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2008
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Guide to correct installation of Solid Wood Flooring

PLEASE NOTE refer to “pre-installation evaluation of job site” before installation commences.

Laying of wooden flooring:

Focal points are vital. It is recommended to start laying a wooden floor at the focal point moving across to the far side of the room. The reason for this is that one would get a full strip of flooring at this main focal point and the cut piece would end the floor at the far side under the skirting. If one starts at the far side and moves towards the focal point then you will more than likely end up with a half board tapering from wider to narrower causing an eyesore and the possibility of relaying the floor at your cost.

- Planning and thought must go into each floor, from focal points to finishing strips and be discussed with the fitting team prior to starting the job.

The direction of the floor is vital; it is always best to have the length of the floor running in the longest direction and the width of the floor running in the shortest direction. This is to avoid having unsightly expansion joints in the middle of the floor and a floor giving trouble during the humid wet seasons.

Strip Floors:

Hardwood flooring is normally supplied in staggered lengths, which are quite convenient when laying as a multi stagger floor, a multi stagger floor with no set pattern is the best way of presenting a strip floor (unless one has all long lengths, like in the case of Larch or Pine)

End matched joints should be at a minimum of 150mm apart from the end matched joint in the previous line of flooring, however 200mm – 250mm is better. One doesn't want to create a pattern in a strip floor as patterns are normally kept for parquet block floors where a specific pattern is the design of the floor for e.g. - herringbone, brick pattern, block pattern etc.

In flooring for example, Bamboo and Oak, the flooring is often supplied in one length. If the room is one length, then the principle of the end cut off being the starter in the next row and this repeated throughout the whole floor, one will be creating a pattern. Should half the room be of one length and then change to a different length, this will create a pattern on the one half and a different pattern on the other.

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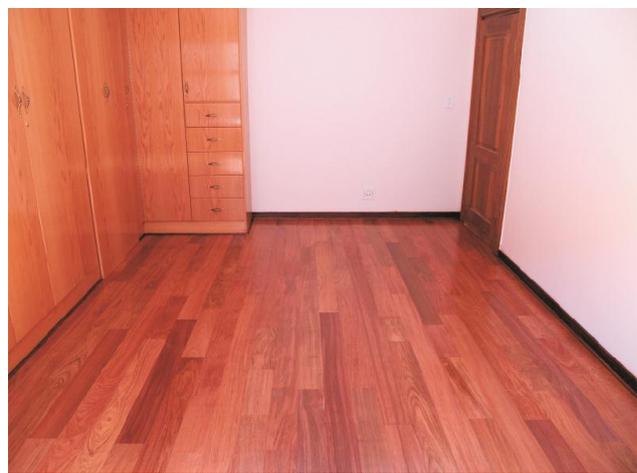
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It is always best not to have a pattern in a strip floor at all and with an equal length of floor board and an equal length room, one would have to play with the lengths of the started plank in each row to create a stagger. This is the recommended method. If one is going to create a pattern due to this phenomenon of one-size boards, we feel it fair to bring this to the attention of the client in order that all parties understand and if approved by the client this should be noted in writing as not to have a situation at the end of the job. Half a pattern and half a stagger are not acceptable. Below you will see a picture of a created pattern and a random stagger: -



This is not recommended unless discussed with the client and if approved it must keep the pattern throughout the floor.



This is a random stagger and is certainly the correct way to lay a strip floor.

Wide Solid Boards:

When a customer is looking for wide board flooring it is recommended to persuade your customer to look at engineered boards due to the extra stability and far less chance of cupping. If this is impossible then for any solid wide boards over 125mm then The Elastic adhesive mat system is the preferred method of installation. Nail down and glue down methods with wide board flooring has more chance of pressure cupping in wet/humid seasons.

Expansion joints:

Expansion joints in the width must always be left, the spec is 3 - 5 mm per linear meter on each side, but always try to leave the maximum 5mm per linear meter, minimum expansion is always 15mm. (Example if the room is 4 meters wide then the expansions on the width side must be minimum 15mm and maximum 20mm on each side).

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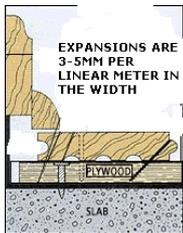
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Skirting and quadrant will conceal these.

Always try to convince the client that the quadrant is important, this will take up any slight unevenness along the floor as well as to create extra space for an expansion to spec). If your floor is butting onto tiles the expansion joints must also be left. These can be concealed with a bevel, T strip, an end cap or an approved expansion joint material. Wooden doorframes can be trimmed at the bottom so the floor can expand under the frame and give a neat finish. Steel doorframe expansion joints must be filled with an expansion joint material, and skirting can be rebated to fit over the steel doorframe.



As wood barely moves at all in the length expansions in the length need only be around 5 - 10mm total (Irrespective of the length) so that when the floor expands in the width the flooring board ends can slide along the wall without getting jammed. As engineered boards are more stable than solid the minimum of 3mm per L/m can be left more acceptably however again, if there is space try leave the maximum as no one wants to go back to a job to put the floor down if it can be avoided.

Please note that the absolute maximum width in any solid floor is 8 meters however if the floor is over 8 meters, then expansion joints must be at a maximum of 6 meters.

If the guaranteed elastic adhesive mat system is used then one can go up to 18 meters with no expansion in the middle of the floor, however acclimatisation of the timber in this case is vital especially at coastal moistures. (If not acclimatised then expect to do a lot of trimming back, as the wood acclimatises after installation but expect no damage to the floor boards or the elastic mat in this case.)

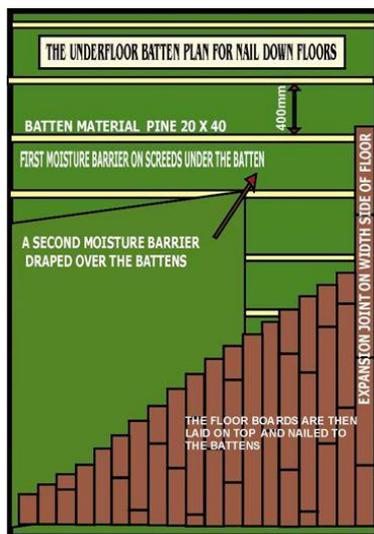
There are four recognised methods of installing solid strip flooring. The items listed in the heading above "**Laying of wooden flooring**" are the same for all four methods unless stated otherwise.

- 1. BATTEN/NAIL DOWN INSTALLATIONS:**
- 2. CRAWL SPACE INSTALLATIONS ON JOISTS:**
- 3. GLUE DOWN INSTALLATIONS: (ELASTISIZED ADHESIVES)**
- 4. PEEL & STICK PERMANENT BOND REINFORCED ELASTIC MAT SYSTEM:**



1. BATTEN/NAIL DOWN INSTALLATIONS:

- * On ground level installation of a 200/250-micron SABS virgin plastic should be fitted below and above the battens well overlapped at the joins.
- * Above ground (1st floor up) as long as moisture levels are tested dry to spec then a 200/250- micron SABS virgin plastic moisture barrier should be draped over the battens
- * Battens should always be from softwood, like Pine so the nail seats well without splitting and should be around 400mm apart, 20 x 40 cleats being minimum thickness. The batten fixing anchors must go through the screed by at least 25mm into the concrete slab.
- * Correct flooring nails must be used, alternately hand nailing using a 40-50mm Oval head nail. With oval nails on harder wood, pilot holes may have to be drilled to avoid splitting. (Pneumatic brad nails **are not** a correct nail for installing wooden flooring and are not acceptable)



Correct flooring nail

2. CRAWL SPACE INSTALLATIONS ON JOISTS:

Open crawl space installations using new Kiln Dried flooring is a definite **NO** and is guaranteed to fail (due to moisture in the crawl space) even if there are air vents in the crawl space. If you have to lay over a crawl space, the following methods can be conducted but are costly. Your customer must be made aware of this, as it is the only way you can give a guarantee.

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A) Plywood subfloor route:

- * Once the old floor has been removed, check all beams and joist for termite and dry rot.
- * If there is a sign of termites then now is the time for the owner to call in pest control.
- * If the structure needs any repair do it now using treated pine joists.
- * Lay 200/250-micron SABS virgin plastic on the soil and around the brick plinths.
- * Lay a second sheet well overlapped and deep looped over the joists, coming up the inside walls.
- * Lay a 3rd sheet of plastic shallow looped over the joists and up the inside walls.
- * Screw 18mm plywood onto the joists making sure the ends of the ply end on a joist and leave 5mm-expansion gaps around each board.
- * Lay a sheet of 200/250 - micron SABS virgin plastic over the ply.
- * Lay a 3mm-polythene foam sound cushioning barrier and nail floor onto the ply with correct flooring nails.
- * If the peel & stick mat is used then the plastic would need to stay but the 3mm polythene is not necessary.



B) Fill/Slab route:

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The client would require a builder to fill up the crawl space and have it compacted, a sheet of SABS 200/250mm-micron virgin plastic thrown over the fill and well overlapped at the joints. A slab can then be thrown and can be floated and screed if necessary. When all is tested dry, any of the three recognised installation methods can be used.



SAWLFA does not sanction the use of old wooden strip, block, carpets or slasto floors as a base or sub floor.

Methods mentioned under the heading of “CRAWL SPACE” are advised. If the installer is pressurised in using the original floor as the sub floor, a letter of indemnity stating clearly, that should the original floor fail or burst under the new floor, the risk is with the client.

3. GLUE DOWN INSTALLATIONS:

- Once tested dry 2 x coats of approved moisture barrier must be applied and the correct approved elasticised adhesives used. Twin Pack epoxy type adhesives **cannot** be used as the rate of movement of the wood is greater than the rate of movement of the adhesive and if used and the floor fails, the fitter will be held responsible for a complete replacement of the entire floor.
- It is vital that the adhesive is applied to the manufacturer's specification and this would normally be applied onto the screed with a 6mm-notched trowel. This goes for all glue down floors. Whether strip or block.
- If the fitter is using the liquid batten method then the thickness of the adhesive beads must be 10 – 12mm high and the spacing centres must be 150mm – 250mm apart.



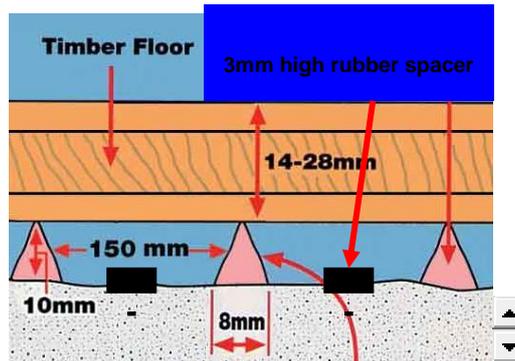
The flooring is adhered to the floor as well as locked together with tongue & grooves.

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- For Solid wooden flooring, under floor spacers of 3mm are compulsory so the glue dries at 3mm thick giving the glue the elasticity it needs to expand at the same rate as the floor.
- For engineered wooden floors the under floor spacer is optional.



- The association in the case of second hand Block floors would also sanction the Bitumen hot melt adhesives but they must be installed to manufactures specifications with the correct screed primers. However in the case of new blocks, the elasticised adhesive method is the route to follow.

Engineered and bamboo floors can also be glued down unless manufacturers spec prohibits this.

4. ELASTIC MAT SYSTEM:

This system is only 10 years old and is new technology; it is a suitable and guaranteed system for all solid and engineered T&G installations. The self-adhesive glue is re-enforced onto the mat with strands ensuring that the adhesive does not delaminate off the mat and the adhesive offers a permanent stick, with a bond guarantee of 70 years. **Beware** of copies that only offer a temporary stick and are not reinforced, as they are not suitable as an installation system for solid wooden flooring. We know how strong the flooring nails grip and how strong the adhesives are, so a system like this has to be equally as strong to work with the movement of wooden flooring. When the flooring expands in the wet season one cannot run the risk of the flooring popping off a mat with only a temporary stick or a mat breaking that has no reinforcing. Should a floor fail due to using an incorrect mat with a temporary stick bond that has no reinforcing, then the installer will be held responsible to either re-lay the floor correctly or replace the floor.

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Once tested dry a 200/250-micron SABS virgin plastic should be fitted on top of the screeds and well overlapped at the joints. The Elastic mat is laid 90 degrees to the direction of the floor (in other word in the opposite direction to the way the flooring is running) The mat is not overlapped at the joints.



Lay the plastic moisture barrier over the screed. Make sure this is well overlapped.



Lay the Elastic mat on top of the sheeting with the adhesive layer and protective foil facing upwards. Obviously these must not overlap.



Peel back a length of protective foil equivalent to the width of two strips of flooring .



Fold an extra piece of protective foil* (from a previous installation) in half lengthways (or cut off the equivalent of two board widths of the elastic mat to create a 'flap' of the protective foil).

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Carefully place the extra piece of folded protective foil on the exposed adhesive layer with the fold along the edge farthest from you (near the wall).*



Install the first row of wooden flooring along the full length of the room. Ensuring the correct expansion joints

From here on one would pull the flap out from under the boards, on the second or third row the dummy flap would be worked out and you would be on the flap attached to the mat that you originally peeled back. When no extra piece of protected foil is available then when rolling out the mat leave the mat longer by two floorboards peel the wrapper back by the two boards and then cut only the mat leaving a flap for you to begin the installation.



Here one can see an installation in progress

ENGINEERED PRE FINISHED FLOORING:

If the flooring is T&G then one of the three systems above must be used. In this case gluing the T&G and floating the floor can be acceptable (with a water based glue with some elasticity) due to engineered flooring being more stable than a solid wooden floor. Preference is rather given to one of the three recognised methods and manufacturer instructions must be adhered to (**Checking they are good for South African installation conditions**)

With inter-locking clip systems 200/250micron SABS virgin moisture barriers are a must with recommended underlay - again manufacturer's instructions are important here.

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Unfinished floors:

The sanding of the floor is normally started with a 40-grit paper onto a 60 - 80 and then 100-grit and the same for the edges with the correct flooring edging sander. (Please ensure that your sanding machines are well maintained and balanced and that the operator is well trained in floor sanding) There are some excellent new machines available on the South African market. An unbalanced machine or debris under the wheels can cause chattering marks and no chattering or graunching marks will be accepted. You could find yourself having to re-sand the floor at your cost. If you over sand the floor unacceptably then beware as you may find yourself replacing the entire floor at your expense.

Don't sub contract sanding out for floors you have fitted, as you are responsible for the job not the sub contractor. If you cannot do it yourself professionally, then stick to pre-finished flooring.

3 coats of sealer are the norm, discuss the gloss factor with your client (Semi gloss is the safest unless the customer wants other gloss factors like matt or gloss) and colour of floor after sealing. Water based is generally a lighter natural colour and solvent base is generally a darker look. Some timbers need a water base, like pink beech or maple as with a solvent base these timbers can get a yellow colour and the water base would keep the natural colour of the timber. One can also achieve a solvent base look with a water base finish. Imported water based sealers are self-levelling and give a brilliant finish. Local solvent-based sealers are acceptable but natural drying types are best without the catalyst drying chemicals. Mostly with local solvent sealers a 120/150-grit polish between coats is done. If using the imported water based floor sealers with a primer, then no polishing is to take place on that primer, if polishing is required it must only take place after the first coat. In the case of floor sealers please adhere to manufacturers application instructions and if the types of applicators are specified by the manufacturer then those are the applicators that must be adhered too. (Remember a bad sanding and sealing job can result in a failed installation and the flooring contractor may not get paid for the job.) If one is waxing or oiling a wooden floor then imported products are again recommended and it is vital to apply to manufacturers spec. Often pre-finished floors are safer as, no possibility of side bonding normally created when wet sealer seeps between the floorboards while still wet, and of course a perfect finish with no chance of unacceptable sanding marks.

Staining of wooden floors:

Staining of wooden floors is a major risk and should not be done unless you are a well skilled and trained fitter who has all the right equipment and knowledge of staining a floor. If one attempts this without the correct knowledge or equipment then the entire floor will have to be redone at your cost by a professional.

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If the floor cannot take anymore sanding then beware you may find yourself replacing the complete floor.

There are specialist, flooring stains on the market with detailed methods of application so success can be ensured.

UNDER FLOOR HEATING AND WOODEN FLOORS:

Under floor heating can be used with some Glue down applications (see manufacturers spec) and with the elastic adhesive mat system, the heat specification is the same as the laminate flooring – a soft heat to a maximum of 27 degrees by a probe set in under the floor, and uniformly distributed. However always check with the manufacturer or supplier that the flooring is ok to be installed over under floor heating

- Probe of heater under the floor not to get hotter (under the floor) than 27 deg. Celsius.
- The heating Elements are to be evenly spread under the floor.
- Heaters should not be under the section of floor where there are cupboards above.
- Heaters in sections where there are rugs or carpets could build up extra heat which could cause extra shrinkage.
- Shrinkage cannot be guaranteed, with or without under floor heating. Shrinkage can definitely be a reality with under floor heating, but using the Elastic permanent bond adhesive mat system would be the best system to stop or minimise the shrinkage due to the elastic properties of the mat.
- If one is really worried about shrinkage then it is suggested that during the winter or dry seasons a humidifier is run that can cope with the cubic meters/ air volume of the room at around 40 – 50% relative humidity.
- If shrinkage does occur then often when the rainy season starts, these gaps will possibly close up but are not guaranteed to do so.
- Under floor heating is NOT recommended with batten down installations as the heat dries the air in the air gap under the floor possibly causing major shrinkage and the installer being held responsible for continuing with such an installation. If pressurised to go this route then a letter must be signed by the owner waiving responsibility of excessive shrinkage or failure



This picture shows the probe under the floor

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Please note:

- * If a floor fails and you have adhered strictly to the above and an inspection is called for, the inspection should go in your favour. If the floor fails and you have not adhered to the above then you could be held accountable for the complete failure.
- * All the above are taken from correct installation procedures used around the world and also in keeping with the new technical research, in saying this SAWLFA cannot be held responsible for your floor failures.
- * The basic tools of a wooden flooring installer are:
 - ◆ Moisture Meter
 - ◆ Aluminium Straight edge
 - ◆ Tape Measure
 - ◆ Broom
 - ◆ Vacuum cleaner
 - ◆ Circular Saw (preferably a Guide Saw)
 - ◆ Flooring Hammer
 - ◆ Claw hammer
 - ◆ Knife
 - ◆ Carpenters Square
 - ◆ Drilling machine
 - ◆ Tapping Block – Check manufacturers specifications
 - ◆ Spacers
 - ◆ Jig saw and blades
 - ◆ Electric mitre saw
 - ◆ Table saw
 - ◆ Pneumatic nail gun

Should you wish to discuss any of the above procedures contact SAWLFA at any time.

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