

Glued Ribbed plywood plates

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About me



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Working on doctoral thesis:

“ Calculations of Rational wooden composite structures and their elements”;

Research assistant at Riga Technical University Institute of structural Engineering and Reconstruction;

- **Plywood**

- Layered wooden material with improved wood properties, with possibility
 - to improve strength (improved with reduce of imperfections)
 - to obtain higher specific strength
 - to obtain low amount of waste
 - to vary with required properties in various directions
 - to get waved form

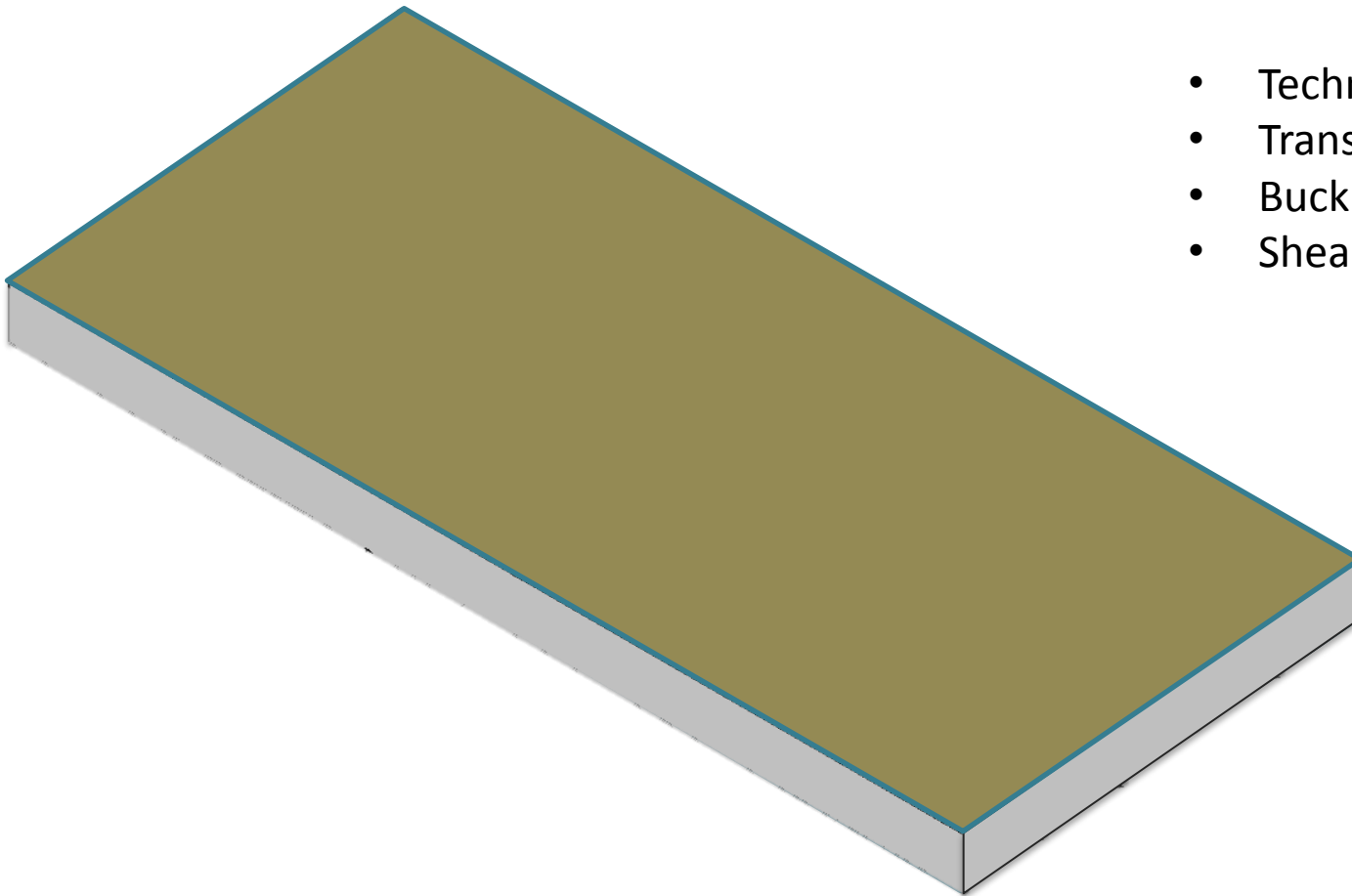


Plate with Cell Type Core



Advantages

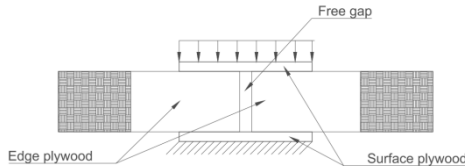
- Technological
- Transversal direction
- Buckling improvement
- Shear properties



Glued Edge-to-Surface Joint



Different pressures applied
(0.3MPa; 0.5MPa; 1.0 Mpa)

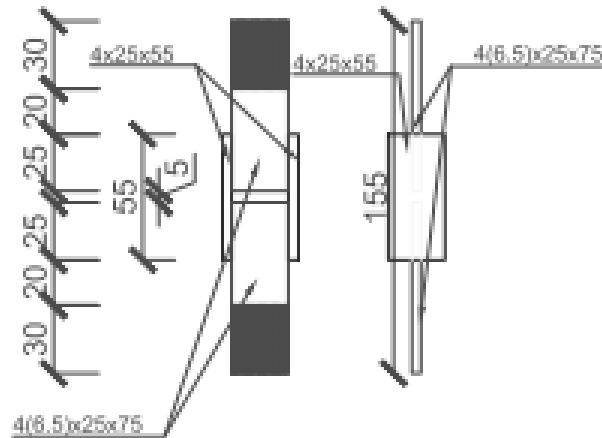


Surface-to-Surface

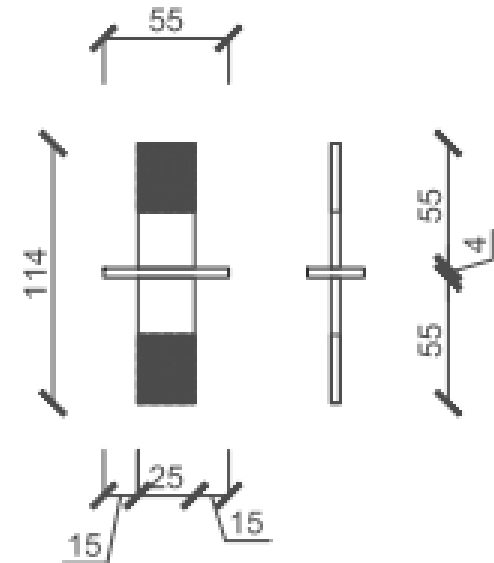


Modified
Edge-to-Surface

ASTM D2528-96 «Standard Test Method for Strength Properties of Double Lap Shear Adhesive Joints by Tension Loading»



Shear joint specimen with dimensions



Tension joint specimen with dimensions

Glued Edge-to-Surface joint



- Various plywood thicknesses and orientations for ribs
- Various material and thicknesses for skins
- ✓ Ultrasound tests
- ✓ Digital Image Correlation
- ✓ Tests until fracture of a joint



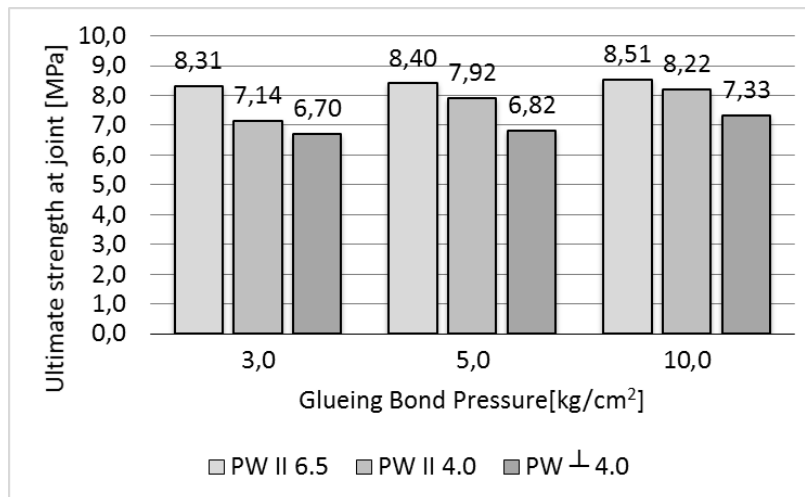
Specimen placed in the testing machine (Instron 3000).

Experimental investigations

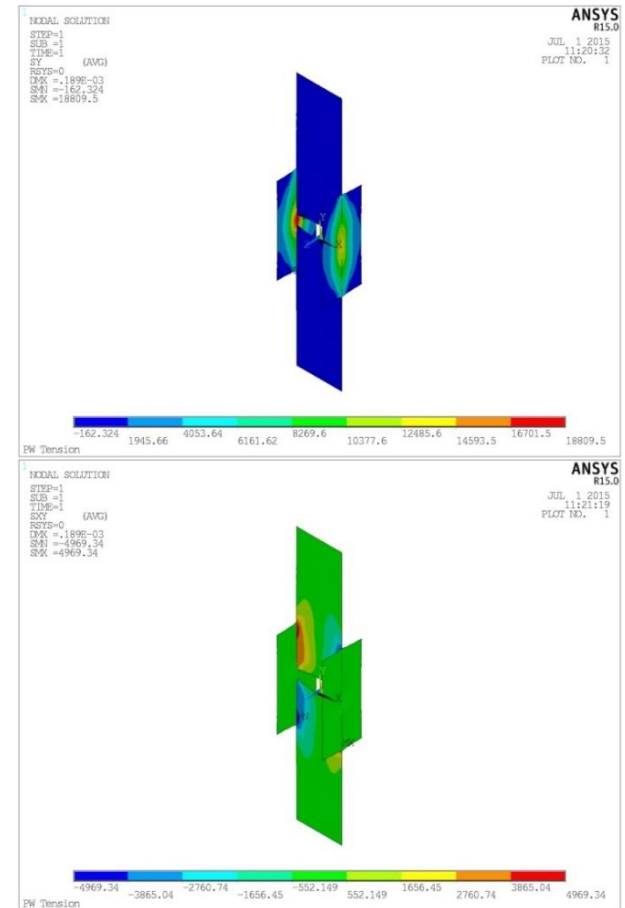


Shear stresses in edge plywood and normal stresses in surface plywood ANSYS simulation (simplified)

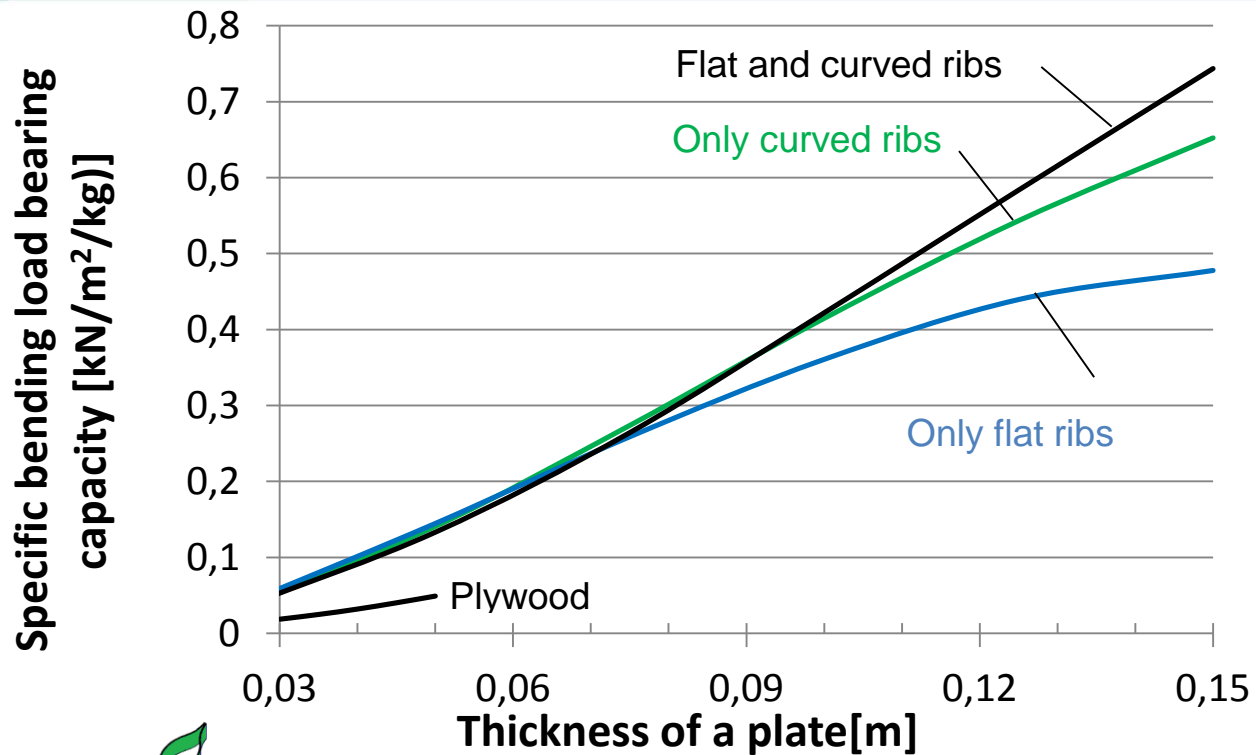
Ultimate Strength



Ultimate strength for different levels of pressure for all samples.

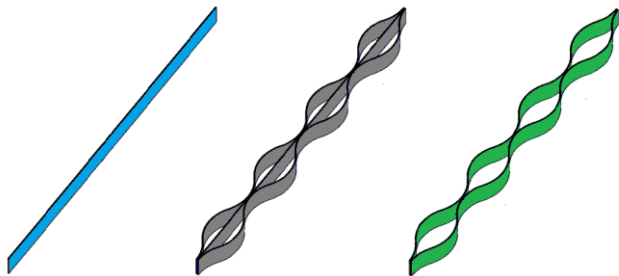


Numerical investigations



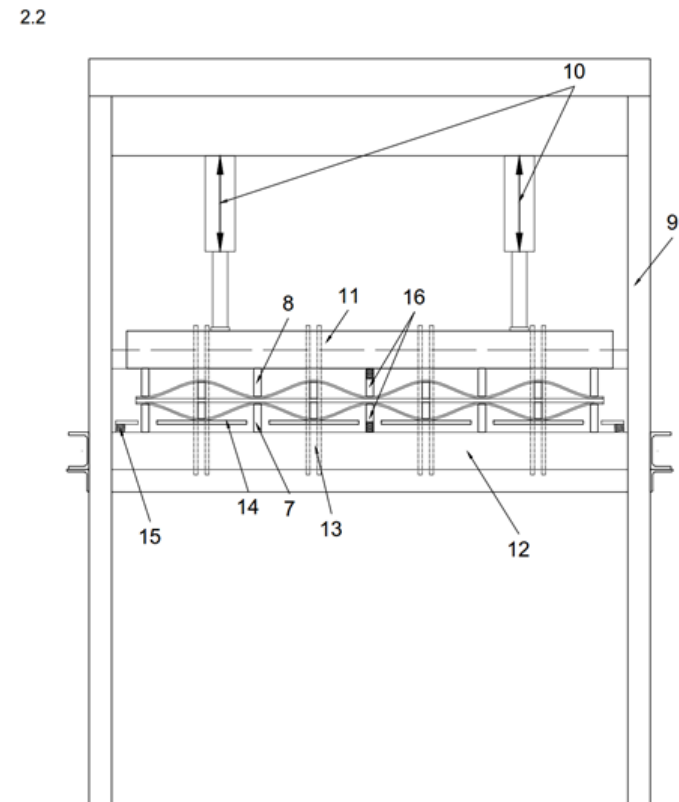
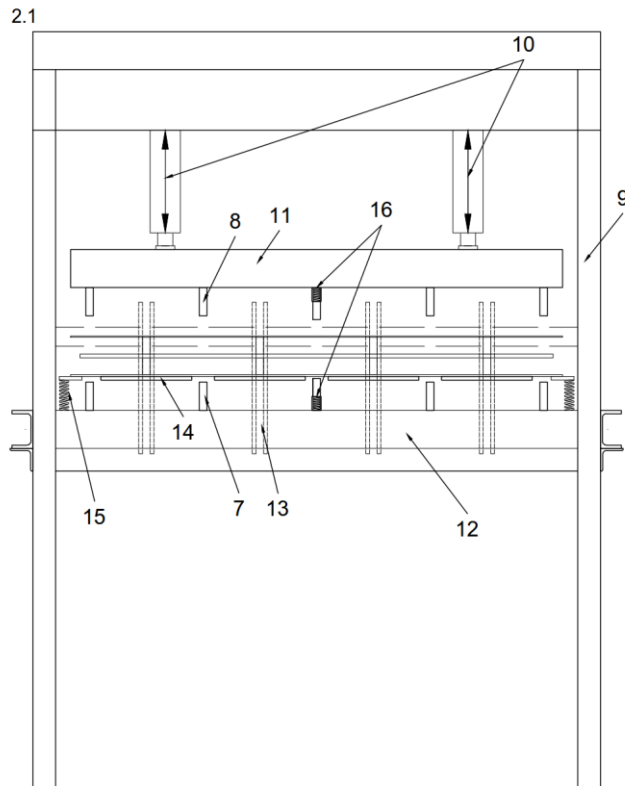
Specific bending bearing capacity (capacity to mass) for different plates

Three types of ribs analyzed:



flat rib; flat and curved rib; only curved rib

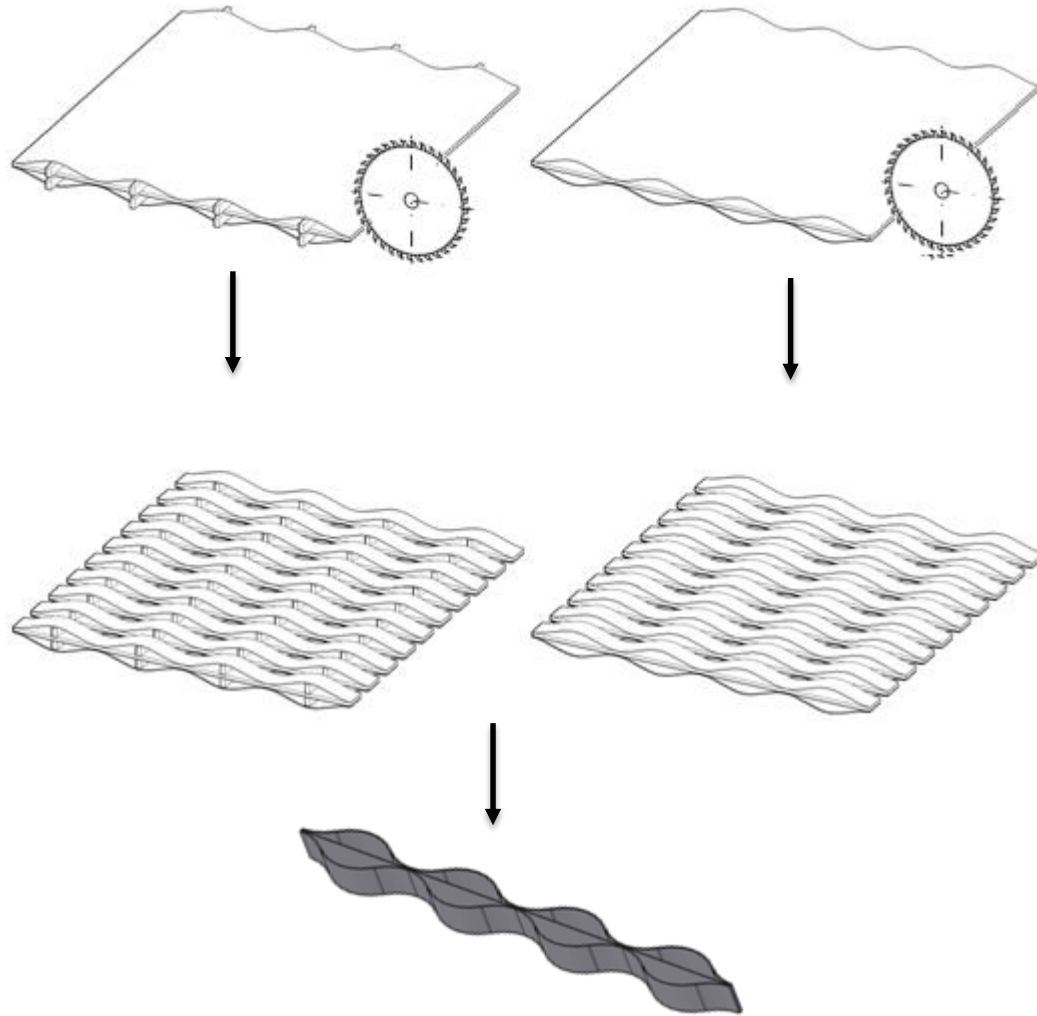
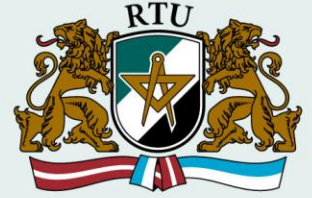
Technology



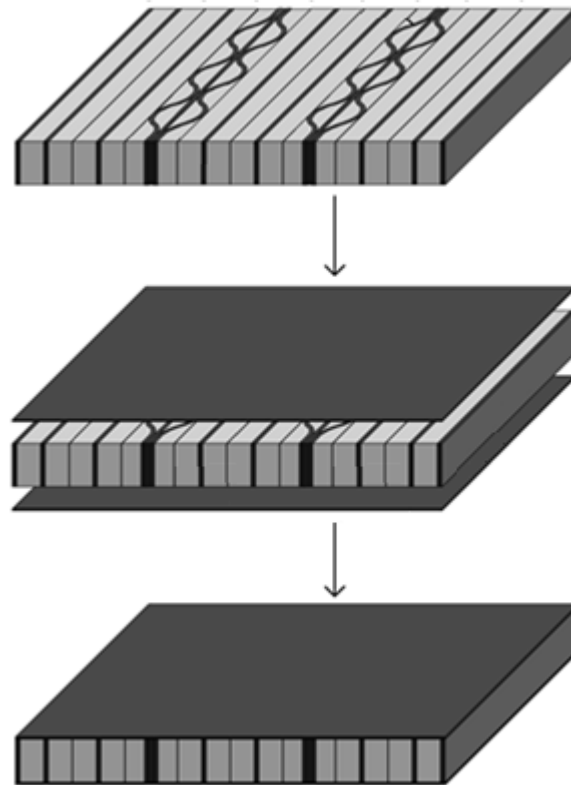
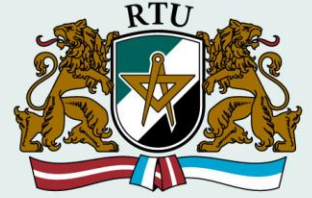
Patent No. **14979** P-14-103 „ Method for producing ribbed plates”. K.Rocēns, A.Kukule, Ģ.Frolovs, J.Šliseris Ģ. Bērziņš

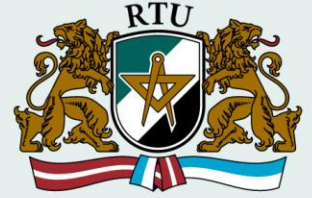
Assigned one patent application P-15-108 “Method and equipment of production for ribbed composite plate with goffered wood-based core” K.Rocēns, Ģ. Frolovs, A. Kukule, J. Šliseris.

Technology



Technology





Thank you for attention !