

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 maximum amount of moisture the air could hold.

Moisture Content (MC) of Wood

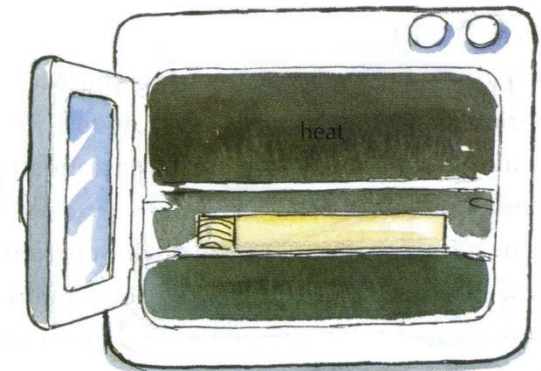
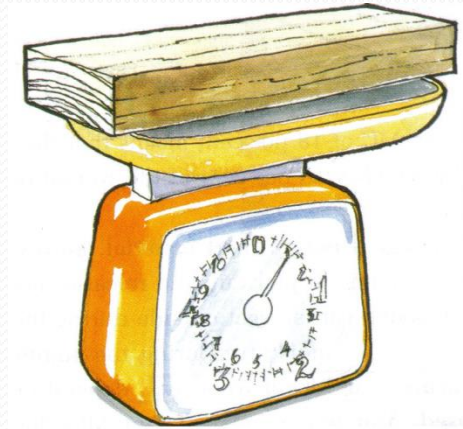
- Moisture content (**MC**) is the term used to describe the amount of moisture in the wood.
- It is expressed as a percentage of the dry weight of the timber
- Like 15% or 25% Moisture
- Two methods are used to determine the moisture content of wood
 1. **The oven drying method.**
 2. **Electronic moisture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

To find the moisture content:

1. 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;

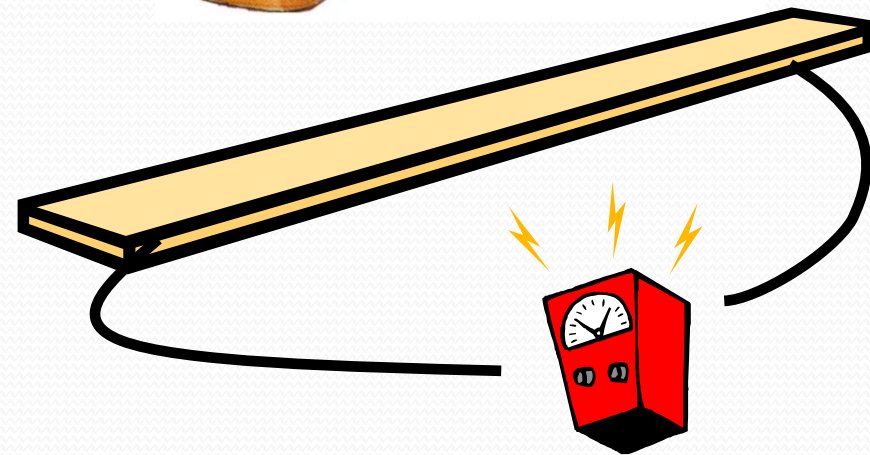
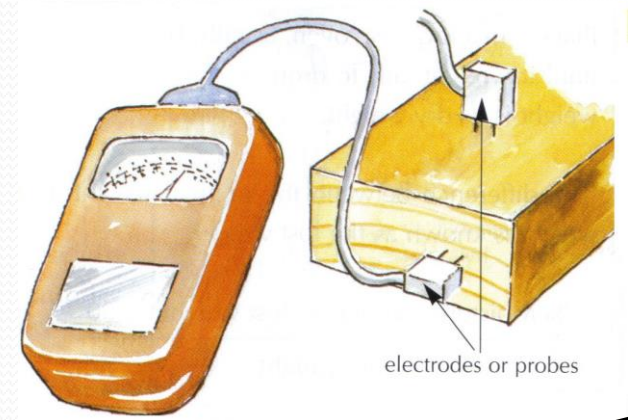
$$\text{Moisture content} = \frac{\text{Lost weight}}{\text{Dry weight}} \times 100$$



To find the Moisture Content:

2. 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.

Problems with drying timber.

- When timber is dried too quickly many drying defects occur.
 - Timber can collapse, shrink, warp and twist.
- If timber has too little water it is dry, brittle and weak.
- This means that drying timber is a very exact science.



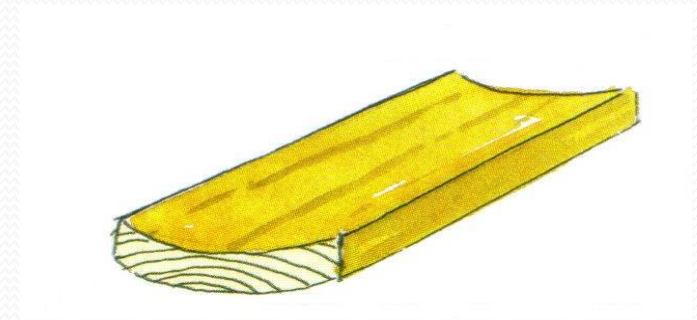
REVISION!!!!

**SEASONING DEFECTS IN
WOOD**

Artificial Defects: Seasoning

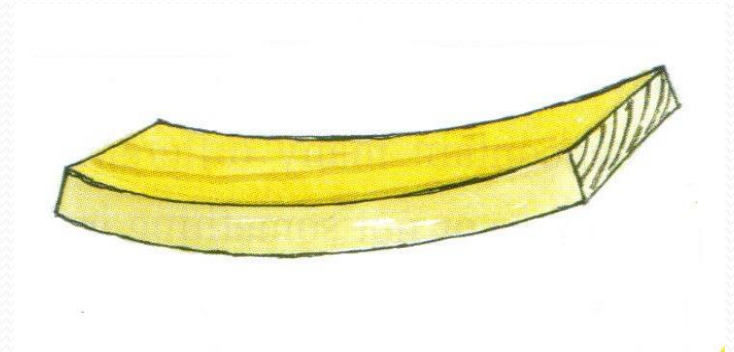
Cupping

- When you look at the end of the board it appears as a curve.
- Caused by unequal amounts of shrinkage along the growth rings.



Bowing

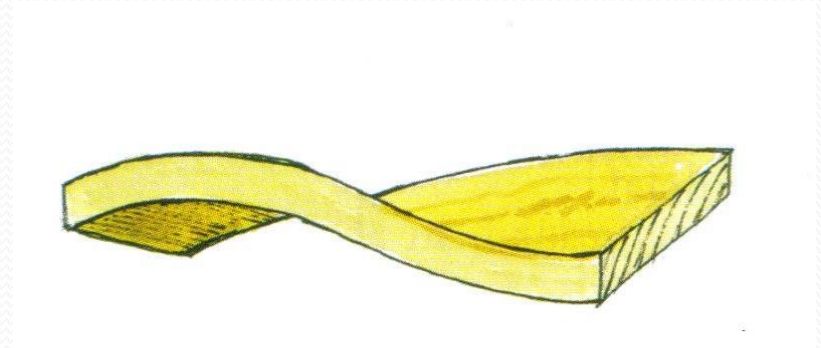
- When you look at the edge of the wood it appears curved.
- Caused by poor stacking.
 - Not enough stickers!



Artificial Defects: Seasoning

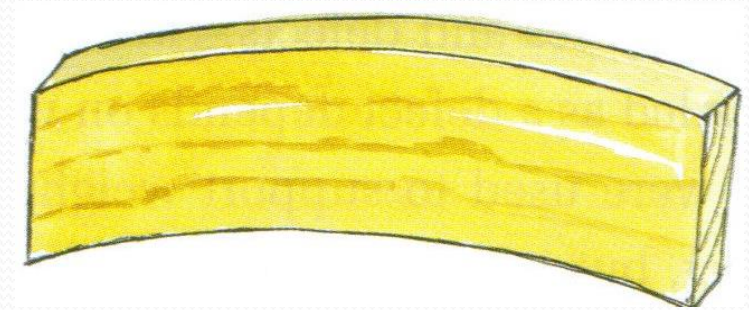
Twisting/ warping

- When the ends of the boards are twisted in opposite direction.
- Caused by shrinkage along spiral or interlocking grain.



Springing

- When the face of the board remains flat and the edge bends inwards to form a curve.
- Caused by shrinkage longitudinally along irregular grain.



Seasoning Defects

End splits

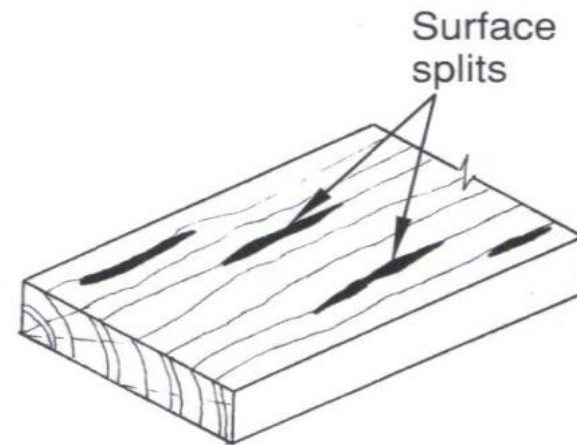
- Occur at the exposed ends of the boards.
- Caused by rapid drying out from the sun
- Prevented by painting the ends of the timber with bitumous paint (water proof)



Seasoning Defects

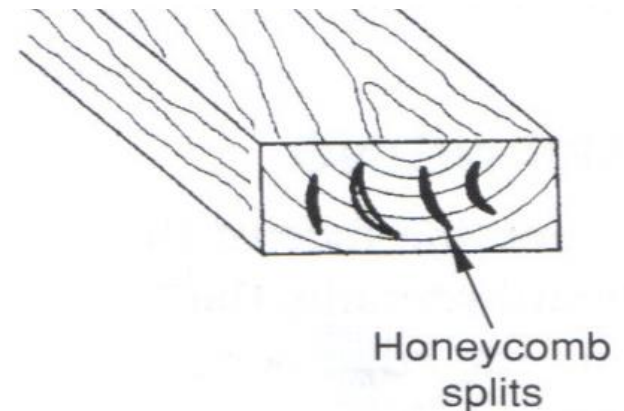
Surface splits/checks

- Usually lie along the grain.
- Caused by rapid drying out on the surface of the wood.



Honeycomb splits/checks

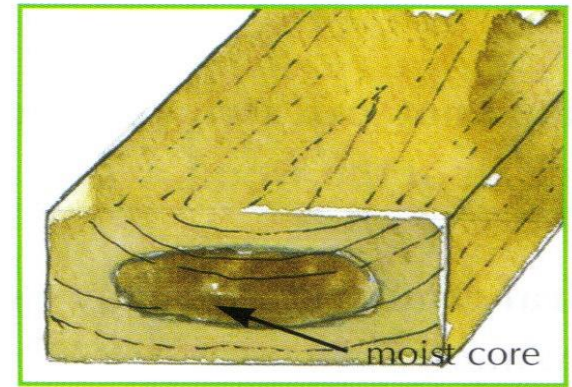
- Occur inside the board.
- Reduces strength.



Seasoning Defects

Case hardening

- Where the outside of the board is dry and hard but moisture is trapped in the centre cells of the wood.
- Caused by rapid drying.



How is timber seasoned?

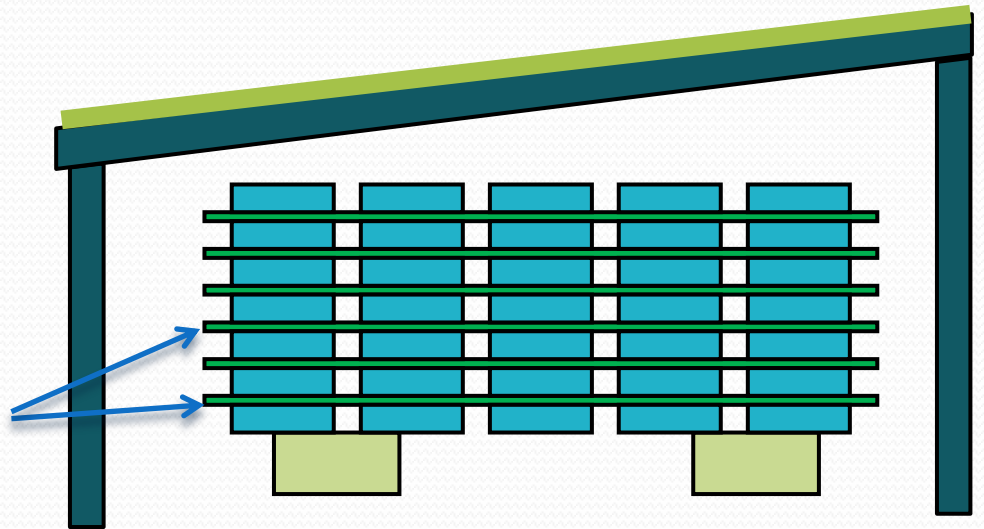
- There are two main ways to dry timber:
 - 1) Natural seasoning
 - 2) Kiln Seasoning
- There are two types of kiln methods
 - Compartment
 - Progressive

1. 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.

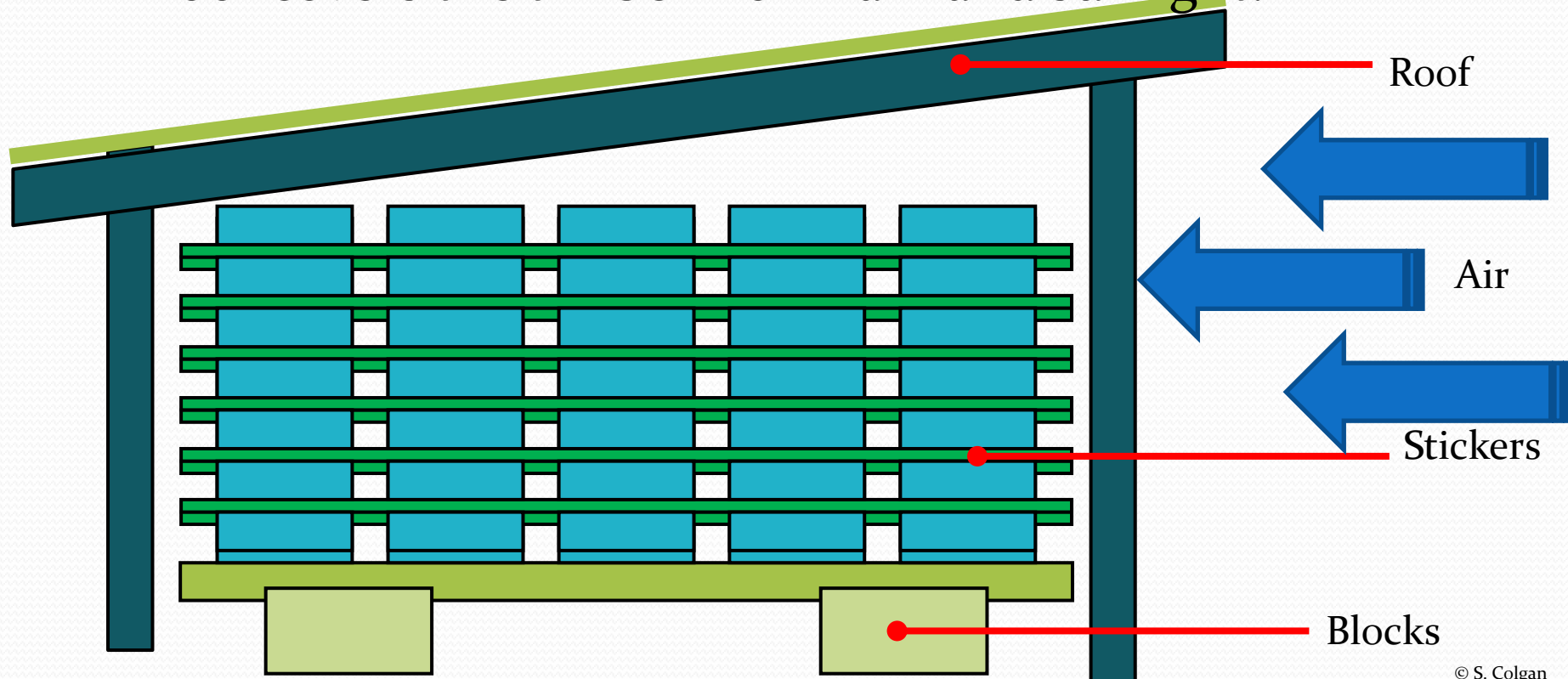
1. Natural Seasoning

- To make sure that air can circulate around the stack of timber, small pieces of timber called **stickers** are placed between the planks of timber.
 - Stickers are 15×25mm thick.
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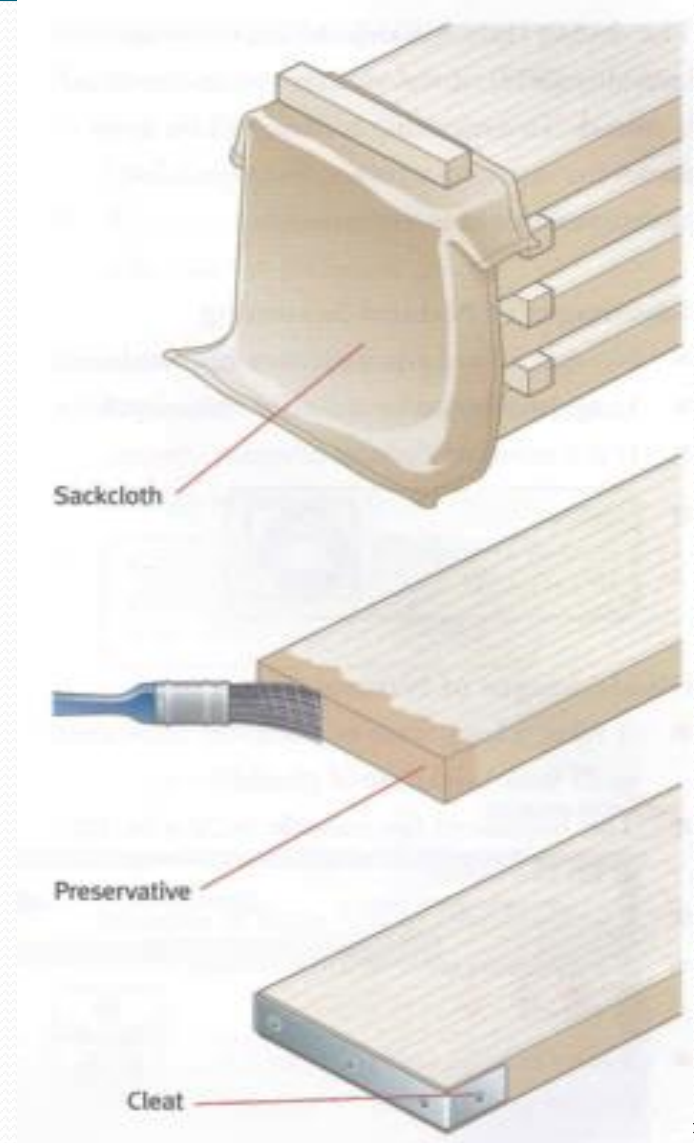
PROCESS OF DRYING

- ✓ 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.



1. 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 they are covered with a damp cloth, called a sack cloth or painted with a bituminous paint.



Natural seasoning

Advantages

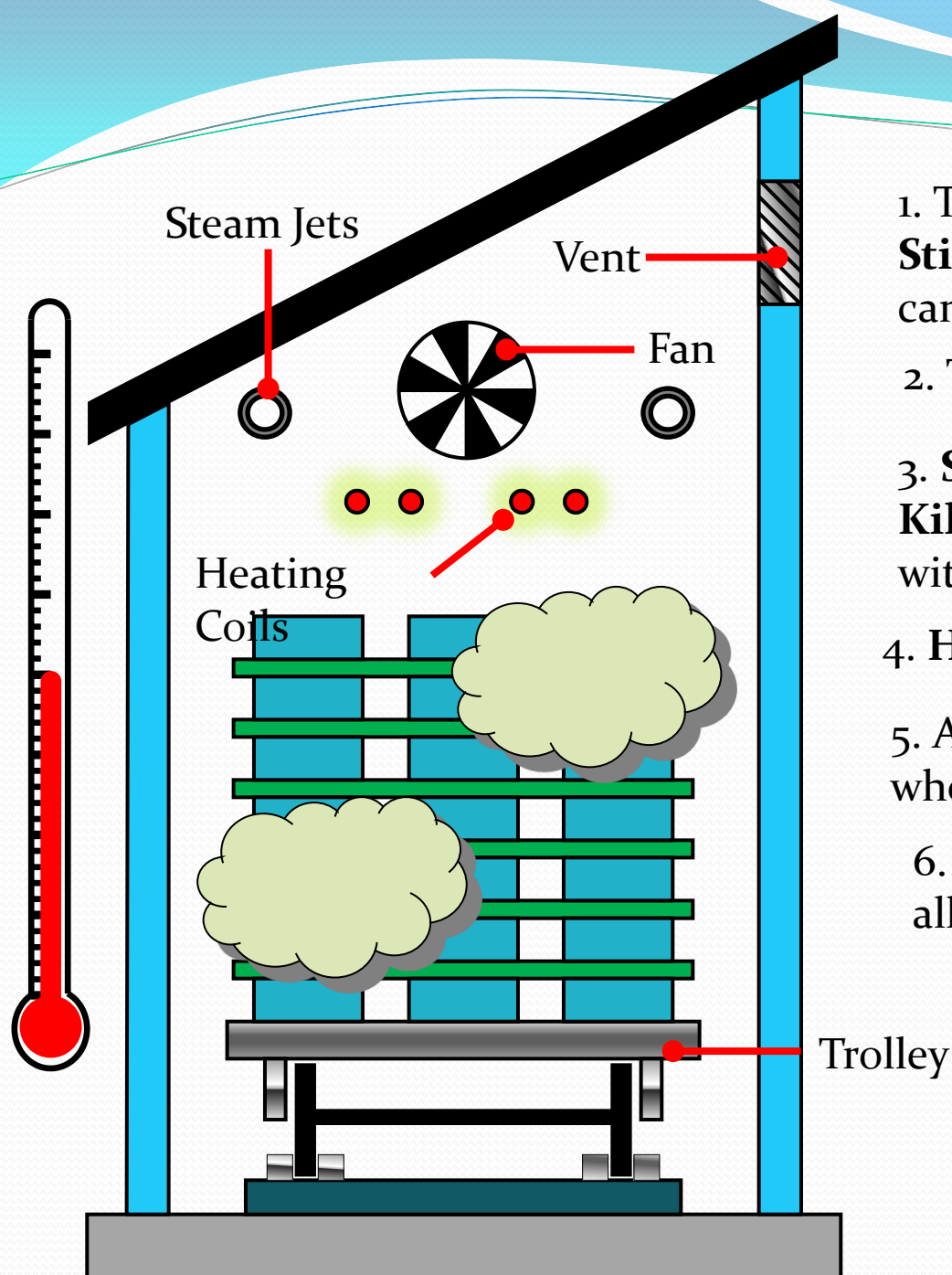
- No expensive equipment needed
- Small labour cost once the stack is made
- Not wasteful of energy

Disadvantages

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

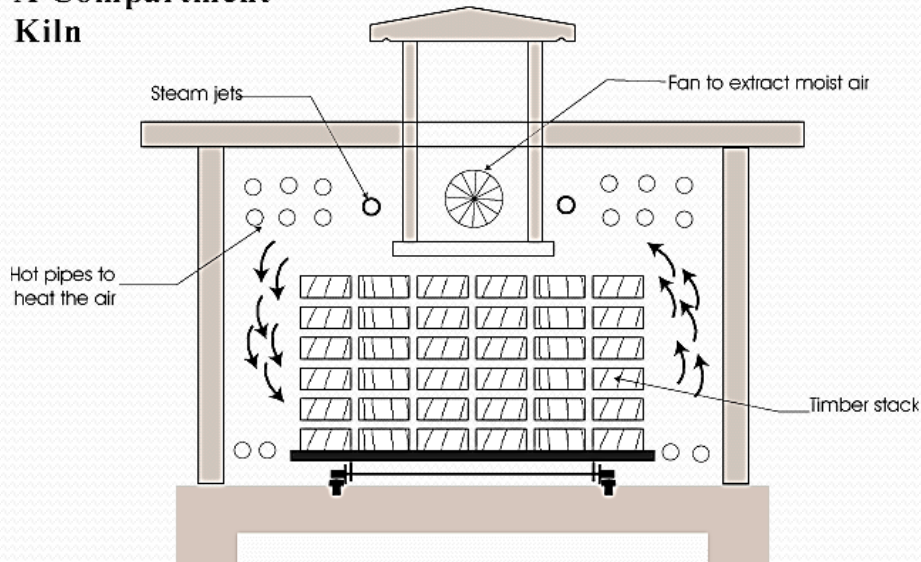
2. Kiln seasoning

- The kiln 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 and species of wood dry at different rates.
- Two types of Kilns
- 1. Comapartment and 2. Progressive



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**

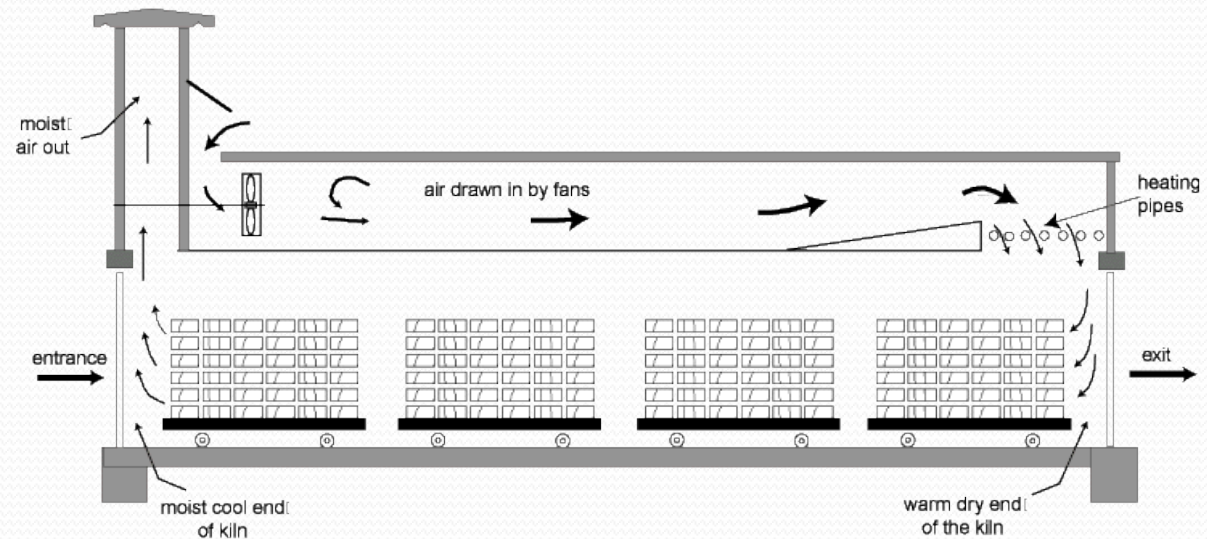
A Compartment Kiln



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Two types of kilns

A Progressive Kiln



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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