

D10

Glued Laminated Girder

Application options

The D10 application is suitable for the design and optimization of laminated timber trusses:

- trusses with straight or curved top and bottom edges
- double-pitch roof trusses with straight or curved bottom edge including the variants:
 - no saddle,
 - sway saddle,
 - fixed saddle,
 - high dry joint and
 - arched beam.

The plies can optionally run in parallel to the truss top edge if the geometric conditions allow this.

Standards

- DIN EN 1995
- ÖNORM EN 1995
- BS EN 1995
- NTC EN 1995
- EN 1995
- DIN 1052

Loading/superposition

In addition to the standard distributed loads (g, q, s), the user can define other load types with permanent and variable portions. The structural calculation offers control options for the superposition of the load cases. Accidental snow loads can optionally be taken into account. The self-weight can also be included automatically.

The superposition of the defined loads is performed automatically and all combination coefficients are taken into account.

Wind loads are included automatically with all associated combinations.

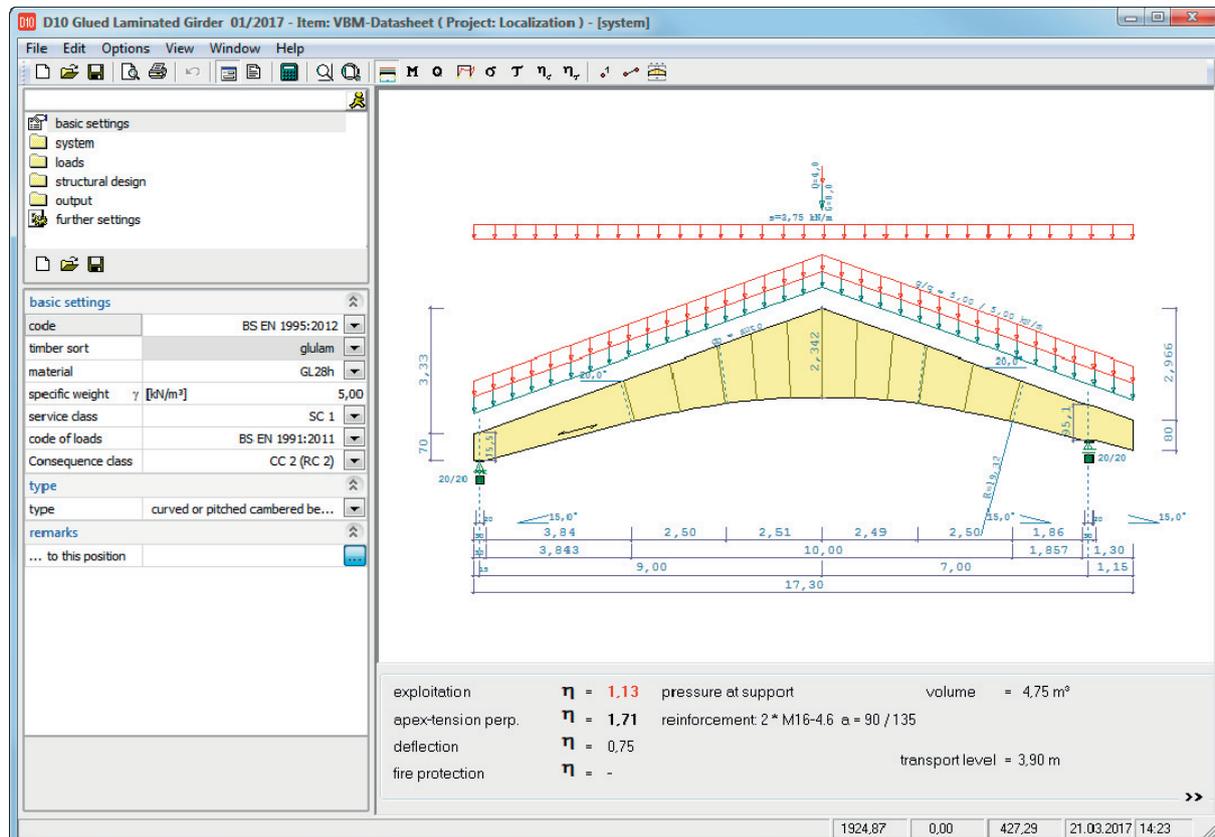
You can include internal pressure by defining $c_p(\text{internal})$.

Analyses - Verifications

In addition to the analyses for cut grains (which take the non-linear distribution of the bending stresses into account) and shear stresses, also verifications concerning the increased stresses on the longitudinal edges, transverse tension and the interaction between transverse tension and shear are performed.

Furthermore, the stability against tilting and the resistance to bearing stress and deformation are verified and the lateral loads acting on the truss are calculated.

The weakening of the cross section is taken into consideration in the other verifications.



Calculation options

- When performing the shear design at the support, the design point is selectable (either on the support axis or at a distance h or $h/2$ from the support edge as specified in the standard).
- You can optionally decrease concentrated loads close to the support.
- Torsion in the supporting area due to pre-deformation can be taken into account in the shear resistance analysis including the calculation of the fork support moments. The cantilevers are taken into account. You can pre-set the size of the pre-deformation.
- Transverse tensile reinforcements:
You can optionally activate the automatic relocation of transverse tensile reinforcements including the dimensioning of the required drill holes along the truss edges. By specifying a distance to the lower truss edge, the user can control the spacing in the transverse tension zones and how the spacing dimensions are rounded. You can optionally include a parts list in the output.
Fire protection: verification of the fire resistance period.

Results/output

All results are put out in a well-structured and comprehensible manner. Extensive options are available to control the scope of the output.

Graphic representation

A new system graph with all dimensions including a load graph with a well-structured legend was implemented.

The following line graphs can be generated in addition:

Superimposed internal forces:

- Moment limiting line M_d / M
- Shear force limiting line V_d / Q
- (Elastic) deformation limiting line

Limiting lines decisive for the design:

- Longitudinal stresses
- Shear stresses
- Stress loading rate
- Shear loading rate

Construction drawings

In the construction drawing view, you can export the geometry without the load arrangement to a DFX-file suitable for CAD systems. If applicable, you can include the transverse tensile reinforcements.

Furthermore:

- Output of the transport height of the trusses
- Supporting forces of the individual load cases
- Timber volume, weight, surface to be coated

