

End-jointed wood

Long timber is hard to find and very costly. The price of end jointed wood does not depend on length, and serious wood defects are eliminated!

End-jointing:

- Butt joint – theoretical possibility
- Scarf joint
- Finger joint

Butt jointing:

- High strength requirement in the longitudinal direction
- Small surface
- End-grain – high resin absorption
- Experimental techniques with high-viscosity resins
- Not used in practice

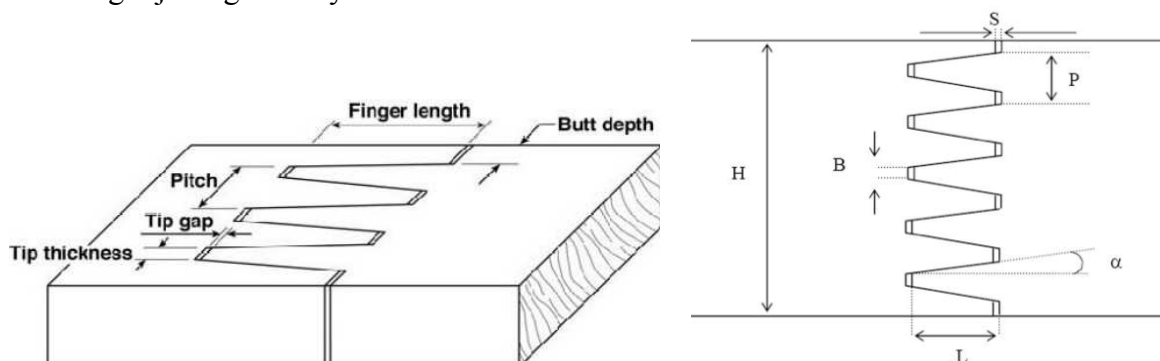
Scarf jointing:

- Increasing the strength by increasing the surface
- The smaller the incline, the higher the strength
- Problems:
 - Large overlap, much waste
 - Problems with cutting (accuracy)
 - Problems when pressing – solutions
- Requirements.

Finger jointing:

Basics, geometry, requirements:

- “A folded-up scarf joint”
- Vertical or horizontal orientation
- Finger joint geometry:



$$\text{Relative gap: } e = \frac{s}{L}, \quad \text{Reduction factor: } v = \frac{B}{P}$$

- Other requirements:
 - Connecting ends must be defect-free, esp. cracks and checks!
 - Knots must be at a distance of at least $3d$!
- Interlocking geometry: $\alpha < 9^\circ$. Factors that help the joint to interlock.

Finger joint strength depends on:

- Geometry
- Wood species
- Moisture content
- Resin type
- Technology parameters

Finger jointing machines:

- Two basic components: moulder and press.
They are usually done separately, except in the most basic machines.
- Moulding:
 - individually (two connecting pieces at a time)
 - individually (conveyor)
 - several pieces together
 - ends should be freshly cut.
- Glue application (usually integrated into the moulder):
 - roller
 - brush
 - jet
- Pressing:
 - one joint at a time (usually immediately after pressing.)
 - several joints together (pressing a longer piece after cutting to approx. length.)
 - continuous pressing in motion
 - Pressures, lateral clamping.