How thick should veneer be?

In this third of a series of workshops relating to the modern use of wood veneer, wood industry consultant *Michael Buckley* explores some of the technical issues, especially the issue of veneer thickness for applications such as furniture and flooring.

The thickness of veneer is crucial not only to its performance in use but also to its handling in production and cost.

Modern technology has resulted in almost no limit to the "thinness" of sliced wood veneers but there are limits to the degree of practicality in handling that is acceptable and also that of damage, failure and waste.

There are also other factors to take into account such as human behaviour and expectations.

Environmental factors

In Asian households, where shoes are not worn, the face veneer in engineered flooring can be much thinner than in western homes where shoes, and especially ladies' high-heels, may easily damage floors.

High traffic areas in public spaces require even greater thickness. Face veneer thickness outside Asia thus can range between 2mm and 3.6mm but may need to be as thick as 6mm in some western markets.

Wood species

Wood species is another issue and the decision to use any particular type is just as crucial.

The assumption is that suitably hard species such as hard maple or oak veneer will be chosen for engineered flooring over species such as black cherry or soft maple if high traffic is anticipated.

The architect of the Opera House in Gothenburg, Sweden did in fact install cherry flooring, as did Renzo Piano in his now famous Rome Auditorium.

A prominent example of appropriate wood species selection is the long-running range chosen by IKEA for their utilitarian veneered furniture.

Hardwearing birch, beech and ash have all been catalogue favourites for IKEA "budget" furniture for years, with oak as their higher-end mainstay.

In the finest furniture and panelling, where abrasion is less of a factor, softer species such as American cherry, red alder

Veneered panels and engineered flooring at Bangkok Architects

or sycamore can be used.

Among the tropical species, teak is, as always, a winner, being hard and highly resistant to crushing and abrasion together with such other benefits as ease of slicing and flexibility in handling.

Benefits of thin veneer

The use of veneer is well known to be an environmentally acceptable way of extending the forest resource, which is especially important for high quality logs in relatively rare or less available species.

The current demand trend for furniture in dark and exotic species such as American walnut and African wenge is a case in point. And here the cost is another element.

For example the difference in material cost between a standard 0.6mm veneer and 0.55mm is eight percent, which is a worthwhile savings in cost and valuable resource if it does not compromise the standard of the product, or its use.

At the extreme end, there is now technology, developed by Japanese and Taiwanese machine producers, and used in China, that allows veneer to be produced at 0.2mm or even 0.15mm where the material cost saving is huge.

However, the loss in veneer damaged by handling, and the investment required for special plant, also needs to be put into the equation – and this is assuming that the end product will perform.

American white oak veneered plywood (Courtesy of Columbia)

Moisture control

Another benefit of ever thinner veneer is in the environmental impact by the reduction in drying costs, until that cost even becomes insignificant.

In fact, ultra-thin veneer is so delicate and usually moist it must be applied almost immediately as it is produced without drying; but requires plant investment by product producers rather than the specialist veneer slicers which then trade veneer to world markets.

Moisture control is thus very closely related to veneer thickness and there are no hard and fast rules by which to go.

As all in the wood industry well know, wood moves according to its inherent and ambient temperature and humidity and this is especially true for veneer. Anywhere between six and 16 percent MC may be called for, depending on location, use and process.

The optimal thickness

Ultra-thin veneer also limits the extent to which it can be manipulated for book-matching or continuous matching for panels – a subject to which this series will return.

The original thickness of such veneer must also take into account the subsequent manufacturing processes involved, such as sanding which reduces the final thickness; for which 0.3mm might be considered a minimum pre-sanding thickness.

The optimum thickness requirement can also be determined where wrapping products such as mouldings or profile doors are needed. In most cases the thickness for such production is determined by the process itself, such as postforming as well as the selection of suitable species.

As with all forms of wood, the individual species have an influence in terms of flexibility, strength and stresses that may cause buckling or uneven surfaces while processing.

Adhesive requirements

There are also issues that relate to the thickness of veneer and the adhesive system used.

In Australia, which has developed veneer standards, the standard thickness of 0.5/0.6mm for hoop pine plywood producer Austral Plywoods Pty Ltd is too thin because wet phenolic

glue, which is normally used, bleeds through this light-coloured species too easily, causing unacceptable staining.

So for their production of thin three ply 1.8mm plywood, the solution is a dry Phenolic glue film.

Differing veneer thicknesses

Shaun I Wood, a Taiwanese owned veneer producer with laminating facilities in Malaysia, is slicing to 0.5mm and 0.6mm but also rotary peeling down to 0.2mm. They report that Japanese slicers are even producing 0.15mm.

However, 0.5mm is the thinnest that they can export due to the handling problems associated. In the case of shipments to Malaysia veneer is shipped by Shaun at 16%MC due to the ambient humidity there.

In the USA, veneer thickness destined for panels and furniture tends to be greater than in Europe.

In Germany, Schorn and Groh GmbH offer a sanded veneer of maximum 1.25mm whereas there are American suppliers offering up to 1.55mm for "thick" veneers.

For engineered flooring there is technically no upper limit to the thickness and the only question then is "When does veneer become solid wood?" which may have tariff implications for internationally traded veneer.

Specialist veneers, such as the engineered architectural veneer "Vinterio" produced by Danzer, are offered in a range of thicknesses from 0.7mm for many species and down to 0.55mm for the more expensive species such as black walnut.

In parquetry, where veneers may be "let in" to solid wood or veneered panels, thickness may be a nominal 1mm in order to allow for sanding down to the same thickness of the host material for final finishing.

Standard thickness rules seem to fall apart once the new breed of lay-ons and veneer sheets with special backing is concerned, but whatever the product the matter of thickness consistency is the major goal of most veneer producers and users.

In conclusion it has to be said that in surfing the web for veneer supplies, among some excellent sites featuring many wood species in fine detail, it is surprising how few state anything about thickness or tolerances at all! PFA

About our Columnist

Mr Michael Buckley's expertise is on the uses and market applications of hardwood species and products. With a Masters in the US and EU hardwoods, Mr Buckley is a Fellow of the Institute of Wood Science and commenced his career working in tropical plywood and panelling in Europe and Asia. He is a Liveryman of the Worshipful Company of Carpenters, an ancient craft guild in the City of London. In recent years he has taken a keen interest in designing with timber, working with leading furniture designers and many architects. Now based in Singapore, he continues close ties with furniture and panel industries in the region.