

Research Project Supplement

DIN EN 1995 - Eurocode 5 - Wooden Structures

Analysis of Different Girder Shapes



Proj.No. 09.007g

Abstract summary english

DIBt Berlin commissioned Harrer Ingenieure, Gesellschaft Beratender Ingenieure VBI mbH, Karlsruhe (project management), with the research project supplement "Analysis of single tapered, double tapered and pitched cambered beams to assess the influence of the taper or roof pitch" to the research project "DIN EN 1995 - Eurocode 5 - Wooden Structures Application Trials".

The aim of this supplementary assignment was to examine whether and to what extent the angles in DIN EN 1995-1-1:2010 with no upper limits constitute a safety deficit compared with DIN 1052:2008, which limits the taper to maximum 10° and the roof pitch to maximum 20° .

The analyses were performed on the basis of both – the currently applicable standards DIN EN 1995-1-1:2010 and DIN 1052:2008, and the old standards DIN V ENV 1995-1-1:1994 and DIN 1052:1988. Additionally, the diagrams in the BLUMER publication from 1972/1979 "*Spannungsberechnungen an anisotropen Kreisbogenscheiben und Satteldachträgern konstanter Dicke*" were used. The supplementary research project was supported by the software firm DLUBAL, which performed analyses with the RFEM program and provided the results. The results of the different calculation formats were compared against one another and the design-relevant calculations were determined.

This allowed the conclusion that the investigated cases, namely tapers of maximum 24° and roof pitches of maximum 35° , represent no safety problem.

A self-regulating limitation for the taper and roof pitch also results from the requirement of a length-to-height ratio of ≥ 6 , in order to meet the prerequisites for the beam theory.

A proposal to supplement the standard text in the A1-Paper to the National Annex was submitted to the responsible mirror committee for DIN EN 1995-1-1.