

exceptionally engineered wide-plank wood floors

While non-engineered solid wood is undoubtedly the grandfather of wood flooring, today's discerning clientele demands exceptional wood flooring that combines classic or contemporary style with the most up-to-date wood technology and performance characteristics.

Wide single-face planks (155 to 340mm) are, without doubt, the most beautiful wood flooring option available. Multi-strip, narrow strip and low budget alternatives pale in comparison. However, when choosing a wood floor, one must look further than simple aesthetics. The changing seasons when combined with various heating systems, subject today's environments to quite extreme changes in temperature and humidity. When subjected to these changes, non-engineered solid wood floors tend to gap, cup and warp - ill effects that can usually be seen within one to three years after installation. To overcome such problems solid wood must be precision engineered and, to do this correctly, an intimate understanding of wood and its properties is essential.

Understanding wood and its properties

It is important to understand that wood is a material derived from a living tree, composed substantially of water. This gives wood the inherent characteristic of expanding and contracting when subjected to environmental changes in temperature and humidity. Because of this, the annular concentric growth pattern of the tree will also cause unequal stresses within sawn timber which, in turn, will cause otherwise flat planks, boards or strips to expand, contract and exhibit curved distortion.

A tree, whether living or felled, is composed almost entirely of organic matter - with cells of cellulose, hemicelluloses and lignin forming the actual physical structure. The lignin bonds and stiffens the woody structure while the cellulose and hemicelluloses add strength and elasticity. The sap, formed from the water that percolates through the roots, feeds the cells that expand or contract according to the quantity of water available for generating 'food' for the tree's growth.

When manufacturers quote moisture content of wood it is calculated as a percentage of the kiln dried weight of the timber, which is why green timber may have moisture content greater than 100%. When the moisture content drops to about 28% (the fibre saturation point) during seasoning, it does not produce significant shrinkage. However, below this value, there is a marked reduction in the water held in the cell walls, causing the wood to shrink as it dries. By the same token, expansion takes place if the moisture content of 'dry' wood increases up to 28%. It should be noted that wood loses moisture until it reaches equilibrium with the amount of water in the air around it; in this condition the wood is regarded as acclimatised and stable. However, equilibrium will be upset as the humidity of the surrounding air changes.

For wood flooring to be used indoors in heated buildings it is essential that the moisture content be matched as closely as possible to the normal onsite environment and that means a moisture content below the air dried 18%.

While timber for constructional purposes is supplied and installed at around 18-24%, internal wood structures such as flooring should use wood prepared and assembled at about 12% moisture content.

Changes in the moisture content play havoc with the dimensional stability of the wood, the most noticeable effect being across the grain. To avoid that unwanted movement, it is essential that users and specifiers relate the moisture content of wood at the time of fabrication to that of its intended environment to ensure that they are in equilibrium. It is equally important to maintain this moisture content during storage and installation.

The degree and type of movement exhibited by the planks or boards, although differing between the various wood species and log-sawing methods employed by the manufacturer, is greatly determined by the type and construction of the planks.

Non-engineered solid wood

Normally available with maximum widths of only 150mm, non-engineered solid wood might appear to be the most immediately attractive option for the modern interior but it is certainly not the most stable with regard to expansion and contraction in a changing environment of temperature and humidity. With decreases in humidity in the exposed wear surface, it will suffer from cupping (concave curving) of the boards or planks as the surface layer dries out. Gaps will appear between the planks as each whole plank dries and shrinks. If the floor has been sanded in an attempt to rectify cupping, the floor will very likely exhibit crowning as equilibrium is restored. Increases in moisture content may also generate excessive compressive forces around the perimeter of the floor - sufficient in some instances for the floor to lift in the most stressed areas. Compared to non-engineered solid wood floors, there is no doubt that the dimensional stability of Mafi engineered wood floor provides a superior installation and a long-term, successful wood flooring solution.

Engineered Wood

Engineered wood flooring has captured 72% of the European market, most markedly at the high end - a sound testimony to its superiority. This type of flooring is accepted by the industry as the most dimensionally stable of the wood flooring options. The novel construction of the wood plank counteracts the forces that make wood expand and contract dimensionally across the direction of the grain. Quite simply, well-engineered wood flooring is a sandwich-like construction of three, not two, layers, the core or inner layer having its grain running at right angles to the two outer layers. Because this core wood is a softwood, it is able to withstand considerable bending and distortional forces along its grain direction and resist any dimensional tendency of the outer layers to change as a result of fluctuations in temperature or humidity. The dimensional stability of Mafi exceptionally well-engineered wood flooring can allow it, for example, to be confidently installed over underfloor heating systems.

Premium-engineered planks are more expensive to produce than solid wood planks. The success of premium-engineered planks, however, has encouraged less fastidious manufacturers and suppliers to offer cheaper, low quality products. Typical examples of low-quality might be two-layer instead of three-layer plank constructions; planks with wood species or materials on the bottom layer that differ from the wood species on the top layer are imbalanced; ply-backed veneers; variations in the density of the core material; poor bonding of the layers; inadequate quality control in the precision machining and inferior plank construction. Such faults compromise the performance of engineered wood with respect to its most important attribute - stability. As with any product that is engineered, insufficient levels of engineering expertise and cost-based compromises will affect product performance and longevity.

The best premium-engineered wood

The Mafi wood flooring range is world famous for its uncompromising engineering standards. Not only are the softwood centre cores of our planks structurally sound but, most importantly, they are formed from blocks with alternating and opposing cross grain to provide guaranteed resistance to any possible warping effects. Both the 4mm top wear layers and the bottom balancing layers of our planks are of the same wood species in identical dimensions; this is critical to ensure that the rates of expansion and contraction will not differ between the top and bottom of the planks. The plank's depth is 19mm - this guarantees outstanding structural integrity and exceptional strength.