

FURNITURE INDUSTRY BASED ON LOCALLY AVAILABLE TIMBER

ENG. CHANNA WIJESKARA

CHAIRMAN - LEEMA CREATIONS (PVT) LTD

PRESIDENT, WOOD BASED INDUSTRIALIST ASSOCIATION

CHAIRMAN, ADVISORY COMMITTEE TO WOOD SECTOR OF MINISTRY OF INDUSTRIES



SELECTION OF WOOD SPECIES\TYPES OF TREATMENT & LEVEL OF DRYING

- Above should be done considering the following aspects.

1. Area of usage.

- Indoor – Low humidity Conditions
- In between Indoor\ outdoor – Medium humidity conditions
- Outdoor – High humidity conditions

2. Application – Load bearing capacity.

- Low load bearing applications
- Medium load bearing applications
- High load bearing applications



1. Area of usage

Indoors

Low humidity Conditions
Ex -: Furniture kept at
rooms, living room,
kitchen & study room

Boron Treatment

In between
outdoor &
indoor

Medium humidity Conditions
Ex-: Furniture kept at open
verandah, window
sashes

ACQ Treatment
Boron Treatment

Outdoor

High humidity Conditions
Ex-: Furniture kept at
outdoor

ACQ Treatment
Copper Chrome Compounds

Special Note – 1. If you want to finish the surfaces transparent with natural or stain finish, better to use boron treatment.
2. If you want to finish the surfaces non-transparent with painted finish, you can use any type of treatment
3. The preservative used for treatment should not be reacting with metal fittings used in wooden items.

2.Application

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graph TD; A[2.Application] --- B[Low load bearing]; A --- C[Medium load bearing]; A --- D[High load bearing]; B --- B1[Ex:-Wall claddings, Ceilings, Wall beadings.]; C --- C1[Ex:- Furniture components.]; D --- D1[Ex:- Roof components, Door & window frames, Decks & Stair cases];
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Low load bearing

Ex:-Wall claddings,
Ceilings,
Wall beadings.

Medium load bearing

Ex:- Furniture components.

High load bearing

Ex:- Roof components,
Door & window frames,
Decks & Stair cases

Main Physical Character in selection of species to be the density.

2.Application

Low load bearing

Some suitable species

1. Lunumidella – 400kg\m³
2. Ginisapu – 530kg\m³
3. Pinus Caribea – 640kg\m³
4. Rubber wood – 570kg\m³

Medium load bearing

Some suitable species

1. Pinus Caribea – 640kg\m³
2. Rubber wood – 570kg\m³
3. Mahogany – Broadleaf – 610kg\m³
4. Teak – 720kg\m³
5. Maara – 620kg\m³
6. Kumbuk – 760kg\m³
7. Sooriya Maara – 750kg\m³
8. Kolon – 722kg\m³
9. Jack – 600kg\m³
10. Coconut – 1000kg\m³

High load bearing

Some suitable species

1. Hora – 800kg\m³
2. Milla – 875kg\m³
3. Palu– 1100kg\m³
4. Tallow wood - 860kg\m³
5. Red gum - 720kg\m³
6. Black Butt - 800kg\m³
7. Rose gum - 640kg\m³
8. Jack – 600kg\m³

- Physical characteristic to be considered before selecting wood species for a given work .

1. Shrinkage - Tangential shrinkage % (T)

Radial shrinkage % (R)

Longt shrinkage %

Ratio of shrinkage - T/R

2. Static bending - Fiber Stress at Proportional Limit (FSPL) \ (uom - PSI or N\mm2)

Modulus of Rupture (MOR) \ (uom - PSI or N\mm2)

Modulus of Elasticity (uom - PSI or N\mm2)

3. Compression – Parallel to Grain (FSPL) (uom - PSI or N\mm2)

Parallel to Grain (Maximum Crushing Stress – MCS) (uom - PSI or N\mm2)

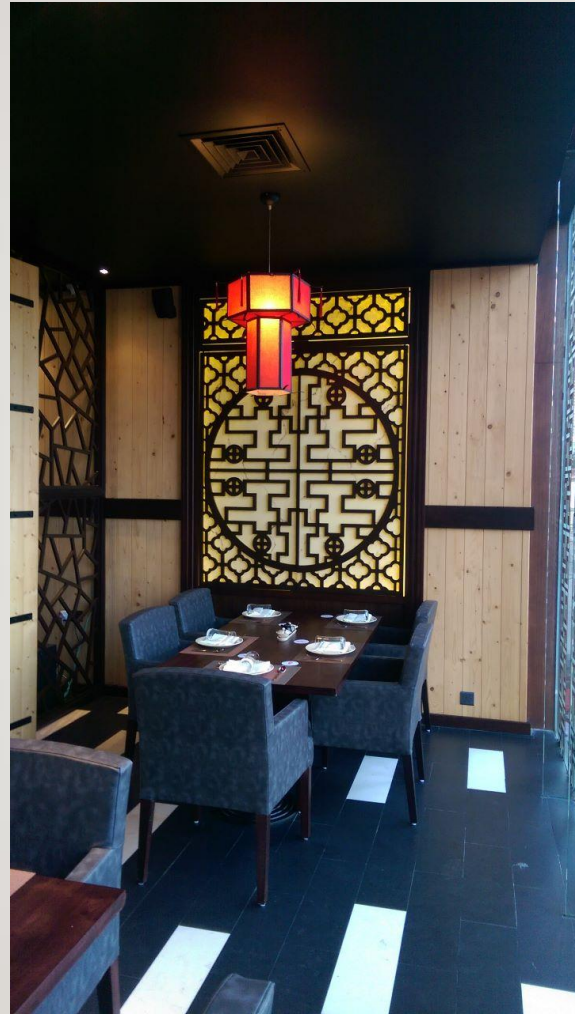
Perpendicular to Grain (FSPL) (uom - PSI or N\mm2)

4. Shear – Parallel to grain (MCS) (uom - PSI or N\mm2)

5. Tension - Perpendicular to Grain (FSPL) (uom - PSI or N\mm2)

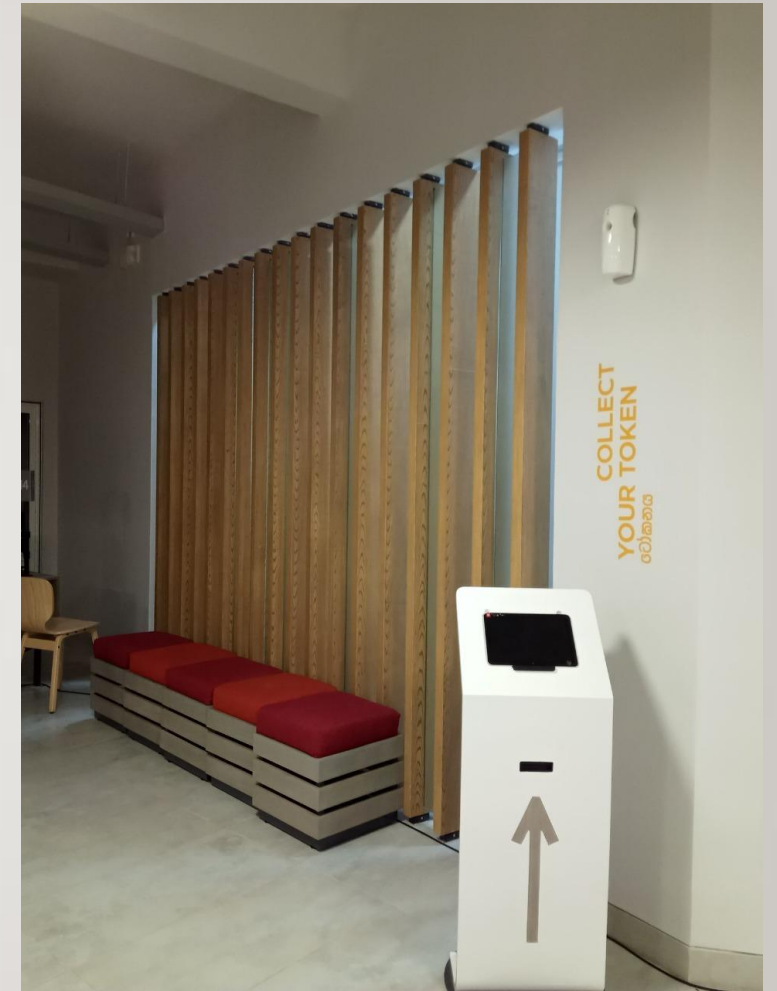
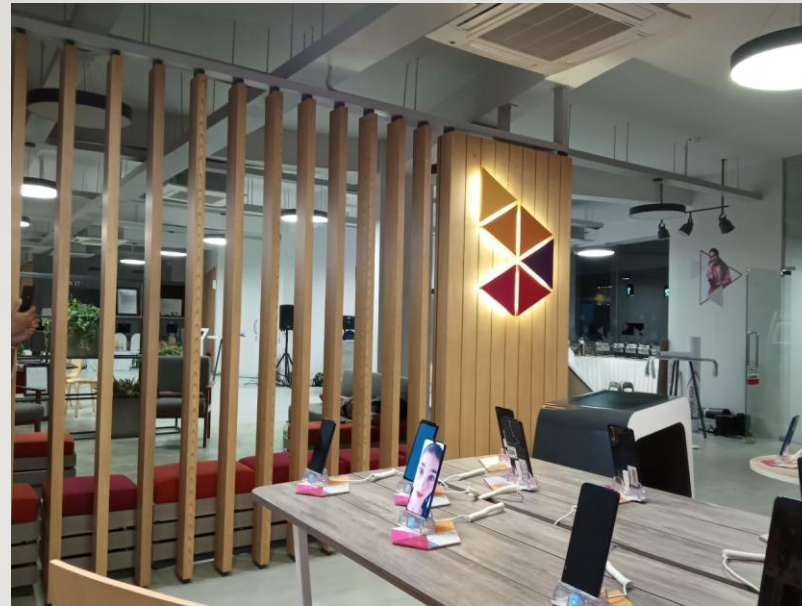
6. Hardness (uom - Lbs)

Some of the work carried-out by my company using local wood

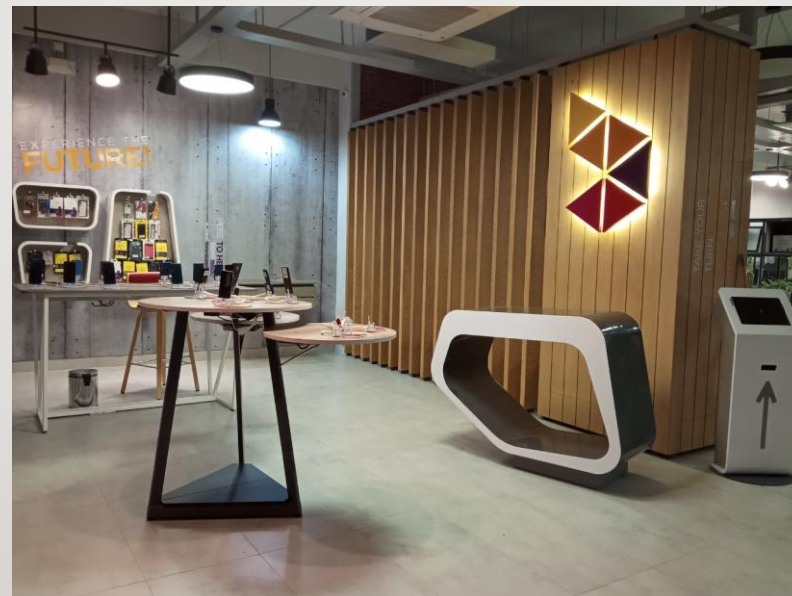


MAINLAND CHINA – Pinewood Cladding

Some of the work carried-out by my company using local wood



Dialogue – Kurunegala
Pinewood Cladding



My observations on wood industry development

The important physical characteristics of wood mentioned below to be identified by the wood innovation center & make it available for general public & the wood working community through their website & publications. Those characteristics are mentioned below.

1. Shrinkage - Tangential shrinkage % (T)
Radial shrinkage % (R)
Longt: shrinkage % (L)
Ratio of shrinkage - T/R
2. Static bending - Fiber Stress at Proportional Limit (FSPL) \ (uom - PSI or N\mm2)
Modulus of Rupture (MOR) \ (uom - PSI or N\mm2)
Modulus of Elasticity (uom - PSI or N\mm2)
3. Compression – Parallel to Grain (FSPL) (uom - PSI or N\mm2)
Parallel to Grain (Maximum Crushing Stress – MCS) (uom - PSI or N\mm2)
Perpendicular to Grain (FSPL) (uom - PSI or N\mm2)
4. Shear – Parallel to grain (MCS) (uom - PSI or N\mm2)
5. Tension - Perpendicular to Grain (FSPL) (uom - PSI or N\mm2)
6. Hardness (uom - Lbs)

The timber should be classified according to their usage area and applications. As widely practiced in America and European countries the modulus of elasticity is printed on timber planks.

Timber species to be classified under following categories.

1. Load Bearing Structural wood – Luxury class\ Medium luxury class etc.
2. Furniture making wood species – Luxury class\ Medium luxury class etc.
3. Cladding & ceiling species.

Certain wood species can be included into more than one category.

- Pinus caribea & treated rubber wood can be included into above first & second categories.
- Jack can be Included into second & third categories.
- Hora can be included into third category.
- Kumbuk can be included into second & third category.
- Red gum can be included into third category.

*Data about T\R shrinkage ratio is very important as some people use kumbuk having greater T\R ratio without drying for different work and encounter lot of manufacturing problems. Even I have this experience in my career. How ever even now I find it difficult to collect this information from a reliable source.

Also note the Strength & Density values appear in this presentation are taken from different Sri Lankan publications. I'm no way responsible for these figures. The figures were given just to elaborate the points I made in this presentation.

My personal opinion is that timber classification should be done by an independent organization which is not involved in timber business such as Timber Innovation Center.