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INFLUENCE OF ENVIRONMENTAL FACTORS ON THE PHYSICAL-MECHANICAL PERFORMANCE OF GLUED LAMINATED WOOD (GLT) ELEMENTS - EXPERIMENTAL STUDY

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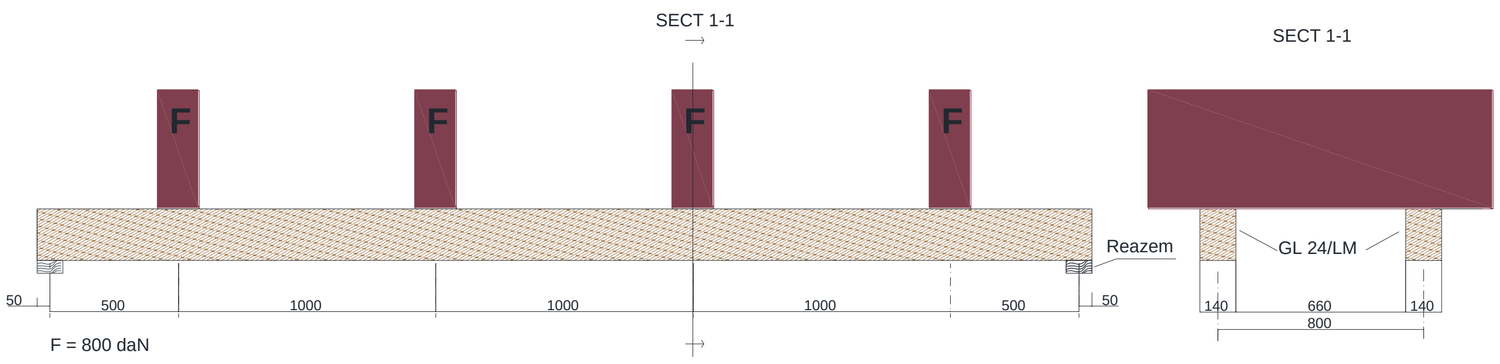
Climate change, simulated via two modes of evolution: continuous, slow moving (temperature, humidity, acidic aquatic environment, etc.) or abrupt abnormalities, **was proven to represent a real danger to building safety and stability**, producing negative effects both, to the overall structural assembly and also to the embedded elements.

I. AIM OF THE STUDY:

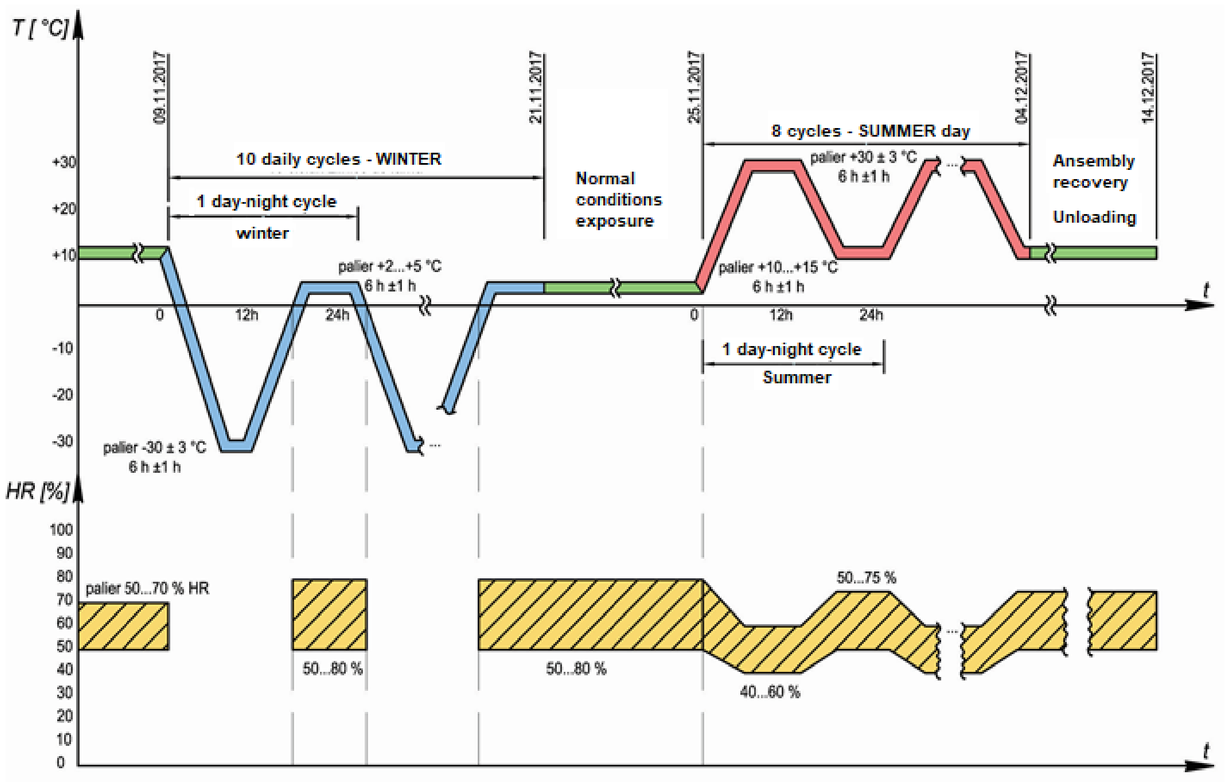
Experimentally evaluation of deflection variation of two types of wooden beams: **solid wood** and **glued laminated timber (GLT)**, when subjected to simultaneous and identical loading: **mechanical loading** and **simulated extreme environmental exposure:** -30°C…+30 °C.

II. EXPERIMENTAL PROCEDURE: mechanical loading & environmental exposure



Mechanical loading scheme: uniform distributed load generated by 4 Points applied load

Environmental exposure simulation - graphical representation of winter & summer alternating cyclestes



Phase 1: Wooden beam specimens *Mechanical loading* and testing assembly stabilizing along 20 days, while exposed in normal thermal and humidity conditions

Phase 2: *The Environmental exposure*

Phase 2a: *Exposure to 10 cycles* of 24h for simulation of alternating night and day T and RH conditions specific for *winter*

Phase 2b: *Recovery – Exposure to* normal thermal and humidity conditions, ranging along: Temperature T: +2°C…+8°C; relative humidity RH: 50%…80%.

Phase 3*: Exposure to 10 cycles* of 24h for simulation of alternating night and day T and RH conditions specific for summer:

III. CONCLUSIONS

The exposure to severe climatic, T and RH variations prove the high adaptability of wooden materials.
No degradations signs were recorded.

As expected, in terms of deflection evolution, the GLT beams to be more stable, with small specimen variation.

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