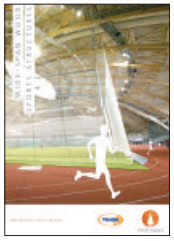
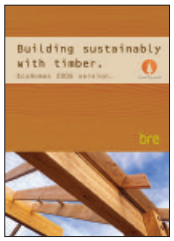
# the builder's guide to wood flooring.

wood. for good.








wood for good is a generic wood campaign sponsored by The Swedish Timber Industry, the Forestry Commission, ConFor (The Confederation of Forest Industries) and the Northern Ireland Forest Service. All members are committed to sustainable forest management. In each of the members' countries credible third party certification schemes are now operating and increased areas of forest are being certified.

Visit **www.woodforgood.com** for more information and for details of seminars, exhibitions and downloads of the following publications:

- Tackle Climate Change: Use Wood
- Climate Change Factsheets (9)
- Building Sustainably with Wood. EcoHomes 2006 version
- Building Sustainably with Wood. Case Studies
- Wide Span Wood Sports Structures
- Large Span Timber Structures
- Innovation and Sustainability. Wood Products for Architects
- Builder's Guide to Timber in Construction
- Builder's Guide to Plywood
- Builder's Guide to Timber in Joinery
- Builder's Guide to Solid Wood Flooring
- Factsheets (Flooring, Cladding, Costructional Timber, Glulam & LVL, Windows & Conservatories, Doors, Mouldings, Climate Change, Decking, Engineered Wood Products, Lofts, Plywood, Timber frame, Finishes)
- David Domoney's Garden DIY Book
- Michael Jewitt's DIY Wood Cookbook

## contents.



**All members of wood. for good. are committed to sustainable forest management. In each of the members' countries credible third party certification schemes are now operating and increased areas of forest are being certified.**

# a sustainable building material.

A wood floor is an environmentally sound choice when the timber is sourced from sustainably managed forests like those typically found in the UK, Nordic countries, Europe, Canada and the United States.

For additional reassurance, look for independent certification by the FSC (Forest Stewardship Council) or PEFC (Pan-European Forestry Certification).

Wood is a truly remarkable material.

It is naturally renewable. In Northern Europe our forests are growing, with an annual surplus of growth over harvest of some 252 million cubic metres* – almost 30 times the UK's total annual timber consumption.

Its use helps limit the growth of global warming, as growing trees absorb carbon dioxide and produce oxygen.

It requires relatively low energy inputs to harvest, transport and mill.

And, finally, it can be recycled and eventually burned for energy as a substitute for finite fossil fuels.

*Source: UN-ECE FAO TBFRA 2000

wood. for good.



## why choose wood?

A wood floor adds value – few features make such a difference to the appeal of a home.

A wood floor is an investment – a solid wood floor will last a lifetime and more, paying for itself time and time again.

A wood floor is individual – there is a wide range of solid wood floors available, from excellent value pine and spruce, through traditional beech and oak to exotic hardwoods.

A wood floor is easy to install – today's wood flooring is simple to fit, whether direct to joists or 'floating'.

A wood floor is easy to repair – dents and scratches can be readily repaired.

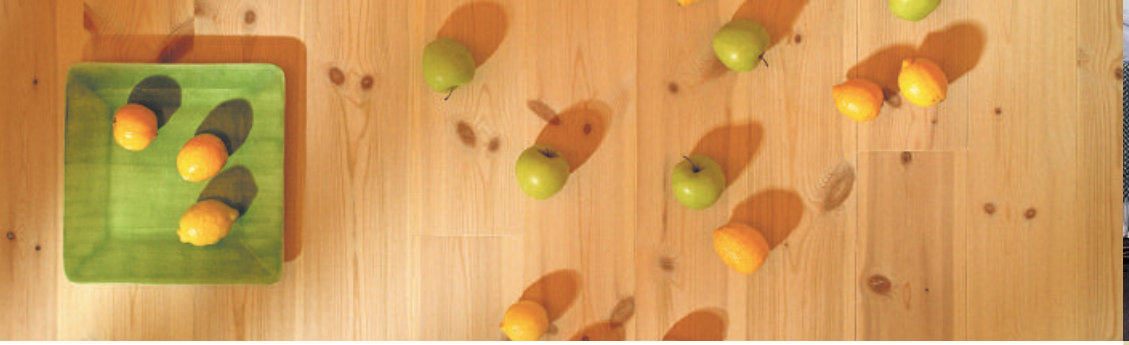
A wood floor is easy to maintain – maintenance depends on the type of wood, the type of finish and the pattern of usage. After some years, the floor may be sanded down and re-finished to look as good as new (many, many times).

A wood floor is versatile – different looks can be created by stains, paint, stencils or a variety of different oils and lacquers. You want to change the look? Just sand down and start again.

A wood floor is healthy – easy to keep clean and free of dustmites, wood floors are particularly beneficial for allergy-sufferers. Wood's humidity-regulating properties make a home healthier to live in, too.

**REMEMBER**

Only use wood that has been kiln-dried to 8-10% moisture for flooring. For best results, allow the wood to stabilise to the room's conditions for 24hrs (48hrs for hardwood) before fixing.



## softwood flooring.

The main advantage of pine flooring is that it provides similar benefits to hardwood flooring at a substantially lower price.

It is also highly versatile, lending itself to a variety of finishes as suitable for a contemporary city loft as for a traditional country cottage and is widely used throughout homes in Scandinavia and mainland Europe.

Softwood flooring is naturally more vulnerable to sharp objects (although dents and scratches can generally be repaired and, being a solid material, some surface marking can become part of the character of the floor). However, new compression processes can provide pine flooring with greater hardness even than oak. *See page 22.*

As with any wood floor, the amount of expected traffic and tracking-in of grit etc. needs to be considered when specifying finishes. *See pages 8/9.*

Use only specialised pine flooring. This comes:

- Shrink-wrapped in protected packs, complete with fitting instructions
- Kiln-dried down to 8-10%
- Tongued/grooved on all four sides
- Made from slow-growth timber (typically from Scandinavia)
- Taken from the heartwood at the centre of the log, for maximum stability
- Stress-grooved on the reverse.

Standard spruce floorings, as found in general house building, are not suitable for exposed finish floors because of their poor decorative finish and because they are not specially kiln dried. This can cause shrinkage and gaps between the boards.

## timber flooring specifications.

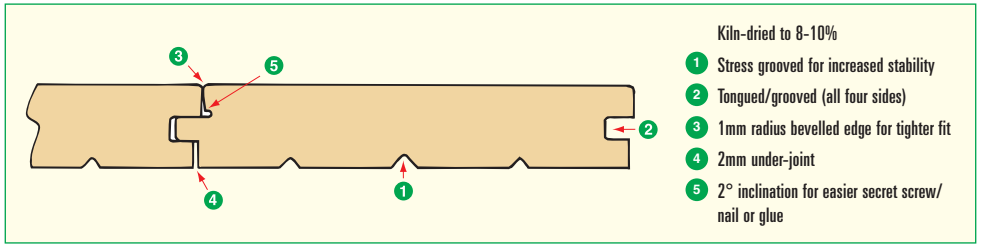
Solid soft or hardwood floors come in a variety of

- Lengths: 1200-5700mm
- Widths: 70-250mm
- Thicknesses: 13-30mm

Thinner boards are suitable for laying over existing floors, reducing the need to adjust doors and skirting heights.

Boards from 18mm are suitable for fixing direct to joists.

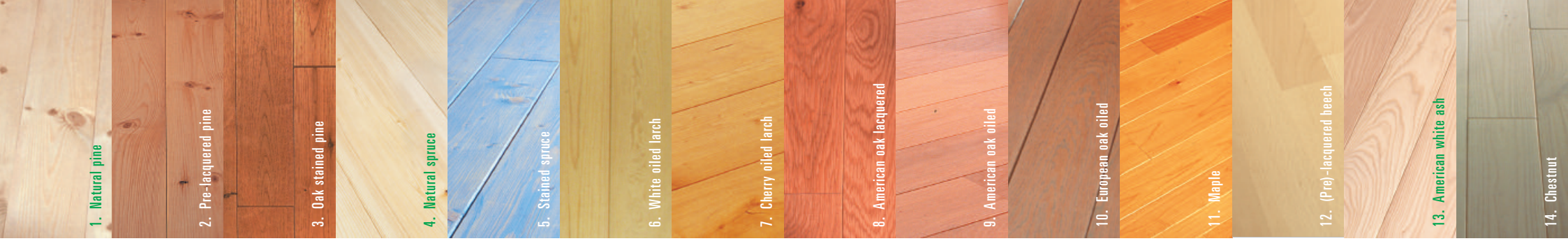
Individual production methods lead to minor dimensional variations, but the main finished sizes are listed below.




### Specification guide for solid timber floors

**Width (actual in mm)**

| Thickness (actual in mm) | 70 | 95 | 112 | 135 | 140 | 155 | 160 | 180 | 200 | 230 | 250 | 280 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13 | | | | | | | | | ● | | | |
| 14 | | | ● | | | | | ● | ● | | | |
| 18 | | ● | | | | | | | | | | |
| 21 | | ● | ● | ● | | ● | | | | | | |
| 22 | | | | | | | | | | | | |
| 25 | | | | | | | ● | ● | | | | |
| 28 | ● | ● | | | | | | | | | | |
| 30 | | | | | | | | ● | | ● | ● | ● |




## main species of solid wood flooring.

**Softwood**

1. Natural pine (redwood)
   Classic Scandinavian-style flooring. Good value, medium wear.
2. (Pre)-lacquered pine
   Easy-lay, easy-care.
3. Oak stained pine (lacquered)
   A more traditional look from a pine floor.
4. Natural spruce (whitewood)
   Simple, good value, medium wear.
5. Stained spruce
   An inexpensive way to get a colourful look.
6. White oiled larch
   A high quality flooring, with few knots. Suitable for heavy traffic areas.
7. Cherry oiled larch
   A warm, traditional quality look.

**Hardwood**

8. American oak (lacquered)
   Highly durable. A popular choice for all domestic floors.
9. American oak (oiled)
   Provides a stylish hardwearing floor.
10. European oak (oiled)
    Makes a design feature of the distinctive oak grain.
11. Maple
    A high quality hardwearing floor capable of heavy duty wear.
12. (Pre)-lacquered beech
    A hard, wear resistant floor, for a wide variety of situations.
13. American white ash
    A luxury hard wearing floor.
14. Chestnut
    Hard wearing floor with lots of character.


## main types of finishes.

The choice of finish depends on personal preference but also on practical considerations.

**Pre-finished lacquer**
Suitable for all usages.

Advantages:
- Simple to lay, as no finishing is required
- Simple to maintain; clean with a damp cloth
- Hard-wearing surface protects wood

Disadvantages:
- No opportunity for a decorative finish
- Will eventually wear where traffic is heaviest; just sand down and re-finish

**Lacquer/varnish**
Suitable for all usages. Use a product like Sadolin PV67 Heavy Duty Varnish.

Advantages:
- Multi-coat application can provide highly durable waterproof surface, even across joints (a well laid tongued & grooved floor will have minimal gaps)
- Flooring can be given a decorative finish by using a coloured varnish or by staining prior to varnishing
- Hard-wearing surface protects wood
- Simple to maintain; clean with a damp cloth

Disadvantages:
- Applying the lacquer takes a little time
- Will eventually wear where traffic is heaviest; just sand down and re-finish. The use of a 'sacrificial' emulsion polish will enhance the protective qualities of the varnish (i.e. it will wear, instead of the varnish)

**Oil**
Suitable for areas exposed to relatively low traffic and grit, like bedrooms. Use one of many wood flooring maintenance oils available.

Advantages:
- Provides a natural finish which allows the texture of the wood to be appreciated
- Can be combined with stains for a variety of effects
- Localised damage, like dents and scratches, can be readily repaired with a fresh application
- Floor can be re-treated without sanding

Disadvantages:
- As the oil doesn't provide the impermeable surface of a lacquer, the wood will be more vulnerable to standing water or tracked grit
- Requires several initial treatments
- Requires regular re-treatment, typically annually, depending on wear and frequency of cleaning


**Soap**
Suitable for areas exposed to relatively low traffic and grit, like bedrooms. Use one of many wood flooring natural soaps available.

Advantages:

- Traditional treatment creates a deep lustre which gets richer over time and with repeated application
- Localised damage, like dents and scratches, can be readily repaired with a fresh application
- Floor can be re-treated without sanding

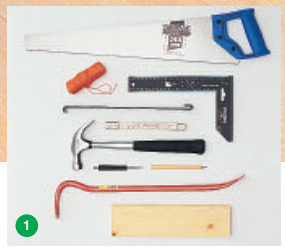
Disadvantages:

- As the soap doesn't provide the impermeable surface of a lacquer, the wood will be more vulnerable to standing water or tracked grit
- Requires several initial treatments
- Requires regular re-treatment, typically annually, depending on wear and frequency of cleaning

**Lye**
This is a treatment used to help preserve the wood's natural pigment and prevent darkening. It also opens the wood's pores prior to finishing.

**Stains**
A varnish like Sadolin Polyurethane Floor Varnish is available in 4 colours, clear satin and gloss (to see the colours available see www.sadolin.co.uk). Sadolin PV67 is also available in clear satin and gloss finishes.

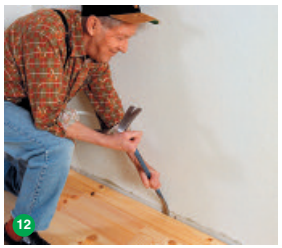
**Paint**
Wood floors can be painted in the usual way. A gloss finish will be easiest to keep clean.



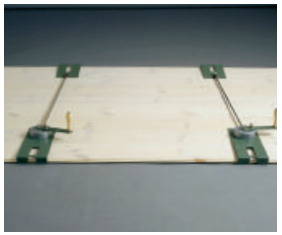
## laying a solid wood floor on joists.

1. Make sure you start with the right tools.
2. Secret nailing is most common, especially for hardwood floors, but screws can minimise creaking. Use special screws with small heads and cutter ribs. They can be countersunk at 45°, using the screw bits supplied with the screws, without splitting the tongues.
3. Use only kiln-dried boards (8-10%). Ensure joists are 14% or drier. Open pack and leave boards in room for 24 hours. Note instructions may be in pack or back of pack.
4. Remember to put 8mm spacer blocks against all walls to allow for natural movement. To reduce noise transmission, use felt, building paper lining, or one of various specialist underlays (like Hoebeek's, or Swiftwood's 'Woodlay') under the flooring. In any building project, check you are complying with Building Regulations.
5. It is important to start correctly. Use a string to ensure you get a straight line. The distance between joists should not exceed 600mm. As the boards are end-jointed, joints do not always have to be over joists.
6. Use a piece of board as a hammering block.
7. To 'secret nail', place the nail (or special screw) diagonally through the tongue into the joists.

8. Use a punch to sink the nail without damaging the board.
9. Remember to glue the boards at the ends (not at the long sides if you are nailing).
10. A special tool may be useful for getting the last board in place.
11. Cut round pillars, angles, etc. Measure the amount of board you need to cut away, leaving enough room for an air gap. Lay the board on top of the outside row and exactly in its final position. Mark the board where you intend to cut using a Try square.
12. Slot the boards together lengthways after the last board in each row has been laid. Use a crowbar if necessary. Remember to protect the wall with a wedge.
13. Before laying the last row, you may need to cut the board lengthways using a circular saw. Don't forget to allow a gap between the board and the wall.
14. Begin by lightly sanding down the floor before undertaking any surface finishing.



## laying solid wood flooring as a floating floor.



- For best results, use a fixing clamp similar to the one shown, available from any builders' merchant
- Apply the same perimeter and expansion gaps as when laying a floor on joists
- A floor wider than 5 metres should be split into sections, with a 'T' piece, or threshold plate, fitted between sections to allow the floor natural movement

- Ensure the entire floor surface is clean, dry and free of projections
- Use a 1000 gauge polythene sheet, to form a suitable vapour barrier
- Additional thermal or acoustic insulation can be achieved through using recommended underlays (such as Hoebeek's, or 'Woodlay' from Swiftwood)

- The boards will need to be glued
- Turn the board wrong side up and hold it diagonally towards you
- Glue the upper edge of the tongue – when the board is turned the right way up the glue will run down the boards
- Apply the glue lengthways and widthways
- Remove any excess glue from the surface of the board

**REMEMBER**
For best results, allow hardwood flooring to stabilise to the room's conditions for 48hrs before fixing.

## tips on fixing hardwood floors.

**The right tools**
- A hardwood floor is a significant investment; it always pays to use the best quality tools, underlay, finishes and adhesives
- Where possible, lay the floor last, to avoid damage

**Nailing**
- Always use nails (unlike softwood floors)
- Nail at 200-250mm centres
- Cleats may be used to allow movement in the floor
- Nail size can be reduced to 45mm (assuming an 18mm or thicker floor) if a 50mm cleat cannot be used
- Always use a recognised nailing tool, such as a 'Powernailer' with mallet and 50mm cleats

**Fixing denser species**
- To avoid splitting the tongues, vary the 45° angle of the nails
- It might also be necessary to drill pilot holes to make nailing easier; blunting nail/cleat ends will further help avoid splitting

**Fixing to existing boards**
- Ensure existing boards are dry
- Lay a plywood subfloor of a minimum 12mm thickness
- Lay and nail as onto joists

**Finishing**
- Wear a dust mask when sanding floors; eye protection may be useful to help avoid dust allergies sometimes associated with imported hardwood species
- Check with both wood and finish suppliers that the treatment is suitable – natural oils and chemicals of some imported hardwoods can react differently to certain finishing products
- If you are working with a new species, use a sample and test it with the proposed finish to view the effect

Jaume Plensa - Installation at BALTIC, 2002. Photo - Neville Blasz

## maintaining wood flooring.

**Basic advice**

- Prevent the tracking-in of grit etc. by using effective entrance matting
- Avoid contact with sharp objects or concentrated pressure, like stiletto heels
- Place pads or cups under furniture
- Dry clean (with a brush, mop or vacuum) and damp clean (with a soap solution) regularly

**Damp cleaning**

- Use a flat mop with a natural soap solution, wrung damp to avoid excess wetting and to dry quickly. This removes minor stains and helps repair scratches and dents as the wood fibres absorb the solution

Hoebeck

**Persistent stains**

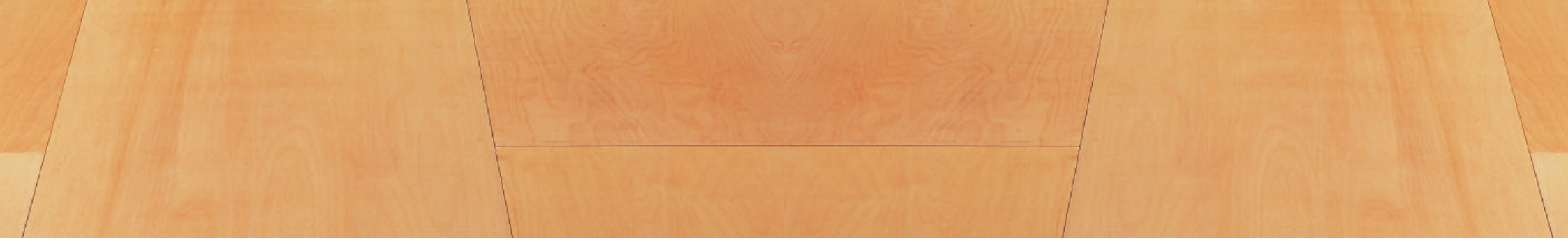
- Sand the area lightly with grade 80 paper
- Re-sand smooth with grade 220
- Apply natural soap or oil and leave to dry

**Oil or soaped floors**

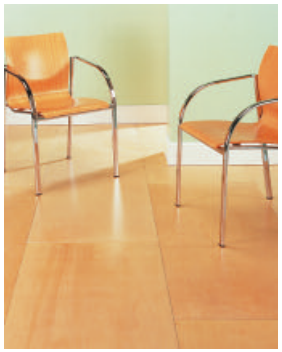
- Use a proprietary intensive wood flooring cleaner
- Scrub the floor with a mop soaked in the solution
- Remove excess dirty water with a mop wrung out in clean water
- Leave to dry naturally (for about 30-40 minutes)
- To re-oil, apply maintenance oil with a soft cloth and burnish
- To re-soap, use natural soap diluted with warm water

**Machine maintenance (commercial premises)**

- Remove all dry dirt
- Apply a solution of intensive wood cleaner with a rotary polishing machine
- Remove excess solution and dirt with a wet pick-up vacuum
- Treat with a light coat of soap or maintenance oil
- Remove excess soap or oil with a clean cloth
- When dry, floor may be burnished using a high speed rotary polisher



## plywood decorative floors.



Specialist plywoods, such as Schauman Birchfloor *(see later for stockists)*, provide attractive, structural and hardwearing flooring for both commercial and domestic applications. They can be laid onto a variety of surfaces, like joists or concrete, provided correct procedures are followed.

It is worth considering the following points at the design stage

- Are there any structural load needs?
- What is the nature of the sub-floor onto which the panels are to be laid?
- How will the floor be used?
- What wear resistance is required?
- What are the overall site conditions?

Schauman Birchfloor, used in appropriate thicknesses, laid to standard practice as a suspended floor, will meet the loading requirements of BS 6399 part 1:1984 "Code of Practice for dead and imposed loads" for domestic floors with a spanning range of 300mm-600mm.

More information on plywood can be found in the Builder's Guide to Plywood, available free from wood. for good.

**Warning**
If you use plywood structurally that isn't listed in code BS 5268-2:2002, you risk liability, should failure occur. Don't take the risk – all Nordic structural plywood is listed in the code.

**Specifications**
The boards are made up of 1.4mm birch veneers (exterior glued, bonding class 3 BS EN 314:1993).

| | |
|---|---|
| Thicknesses: | 9/12/15mm for overlaying existing floors<br>12/15mm for floating floors<br>15/18mm for joisted floors |
| Panel size: | 1200mm x 600mm (laid measure)<br>1500mm x 750mm (laid measure) |
| Profile: | Tongued and grooved, with a slight chamfer, to all four edges |
| Finish: | Sanded, with natural, unfinished birch veneer |
| Fire properties: | When laid in accordance with the manufacturer's instructions, it will have fire resistance not less than a similar thickness of solid timber softwood flooring. |

**Protection**
These panels have highly decorative faces and accurately machined tongued and grooved edges for easy fitting, so make sure they are protected from damage before use:

- Ideally, lay the floor last
- Treat the boards with a suitably thick coating of protective varnish/lacquer, like Sadolin PV67 or Polyurethane Floor Varnish, before laying, to prevent damage (varnish is best applied thinly – build the thickness up by applying several layers)
- Seal the reverse face too, so as to ensure the boards stay in a balanced condition; check they are dry before laying.

## fixing plywood onto joists.

Plywood panels are fixed in much the same way as solid timber flooring:

- Ensure joists are dry and even, presenting a level surface (regularise, if necessary)
- Lay panels with the face grain parallel to the span
- Support all short edges on a joist
- Stagger end joints
- Support perimeter on continuous noggins
- Allow a perimeter expansion gap of 2mm/metre floor width/length, with a minimum 10mm gap
- Use a waterproof PVA adhesive to glue joints and panels to joists
- Secret nail/screw to existing joists, using galvanised annular ring shank nails 2.5 times the panels' thickness, or countersunk screws recessed 2mm below the panels' surface
- Space fixings not less than 10mm from the panels' edge and at 300mm intervals elsewhere
- For extra fixing, use a suitable mastic, applied to the underside of the panels and to the joists.

## laying plywood onto continuously supported floors.

- Ensure surface is clean, dry and flat, free of any projections; screeded floors must be fully dry
- On concrete, beam and block floors, lay a 1000 gauge polythene sheet as a vapour barrier
- Lap and seal joints with a vapour-resistant tape
- Depending on the amount of thermal insulation required, an insulating underlay (such as closed cell extruded polystyrene) can be placed on the sub-floor
- Lay the panels with the short edges staggered
- Spot-bond the underside of the panels to the sub-floor with a mastic-type adhesive
- Allow expansion gaps as with fitting to joists
- Pre-plan access traps and provide support with noggins etc. on all sides.

Walk on Wood compressed engineered flooring

Södra-Semi flooring cassette

## engineered and innovative wood flooring.

Full plank

Half plank

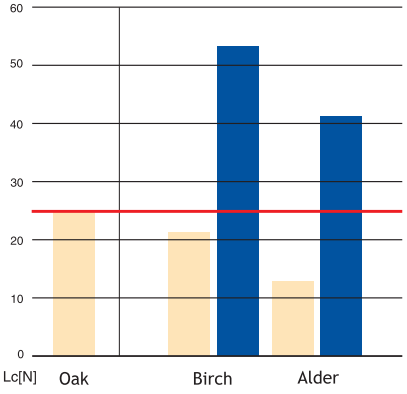
Two-row slats

Three-row slats

**Wood veneers**
A real wood surface, typically 2.5mm to 3.5mm thick, combined with a three-ply veneer substrate, provides the look and feel of natural wood with greater stability and lower cost. Often the veneers, glued crosswise for stability and accuracy, are from the same species as the surface. Sometimes they can be made of plywood.

The planks come in a variety of formats, tongued and grooved, with a hardened finish of up to six coats of lacquer, oil or wax.

**Compressed wood**
Generally only a limited number of species used to be considered suitable for hard-wearing floors. However, new, patented compression processes can produce a threefold increase in the hardness of the wood, making species like birch, pine and spruce harder-wearing than oak and eminently suitable for use in public buildings.




Abrasion resistance before (light) and after (dark) compression is comparable to that of untreated oak (red line). The higher the value, the higher the floor's abrasion resistance.


Engineered flooring with hardwearing solid wood surface.

**Constructional solutions**
Major manufacturers, like Södra and Finnforest, are supplying readymade systems that are changing the way floors are installed in large-scale commercial buildings.

'Södra-Semi' is a cost-effective pre-fabricated party floor system, specially developed to meet the demand for sound insulation. Södra-Semi Housing meets the high standards of sound insulation, fire safety and load-bearing capacity required in the housing sector, while Södra-Semi Office meets the specific requirements for office buildings.

Finnforest offers a range of engineered timber floors and 'Finnjoist' I beams, together providing a guaranteed dry, stable timber floor solution.

I beams.

## frequently asked questions.

**Q** Can I use any solid wood flooring from my local supplier?
**A** No. You must ensure the product you are buying has been specially manufactured and kiln-dried down to a moisture content of 8-10%.

**Q** Do I have to take up the existing floorboards to lay a new solid wood floor?
**A** No. Providing the existing floorboards are dry and secure, you can use a thinner solid wood floor – say 14mm – which can be fitted directly onto the existing boards.

**Q** Can solid wood flooring be used in kitchens and bathroom?
**A** Yes. As long as it is finished and maintained to the manufacturers' instructions.

**Q** Why do you often see wide gaps between the floor boards?
**A** Gaps result from poor fitting and high moisture content. Specially kiln-dried and tongued and grooved boards will fit neatly with a minimum of movement.

**Q** Aren't wood floors noisy?
**A** No. Correct installation, with a specialist underlay, significantly reduces noise transmission.

**Q** Are wood floors warm?
**A** Yes. Wood is a good thermal insulator and a poor conductor of heat, so wood floors feel warm to the touch.

**Q** Are wood floors healthy?
**A** Yes. Solid wood floors are easy to keep clean and free of dustmites (a benefit to allergy sufferers); they contain no chemicals or toxins (like the moth-proofing in carpets) and will help regulate the room's humidity.

**Q** If I am not a qualified joiner, how do I find someone to fit a solid wood floor?
**A** Your supplier may recommend a local joiner or builder. Or contact the Contract Flooring Association, who will put you in touch with a local member.

**Q** Can I use underfloor heating with solid timber floor?
**A** Yes. The timber has been specially kiln-dried to accommodate underfloor heating, but you need to liaise with the heating system manufacturer prior to installation.

**Q** Does a solid wood floor need to be specially installed?
**A** It can be fixed by secret nailing or screwing. Manufacturers provide precise fitting instructions with their products.

**Q** Will a wood floor damage easily?
**A** Damage resistance depends on the species and finish you specify. In general, care should be taken to avoid contact with sharp objects and tracking in grit. As it is a solid product, some wear and tear can become an attractive part of the character of the floor - although minor scratches and dents can usually be easily repaired.



## suppliers and stockists.

### Flooring

| | | |
|---|---|---|
| M&S Softwoods Ltd (softwood) | | 01553 760071 |
| Buildbase Ltd (hardwood) | www.buildbase.co.uk | 01865 871700 |
| A.W.Champion | www.championtimber.com | 020 8949 1621 |
| Jackson Building Centres Ltd | www.jacksonbc.co.uk | 01522 511115 |
| Jewson Ltd | www.jewson.co.uk | 02476 438400 |
| Taylor Maxwell Ltd | www.tmtgroup.co.uk | 0113 274 4655 |
| Timbmet Ltd | www.timbmet.com | 01865 860300 |
| Travis Perkins Ltd | www.travisperkins.co.uk | 01604 752424 |
| E.A. Stephens Ltd | www.lpcc.co.uk | 01519 229952 |
| C.W. Berry Ltd | www.cwberry.com | 01772 431216 |
| Rembrand Timber | | 01382 323200 |
| East End Sawmills Ltd | sales@eastendsawmills.co.uk | 01415 547294 |
| Swiftwood Imports Ltd | www.swiftwood.co.uk | 01945 587000 |
| Baseco | www.basecofloors.co.uk | |
| Gilsons Timber | www.gilsonstimber.co.uk | 01752 772775 |
| Robbins Timber | www.robbins.co.uk | 0117 963 3136 |
| M.A.F. Kildea | www.wood4floors.co.uk | 020 8699 7527 |

### Finishing products

| | | |
|---|---|---|
| Sikkens | www.sikkens.co.uk | 01480 496868 |

### Underlays

| | | |
|---|---|---|
| Ball and Young | www.underlay.com | 01536 200502 |

### Maintenance

| | | |
|---|---|---|
| Dane Care | www.danecare.co.uk | 01476 762307 |
| Hoebeek (contact via Taylor Maxwell) | www.hoebeek.be | 0113 274 4655 |

### Fitting

| | | |
|---|---|---|
| Contract Flooring Association | www.cfa.org.uk | 0115 941 1126 |

### Softwood manufacturers

| | |
|---|---|
| Baseco | www.basecofloors.co.uk |
| GAPRO | www.gapro.se |
| Setra | www.setragroup.se |
| Siljan | www.siljan.com |
| UPM-Kymmene Wood Ltd | www.wisa.com |
| Södra | www.sodra.com |

### Softwood and hardwood manufacturers

| | | |
|---|---|---|
| Hoebeek (contact via Taylor Maxwell) | www.hoebeek.be | 0113 274 4655 |

### Engineered wood manufacturers

| | |
|---|---|
| Finnforest | www.finnforest.com |
| Södra | www.sodra.com |
| Walk on Wood | www.walkonwood.nu |
| UPM-Kymmene Wood Ltd | www.wisa.com |