D10+

Glued Laminated Girder

The D10+ program is suitable for the design and optimization of the following girder types:

- Parallel chord straight/curved
- Single-pitch roof
- Saddle roof UK straight/round
- Fishbelly circular/parabolic
- Ridge options
  - without saddle
  - sway saddle with raised dry joint
  - fixed saddle

If the geometric conditions allow it, the plies can run in parallel to the girder top.

The computable structural systems comprise single-span girders with one or two cantilevers.

Available standards

- DIN EN 1995
- ÖNORM EN 1995
- BS EN 1995
- NTC EN 1995
- EN 1995

Loads - superposition

In addition to typical standard loads such as self-weight, snow and live loads applying over the total length of the girder, other load types (concentrated and trapezoidal loads) can be included in the calculation. In addition, accidental snow load, e.g. in the Northern Lowlands of Germany, can be taken into account with a freely selectable factor.
Wind and snow loads are automatically generated as "standard load cases" according to the relevant standards and can be modified or supplemented via the tab "Additional load cases".
During the calculation, entered loads are automatically superimposed with consideration of all combination coefficients.

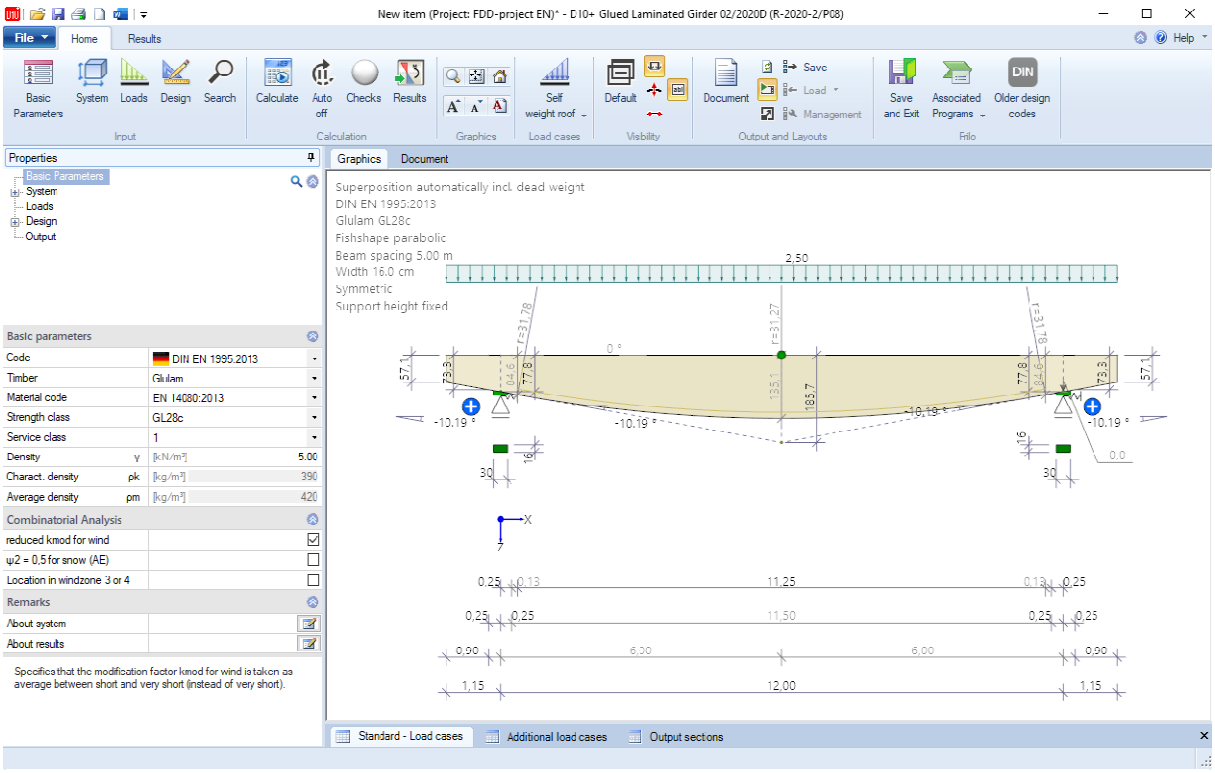
Internal pressure or suction can be applied via the fields coi(+) and cpi(-).

Verifications - Calculation

Verifications are carried out for cut grains and shear stresses, the increased longitudinal edge stresses, transverse tension and the interaction between transverse tension and shear at ridge points as well as for normal force.

In addition, the stability against tilting and the resistance to bearing pressure and deformation are verified. A camber can be specified separately for the span and the cantilever to verify the serviceability.

The lateral girder load is determined and the rise of the initial imperfection can be specified.



Calculation options

- Depending on the relevant NA, options are offered for reducing the design shear force, such as the reduction of concentrated loads close to the supports.
- Optionally, torsion in the supporting area due to the initial imperfection can be taken into account in the shear resistance analysis including the calculation of the fork support moments.
- Transverse tensile reinforcements: automatic laying of transverse tensile reinforcements with glued-in threaded rods and fully threaded screws including dimensioning of the holes to be produced along the edges of the girder.
- By specifying a distance to the lower girder edge, the user can control the spacing in the transverse tension zones and how the spacing dimensions are rounded. The weakening of the cross section is taken into consideration in the other verifications.
- Fire protection: Verification of the fire resistance duration.

Output

The scope of the output can be reasonably limited by options.

You can optionally include a parts list in the output.

Graphical display of results

The following graphics can be displayed for combinations and load cases:

- Internal forces M, V
- Support reactions Az
- Deflections wz
- Maximum utilizations

Construction

- Timber volume and surface area to be coated

Load transfer

The support loads can be transferred to the program Timber Column HO1+ and the Toolbox module TB-HHP Timber Pressure.