



Makerjoint, a New Concept for Joining Members in Timber Engineering – Strength Test and Failure Analyses

<https://research.thinkwood.com/en/permalink/catalogue260>

Author: Rebstock, Florian
Bomark, Peter
Sandberg, Dick

Year of Publication: 2015

Format: Journal Article

Material: LVL (Laminated Veneer Lumber)

Topic: Connections
Mechanical Properties

Keywords: CNC
Prefabrication
Failure Modes
Tensile Strength
Compressive Strength
Joints

Research Status: Complete

Series: Pro Ligno

Summary:

The wood construction industries are becoming more focused on climate change and resource depletion, and individual and industrial consumption must reflect a greater degree of concern for the climate and environmental wellbeing. This paper presents a new concept for timber engineering, the purpose being to acquire information about the failure modes and the tensile and compressive strengths of two types of joint, the Simple Gooseneck and Thick Gooseneck, that can be used in a new concept for joining members in timber structures. This Makerjoint concept uses laminated veneer lumber (LVL) as nodes in regions with a pronounced non-uniform stress distribution and sawn timber in regions with a more uniform stress distribution. No metal fasteners or adhesives are used in the joint between timber and LVL. The concept is intended for joints using 3-axis CNC machinery and to be a system for on-site- and pre-fabrication of e.g. small houses, emergency shelters and exhibition stands. The joints have a higher compressive than tensile strength. The joints exhibited brittle failure in tension (beam and/or node failure) and buckling occurred in compression around the thinnest cross section of the beams. Suggestions are made for how the mechanical properties of the joints can be improved.

Online Access: Free

Resource Link

http://www.proligno.ro/en/articles/2015/4/Rebstock_final.pdf