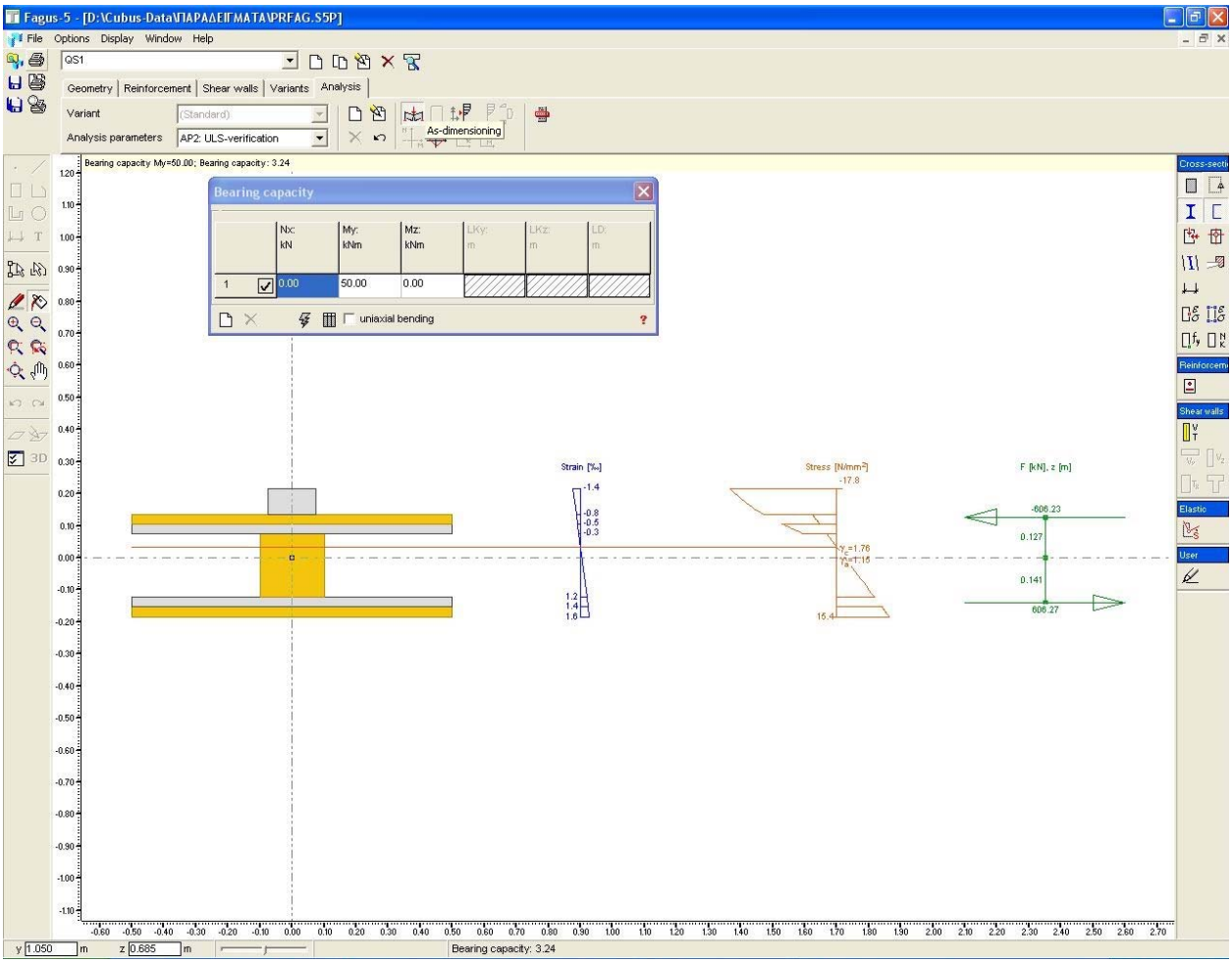
FAGUS-5W

Module for the cross-section analysis of timber structures



FAGUS-5W is an optional module of your familiar FAGUS-5 that allows the design of wooden cross-sections. The particularity of this material is the intense orthotropic properties that have to be taken into account.

cubus Hellas Ltd

Software · Consulting Services

General

The regulations specify allowable values of the strength for the bending stress and separately values for tensile or compressive stress. Further, each value depends on whether the stress is parallel or perpendicular to the direction of the fibers. FAGUS-5 contains libraries with values of various regulations (SIA265, DIN1052 etc.).
A wooden cross-section may as usually consist of various partial cross-sections of different materials and for each partial cross-section a different directions of the fibers may be specified.

For commonly used cross-sections there is a library with parametric cross-sections.

Types of analysis

FAGUS allows the following wooden cross-section analyses:

- stress analysis
- ultimate strength (resistance) analysis
- interaction diagrams

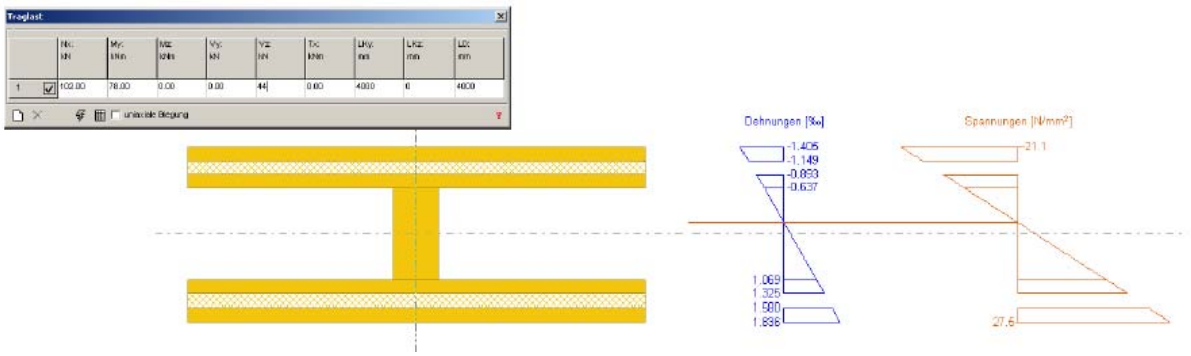
For the calculation of the ultimate resistance the specified by the user internal forces are increased until the stresses reach a maximum at any point of the cross-section. Interaction diagram represents graphically the evaluation of a series of ultimate resistance analyses. The user may choose two components from the N, My and Mz combinations and ask the construction of the diagram.

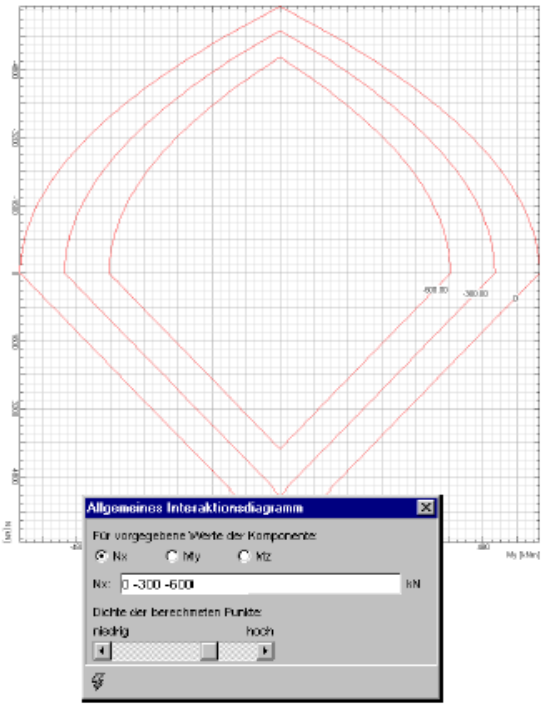
Buckling

If the buckling lengths are specified, the calculation of the ultimate resistance is based on these parameters as well. The intermediate results (k_c, k_m etc.) are also presented in a special table.

Statik-5 checks

Fagus-5 module for timber structures allows the automatic execution of the above analyses directly through Statik-5. This facility enables the evaluation of the ultimate resistance, for instance, of a whole structure with a simple run. The procedure is similar with the checks of AVENA for structural steel members.
The shear and torsional stress and strain verifications are limited, in the current version of the program, to the rectangular cross-sections.





Composite cross-sections

Fagus-5 allows also the combination of wood with other materials under the assumption, in the current version of the program, of the complete bond between the partial cross-sections.
Calculation procedure for the analysis of the ultimate resistance:
With the assumption of the Bernoulli hypothesis (plane sections to remain plane within the cross section), the permissible stresses, that depend on the contribution of the axial force or bending, are checked in the wooden partial cross-sections. For the rest partial cross-sections (concrete, steel) the usual conditions of FAGUS are valid, i.e. the limit state check is based on the maximum strain of the cross-section boundary.

CUBUS HELLAS Ltd | TH. SOFOULI 7 Str. | 154 51 N. PSYCHIKO
TEL: (210) 6722 –360 –366 –389 | FAX : (210) 6722382
e-mail: cubus@ath.forthnet.gr | www.cubushellas.gr