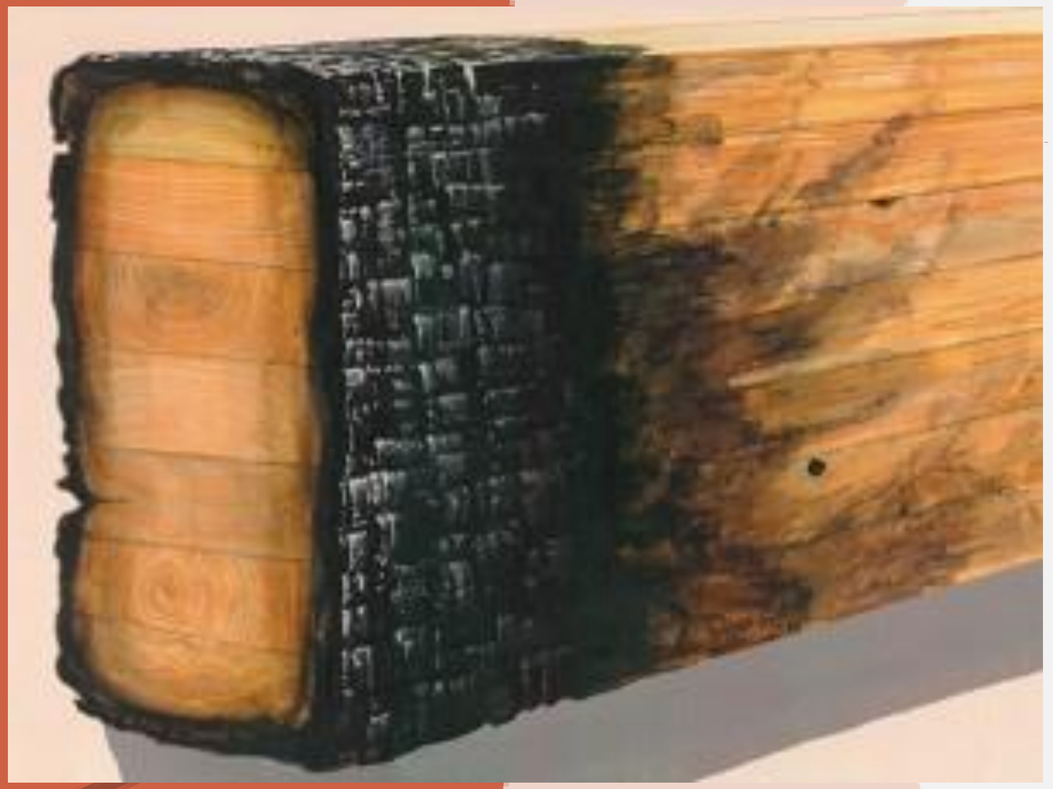
JACKHAMMER
WOODEN-STEEL

FIRE BEHAVIOUR OF MASS TIMBER

MYTHS & REALITIES



CAUSES OF FIRE IN BUILDINGS

- ✓ Electrical issues.
- ✓ Open flames (candles, cigarettes etc).
- ✓ Heating system malfunctions.
- ✓ Arson./ Intentional causes.
- ✓ Cooking accidents (grease, unattended cooking).
- ✓ Appliance malfunctions.

“ FIREPROOF BUILDINGS DO NOT EXIST ”

~ American Institute of Timber Construction

FIRE INCIDENCES

World Trade Centre, USA (2001)

The World Trade Centre was attacked by terrorists on 9/11, causing fires that weakened the steel structure due to intense heat, leading to the building's collapse

Kuwait Fire (2024)

A fire broke out in Kuwait City in June 2024, resulting in multiple casualties and injuries.

FIRE INCIDENCES

Central Revenue Building, New Delhi (2021)

A major fire broke out at the Central Revenue Building in New Delhi in April 2021, causing significant damage to the structure and disrupting operations

Rajkot Gaming Zone Fire (2024)

A devastating fire swept through a gaming zone in Rajkot in May 2024, resulting in loss of life and property

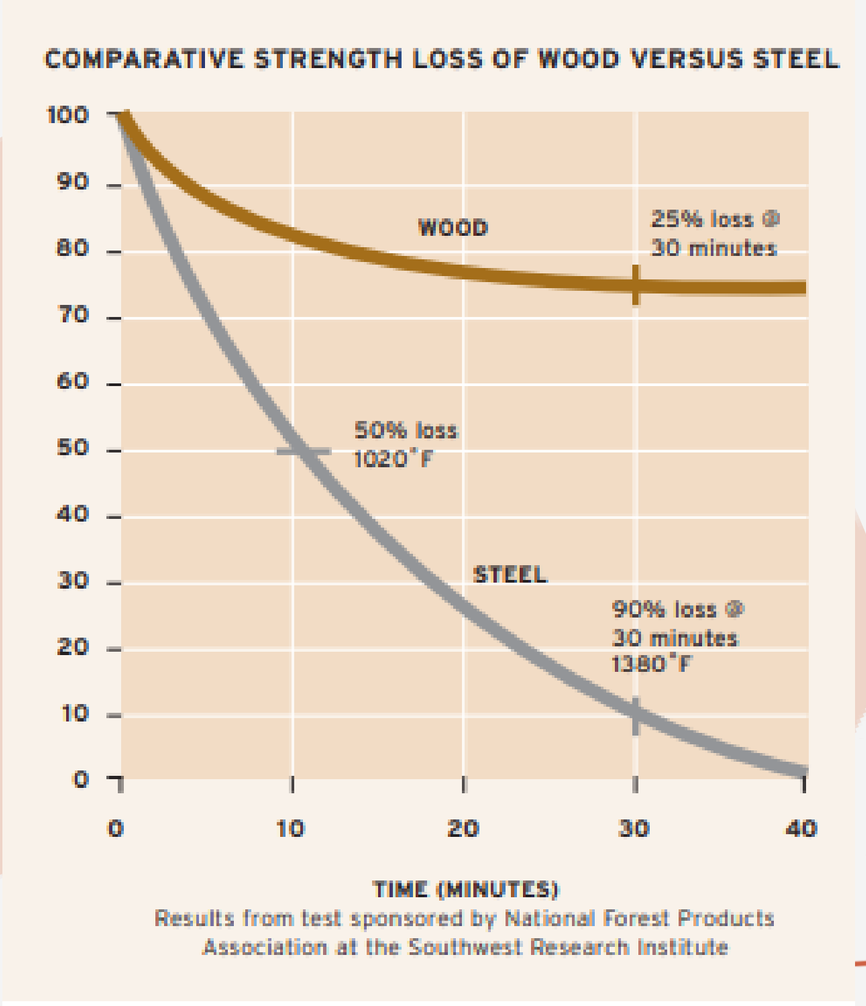
MASS TIMBER AND FIRE

- ✓ Mass timber performs well in fire due to its inherent properties.
- ✓ Charring on the surface protects the inner wood from damage.
- ✓ Slow burn rates and predictable behavior make mass timber a safe choice.
- ✓ Fire resistance ratings of up to 2 hours can be achieved with mass timber.
- ✓ Self-extinguishing properties reduce risk of fire spread.

TIMBER VS STEEL

Aftermath of the fire at Turbotech, Inc. in Vancouver, WA. Glulam remained standing while the rest of the so-called “fireproof” building collapsed.

Steel beams have melted and collapsed over charred timber beam which, despite heavy damage, remains in place.



Timber Vs Steel

Source: AITC

FIRE RESISTANT CONSTRUCTION

Insulating material

Sprinkler system

Impregnation

Coating

Effective fire resisting construction includes:

- ✓ Treating wood materials with fire retardant chemicals.
- ✓ Using fire-resistant wood species or engineered wood products.
- ✓ Implementing advanced framing techniques and materials.
- ✓ Installing fire-stopping systems and barriers.
- ✓ Applying intumescent coatings or sprays.
- ✓ Incorporating fire-resistant materials, such as gypsum or cement panels.
- ✓ Designing with passive fire protection principles.

TESTING OF FIRE BEHAVIOUR

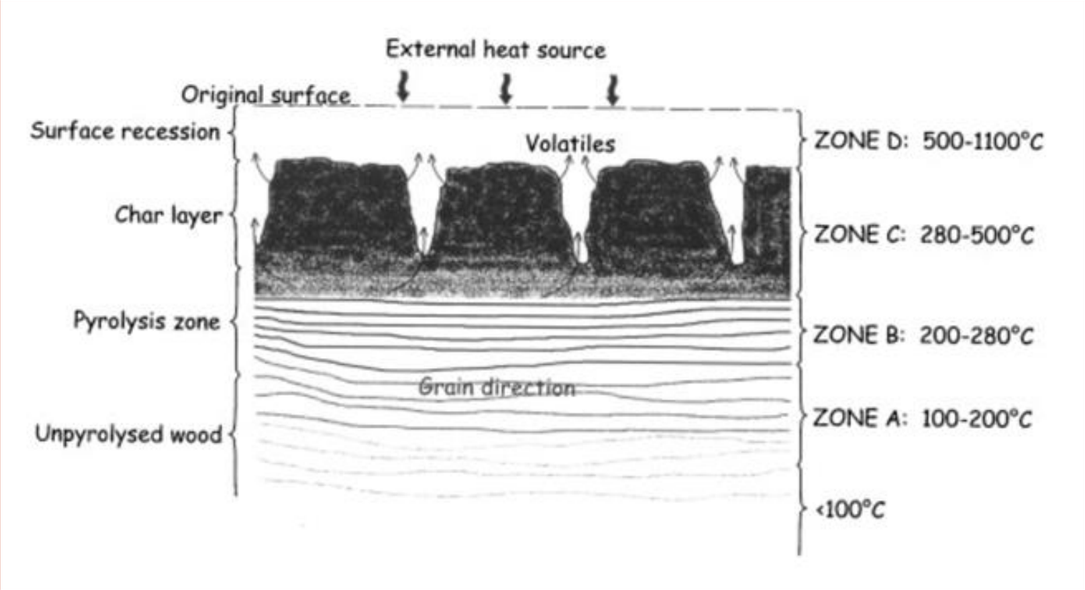
Mass timber structure during the fully developed fire.

State of mass timber structure after fire research test.

Fire testing of mass timber building by Canadian Wood Council in Ottawa

Fire testing of a steel structure in China

TESTING OF FIRE BEHAVIOUR



Temperature zones in Timber when exposed to fire

large-scale fire tests being conducted on timber compartments (ARUP, 2021)

Source: Prof Richard Walls and Darren Sulon

Also Have a look

- https://youtu.be/shvZnKN3YUM
- https://youtu.be/DyYl0fAL_PU
- https://youtu.be/JCQ_Hfg6lX8
- https://youtu.be/qSveiEKF0m4
- https://thewoodapp.com/timber-in fire/#:~:text=To%20assess%20the%20performance%20of,standard%20fire%20time%2Dtemperature%20curve.
- https://youtu.be/mZnWDSgoxWE
- https://youtu.be/Gf6WsSnVjH8
- https://youtu.be/ftubLkEAwho
- https://youtu.be/jOELM-cv-U8?si=rN6HLMT1c629qXDU

THANK YOU

JACKHAMMER
WOODEN-STEEL

Corporate Office: 74 Technopark, 74/11, C Cross Road, Opp. Gate

No. 2, MIDC, SEEPZ,

Andheri Kurla Road, Andheri East, Mumbai 400 093,

Maharashtra, India

Email : info@jackhammer.in