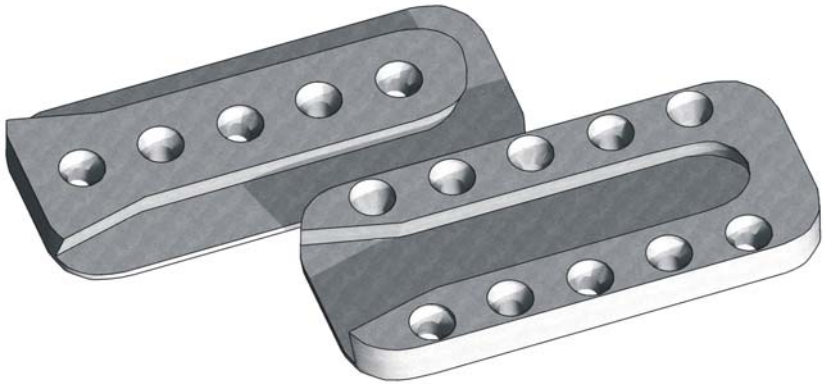
Sherpa conectors!

Wood is a building material with some negative properties – shrinking and swelling!

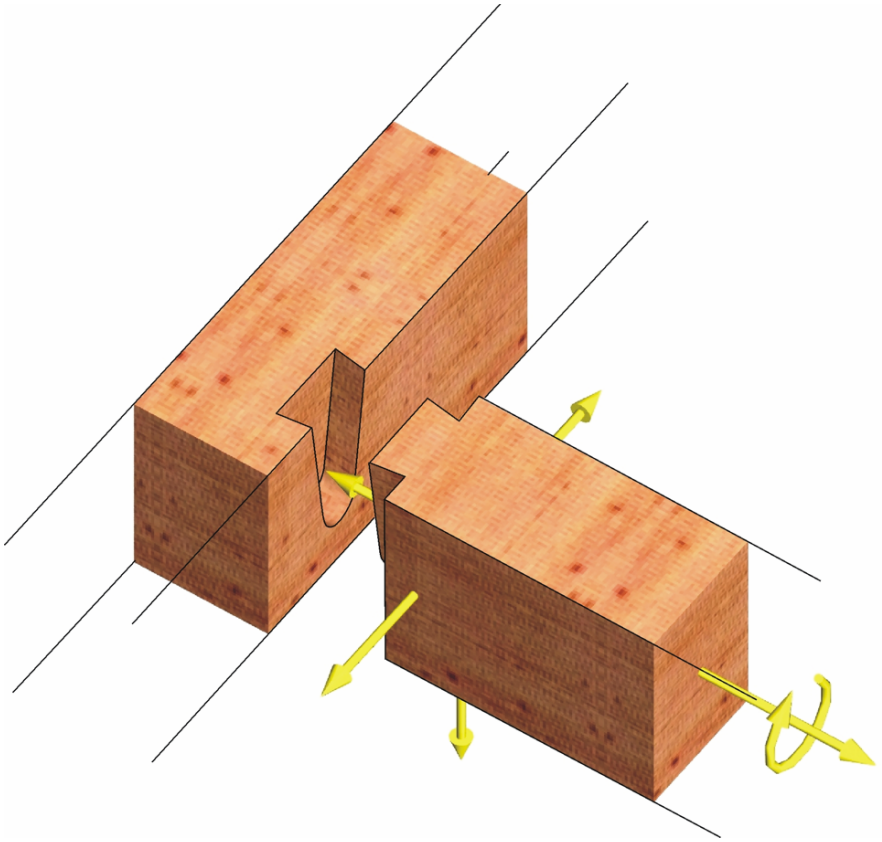
Wood is very strong – however, not in all directions!
-End grain – strong against pressure

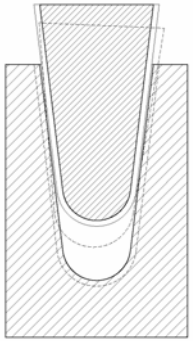
There are many traditional types to connect wood! Dovetail, joist hanger…

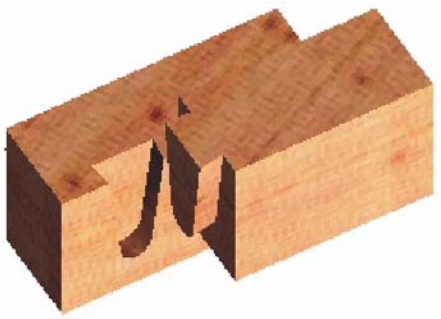


Dovetail - Connection

Usefull for a lot of constructions; Easy to assamble







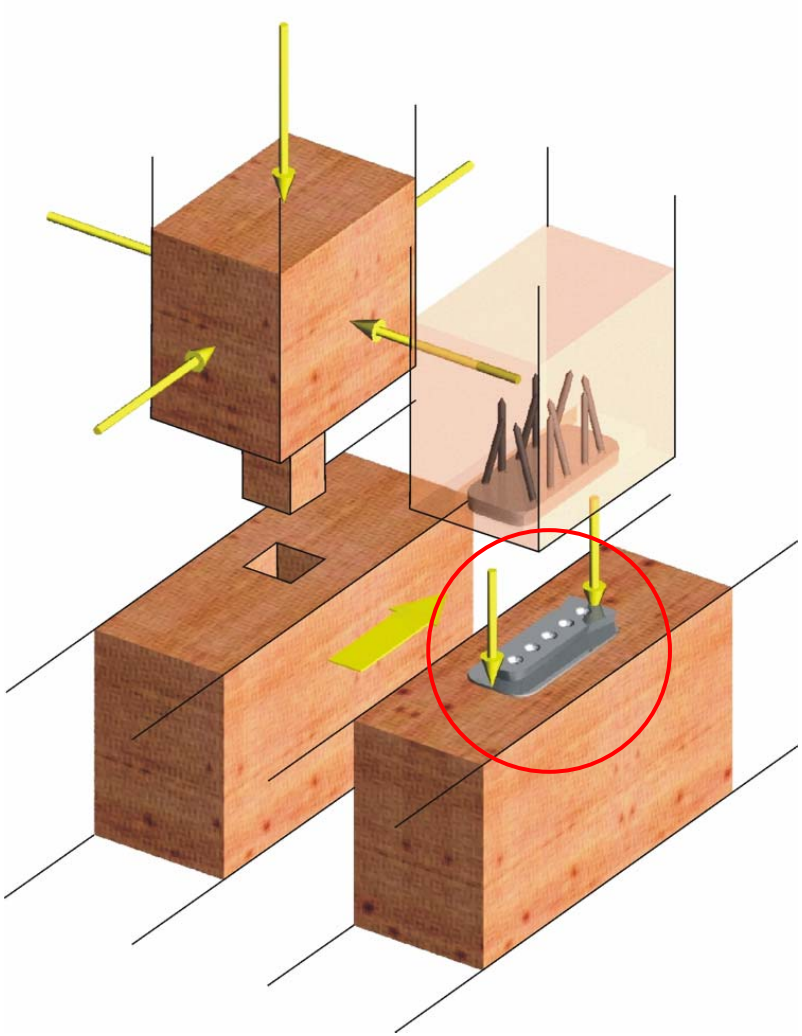
Dovetail – Connection can transmit loads from all directions

sheare loads
pressure
torsion
tensile loads

Disadvantage: Shrinking and swelling problems of wood – could be a problem for dovetails.

Mortise and tenon joint

Traditional to connect pilots and beams



Grain wood on a beam

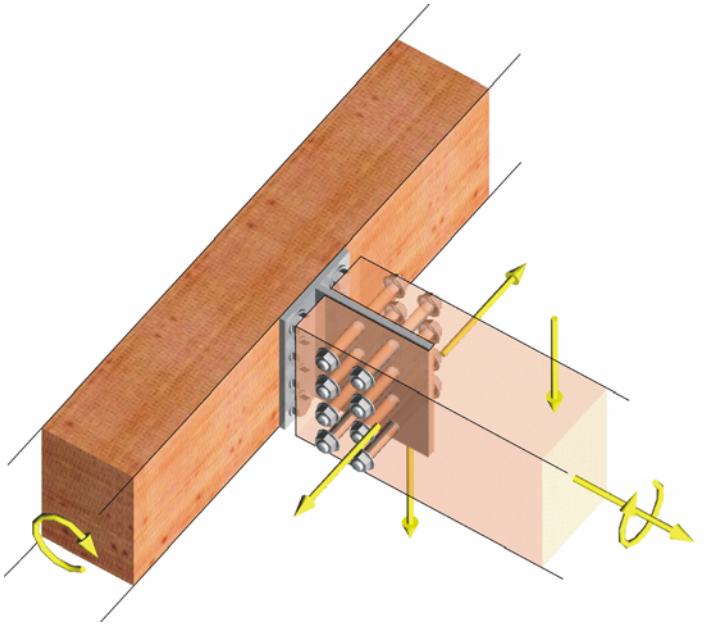
The load capacity of wood normal to the fiber is better than across the fiber. The wood-mortise can only used for low sheare loads.

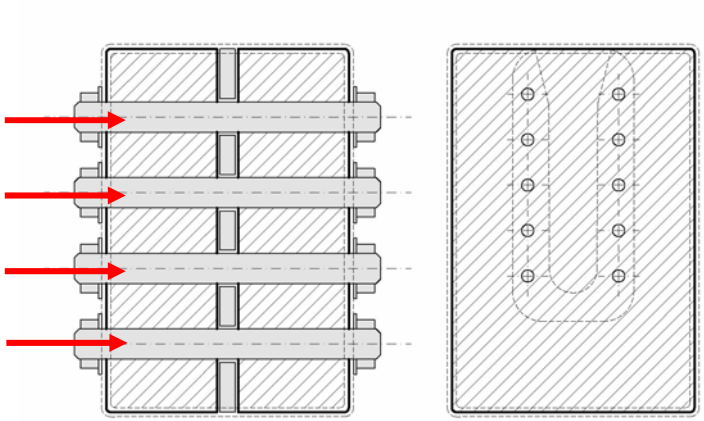
Sherpa

The metal plate arranged the loads better than the mortise and tenon joint. Sheare loads and torsion are not a problem for the Sherpa.

Slotted plate

Connecting major and secondary beams





Possible loads for slotted plate: pressure, torsion and tensile loads. Disadvantages: weakening of the wood dimension, not easy to handle and assemble.

Wood works every time (shrinking, swelling)! Metal does not works in the same way.

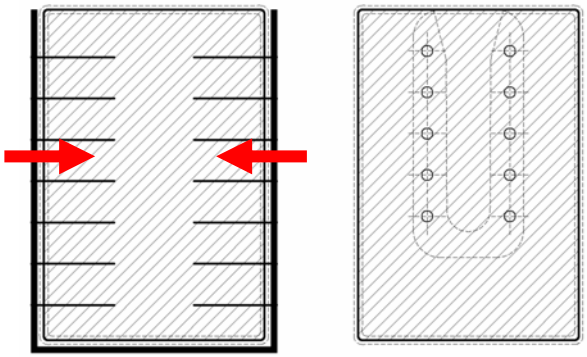
Sherpa
Is easier to handle and “works” better with the wood-movement.

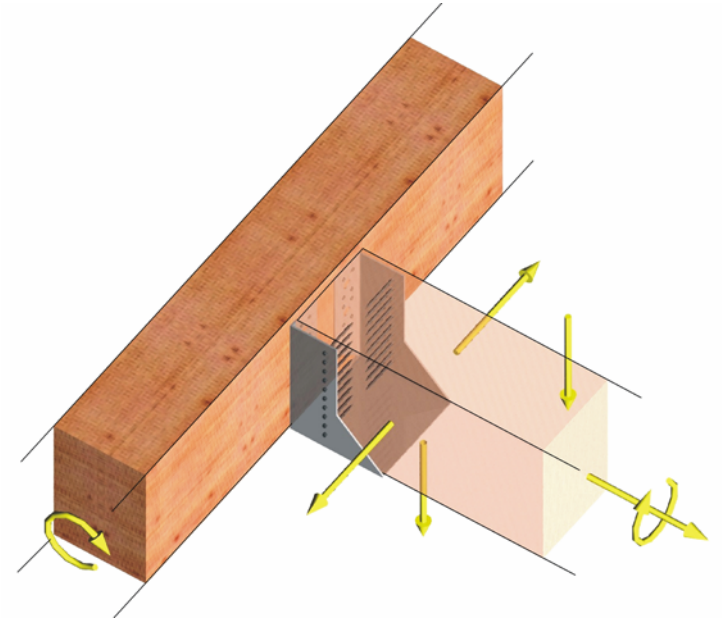
Fire protection

Slotted plates are not protected against fire!

Joist hanger

Connecting major and secondary beams





Possible loads for joist hanger: pressure, torsion and tensile loads. Disadvantages: not easy to handle and assemble.

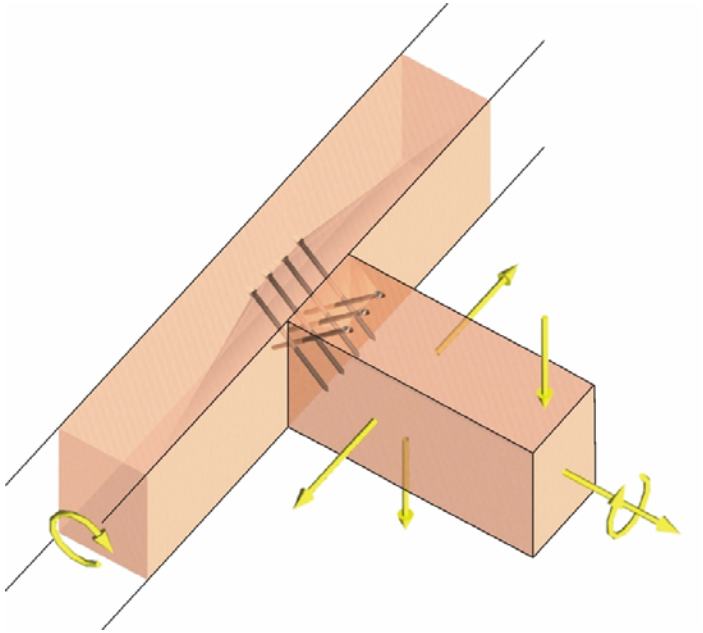
Wood works every time (shrinking, swelling)! Metal does not works in the same way.

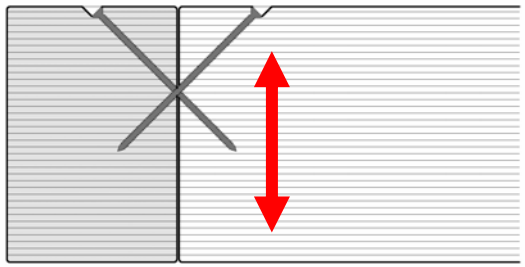
Sherpa
Is easier to handle and “works” better with the wood-movement.

Fire protection
Joist hanger are not protected against fire!

Screws

Connecting major and secondary beams

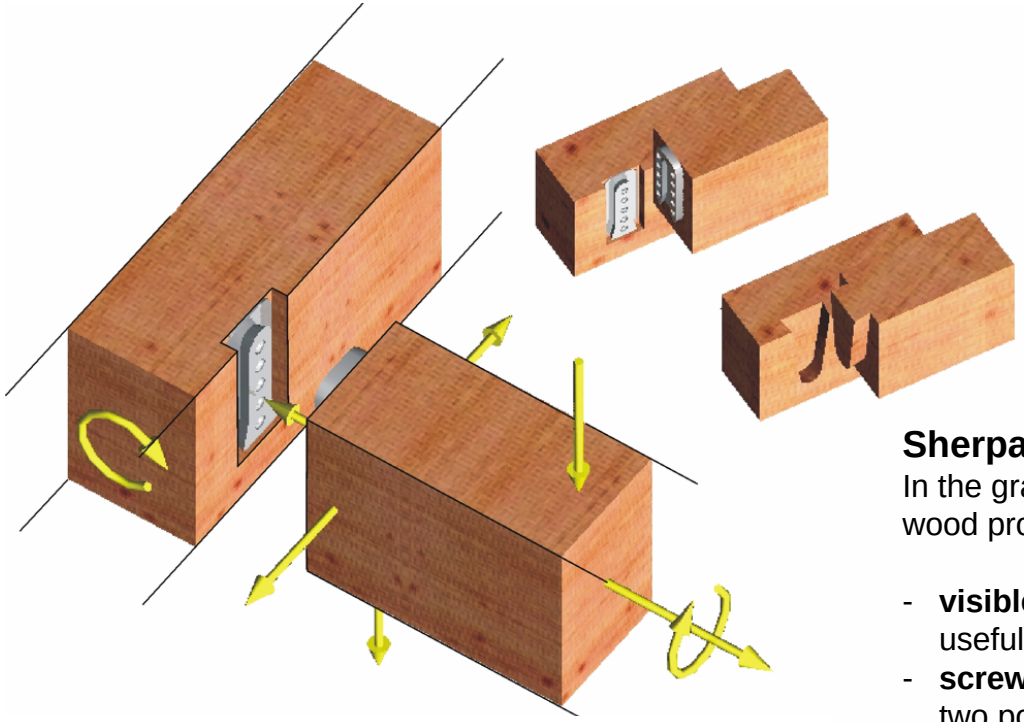


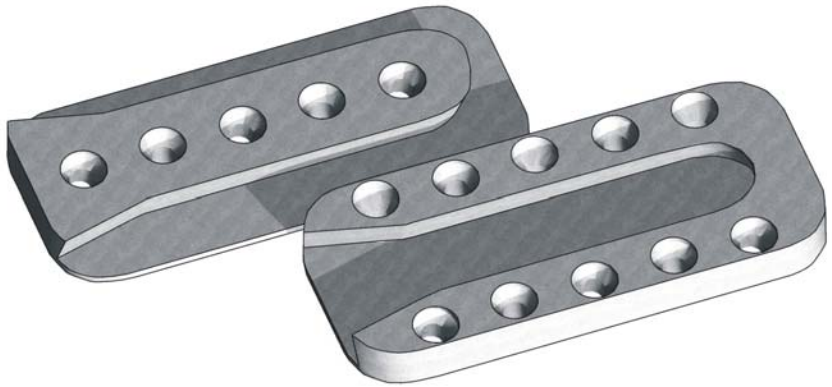


Cheap connection -

- No torsion allowed.
- Only for low tensile loads.
- Fixing/positioning of the beams are difficult.

Sherpa – similar to dovetail joints, but not the same





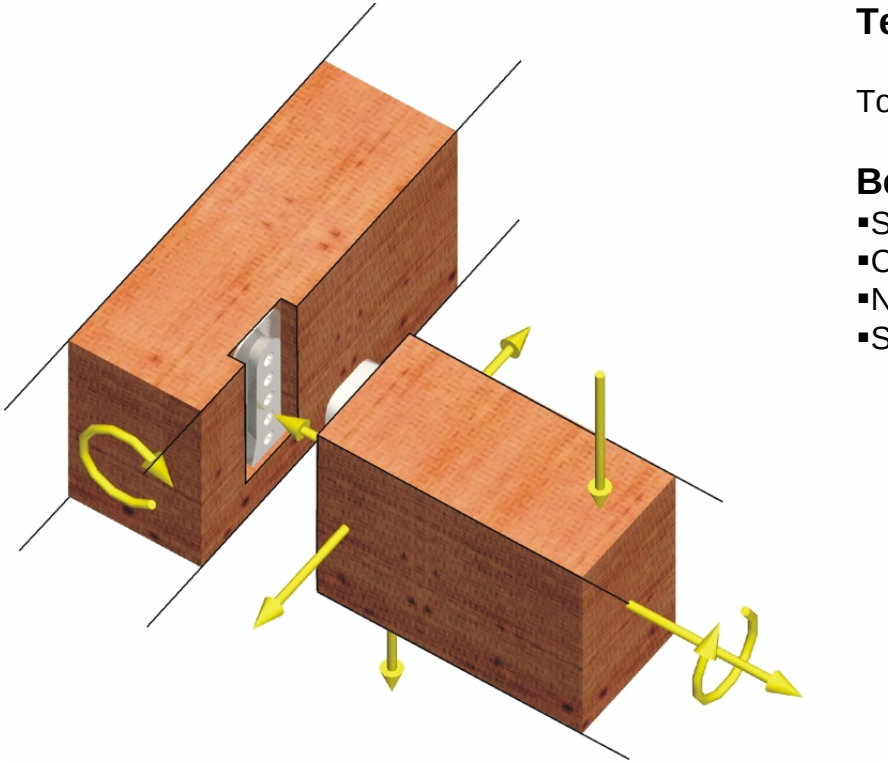
Sherpa

In the grain wood are more screws – this is a reason of the wood properties

- **visible / hidden**
  useful for visible constructions and fire protection!
- **screwed / glued**
  two possibilities of fixing

Sherpa – assembling & loads

Easy to handle & very strong



Tensile loads – pressure – sheare loads - torsion

Torsional moment is possible, the major beam is fixed

Benefits of assembling:

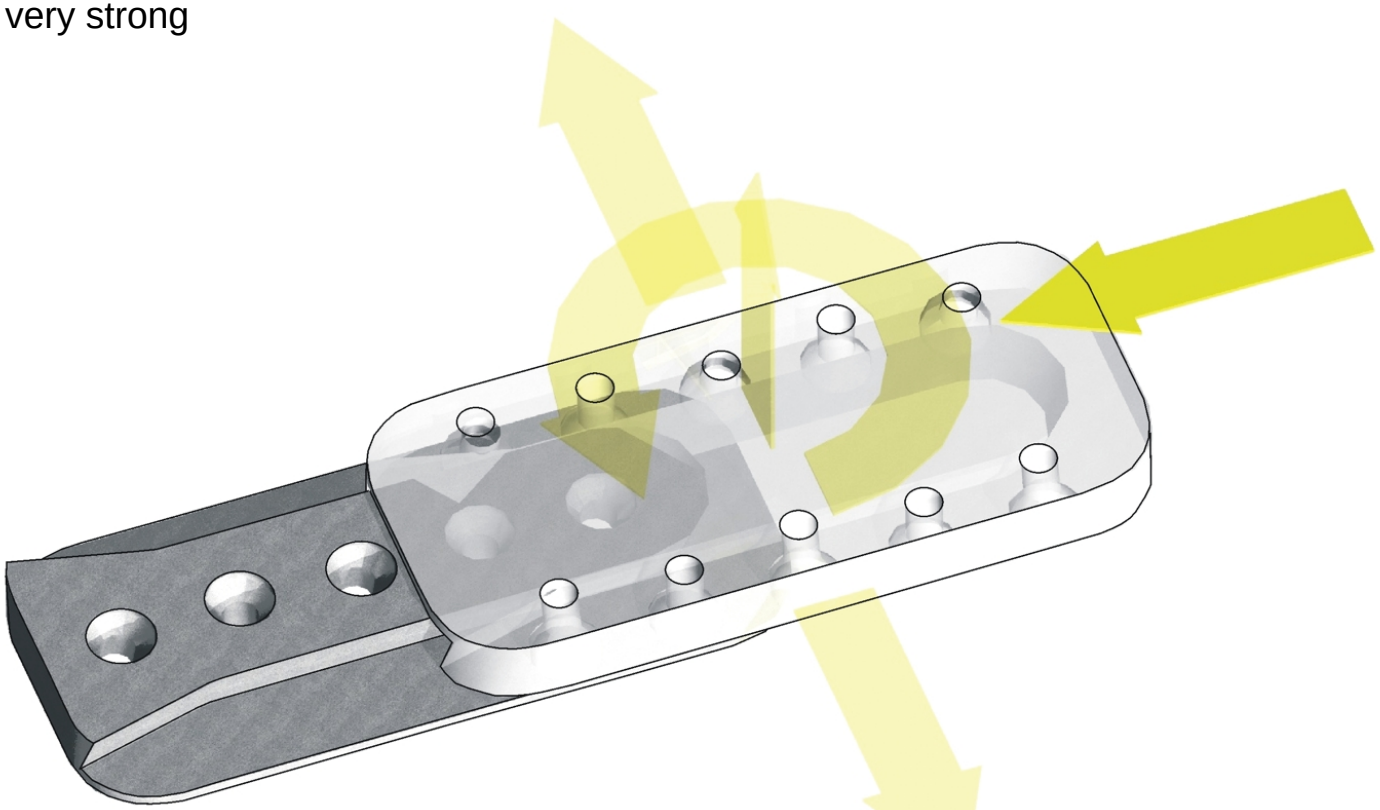
- Straight chop cut
- Chop cut must be only plane
- Not special machines for flute
- Special screws for a otimum of fixing

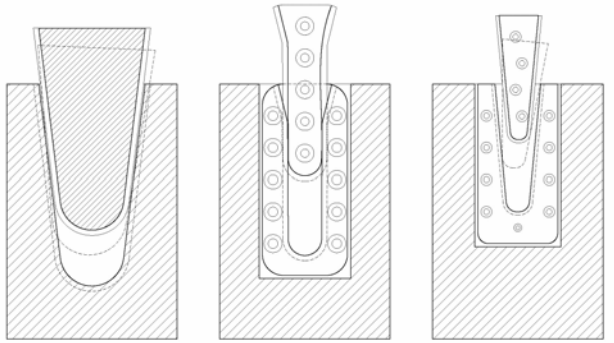
Sherpa – assembling & loads

Easy to handle & very strong

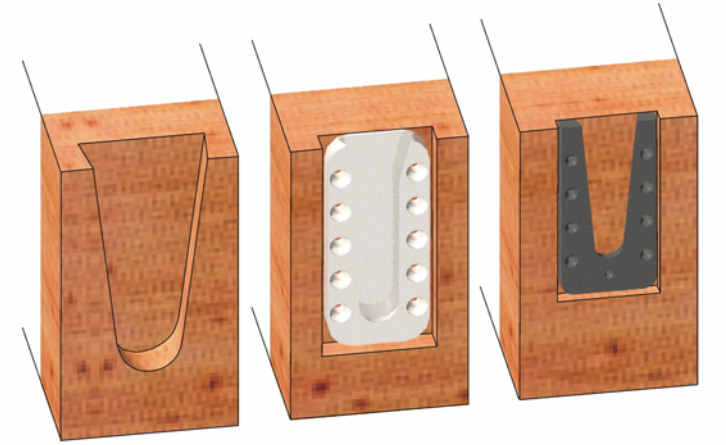
Possible loads:

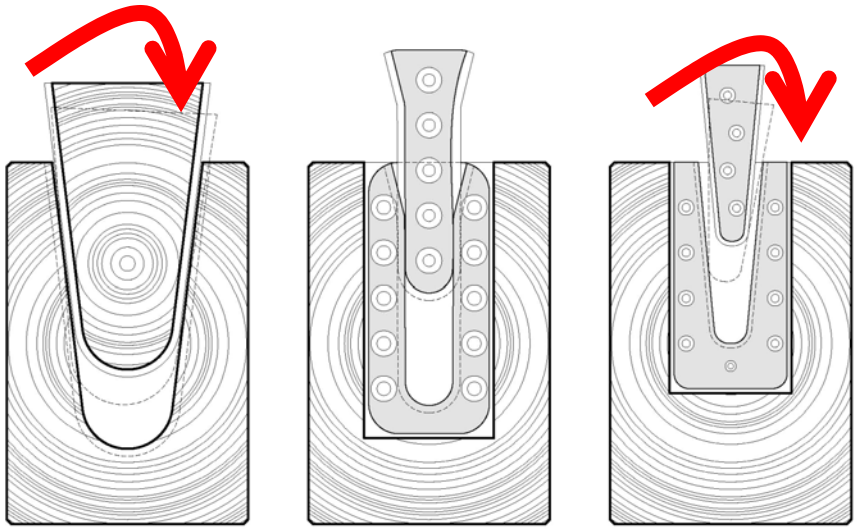
Tensil loads
Pressure
Shear loads
Torsion





Sherpa – similar to dovetail joints, but better





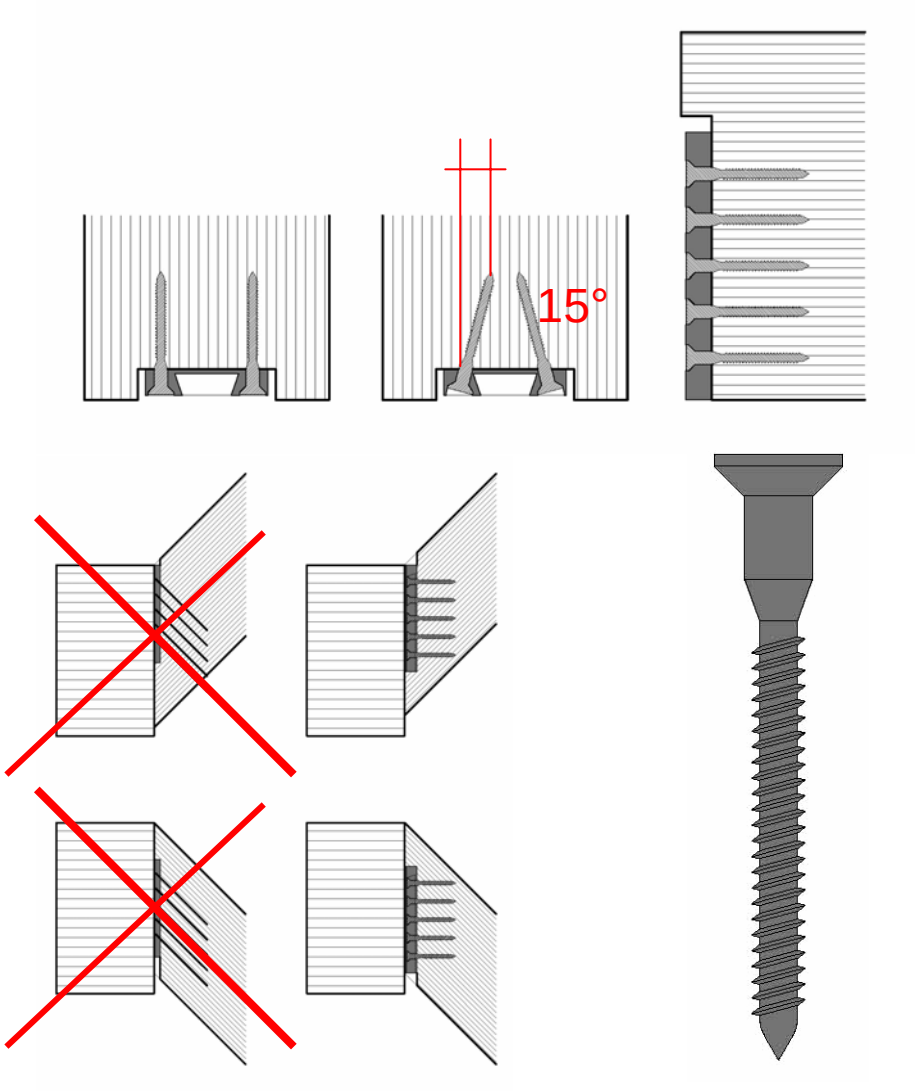
Important criterion for assembly and loads:
Tolerances Must the connection be closed to transmit loads?

Sherpa = Harrer-patent!
-can transmit loads after closeing-50%
-Easy to assamble

Dovetail-joints and other wood fastener need 100%-closeing to transmit loads!

Sherpa – Screws

Numerous, position and shape of the Sherpa-screws are optimized

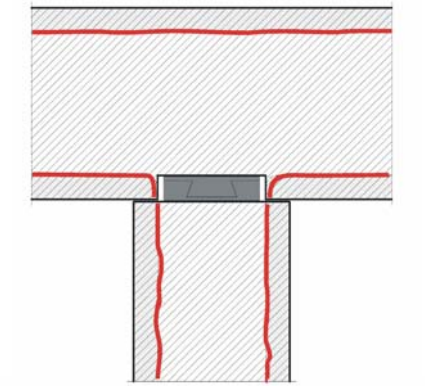


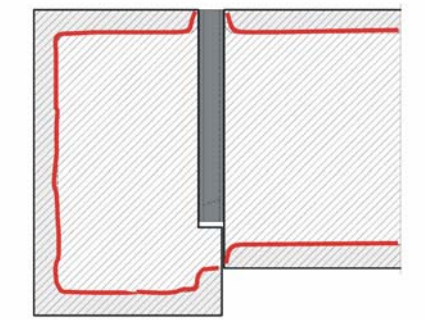
Quality marks:
-Length of the screws are branded on the top
- no tolerances between the sherpa and the screws
-Predrilling the screw-holes
- no weaking of the wood dimension

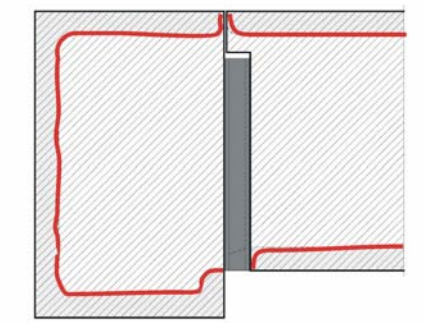
→Possible: fixing the sherpa with glue

Sherpa – Benefits: Fire Protection

A hidden connection is possible







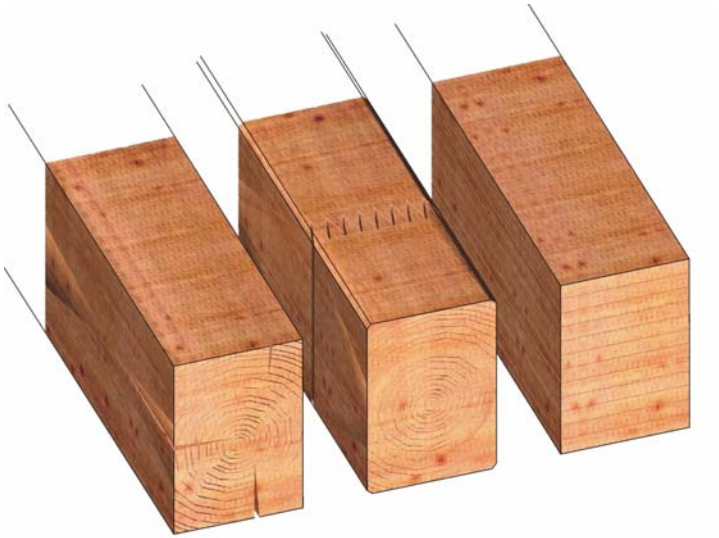
Wood and fire!

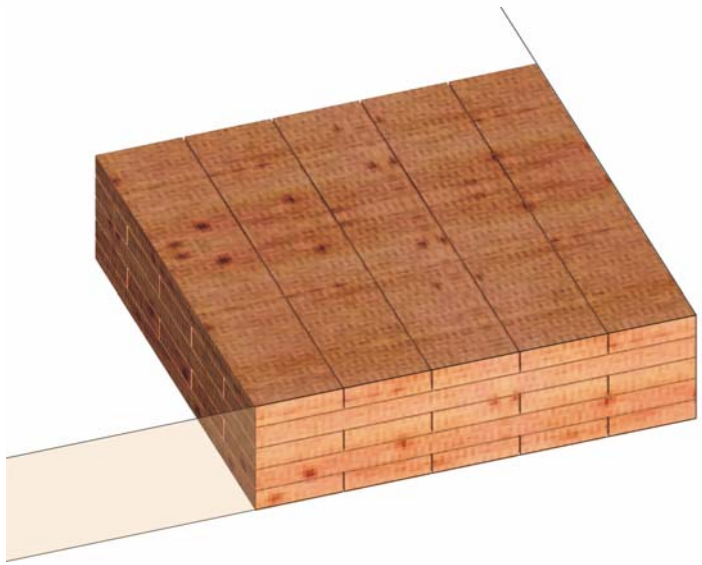
Wood burn-off

Fire=0,65mm/min = 20mm/30min

-Slotted plates or joist hanger contact fire directly, and trasport the heat into the wood.
-If the Sherpa is hidden, the wood will protect the fastener.

Wood and wooden products





Solid wood
KVH
GL 24
BSP

Differences
Stability (form, strength and dimension)

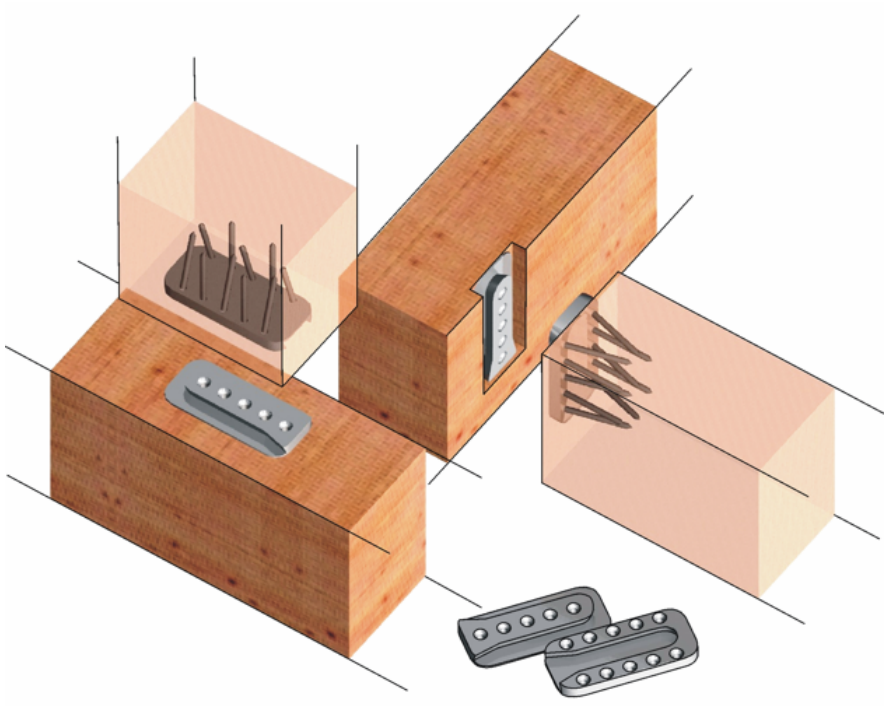
Solid wood
+ cheap product
- torsion,

KVH
+ good dimension stability
+ every length available

BSH / GL24
+ for high loads
+ every length available
- Expensive product

KLH
+ static plate
- expensive

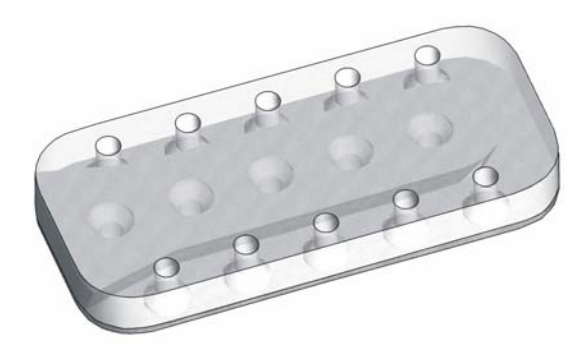
Sherpa – Use

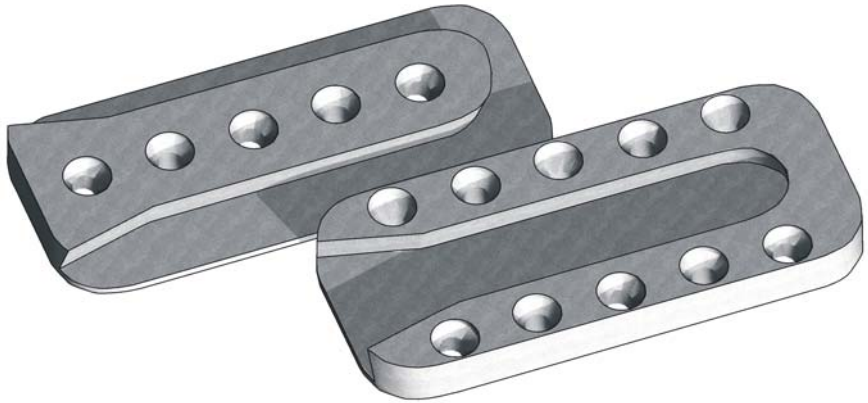


Roofs
Walls
Stairs
Pilots
Balcony
Boncers
…

Sherpa - properties

Alu or plastic





Properties:

Plastic

+ cheap
- Low loads

Aluminium (major sherpa material)

+ for high loads
+ ideal for small series and special Sherpas
+ resistance against wood-acid
- High product-costs