Seasoning of Timber
Learning Objectives

- To understand the importance of seasoning timber.
- To be able to identify the different method of seasoning.
- To be able to explain how each method works.
- To identify the advantages and disadvantages of each method.
Moisture and Timber: Key Words

- Wood is **hygroscopic** this means that it will either **absorb** moisture from the atmosphere or **release** moisture to the atmosphere.

- **Fibre saturation point (FSP)** is when water in the cell cavity has evaporated but water remains in the cell wall.

- **Relative humidity** is the actual amount of moisture in the air compared to the amount of moisture the air could hold.
Moisture Content (MC) of Wood

- Moisture content (MC) is the term used to describe the amount of moisture in the wood.
- It is expressed as a percentage of the dry weight of the timber
- Like 15% or 25% Moisture
- Two methods are used to determine the moisture content of wood
  - The oven drying method.
  - Electronic moisture meter.
1. To find the moisture content: 
Oven drying method

1. Take a sample cut from timber and weight it.
2. This weight is known as the wet weight.
3. Place the sample in the oven and dry it out completely until no weight loss is recorded. This weight is known as the dry weight.
4. The moisture content can be calculated using the following formula;

\[
\text{Moisture content} = \frac{\text{Lost weight}}{\text{Dry weight}} \times 100
\]
2. To find the Moisture Content: Electronic Moisture meter method

- Works on the principle that electricity passes through moisture (water) quickly.

- The meter measures the how hard it is for electricity to pass through the wood and expresses its answer as a percentage.
What is seasoning?

- Seasoning is the name given to how timber is dried.

Why do we season timber?

- When a tree is growing it absorbs water.
- This makes the timber very heavy and difficult to transport.
- Wet timber is much harder to work with.
- Wet timber is prone to insect and fungal attack.
- Wet timber is prone to warping and other defects.
How wood dries.

- If wood is too dry it will absorb water from the air and swell.
- If wood is too wet it will lose water (through evaporation) and shrink.
- If we season wood so its moisture levels are close to those of the air it will not shrink or swell.
Problems with drying timber.

- The amount of water in timber is called its moisture content.
- When timber is tried too quickly many drying defects occur.
  - Timber can collapse, shrink, warp and twist.
- If timber has too little water it is weak.
- This means that drying timber is a very exact science.
How wood dries

- Water dries off the surface of the wood first
- However, the centre can still be wet.
- The dry outer surfaces of the wood absorbs water from the centre, much like a dry sponge absorbing water.
- The outer surfaces then dries out and absorbs more water from the centre of the timber.
- By continually drying the outside of the timber the entire piece will dry.
How is timber seasoned?

- There are two main ways to dry timber:
  1. Natural seasoning
  2. Kiln Seasoning
Natural Seasoning

- This method is also called air seasoning
- Timber seasoned by this method is left outside to dry for many months
- The timber is stacked on large planks of timber, these planks are stacked on blocks.
- The blocks stop the timber absorbing water from the ground
- The timber is covered by an over hanging roof.
Natural Seasoning

- To make sure that air can circulate around the stack of timber, small pieces of timber called sticker are placed between the planks of timber.
  - Stickers are $15 \times 25\text{mm}$ thick.
- Only the same type of timber should be kept in the same stack
- Boards of the same thickness should be kept together as they dry at the same speed.
Natural seasoning

- This method is slow and effected by the weather, and can be ineffective during winter.
- This is suitable only for joinery to be used outdoors
The timber is stacked on blocks. This stops rain splashing off the ground and hitting the timber.

The timber is stacked with sticker between the timber so air can circulate.

A roof covers the timber from rain and sunlight.
Natural Seasoning

- The ends of a plank of timber can dry quicker than the middle of the plank.
- This is because water flows out of the end grain easier than the sides.
- Also the ends of a plank might receive more sunlight when drying.
- To stop the ends drying faster than the rest of the plank and causing end splits, they are covered with a damp cloth, called a sack cloth or painted with a bituminous paint.
Other preventions of end splitting

- Painting the ends of the planks with bituminous (waterproof) paint
- Nailing a metal cleat to the end of the plank
Natural seasoning

Advantages

- No expensive equipment needed
- Small labour cost once the stack is made
- Not wasteful of energy

Disadvantages

- Slow drying rate
- A large area is required for lots of timber
- It is dependant on weather conditions
Kiln seasoning

- Is a large oven which is used to dry wood
- The operator will have **drying schedules** (a guide for each kiln) for every type of timber and its particular thickness
  - Different thicknesses of wood dry at different rates.
1. The timber is stacked on a **Trolley**, with **Stickers** placed between the timber so air can circulate.

2. The **Trolley** is rolled into the **Kiln**.

3. **Steam Jets** pump steam into the **Kiln**. This raises the temperature without drying the timber.

4. **Heating Coils** maintain the heat.

5. A **Fan** circulates the air around the whole stack.

6. **Vents** let out the moist air and allows new air into the **Kiln**.
Kiln seasoning

**Advantages**
- Quicker than natural seasoning
- Achieves a lower moisture content
- Defects associated with drying can be controlled

**Disadvantages**
- Expensive
- Requires supervision by a skilled operator
- Is dependant on energy
Kiln Seasoning

During the seasoning process the wood must be checked to see if it is drying correctly.

Samples are taken from planks in the stack and tested with a moisture meter.
Moisture meters

- Wood is a poor conductor of electricity
- Water is a good conductor
- If electricity passes easily through the timber then a lot of moisture is present
- How easily current passes through the timber tells us how wet the wood is