

EXCELLENT FIRE RESISTENCE:

Although combustible, **WOOD** is resistant to fire. In case of fire, the mechanical resistance is not influenced by the increase in temperature in the residual section (<100°).

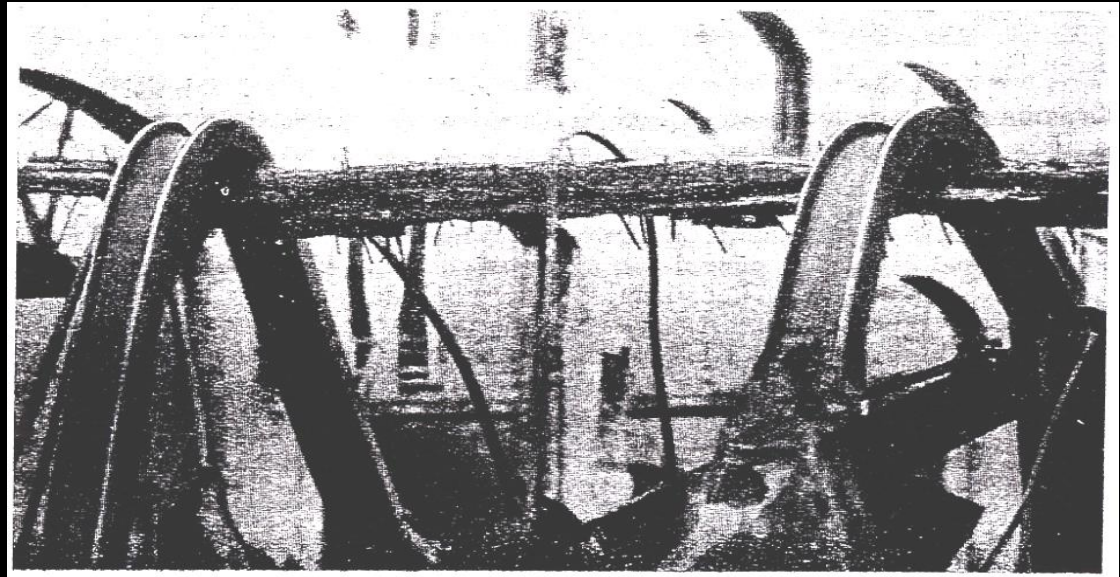
Although non-combustible, **STEEL** (reaction class “0”) loses its strength characteristics at 400° C. A temperature, which is reached after 10 minutes of a standard fire.

CONCRETE with its internal metal elements (of 2.5cm), gives way due to the very strong dilatation to which the armour is subject. This phenomenon is more noticeable for the concrete included within.

Fire resistance: capacity of maintaining loading capacity under the influence of “normal” fire.

R15, R30, R45, R60, R90, R120, R180 are measured in minutes for structural materials.

Reaction to fire: degree of participation to the fire of a material, i.e. inflammable capacity >>>> of complementary materials, finishing or cladding (class0 class1 class2 class3 class4 class5). A type-approval certificate is released by the Ministry of Internal Affairs for experimental trials.



**FIRE RESISTENCE CAPACITY IS IMPORTANT
WHEN LOOKING AT STRUCTURAL MATERIALS**

EXCELLENT FIRE RESISTENCE:

Scarce flammability: due to the use of roof frameworks for loadbearing sections with high specific surfaces (specific surface = surface/volume).

Low thermal dilatation coefficient: $L/L = 0.00005$ from which none-important elongations and therefore without risk of collapsing or deterioration of the dilatation joints.

Low thermal conductivity coefficient: $0.13 \text{ Kcal/mq h } ^\circ\text{C}$ that highly reduces the propagation of heat within the section.

The mechanical characteristics are not influenced until the temperature reaches 100°C . After an hour, the internal temperature still does not exceed 100°C . For smaller elements, a decrease of elasticity (E dry) equal to 10-15% has been noted (UNI 9504*EC).

VELOCITY OF CARBONIZATION:

The carbonization velocity is assumed constant and is determined with experimental investigation.

The values observed vary from **0.5-1.1** mm/min.

These depend from:

- volume mass of the wood or timber;
- humidity content.

The wood is left to dry until the **humidity** of the fibres is of about 7% to 18%

Water is expelled in the preheating-evaporation stage.

More the wood is dry, higher is the velocity of carbonization

It is independent from:

- orientation of the sheets;
- gluing and type of glue.

