
Defects in Timber

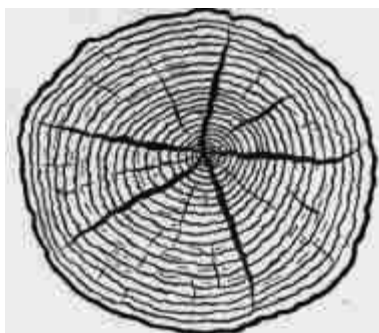
All kinds of timber several natural defects occur. They are caused by the nature of the soil upon which the tree grew and also by the changes in nature to which it was subjected while growing.

1. Heart shakes:

These are the splits or cracks widest at the center and diminishing towards the outside circumference. This defect usually occurs in over-matured trees and is probably caused due to the shrinkage of the heartwood. Heartwood shake which follows a straight course along the timber is not so serious as compared with that which follows a twisted course.

2. Star Shakes:

These are radial splits or cracks widest at the circumference and get diminishing towards the center of the tree. Star shakes are more serious as they tend to separate the log into a number of pieces when it is sawn. These may arise mostly from severe frost and fierce heat of sun.



3. Cup Shakes or Ring Shakes:

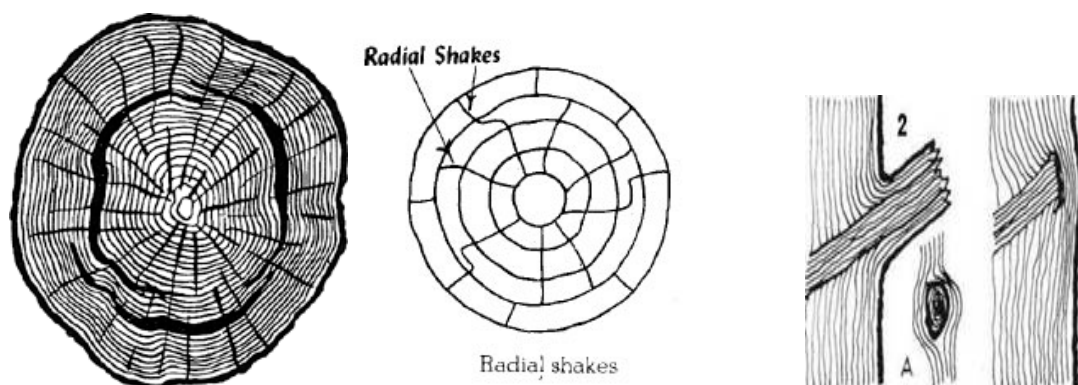
There are formed by the rupture of the tissues in a circular direction across the cross-section of a log, usually along annular rings. When the rupture extends only part around, it is called a cup shake and when the whole way round or almost so a ring shake.

4. Radial shakes:

These are similar to star shakes but they are fine, irregular and numerous. They occur when tree is exposed to sun for seasoning, after being felled down. They run for a short distance from bark towards the center, then follow direction of annual ring and ultimately run towards pith.

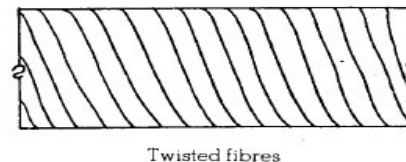
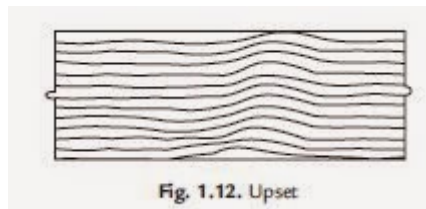
5. Rind Galls

The rind means bark indicates abnormal growth. hence, peculiar curved swellings formed on the body of a tree are known as the rind galls. These are caused generally by the growth of layers over the wounds left after branches have been improperly cut off or removed.



6. Upsets or Rupture:

This defect is due to crushing of fibers which are deformed as a result of the injury thus caused. These are due to violent wind.



7. Twisted Fibers:

This defect is developed in a tree owing to its peculiar position where the prevailing winds turn the tree constantly in one direction. The fibers of such a tree are twisted longitudinally. The timber with twisted fibers is unsuitable for sawing. It can however be used for poles in an unsawn condition.

8. Wind Cracks:

When wood is exposed to atmospheric agencies, its exterior surface shrinks. Such a shrinkage results into cracks.

9. Knots:

- Knots are the roots of small branches of the tree. Knots disturb the homogeneity of wood texture. The fibers of wood get twisted or curled in the vicinity of knots and this affects the strength of the wood. The position, size of the knot, and the degree of grain distortion around it.

- When the formation of knot is free from decay and other defects and is firmly intact with the surrounding wood, it is called a live knot. A knot which is not held firmly in place is called a dead knot.
- Timber containing large dead knots or many smaller ones should be rejected, as they are poorer in appearance and strength.

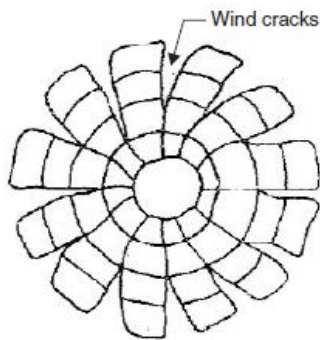
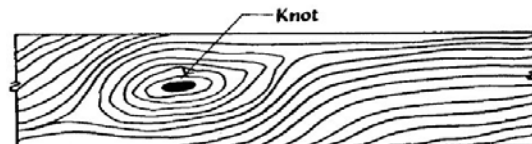


Fig. 1.11. Wind cracks



10. Druxiness:

This defect is indicated by white spots which are due to access of fungi, probably through a broken branch.

11. Foxiness:

This defect is indicated by reddish or yellowish brown stains, caused by over maturity. It is also caused by bad ventilation during storage.

Methods of Preservation

- 1- **Tarring:** It consists in applying a coat of tar. It is employed for rough types of works, such as timber fences, ends of door.
- 2- **Charring:** It is done to prevent dry rot and the attacks of insects and is carried out at the lower ends of the posts to be embedded in

the ground. The posts are charred to the depth about 1.5 cm over a wood fire and then quenched in water.

- 3- **Painting:** Painting should be carried out on the thoroughly seasoned wood otherwise the paint may confine the sap and cause the decay. Oil paint preserves the wood from moisture and prolongs its life. The well known oil paints are can effectively bear white ants' attack.
- 4- **Creosoting:** Creosote oil is the most widely used preservative treatment where dark color and odour do not make the product too objectionable. Its toxic ingredients, are complex phenols, of which the simplest is the phenol of carbolic acid, used as a germicide by surgeons. A secondary advantage of creosote oil is that it imparts some water repellent properties to the wood. The pieces of wood to be heated are placed in cylinders which can be closed tightly. Creosote oil under a pressure of 9 bar and at a temperature of 50°C is pumped in until the desired absorption is reached. Creosoting preserves the timber from rot and attacks by white ants. it is usually employed for piles.
- 5- **ASCO treatment:** ASCO is in powder form. For use 6 parts by weight of the powder is dissolved in 100 parts by weight of water. The solution (odorless) is sprayed on the timber. treated by this method can be painted, varnished, polished or waxed.
- 6- **Fire proofing:** A coating of an non-combustible material protects the surface of the wood from direct contact with flying embers as well as from radiant heat If these materials are applied as a paint the binder should also be non-combustible. Another method of increasing the resistance to fire is to impregnate the wood with a fire-retarding chemical. The chemical should preferably be one that absorbs heat and dissociates when it is

heated. Water solutions of ammonium phosphate, ammonium sulphate, borax and boric acid either singly or in admixture are used. All require high absorption of the chemical for their full effect, and hence are not cheap. Wood treated with zinc chloride as a preservative against decay kindles less readily than untreated wood. To acquire much protection against fire, the amount of zinc chloride should be two or five times the minimum specified as a preservative.

- 7- **Abel's process:** In this process the surface of the timber is first painted with dilute solution of sodium silicate, then with a cream like paste of slaked fat lime and finally with a concentrated solution of soda.