily than others. Woven synthetic secondary backings will be easier to stretch than jute secondary backings. Many installers use the rule of thumb that jute should simply be stretched ‘drum tight’.

Below is the process used to stretch carpet using a power stretcher. Note that you should not use a knee kicker to stretch carpet, because it won’t provide a uniform tension across the full width of the floor.

Using a power stretcher

1. Place the power stretcher on the carpet, with the head near the wall you are stretching to and the foot near the opposite wall.

2. Hook the carpet onto the gripper at the foot end, making sure you leave room either side of the seam for the seaming iron.

3. Set up the power stretcher by putting the head about 150 mm from the wall you are stretching to, and the foot hard against the opposite wall.

4. Position the handle at about 45 degrees, and stretch the carpet by pushing down on the handle. You can mark the amount of stretch you're looking for with a piece of chalk on the skirting or wall. It may take several stretches to achieve the 1 to 1 ½ % total stretch required.

Australian Standards recommendations

AS/NZS 2455 says that tufted carpet should be two-way stretched using a power stretcher. The diagram below is taken from Appendix C. It shows eight steps for stretching tufted carpet.

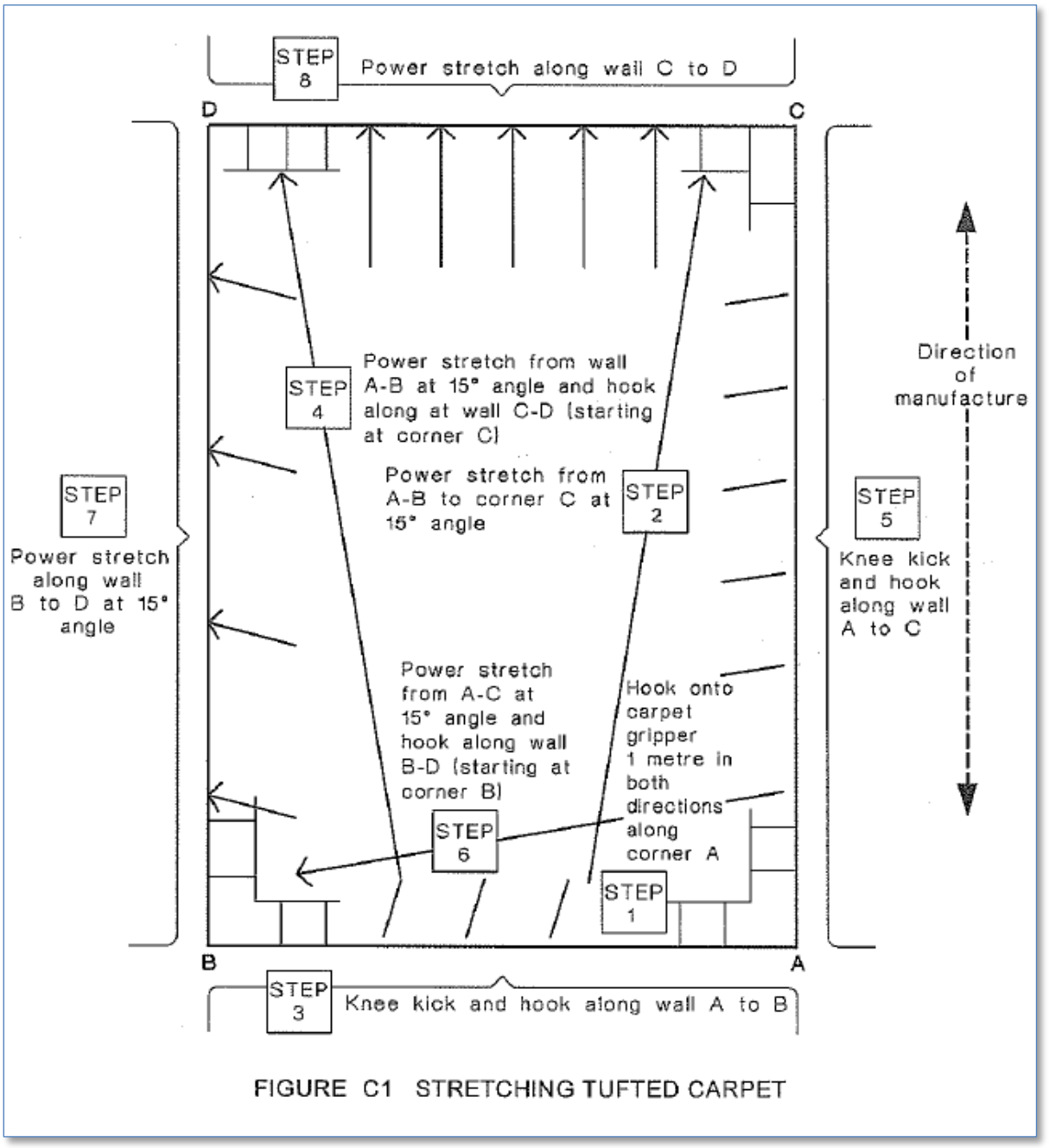
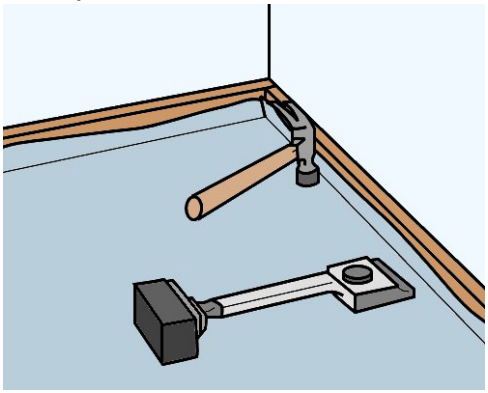


FIGURE C1 STRETCHING TUFTED CARPET

Let's have a closer look at each step, and also discuss the extra installation procedures you should follow as you undertake each step.

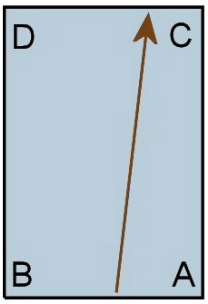


Step 1. Hook carpet onto gripper at corner A

Nudge the carpet into the starting corner (A) with a knee kicker.

Fold the corner back and put in a notch cut to make it fit tight into the corner.

Hook the carpet onto the gripper strip pins for about 1 metre in both directions to secure the corner.

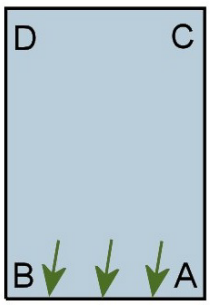


Step 2. Power stretch from A-B to C

Use the power stretcher to stretch the carpet the full length of the room from wall A-B towards corner C.

Run the power stretcher at a 15 degree angle, towards corner C.

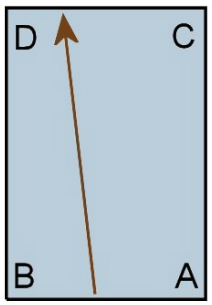
Put a notch cut at corner C and hook the carpet onto the gripper for about 500 mm to secure it.



Step 3. Knee kick and hook from A to B

Start at corner A and work along the wall towards corner B, bumping the carpet onto the gripper strip and hooking it onto the pins.

Angle the knee kicker slightly towards corner B to remove any slackness in the carpet and repeat the process every 150 mm.



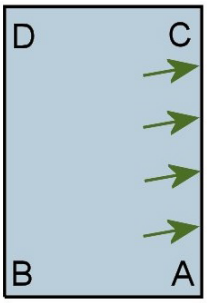
Step 4. Power stretch from A-B to C-D

Use the power stretcher to stretch across the room from A-B to C-D. Hook the carpet onto the gripper along C-D, starting at corner C.

Angle the power stretcher towards corner D, at about 15 degrees.

Move along the wall at intervals the same width as the width of the stretch head.

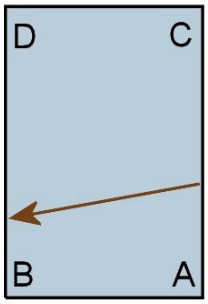
Step 5. Knee kick and hook along wall A to C



Start at corner A and work along the wall towards corner C, bumping the carpet and hooking it onto the gripper.

Angle the knee kicker slightly towards corner B and repeat the process every 150 mm.

Step 6. Power stretch from A-C to B

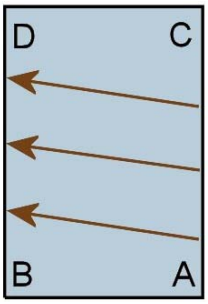


Use the power stretcher to stretch across the room from A-C to corner B.

Hook the carpet onto the gripper along B-D, starting at corner B.

Angle the power stretcher towards corner B at about 15 degrees.

Step 7. Power stretch along wall B-D

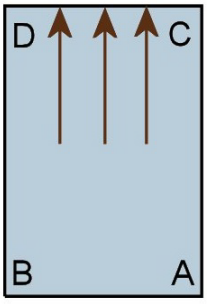


Use the power stretcher to stretch along wall B-D from A-C.

Angle the stretcher at 15 degrees towards corner D.

Move along progressively at intervals the same width as the width of the stretch head.

Step 8. Power stretch along wall D-C



Use the power stretcher to stretch along wall D-C from A-B, starting at corner C.

Use the same procedure as above, moving along the wall progressively towards corner D

Learning activity

Have you used a power stretcher before? What is its model name and who is the manufacturer?

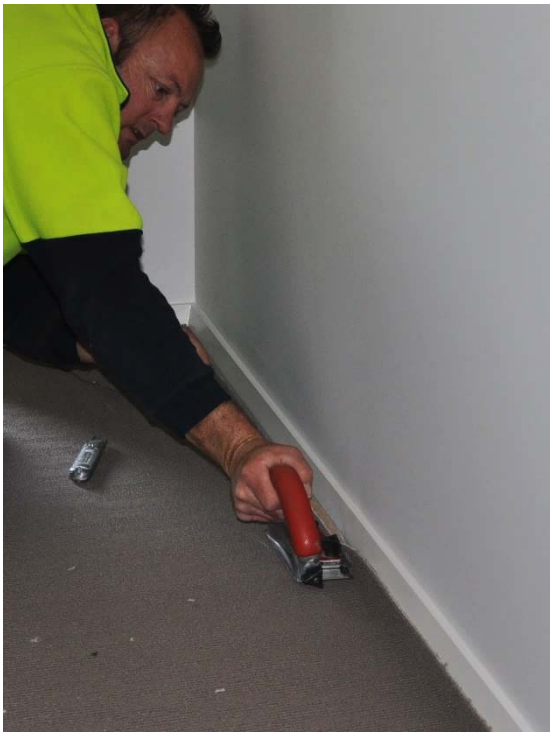
If you haven't used one before, do some research and find out a name and manufacturer for a particular model.

Trimming in

Once the carpet has been stretched and secured onto the gripper strip right around the room, you can trim it in. The most efficient combination of tools for this job is a wall trimmer, utility knife and stair tool.

Check that the blades are sharp before you start. Remember, it's easier, quicker and safer to use sharp blades, and to either sharpen or replace them before they become too dull to cut properly.

The basic process is as follows:



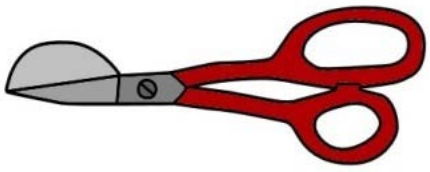
1. Set the wall trimmer to trim the carpet at about 5 mm over the required dimension
2. Begin the trimming cut at the top edge of the carpet where it is lapped up on the wall. You can use a utility knife to start the cut.
3. Cut down from the top edge until the trimmer base is flat on the carpet, and then run along the wall.
4. Tuck in the 5 mm over-length into the gully between the wall and gripper strip. You can either use a stair tool or the trimmer itself – the outrigger or flat bar portion of the wall trimmer is made for this purpose.

When you have finished, inspect the carpet around the edges for any protruding strands or high face yarn. Tuck in unsecured edges with the stair tool or wall trimmer, and clip loose ends with a pair of napping shears.

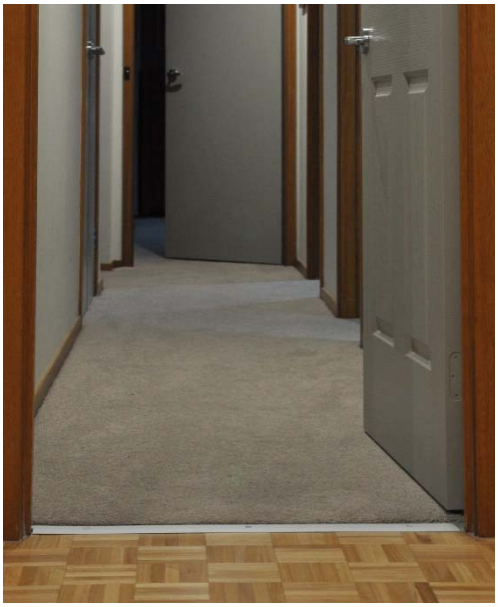
Learning activity

Duckbill napping shears are used trim off loose yarns in the carpet tufts.

What is the purpose of the 'duckbill' shape?



Finishing the installation



Once you've completed the installation, you should carefully check the finished floor to make sure everything looks right.

You should also clean up all scraps and vacuum the floor. This will make it easier for you to see any blemishes or problems that might need fixing before you leave the site.

If you do find any problems, fix them straight away – don't wait for complaints or call backs from the client.

Another reason for making sure everything is left clean and tidy is that it will enhance your image as a professional operator.

Clients appreciate tidy tradespeople – especially if you're working in their home.

Be careful with hazardous products, such as adhesives and patching compounds. Make sure you clean up any left-over substances and put them in sealed bags for later disposal. Also check that any partly-used containers are resealed properly before you put them back in your vehicle.

Learning activity

We covered the topic of hazardous products and their disposal in more details in the unit: *Safety at work*.

What should you do with the following types of waste products that are left over on-site?

- Liquids – such as left over primers
- Solids – such as left over patching and levelling compounds
- Small carpet offcuts
- Large carpet offcuts

Assignment 4

This Assignment follows on from Assignment 3, and should be completed once you have carried out a suitable carpet installation as part of practical assessment events. See the back of this learner guide for details on the practical demonstration requirements.

You may undertake the various components of this assignment at the most appropriate times – which could be before, during or after the practical demonstration event.

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1. Provide details on the following aspects of the carpet installation you have chosen for Assignments 3 and 4.
   - brand name and manufacturer of the carpet
   - type of carpet (tufted or fusion bonded)
   - pile texture and materials used in the carpet fibres
   - backing materials used.
2. Provide brand/model names and manufacturers of the following tools used to carry out the carpet installation:
   - stretching tools
   - seaming tools
   - trimming and cutting tools.

Practical demonstrations

In this unit we have provided background materials to cover the following two competencies:

MSFFL2017: Install carpet cushion underlays and gripper accessories

MSFFL2018: Install unpatterned tufted and bonded carpet floor coverings.

The checklists below set out the sorts of things your trainer will be looking for when you undertake the practical demonstrations for this unit.

Make sure you talk to your trainer or supervisor about any of the details that you don't understand, or aren't ready to demonstrate, before the assessment event is organised. This will give you time to get the hang of the tasks you will need to perform, so that you'll feel more confident when the time comes to be assessed.

When you are able to tick all of the YES boxes below you will be ready to carry out the practical demonstration components of this learning unit.

MSFFL2017: Install carpet cushion underlays and gripper accessories

Specific performance evidence – you will need to:	Yes
Complete a minimum of 2 carpet cushion/underlay installations, with 1 incorporating obstructions such as doorways, fittings and irregular (obtuse/acute) angles using the carpet gripper installation system	❑

Specific knowledge evidence – you will need to demonstrate your understanding of:	Yes
Carpet cushion/underlay and gripper accessories – including the different types available and their characteristics, uses and limitations	❑
Tools and equipment, including procedures for their safe use, operation and maintenance	❑
Cutting and fitting of carpet cushion/underlays and gripper accessories	❑
Characteristics and requirements of sub-floor preparation	❑

MSFFL2018: Install unpatterned tufted and bonded carpet floor coverings

Specific performance evidence – you will need to:	Yes
Complete a minimum of:	
• 1 installation of tufted carpet (Installation 1)	❑
• 1 installation of bonded carpet using a carpet gripper installation system to connecting rooms, including at least one seam join and one cross join (Installation 2)	❑

Specific knowledge evidence – you will need to demonstrate your understanding of:	Yes
Tools and equipment, including procedures for their safe use, operation and maintenance	❑
Types, characteristics, uses and limitations of tufted and bonded carpets	❑
Techniques for installing, joining and stretching carpet	❑

General evidence requirements for both competencies

Performance evidence – you will need to demonstrate your ability to:	Yes
Correctly understand instructions and work orders, and seek out all relevant information	❑
Handle tools, materials and products safely, and wear all required PPE	❑
Use safe work practices to minimise the risks of injury to self and others	❑
Follow procedures to prevent damage to materials or equipment and minimise wastage	❑
Plan activities to avoid any backtracking, interruptions or wastage	❑
Work efficiently to optimise work flow and maintain production output and product quality	❑
Carry out pre-checks and inspections to anticipate problems and take corrective action	❑
Modify activities to cater for variations in workplace conditions	❑
Interpret basic plans and take accurate measurements	❑
Calculate area and estimate material requirements	❑
Communicate effectively, work cooperatively with others and ask for help when needed	❑
Report work outcomes and problems	❑

Knowledge evidence – you will need to demonstrate your understanding of:	Yes
WHS legislation, regulations, standards and codes of practice relevant to the task	❑
Company and worksite policies and procedures relevant to the task	❑
Types of tools and equipment, and procedures for their safe use and maintenance	❑
Control measures and safety equipment used to manage risk	❑
Procedures for recording workplace information and reporting problems	❑
Methods for estimating and calculating quantities and measurements	❑
Strategies for working with others in a team	❑
Environmental protection requirements	❑
Lines of communication and procedures for resolving problems	❑

