

Good Industry Practices On Timber Flooring



School of Graduate Development and Management

Good Industry Practices On Timber Flooring

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Ms. Tan Lih Tuan

Managing Director



Perswood Pte Ltd is a established timber flooring company in Singapore and Malaysia for quality timber floor projects in commercial, condominium, education and private residential sectors.

- Certified timber floor inspector with ATFA (Australian Timber Flooring Association)
- Lecturer at BCA, Singapore for Good Industrial Practices for Timber Flooring, since 2005
- Member of the NWFA (National Wood Flooring Association, USA)
- Member of ATFA

Topic Outline

Session 1 - Design & properties of wood
Relationship of water and wood
Key differences between solid and engineered wood

Session 2- Productivity efficiency with engineered Wood
Design consideration in using engineered wood
Delivery/ Handling/ Storage
Preparatory works for solid and engineered floor

Session 3 - Good installation practices of solid and engineered floor
Installation of skirting
Protection / Maintenance

Session 4 - Common complaints
Conquas Assessment
Repair and touch up techniques
MCQ assessment

Session 1:

- Design / Properties of Wood
- Relationship of Water and Wood
- Key differences between Solid and engineered wood

Strip Floor

- Solid boards installed in parallel rows, produced in various thickness and width. The strips have tongue and groove profile on width and sometimes at end of strip. They are for nail down installation directly to plywood sub-floor.



Block

- Individual short strip floor, usually not more than 400mm in length produced in various thickness, may or may not have tongue and groove profile. Blocks are for glued down installation directly to screed sub-floor or over plywood sub-floor.



Engineered Floor

1. Finishing layer

This finishing layer may consists of: layers of UV-cured water based lacquer or oil, wax. This layer protects the floor against wear, scratches and stains, and makes it easy to maintain.

2. Hardwood wear layer

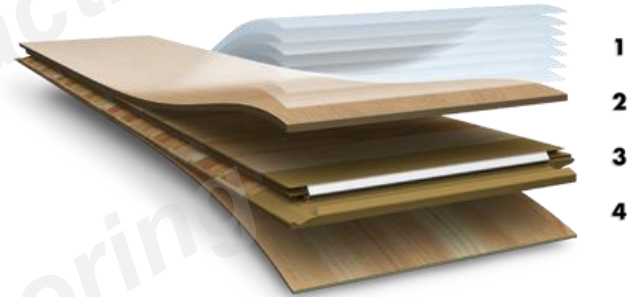
Solid wood layer in different species and available in smooth flat surface or texture effect like wire brushing, distressed, scrapped, fire torched etc... Wear layer range from 2mm to 8mm, most commonly available are 3-4mm. The wear layer can be sanded and refinished if the thickness is more than 2.5mm

3. Core layer

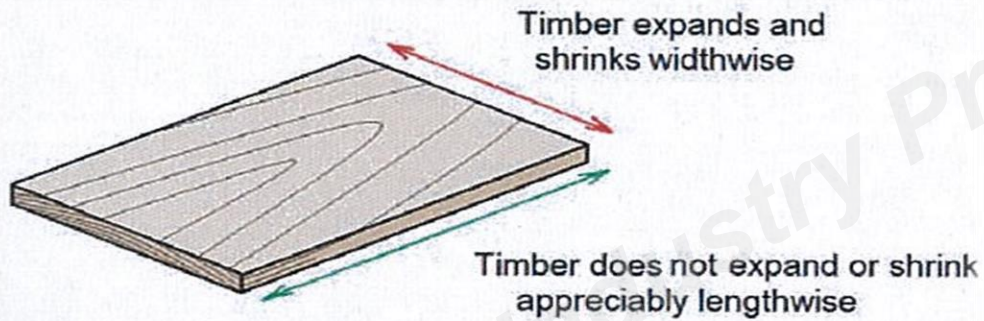
The core layer It absorbs stress and strain and keeps the floor stable in all conditions. The core layer may be made up of multilayer plywood, plantation wood, HDF, soft wood like spruce

4. Back layer

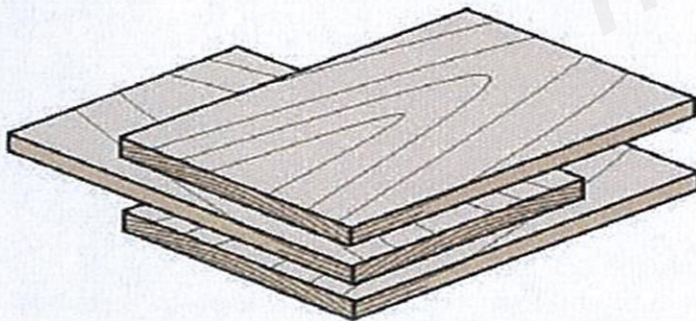
A backing layer of spruce, pine veneer. In combination with the other layers, it prevents the floor from cupping or warping.



Installation methods:
Float, glue direct, glued and nailed to plywood sub floor



With cross laminating the pieces are glued together like this. The central piece that does not expand lengthwise significantly reduces the widthwise expansion of the top and bottom layers.

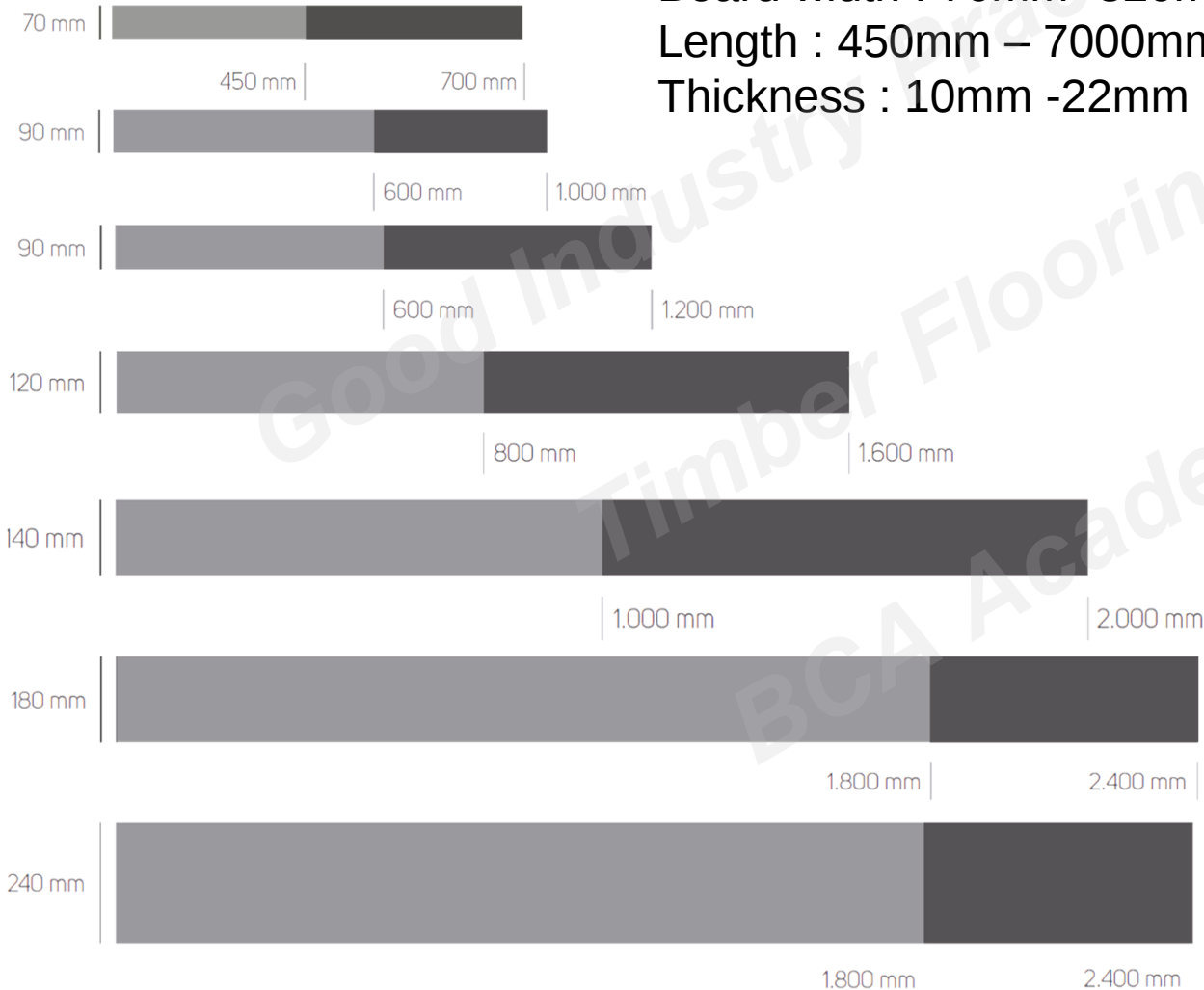


Sizes available :

Board width : 70mm -320mm

Length : 450mm – 7000mm

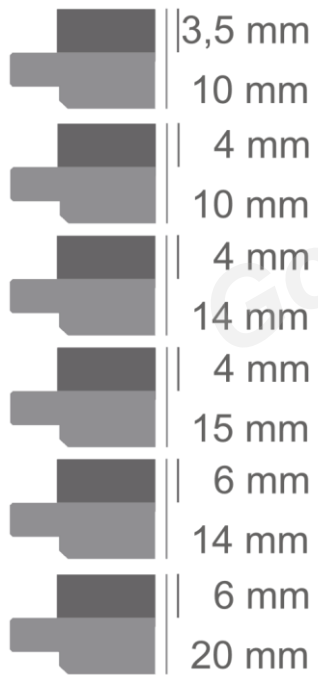
Thickness : 10mm -22mm



Clip or T&G connection



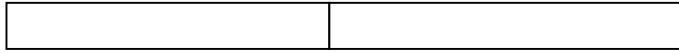
Wear Layer : 2mm to 8mm



Surface
treatment

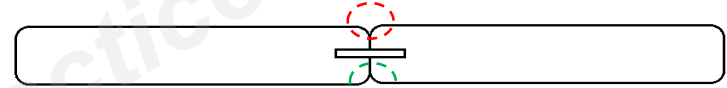


Types of Edge Finishes

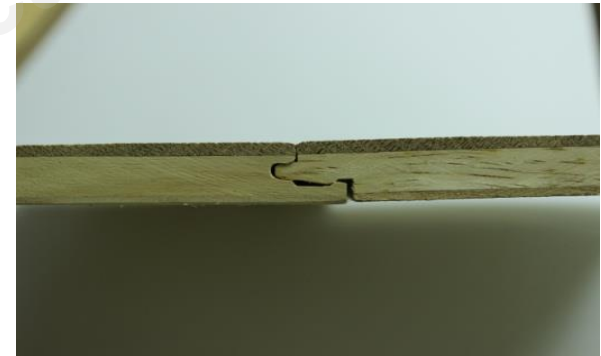
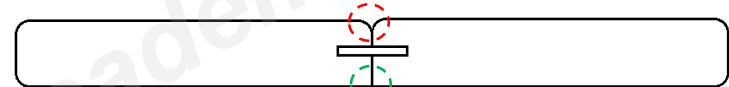


Square/flat edge

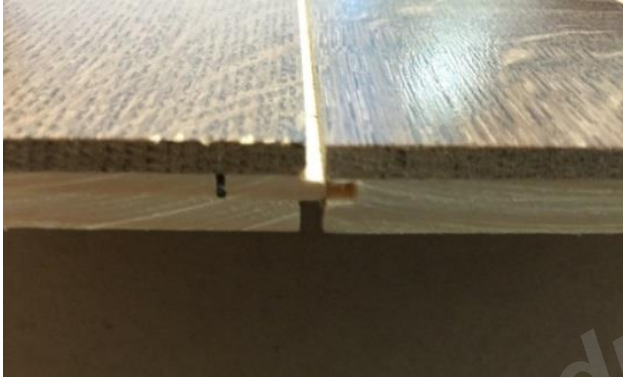
Bevel or micro-bevel edges on the lamella can be on the longitudinal sides or all the four sides of the planks



Top & Bottom Bevel / Micro-bevel



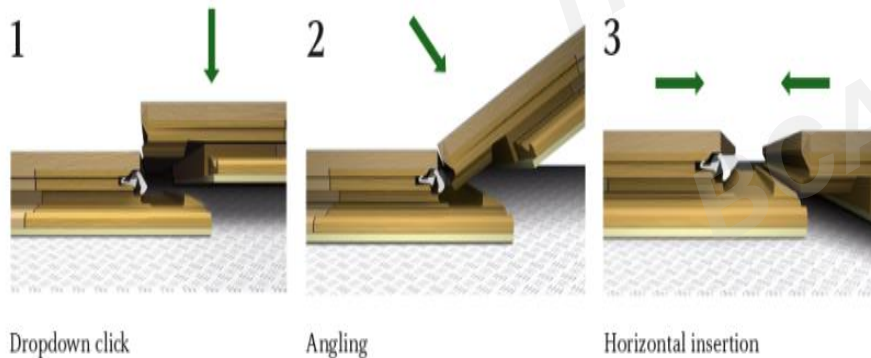
Top Bevel / Microbevel & Square Underside



Proprietary Locking System



Proprietary Clicking System



Courtesy of Unilin - patented Uniclic Multifit System





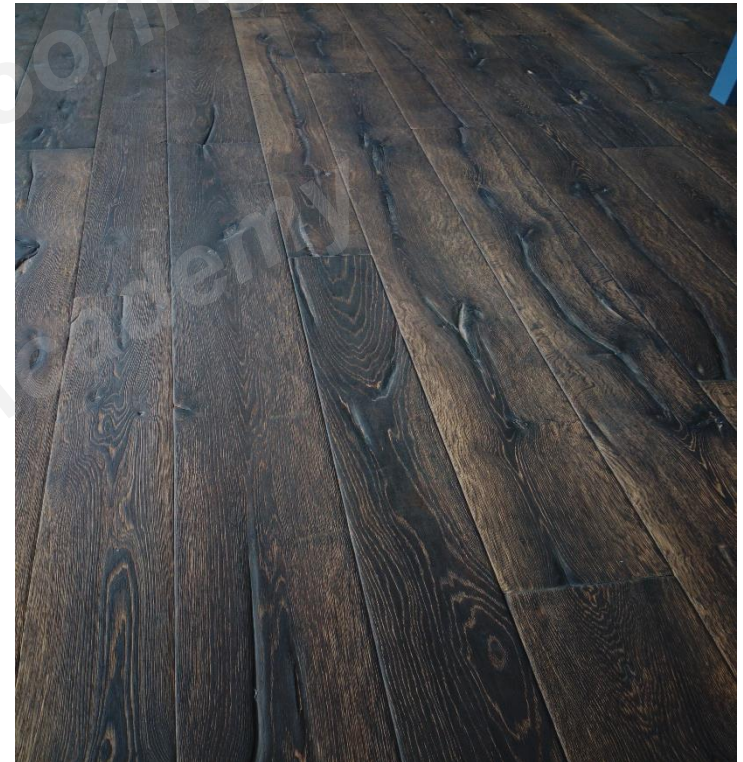
Asian market
prefer micro
bevel edges



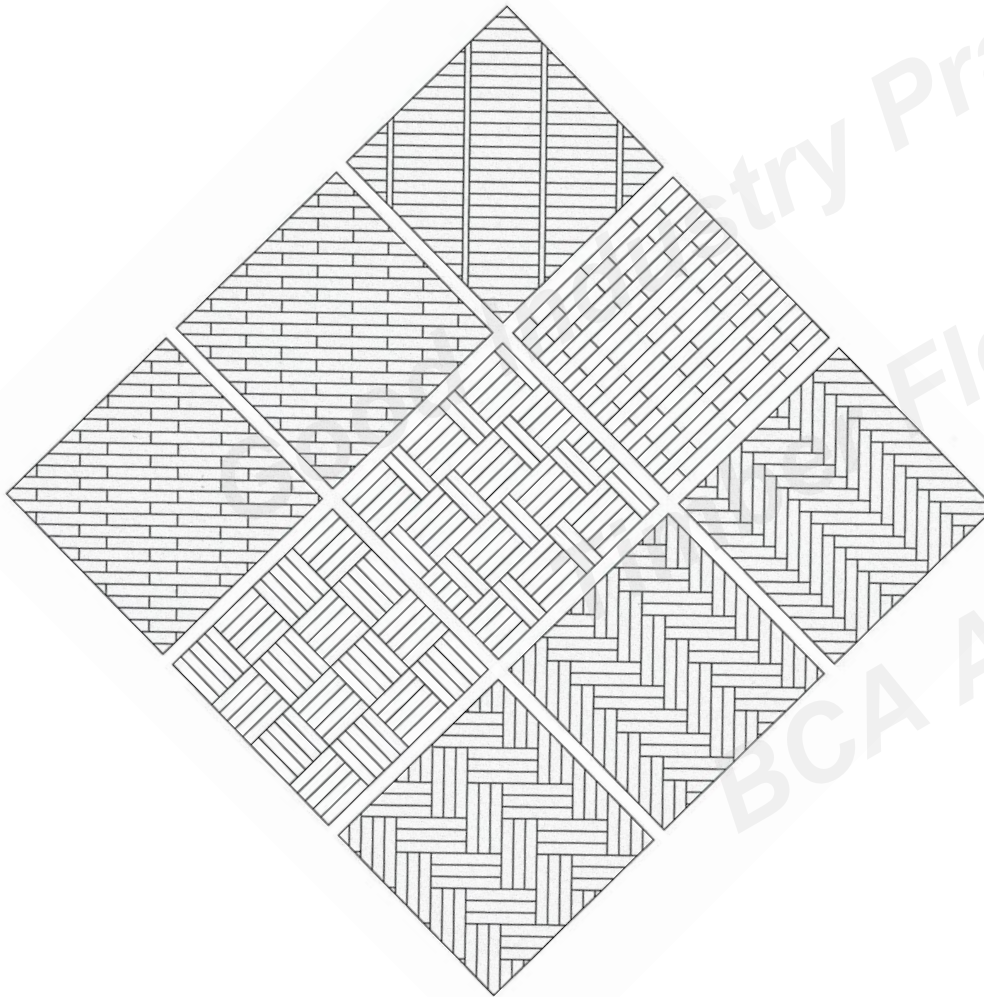
Micro bevel edge on all 4
sides



Wide range of colours, difficult to achieve for site finished floors



For that extra visual interest



Different laying patterns

Pattern floor has a very distinctive look and feel that differs from the classic plank.

The timeless herringbone pattern can be given a modern twist, using extra long and extra wide planks.

There are many possibilities with engineered floor boards

Maximise use of timber resources



A 25mm board could be cut into 4 slices of 4mm wear layer

Due to the construction of core layer, it is more stable especially if the design call for very wide and long boards

Solid Prefinished Timber Boards



Hand scrapping solid hickory



Installation method: glued and nailed to plywood sub floor only. Use only more stable wood species

Timber Floor Installation Method

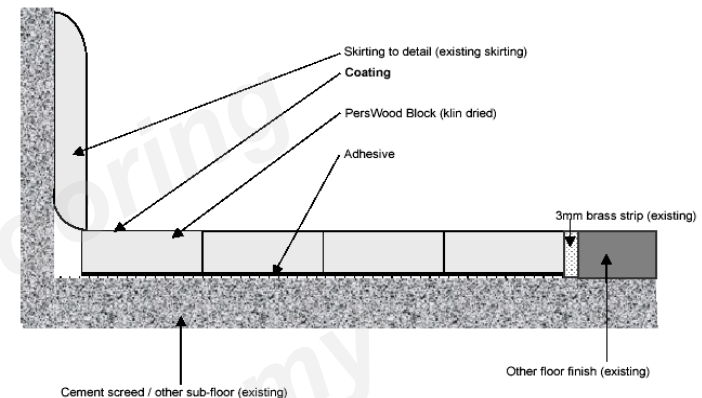
Direct to screed

Timber Profile :

- Engineered / Block

Take Note :

- Quick installation
- Very economical and effective
- “Hard” feeling floor
- Extra careful with moisture of sub-floor
- Check with engineered manufacturer on recommendation for direct lay to screed.



Timber Floor Installation Method

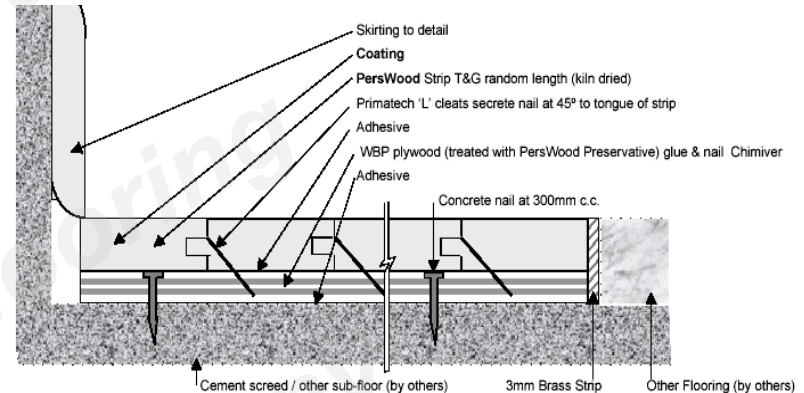
On Plywood Base

Timber Profile :

- Block, Strip, Prefinished

Features :

- Usually use 9mm or 12mm plywood, but may use other thickness to level off areas of different height requirement.
- Recommend WBP grade plywood because it has moisture resistant properties
- “Soft Cushion” feeling floor.
- Plywood prone to beetles attack, recommend to have wood preservative coating.

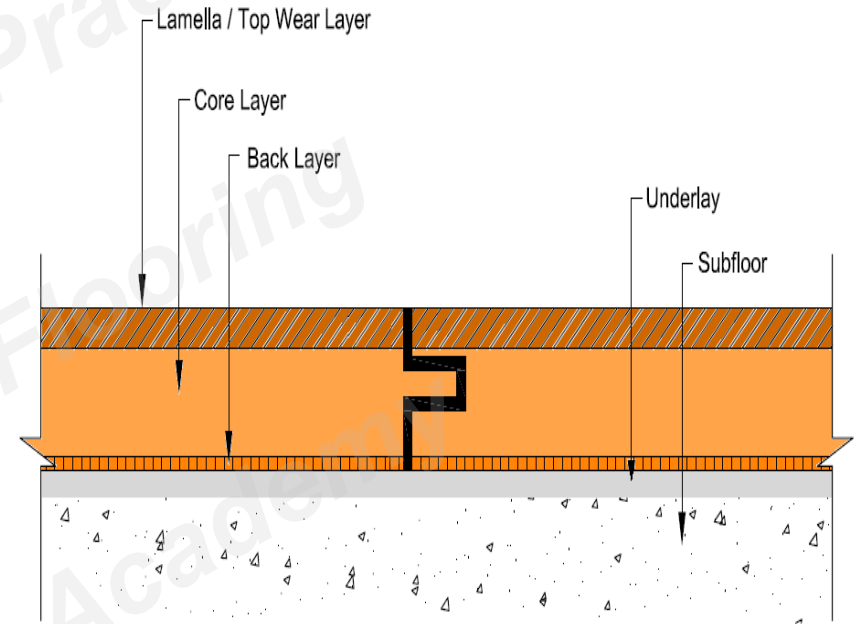


Timber Floor Installation Method

Floating and underlay

Timber profile:

- Proprietary clip design



The underlay is not fixed to the subfloor and the engineered wood flooring strips are installed without fixing to the underlay. This method provides a floating feel.

Selection of Timber

- Function / Usage of area



Selection of Timber

- Hardness



While Janka values give a general sense of hardness, many other factors also contribute to a wood floor's durability, including the type of cut (i.e. plainsawn, quartersawn), denseness of cell structure, and finish used.

- Dimensional Stability



GRADING

- National Hardwood Lumber Association NHLA
- American Walnut Manufacturers Association AWMA
- Maple Flooring Manufacturing Association MWFA
- National Oak Flooring Manufacturing Association NOFMA
- Canadian Lumbermen's Association CLA
- Australian Standard AS2796.2-2006



GRADING

- Bring a degree of consistency to wood floors among member manufacturers
- Consumers are informed of look and features of the grade purchased
- An impartial party to settle disputes about grading
- Provide clear guidelines on grading inspections

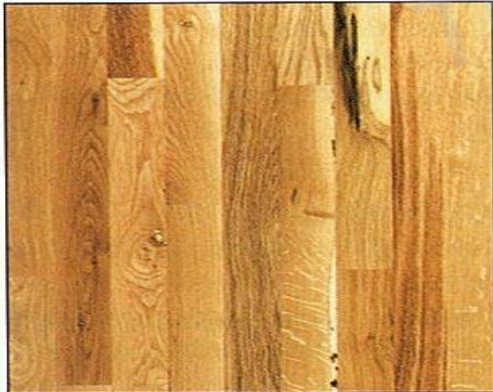
NOFMA/NWFA GRADING



CLEAR



SELECT



No 2
COMMON



NO 1
COMMON



CLA GRADING



FIRST
GRADE



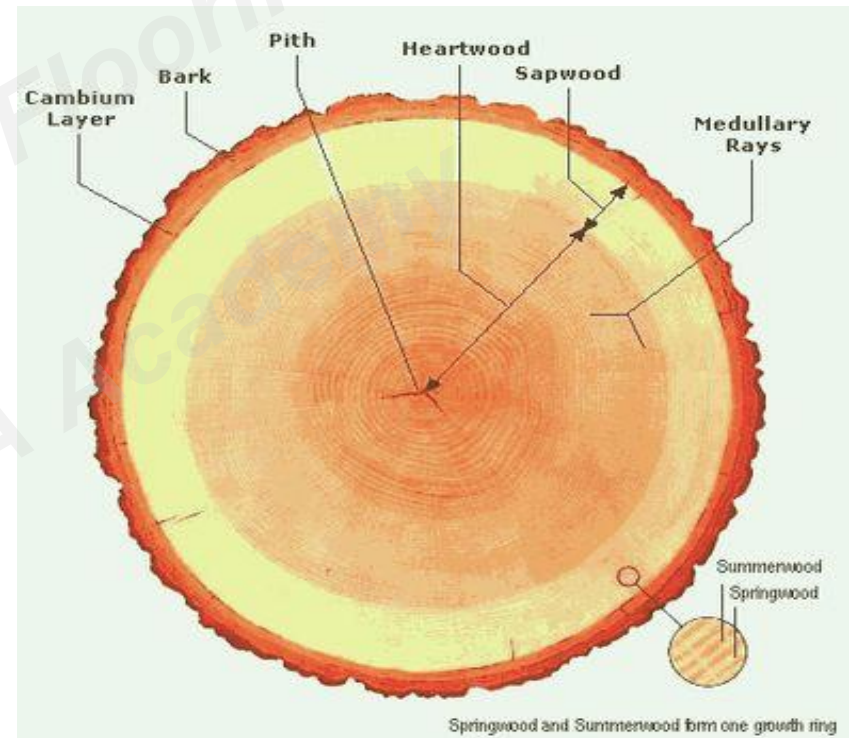
SECOND
GRADE



THIRD GRADE

Properties affecting timber appearance

- Heartwood / Sapwood
- Wood grain
- Flat sawn / Quarter sawn

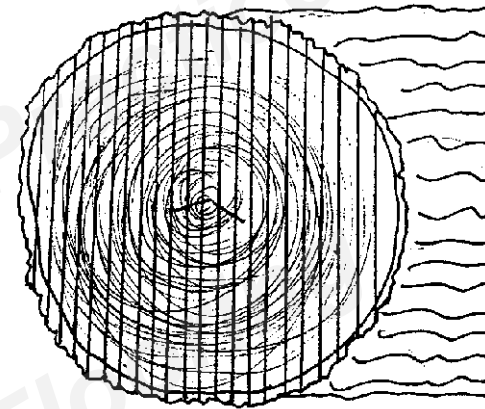


Cut Section of Tree Trunk



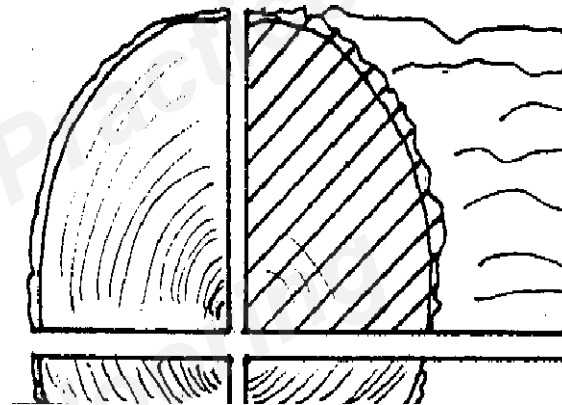
Types of Cut

Flat Sawn

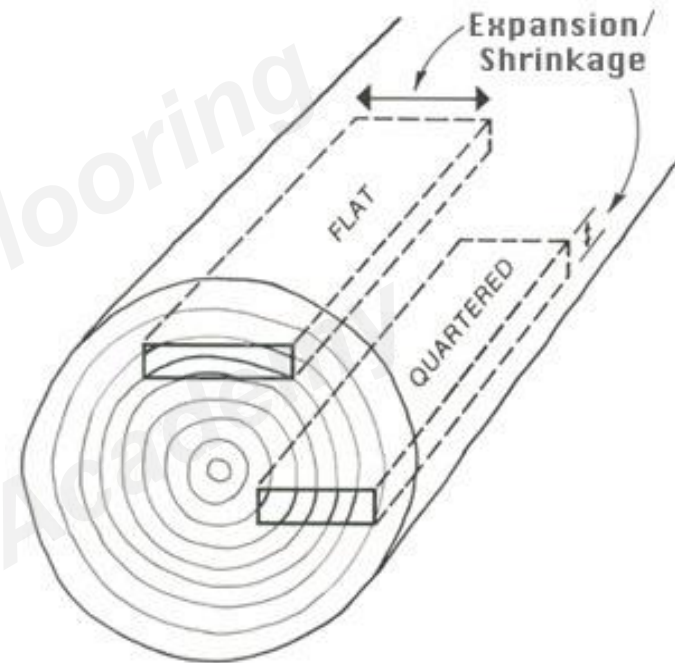
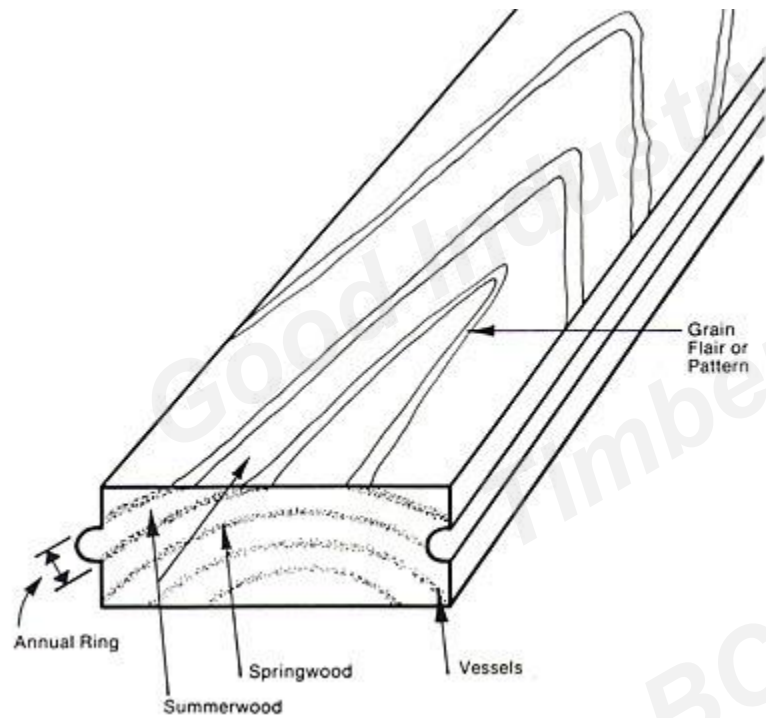


- Cut on tangent to circumference, remain cuts follow the rest
- Most common and economical way of sawing – most wood flooring cut in this way
- Produces the widest board and minimum wastage
- More Variation within board

Quarter Sawn



- First quarter the log and saw perpendicular to growth rings
- More stable profile
- Produce narrower boards, more wastage, more expensive
- Straight grain



Selection of Timber



Character grade white Oak, Factory grade

Selection of Timber



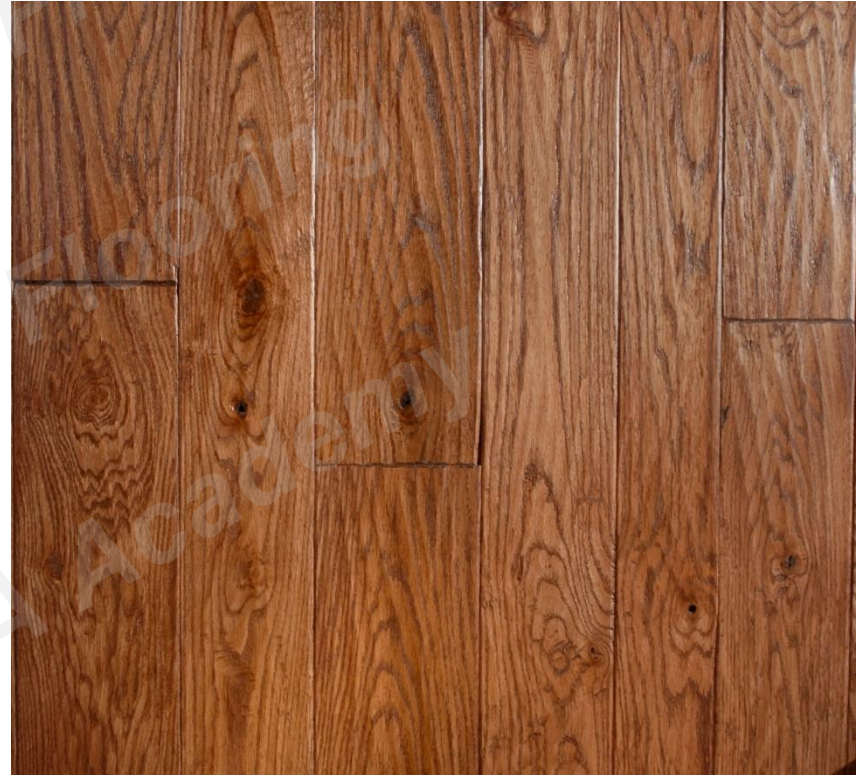
Clear grade white oak, factory grade

Prefinished Solid Timber Boards

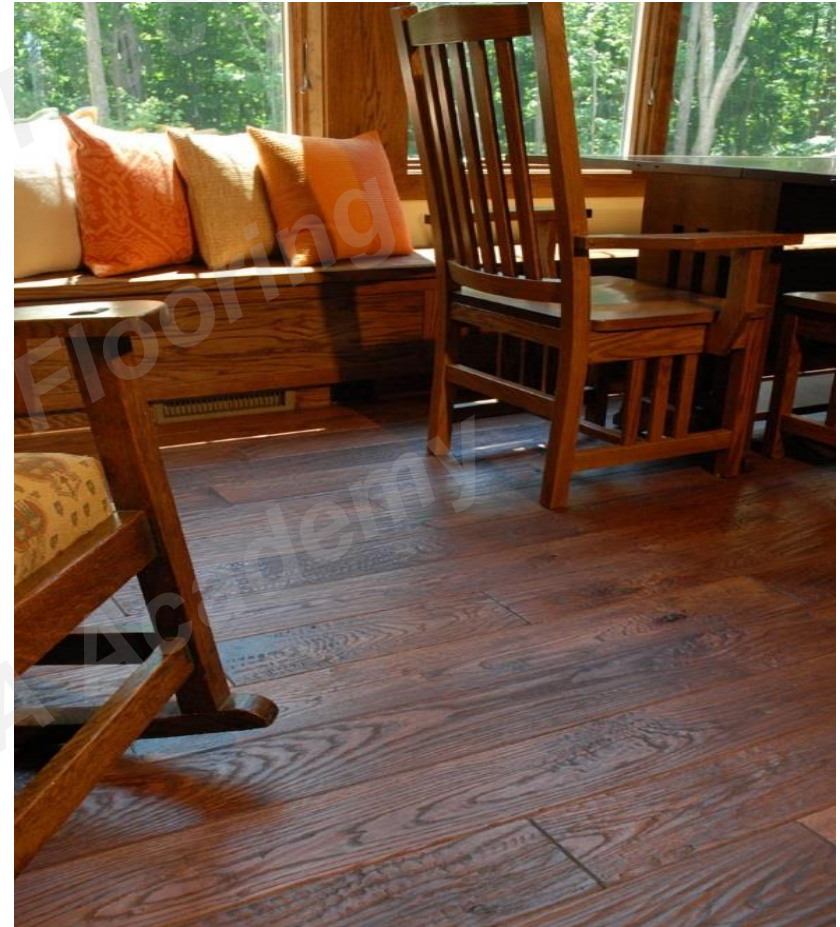
sizes: 20/25mm x 125-160mm x 2400mm



Solid Zircon, wire brushed, UV oil finish



Solid White Oak, handscrapped, stain with UV lacquer



Selection of Timber



Prefinished - Feature grade



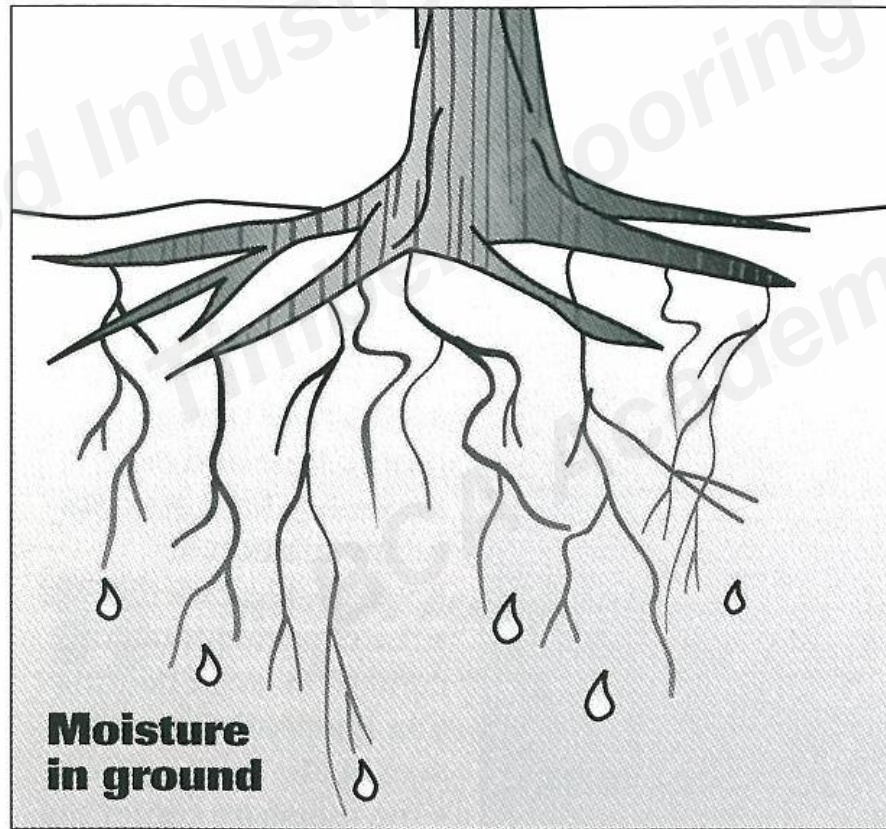


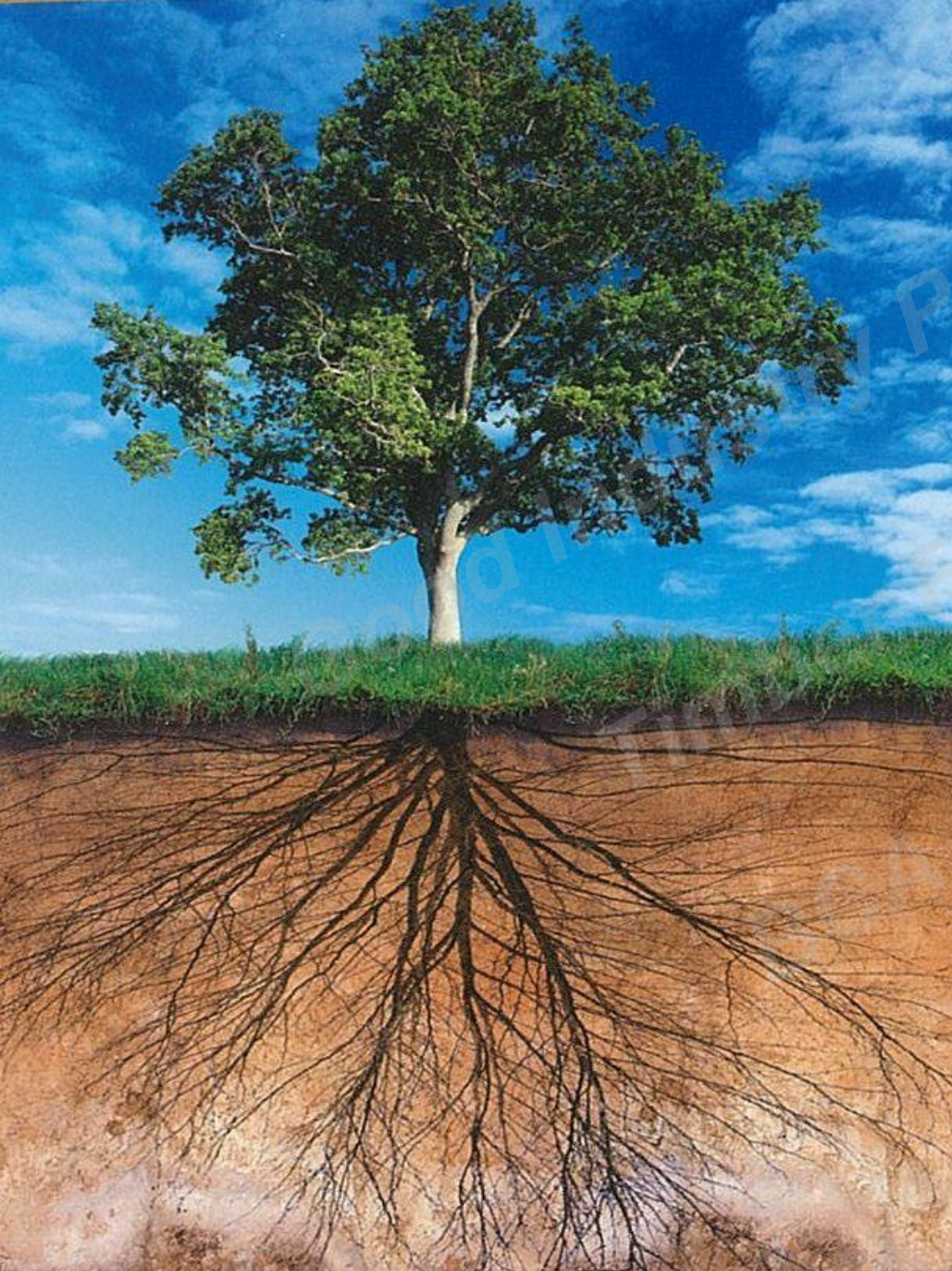
Selection of Timber

- **Cost**



Water and Wood Relationship





Roots collect moisture and nutrients and ship them through vessels up the trunk to branches and leaves



Trees dry out and fibre vessel shrink on thickness and diameter

This shrinkage is characteristic of all woods. It is the key to understanding effect of moisture on wood flooring

What is Equilibrium Moisture Content?

- Wood is hygroscopic, when exposed to air wood will gain equilibrium with the humidity of air
- When the wood is neither gaining nor losing moisture, equilibrium moisture content (EMC) has been reached.
- Wood technologists have researched and are able to precisely tie EMC, relative humidity and temperature

MC of Wood at Various Temp and Relative Humidity

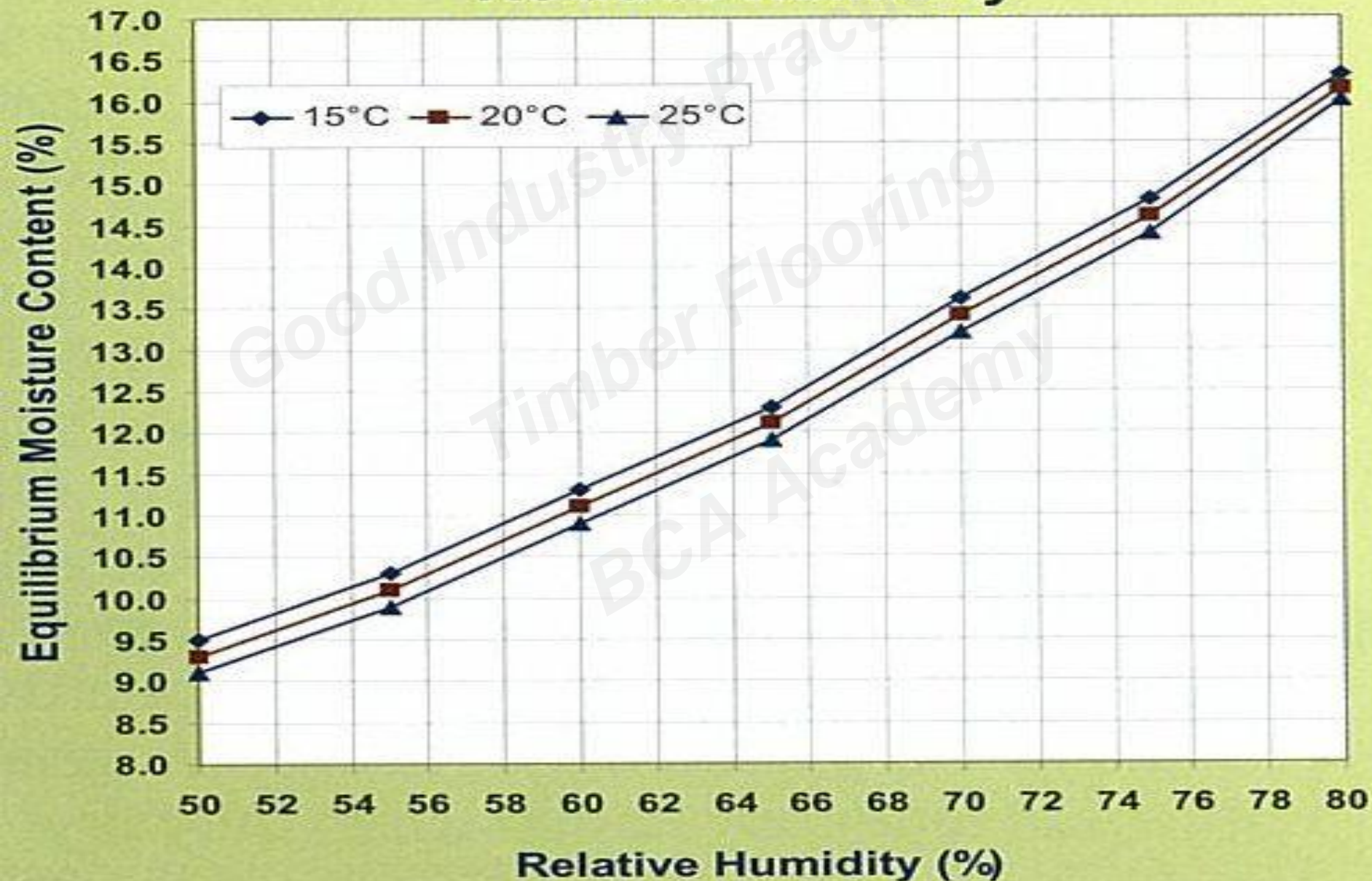
Temp°C

21.1	10.1	11	12	13.1	14.4	16.0	17.9	20.5
26.6	9.9	10.8	11.7	12.9	14.2	15.7	17.7	20.2
32.2	9.7	10.5	11.5	12.6	13.9	15.4	17.3	19.8
37.7	9.5	10.3	11.2	12.3	13.6	15.1	17.0	19.5
	55	60	65	70	75	80	85	90

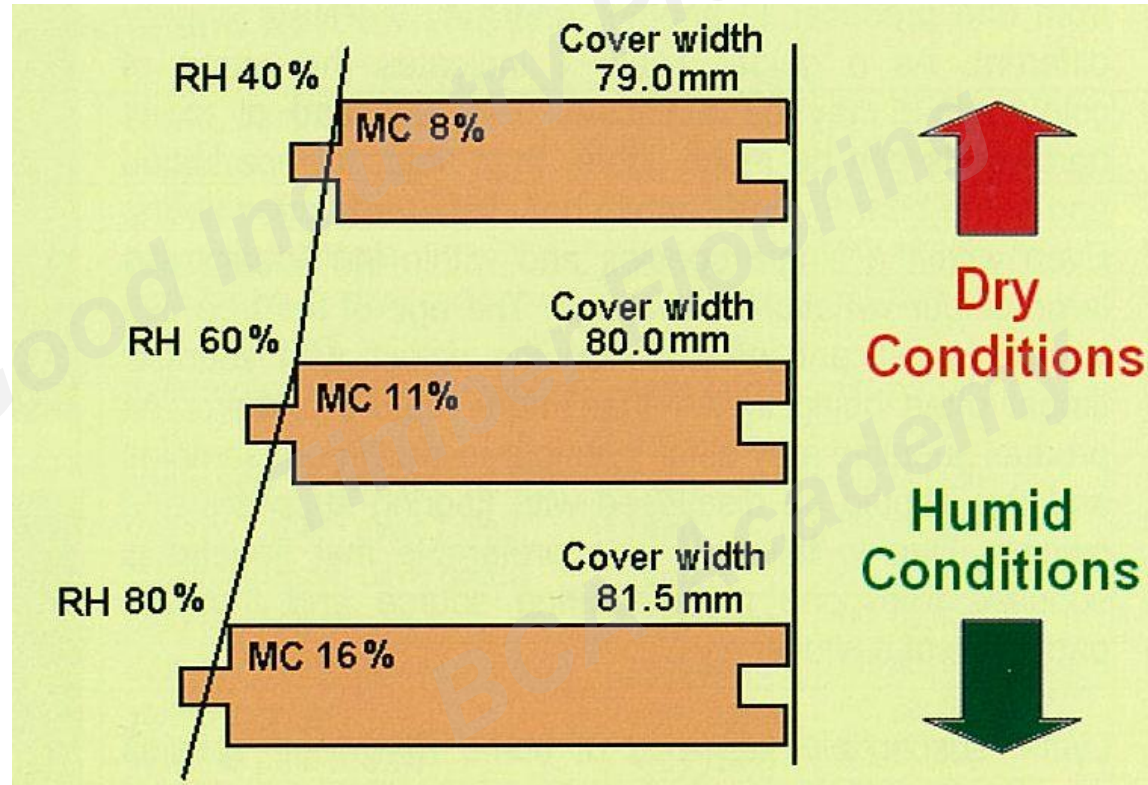
Relative Humidity (%)

- The chart indicate the moisture content wood will likely have at any given combination of temperature and relative humidity.

Relationship between Equilibrium Moisture Content, Temperature and Relative Humidity

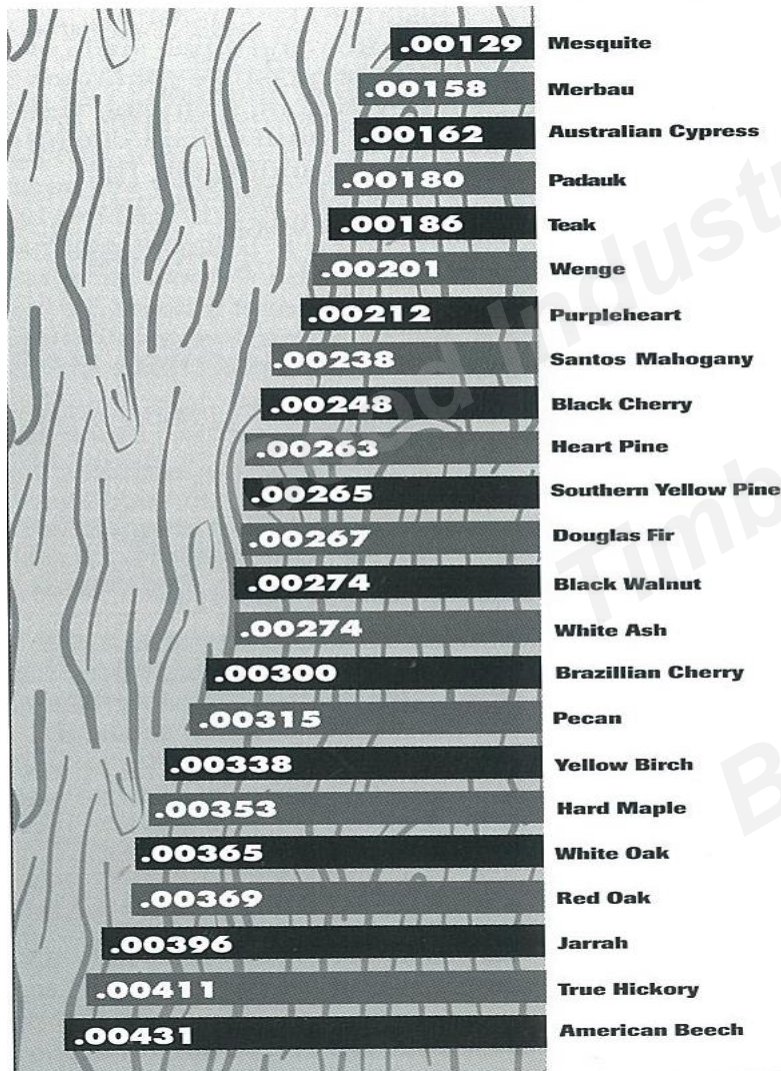


TIMBER MOVEMENTS



BOARD WIDTH WILL EXPAND OR CONTRACT WITH CHANGES IN RELATIVE HUMIDITY

DIMENSIONAL CHANGE COEFFICIENT FOR 23 COMMON WOOD SPECIES



Source: Wood Species Used in Wood Flooring

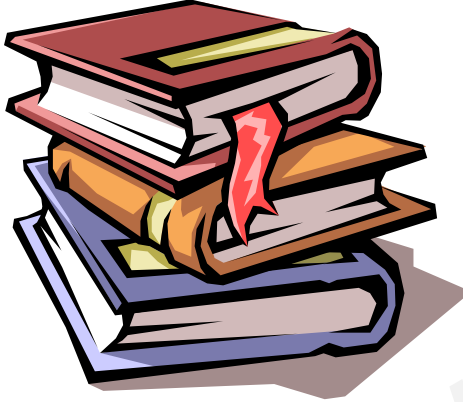
Example:

A red oak (change coefficient : 0.00369) board 5 inches wide experiences a moisture content change from 6 to 9 percent – a change of 3 percentage point.

Calculation:

$$3 \times 0.00369 = 0.01107 \times 5 \\ = 0.055 \text{ inches}$$

In actual practice, however, change would be diminished in a complete floor, as the boards' proximity to each other tends to restrain movement.



Questions ?

Comments ?