Subfloor coatings and toppings

Supporting:

MSFFL2006: Prepare, select and apply smoothing and patching compounds

MSFFL2007: Select and apply appropriate compounds and additives

MSFFL2009: Select, prepare and apply moisture barriers and damp proof membranes to concrete sub-floors

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INDUSTRY NETWORK TRAINING & ASSESSMENT RESOURCES

Workbook

FLOORING TECHNOLOGY

Name:

Subfloor coatings and toppings

Workbook

Containing learning activities and assignments for the units of competency:

MSFFL2006: ***Prepare, select and apply smoothing and patching compounds***

MSFFL2007: ***Select and apply appropriate compounds and additives***

MSFFL2009: ***Select, prepare and apply moisture barriers and damp proof membranes to concrete sub-floors***

The assignment templates are also available in an electronic 'Word' version, downloadable from the INTAR website at:

www.intar.com.au

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This training resource forms part of the **Flooring Technology project**, developed and coordinated by INTAR (Industry Network Training and Assessment Resources). To see the on-line versions of the resources available under this project, please go to the INTAR website and follow the links.

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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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Introduction

Subfloor coatings and toppings is a 'learning unit' from the Flooring Technology training resource. It supports the following competencies from the *Certificate III in Flooring Technology* (MSF30813):

- *MSFFL2006: Prepare, select and apply smoothing and patching compounds*
- *MSFFL2007: Select and apply appropriate compounds and additives*
- *MSFFL2009: Select, prepare and apply moisture barriers and damp proof membranes to concrete sub-floors.*

To be assessed as competent, your assessor will use a range of methods to check your understanding of the concepts presented in the Learner guide for this unit and your practical ability to apply subfloor coatings and toppings.

These may include:

- written assignments
- practical demonstrations
- on-the-job discussions about how you go about particular activities
- learning activities undertaken while you're progressing through the unit
- examples of installations you have undertaken
- log book or work diary.

Literacy, numeracy and computer skills

Literacy is the ability to read and write. To complete this qualification, you will need sufficient literacy skills to produce a range of workplace documents. You will also need the skills to be able to read and understand documents such as order forms, installation instructions, project briefs and safe operating procedures.

Numeracy is the ability to work with numbers. Flooring installers need to do lots of measure-ups and calculations, so there will be many opportunities for you to learn and practice your numeracy skills.

When it comes to completing the written assignments for this qualification, a certain level of literacy ability is required to read the questions and write down your answers. There will also be times when you are asked to generate documents on a computer.

Obviously, it's important that you clearly understand what the assignment is asking you to do, and that your work is a good reflection of what you really know. So if you're having trouble reading the questions, writing down your answers, or using certain computer programs, make sure you speak to your trainer before you hand the assignment in.

There are various ways your trainer can help you. For example, they may be able to ask the assignment questions verbally and help you to write down your answers. They may also be able to show you sample answers to similar questions, which will let you look at the way they're written and give you hints on how to write your own. You may also be allowed to do the assignment with the assistance of another person.

Applying for RPL

RPL stands for **Recognition of Prior Learning.** It is a form of assessment that acknowledges the skills and knowledge you have gained through:

- on-the-job experience
- formal training in other courses
- life experience, through your hobbies or other outside activities.

If you believe that you are already competent in some or all of the skills covered in this unit, ask your assessor about how to apply for RPL.

Using this workbook

All of the lessons in the Learner guide for this unit have learning activities at the end. Their purpose is to provide discussion points and questions to help reinforce your understanding of the concepts being presented.

There are also a range of assignments, which appear at the end of each section. These are designed to test your knowledge of the subject matter and ability to submit written responses in an acceptable format.

This workbook reproduces all of the learning activities and assignments in a format that lets you handwrite your answers to the questions.

Note that your trainer may ask you to produce a computer-generated document for all of the formal assignments, either printed out in hard copy or submitted electronically. To do this, go to the website version of the unit and look for the *Assignment* link in each section. This will allow you to type your answers into the 'Word' document and then either print it out or email it direct to your trainer as an attachment.

You may also be asked to share your learning activity answers electronically, especially if you are undertaking this unit by distance learning and are linked up with fellow students in other locations. This might be done through group emails or via a social networking site such as Facebook. In these cases, you should use the website resource rather than this workbook.

Part 1

Learning activities

Section 1: Preparations

Checking moisture and pH levels

If you haven't already completed the unit *Inspecting and testing subfloors*, you should go to it now and read through Section 4: 'Measuring moisture and pH'. Even if you have completed it, you might want to refresh your memory on these topics and have another look at the range of YouTube video clips showing how the various test procedures are carried out.

Below is the link to a video clip produced by Wagner Electronics on how to use the Rapid RH probe (pictured at the beginning of this lesson in the Learner guide).

http://www.wagnermeters.com/video-install.php

Preparing concrete substrates

The link below will take you to some video clips produced by ConcreteNetwork.com on how to use:

- Concrete scarifiers
- Concrete shot blasters
- Concrete floor scrapers
- Squeegee vacuums.

http://www.concretenetwork.com/videos/surface-preparation/

There is also a video clip on moisture testing that includes a demonstration on how to carry out a calcium chloride test. You'll remember that we discussed the problems with this test in *Inspecting and testing subfloors*.

What is wrong with the calcium chloride test, and why is it no longer acceptable under AS 1884-2012?

Preparing timber substrates

The link below will take you to a YouTube tutorial produced by ‘Allaboutflooring’ on how to prepare and sand a timber subfloor. Have a look at this clip now.

http://www.youtube.com/watch?v=LnCg2GHRBn8

Have you been involved in sanding a timber subfloor? Did you do anything differently from the way it's shown in this clip? If so, describe the differences.

Tools and equipment

Which of the tools shown in this lesson do you use at work when you’re preparing subfloors and installing underlayments? Make up a list and compare it with other learners in your group.

Are there any tools you use that aren't listed above? Name the tools and provide a brief description of what you use them for.

Tool	Description

If you are studying this unit by flexible delivery, you could also take digital photos of the tools.

Health and safety

Choose a coating or underlayment product that requires the use of personal protective equipment (PPE) when you're mixing or applying it.

Get a copy of the MSDS for the product and answer the following questions.

1. What is the brand name of the product?

2. What type of product is it (i.e. what is it used for)?

3. What items of PPE are required, and when do you need to wear them?

4. What other precautions should you take while you're preparing, mixing or applying this product?

5. How should you dispose of the leftovers once the job is finished?

Section 2: Concrete moisture barriers

Moisture and pH problems

We've mentioned the rule of thumb that concrete dries at a rate of about 1 mm per day. But there are lots of reasons why concrete could take much longer to dry down to a moisture content that's in equilibrium with the surrounding atmosphere. One of these reasons is the presence of a curing compound on the surface.

How many other reasons can you think of?

Make up a list and share it with other learners in your group or with your trainer.

On-site issues

1. Why do you think that air conditioning systems get a special mention in AS 1884?

2. What does an air conditioner do to the humidity level inside the room?

3. How would this affect the difference in RH levels between the concrete subfloor and the room atmosphere?

Types of moisture barriers

Choose one liquid-applied moisture membrane and answer the questions below.

1. What is the brand name of the product?

2. Who is the manufacturer?

3. What membrane class does it belong to?

4. What is its chemical base (e.g. acrylic, polyurethane, epoxy resin)?

5. When should the product be used? (Give some examples of the types of applications specified by the manufacturer for this product.)

If you're not familiar with any particular brands, follow the links below to two manufacturers' websites – Ardex and Davco – and choose one of their products.

http://www.davco.com.au/productCategory.php?id_category=15

http://www.ardexaustralia.com/products/waterproofing

Alternatively, you could select a product being stored on the shelf at your workplace, or simply go to your local hardware store.

Applying moisture barriers

The link below will take you to a YouTube video produced by Altro Flooring on how to install their AltroProof Solo Damp Proof Membrane.

http://www.youtube.com/watch?v=3aG08Iq7m5s

Watch the clip and then answer the following questions.

1. What is the chemical base of AltroProof Solo DPM?

2. After you add the hardener to the base, how long should you stir the mixture for?

3. What tools are used to apply and spread the membrane on the floor?

Applying moisture suppressants

Below is a link to a video clip demonstrating the installation of Protect Crete 'Moisture fix' concrete moisture barrier. Although this product provides a fully waterproof membrane, it shows a simple application technique which can also be used for moisture suppressants.

http://www.youtube.com/watch?v=0IkJMveIMWo

Watch the clip and then describe the process used and equipment required to spread the product.

Section 3: Priming, patching and levelling

Types of levelling compounds

See if you can identify one brand name for each of the following types of compound. State the product's brand name and manufacturer.

Smoothing compound

Brand name	
Manufacturer	

Levelling compound

Brand name	
Manufacturer	

Bulk filler

Brand name	
Manufacturer	

Repair/patching compound

Brand name	
Manufacturer	

Applying primers

The link below will take you to a video clip produced by Ardex demonstrating its range of primers and bonding agents. The clip shows these products being applied to a range of substrates, including timber and concrete subfloors.

http://www.ardexaustralia.com/products/primers-bonding-agents-additives/ardex-p-51

What tools are used to spread the various primers on the subfloors?

Applying patching compounds

Below is a link to a video clip demonstrating how to use Ardex Liquid Backerboard. At the beginning of the clip the installer mixes up a patching compound and applies it to a ply subfloor to fill the grooves between the plywood sheets.

http://www.youtube.com/watch?v=35NbjSh5h0w&list=PL854198DCA86F58A6

Watch the clip and then answer the following questions relating to the patching compound:

1. What is the mixing ratio of water to patching compound?

2. What tool is used to apply the compound to the floor?

3. What is the range of thicknesses that Ardex recommends for this compound?

Applying levelling compounds

The link below will take you to a short training video produced by Ardex on the recommended methods for installing K15 self-levelling compound. The video also demonstrates the application of their priming and patching compounds.

http://www.youtube.com/watch?v=q34TONR760g

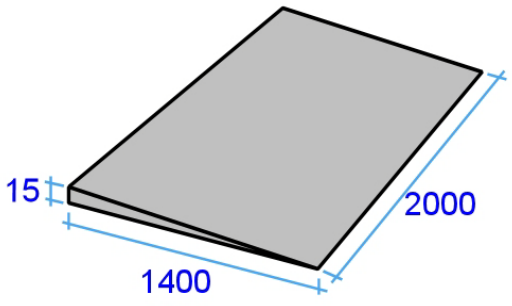
This is a good demonstration of how the products are applied and the precautions that should be followed. But the narrator gives some advice at the beginning on the best way to check the moisture content of the floor.

What is wrong with this advice? (If you don't know, you will need to refer back to the unit: *Inspecting and testing subfloors*.)

Estimating quantities

You need to install a ramp between two floor levels, as shown in the drawing below. The slump-free repair mortar compound has a coverage rate of 14 m^2 at 1 mm thick per 20 kg bag.

You will then apply a primer to the finished ramp. The primer coverage rate is 5 m^2/L. However, you will dilute the primer with water at a 1:1 ratio.



How much repair mortar and primer will you need for this job? Add a 10% wastage factor to each amount.

Show all workings.

Part 2

Assignments

Assignment 1

Name		Date	

1. What are the maximum relative humidity (RH) levels permitted in a concrete subfloor under AS 1884 and AS 2455 using the following two testing methods?

   (a) surface-mounted insulated hood' test

   (b) in-situ probe test

2. How many RH tests should be carried out to determine whether the floor meets the requirements of the Standards? State the number of tests required and the floor area.

   Number of tests: Floor area:

3. What is the acceptable moisture content range for timber subfloors, as specified under AS 1884 and AS 2455? State the upper and lower levels.

   Upper level: Lower level:

4. If the moisture content reading was too high in a raised timber subfloor, what might be causing the problem? List three possible causes.

   1.

2.

3.

5. The latest Australian Standard for resilient flooring installation (AS 1884-2012) says that a pH test must be carried out on all concrete subfloors. What is the pH range specified in this Standard?

6. How should you remove the following contaminants and substances from a concrete subfloor?

   (a) a small amount of oil or grease on the subfloor surface

   (b) a large amount of oil or grease that has penetrated the pores of the concrete

(c) blobs of cornice cement and surface dags

(d) spalling or weak surface material

(e) dust from scraping and grinding

7. What is the best way to remove surface contaminants from a timber subfloor?

8. If you were preparing an old subfloor for a coating or topping and came across asbestos-based products, what should you do?

Assignment 2

Name		Date	

1. (a) What is hydrostatic pressure?

(b) What types of landscaping or land formations tend to contribute to hydrostatic pressure in the soil under a slab?

2. (a) What are capillaries?

(b) How do capillaries in concrete allow moisture to travel through a slab?

3. How should an expansion joint be dealt with when you are applying a moisture barrier?

4. (a) What is the purpose of a bond breaker?

(b) Where should you use bond breakers?

5. Select the liquid moisture barrier product that you plan to use for your practical demonstration in this unit. Obtain the manufacturer's MSDS and technical data sheet for the product and answer the following questions.

   (a) What is the product's brand name and who is the manufacturer?

   (b) What is its chemical basis (water, polyurethane, epoxy, etc)?

   (c) What membrane class is it?

   (d) What type of bond breaker tape or materials are required at joints?

   (e) What items of PPE are required when mixing and using this product?

   (f) What other safety precautions apply to the use of this product (such as ventilation and lighting)?

(g) How many coats are required and how long should you wait between coats?

(h) What is the curing time after the final coat has been applied (that is, how long should you wait before moving onto the next stage of the subfloor preparation)?

6. Select the moisture suppressant product that you plan to use for your second practical demonstration in this unit. Obtain the manufacturer's MSDS and technical data sheet for the product and answer the following questions.

(a) What is the product's brand name and who is the manufacturer?

(b) What is its chemical basis (water, polyurethane, epoxy, etc)?

(c) What items of PPE are required when mixing and using this product?

(d) What other safety precautions apply to the use of this product (such as ventilation and lighting)?

(e) How many coats are required and how long should you wait between coats?

(f) What is the curing time after the final coat has been applied (that is, how long should you wait before moving onto the next stage of the subfloor preparation)?

Assignment 3

Name		Date	

1. State the tolerance for ‘planeness’ in a concrete floor, as specified in AS 1884.

2. State the tolerance for ‘smoothness’ in a concrete floor, as specified in AS 1884.

3. Select the primer that you plan to use for one or more of your practical demonstrations. Obtain the manufacturer’s MSDS and technical data sheet for the product and answer the following questions.

   (a) What is the product’s brand name and who is the manufacturer?

   (b) What is its chemical basis?

   (c) What items of PPE are required when mixing and using this product?

(d) What other safety precautions apply to the use of this product?

(e) How many coats are required? If more than one coat is required under certain conditions (or certain types of subfloor), state the number of coats and the conditions that apply. Also state the recommended drying time between coats.

(f) Are there times when the primer should be diluted or be mixed with other additives? If so, what are they and what additives should be used?

(g) What is the drying time after the final coat has been applied (that is, how long should you wait before moving onto the next stage of the subfloor preparation)?

4. Select the patching compound that you plan to use for one or more of your practical demonstrations. Obtain the manufacturer's MSDS and technical data sheet for the product and answer the following questions.

   (a) What is the product's brand name and who is the manufacturer?

   (b) What is its chemical basis?

   (c) What items of PPE are required when mixing and using this product?

   (d) What other safety precautions apply to the use of this product?

   (e) What types of holes, cracks and voids is this product suitable for?

(f) Are there any types of cracks or other defects that this product is not suitable for? If so, what are they, and what product would you use in those instances?

(g) How long should you wait before moving onto the levelling stage?

5. Select the levelling compound that you plan to use for one or more of your practical demonstrations. Obtain the manufacturer's MSDS and technical data sheet for the product and answer the following questions.

(a) What is the product's brand name and who is the manufacturer?

(b) What is its chemical basis?

(c) What items of PPE are required when mixing and using this product?

(d) What other safety precautions apply to the use of this product?

(e) What types of subfloor is this product suitable for?

(f) Are there any types of subfloor that this product is not suitable for? If so what are they, and what type (or types) of levelling compound would you use in those instances?

(g) What is the maximum recommended thickness for applying this levelling compound (without adding any aggregate)?

(h) Is this product suitable for using as a bulk filler? If so, what extra components would you need to add and how would you go about it?

(i) What is the curing time after the levelling process has been completed (that is, how long should you wait before beginning the floor covering installation)?

Practical demonstrations

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

MSFFL2006: Prepare, select and apply smoothing and patching compounds

MSFFL2007: Select and apply appropriate compounds and additives

MSFFL2009: Select, prepare and apply moisture barriers and damp proof membranes to concrete sub-floors

The checklists below set out the sorts of things your trainer will be looking for when you undertake the practical demonstrations for this unit. The performance evidence for the individual competencies are listed separately below.

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 component of this unit.

MSFFL2006: Prepare, select and apply smoothing and patching compounds

Specific performance evidence	YES
Complete each of the following subfloor preparations to the standards specified in the relevant Australian Standards:	
• Patch and repair (Preparation 1)	❑
• Level pour (Preparation 2)	❑

General performance evidence	YES
1. Follow all relevant WHS laws and regulations, and company policies and procedures	❑
2. Read and interpret plans and written instructions relevant to the tasks	❑
3. Inspect the floor to ensure it is suitable for the preparation to be applied	❑

4.	Carry out a trial to test the compatibility and finish of the primer and compound	❑
5.	Select the correct tools and equipment, and carry out all necessary pre-start checks	❑
6.	Read the relevant MSDSs and follow the directions specified	❑
7.	Set up a mixing station, prepare the materials and clean the floor surface	❑
8.	Apply the surface coating in accordance with the manufacturer's recommendations	❑
9.	Check the floor level and surface finish	❑
10.	Store or recycle unused materials	❑
11.	Clean and store tools and equipment appropriately	❑
12.	Clean up work area and dispose of rubbish properly	❑
13.	Accurately complete all required documentation	❑

MSFFL2007: Select and apply appropriate compounds and additives

Specific performance evidence	YES
Complete a minimum of 3 different applications of compounds and additives to substrates – involving the selection, preparation and application of appropriate compounds and additives in order to prepare the substrate for finish coverings	❑

General performance evidence		YES
1.	Follow all relevant WHS laws and regulations, and company policies and procedures, including the correct use of PPE	❑
2.	Read and interpret plans and written instructions relevant to the tasks	❑
3.	Identify the types of wall and floor structures used in the building	❑
4.	Inspect the floor and walls for irregularities, contamination, moisture content, planeness and smoothness, and run datum lines to check dimensions	❑

5. Select suitable compounds, additives and application methods for the job at hand	❑
6. Select the correct tools and equipment, and carry out all necessary pre-start checks	❑
7. Plan the sequence of tasks, and establish working lines and the starting point	❑
8. Set up a mixing station and prepare the materials	❑
9. Apply the compounds and additives according to manufacturer's instructions	❑
10. Inspect the completed job and carry out rework as required	❑
11. Store or recycle unused materials	❑
12. Clean and store tools and equipment appropriately	❑
13. Clean up work area and dispose of rubbish properly	❑
14. Accurately complete all required documentation	❑

MSFFL2009: Select, prepare and apply moisture barriers and damp proof membranes to concrete sub-floors

Specific performance evidence	YES
Complete the following installations:	
• One moisture barrier – dealing with an external moisture problem that may be due to hydrostatic pressure or capillary action (Installation 1)	❑
• One moisture suppressant – dealing with construction moisture in green concrete (Installation 2)	❑

General performance evidence	YES
1. Follow all relevant WHS laws and regulations, and company policies and procedures	❑
2. Read and interpret plans and written instructions relevant to the tasks	❑
3. Inspect the subfloor in accordance with Australian Standards and treatment system	❑
4. Select the correct tools and equipment, and carry out all necessary	❑

	pre-start checks	
5.	Read the relevant MSDSs and follow the directions specified	❑
6.	Prepare the materials and clean the floor surface according to instructions	❑
7.	Apply the moisture suppressant according to manufacturer's recommendations	❑
8.	Prior to moisture barrier application, establish the cause of the moisture problem	❑
9.	Strengthen corners, cracks and other areas of penetration	❑
10.	Apply the moisture barrier according to manufacturer's recommendations	❑
11.	Inspect finished job for imperfections or problems	❑
12.	Store or recycle unused materials	❑
13.	Clean and store tools and equipment appropriately	❑
14.	Clean up work area and dispose of rubbish properly	❑
15.	Accurately complete all required documentation	❑