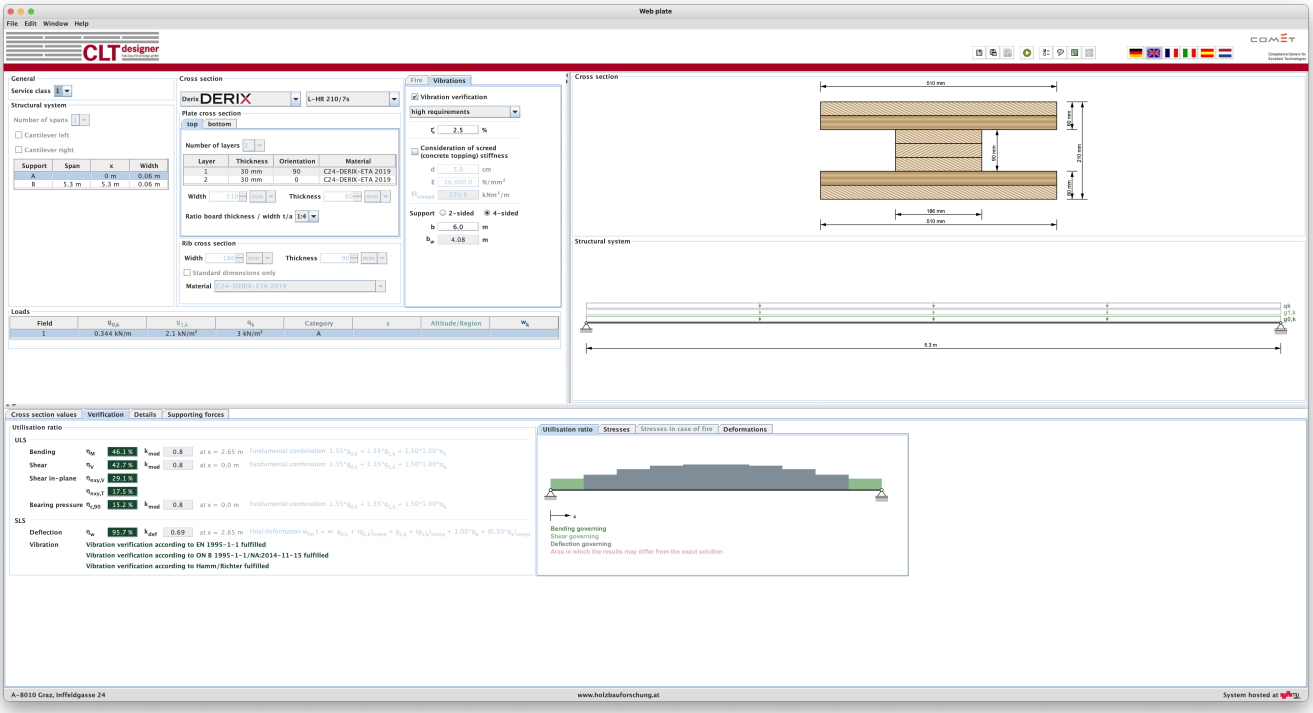
Module "Web plates"



Input data

The input is divided into:

- general information about the project and the considered structural element
- definitions of the structural system
- definitions of the cross section
- input of the loads
- informations about vibration parameters
- calculation options

General

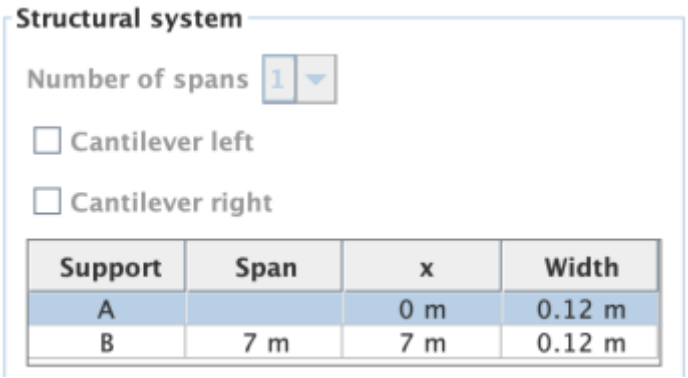
The input field "General" defines the service class. It is only allowed to use CLT elements in areas of service class 1 and 2.

- Service class 1 (interior service condition) is in general consistent with a common utilisation of living spaces.
- Service class 2 (protected exterior service condition) is generally used for open but roofed structures.

General · 2026/08/14 13:37

Structural system

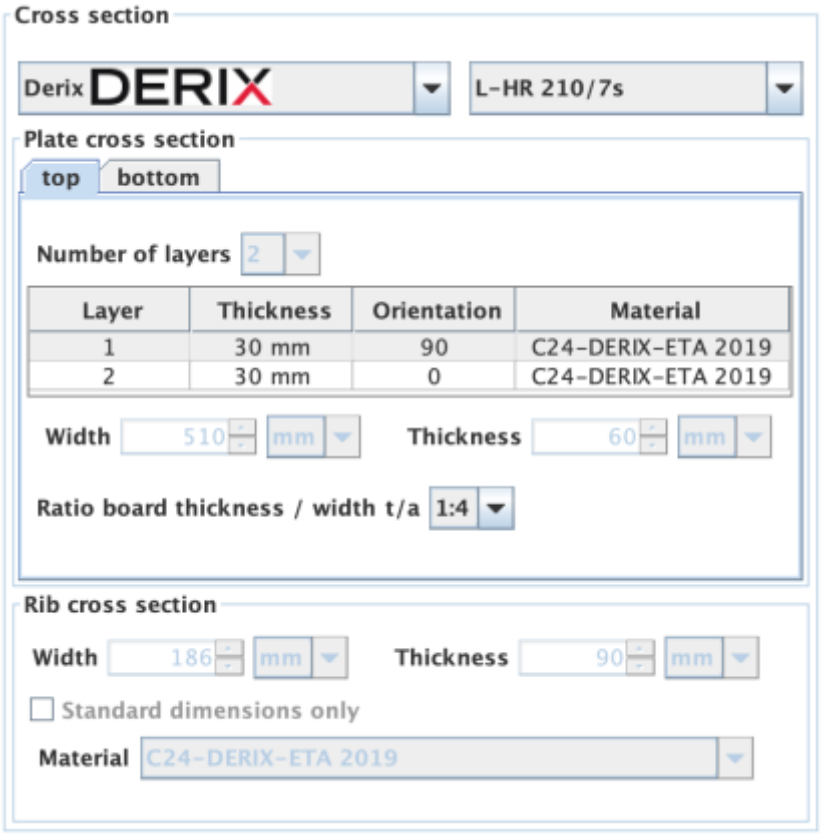
In this release, only single span girder can be calculated. The supporting width and span (via x-value in the table) can be defined within this input field.



Structural system · 2024/10/10 15:05 · Alexandra Thiel

Cross section

In this module, the cross-section is defined by selecting a product.



Loads

The input is the same as for the Module "CLT-Plate 1D - Continuous beam", but limited to distributed loads.

Show description

The loads are divided into the dead load (weight of the plate) ($g_{0,k}$), permanent loads ($g_{1,k}$), imposed load (q_k), snow load (s_k) and wind load (w_k). This classification is necessary to automatically carry out calculations for different load case combinations.

The plate weight is calculated automatically. The calculation method can be selected in the settings/preferences window. The default calculation method is in accordance with ON B 1991-1-1. A unit weight of 5.5 kN/m³ is assumed in the calculation. However, the unit weight may also be calculated using:

- calculation based on the mean value of density of the chosen material
- calculation based on a user-defined density

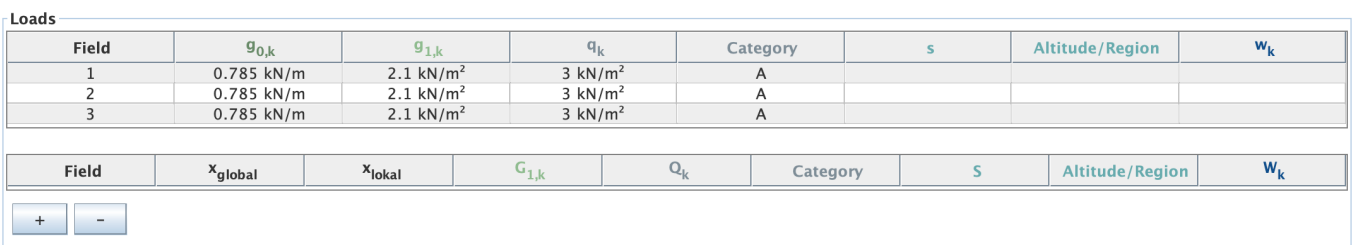
When entering the imposed loads, one of the following categories has to be chosen:

- A: Areas for domestic and residential activities
- B: Office areas
- C: Areas where people may congregate (with the exception of areas defined under category A, B and D)
- D: Shopping areas
- E: Areas for storage and industrial activities
- F: Traffic and parking areas for light-duty vehicles
- G: Traffic and parking areas for medium-duty vehicles
- H: Roofs

When entering the snow load, the country code or an altitude above sea level where the structure will be located has to be specified:

- < 1000 m
- > 1000 m
- FIN, IS, N, S

Concentrated loads can be entered in the second table. The position can be defined whether by the local or global x-coordinate.


Loads

Field	$g_{0,k}$	$g_{1,k}$	q_k	Category	s	Altitude/Region	w_k
1	0.785 kN/m	2.1 kN/m²	3 kN/m²	A			
2	0.785 kN/m	2.1 kN/m²	3 kN/m²	A			
3	0.785 kN/m	2.1 kN/m²	3 kN/m²	A			

Field	x_{global}	x_{lokal}	$G_{1,k}$	Q_k	Category	S	Altitude/Region	W_k

+ -

Loads · 2026/08/14 13:37
Loads · 2024/10/10 15:05 · Alexandra Thiel

Fire

In this module, currently no structural fire design is possible.

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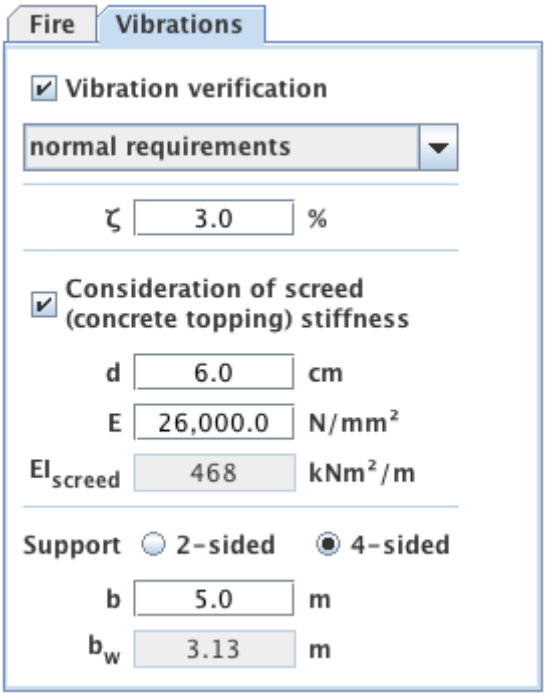
Vibrations

The tab "Vibrations" allows for vibration verification.



For the vibration verification the following specifications are of importance:

- high or normal requirements? This choice will have an influence on the limit values.
- modal damping factor
- consideration of the screed (concrete topping) stiffness
  - thickness of the screed (concrete topping)
  - modulus of elasticity of the screed (concrete topping)
- support (2-sided or 4-sided)
- room width b perpendicular to the load carrying direction

The effective width b_w of the chosen cross section used by the stiffness criteria will be specified.

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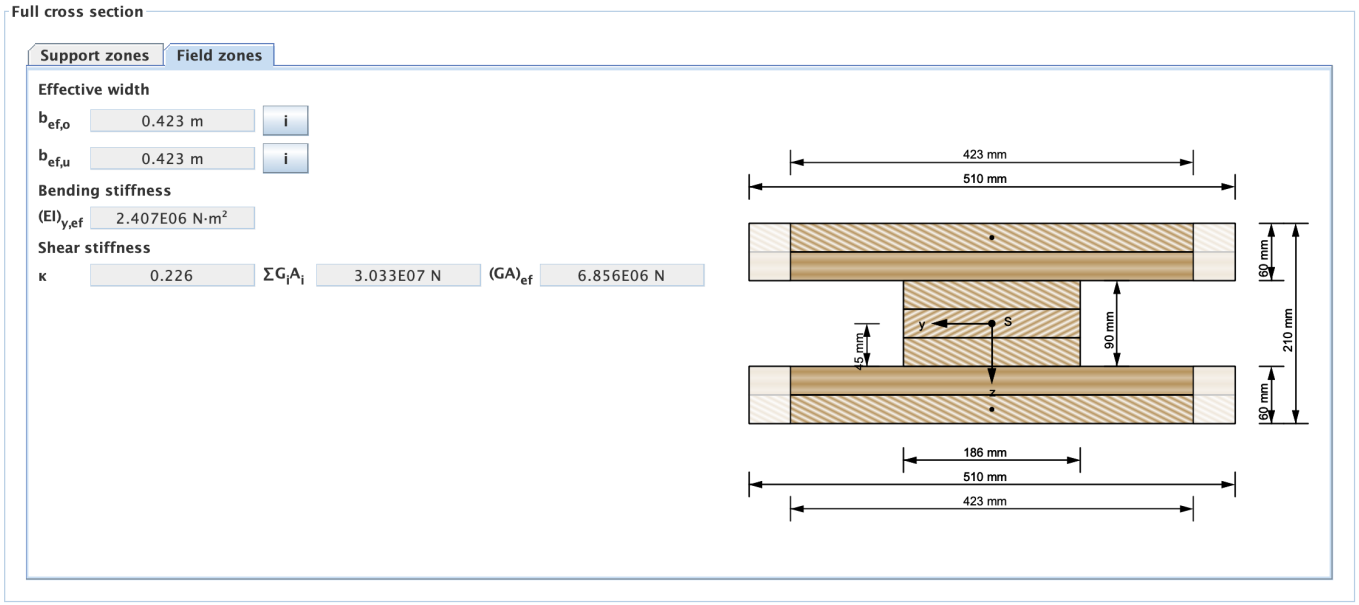
Results and Output

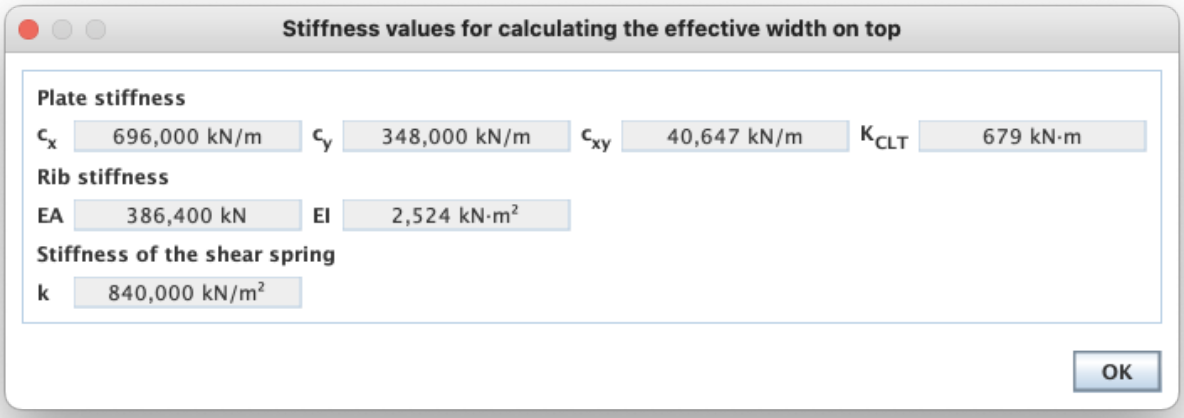
Cross section values

On the tab "cross-section values", the effective width, the center of gravity as well as the bending and

shear stiffness of the T-beam at the supports and in between are shown.



The button i can be used to display the stiffness values of the CLT panel, the glulam beam and the shear spring, which are the input parameters for determining the effective width.

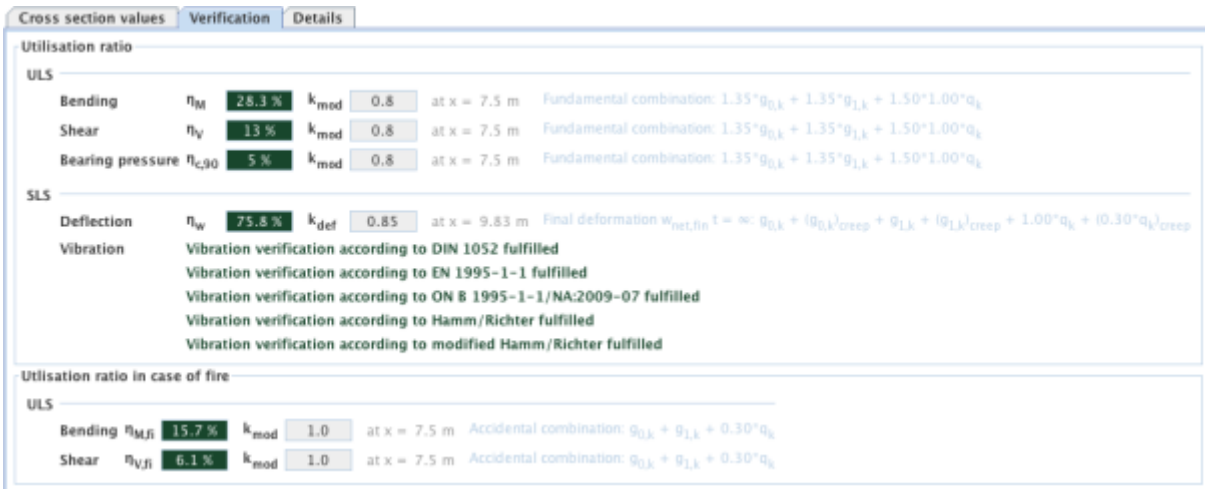


Summary of the results

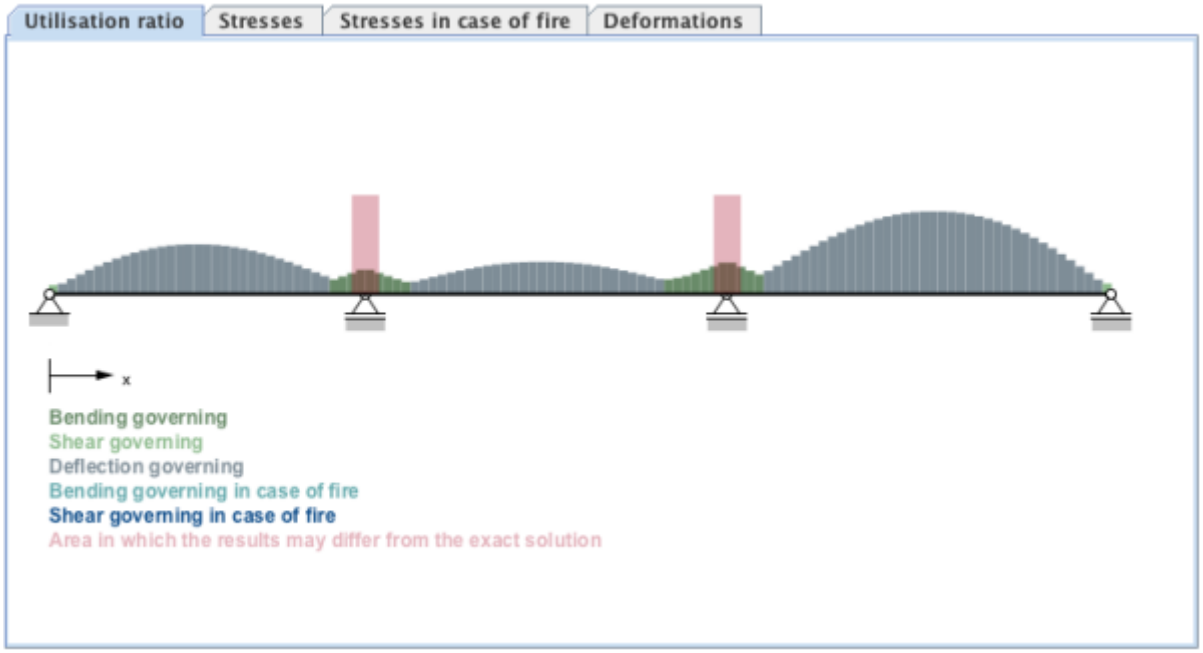
The summary of the results is analogous to the Module "CLT-Plate 1D - Continuous beam".

Show description

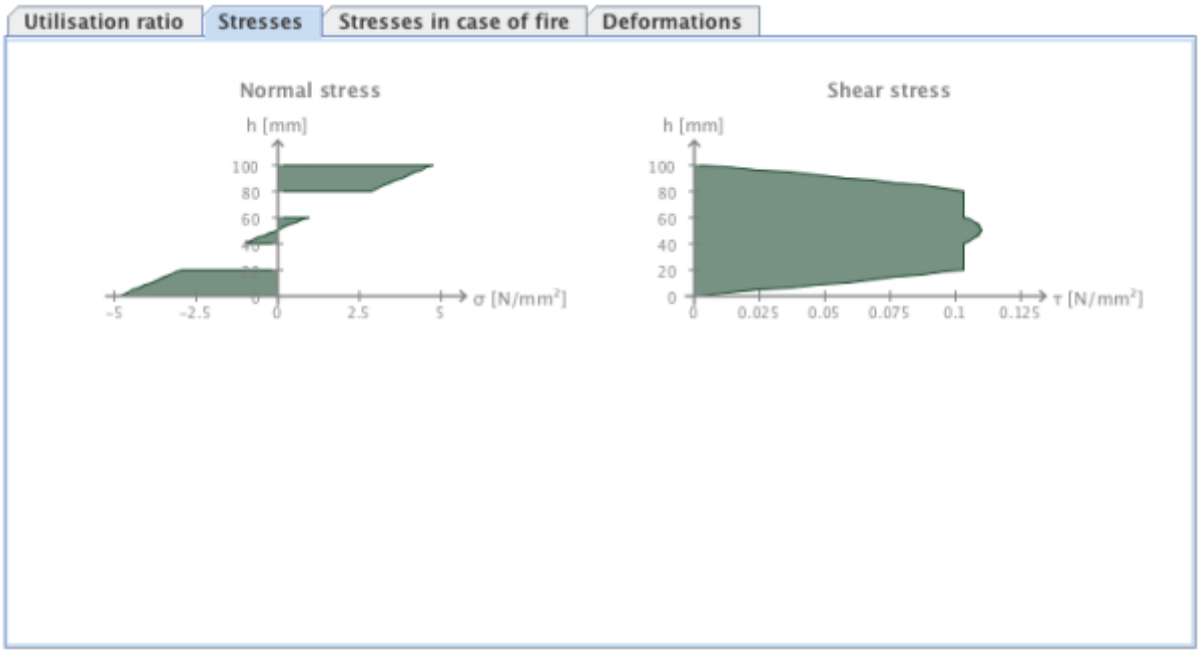
A summary of the verifications can be retrieved via the tab "Verifications". The utilisation ratios for various limit states are colour-coded indicating if the verification is fulfilled (green), not fulfilled (red) or a more accurate verification is needed (yellow). The locations of the maximum utilisation ratio and the governing combinations are compiled in the same way.



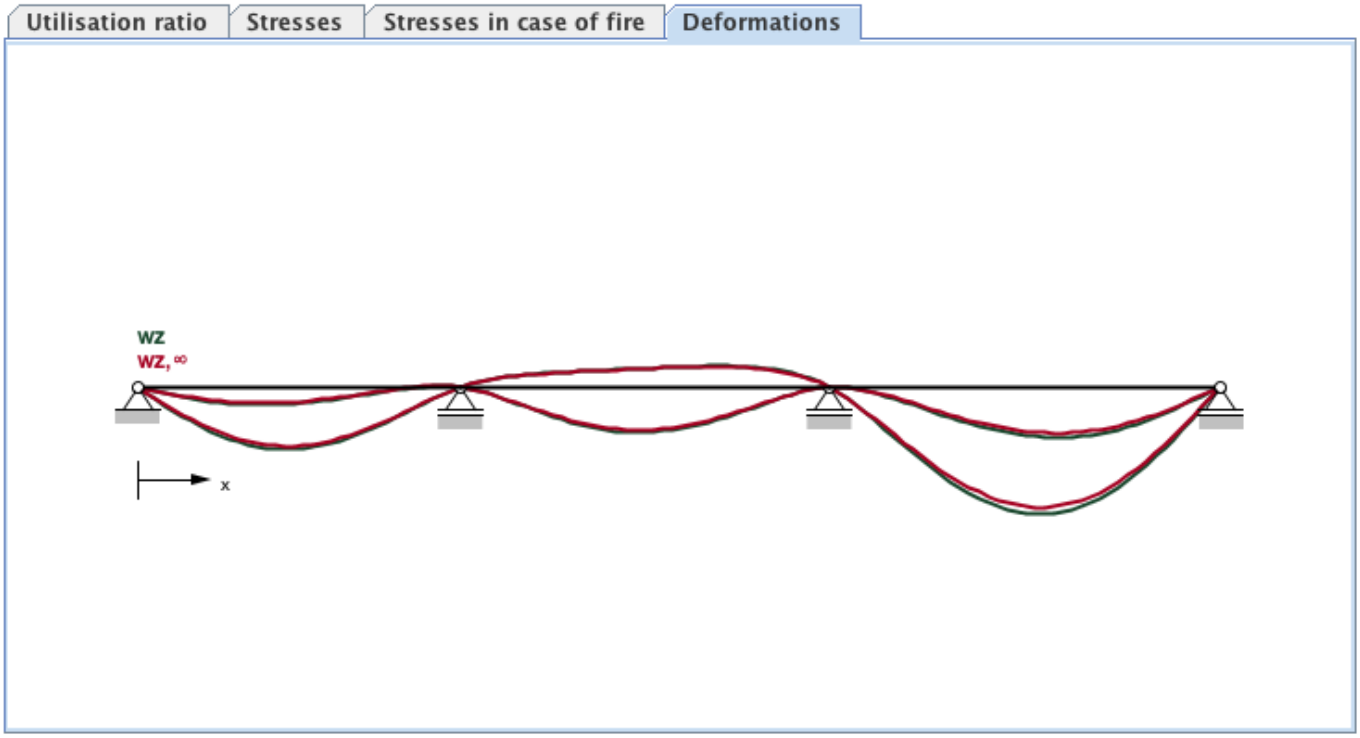
The tab "Utilisation" shows the distribution of the governing utilisation ratios along the beam. Areas in which the results may differ from the exact solution are marked here.



The tab "Stresses" shows the governing stresses resulting from the ULS verification. If a structural fire design was carried out, the governing stresses in case of fire are shown in the tab "Stresses in case of fire"

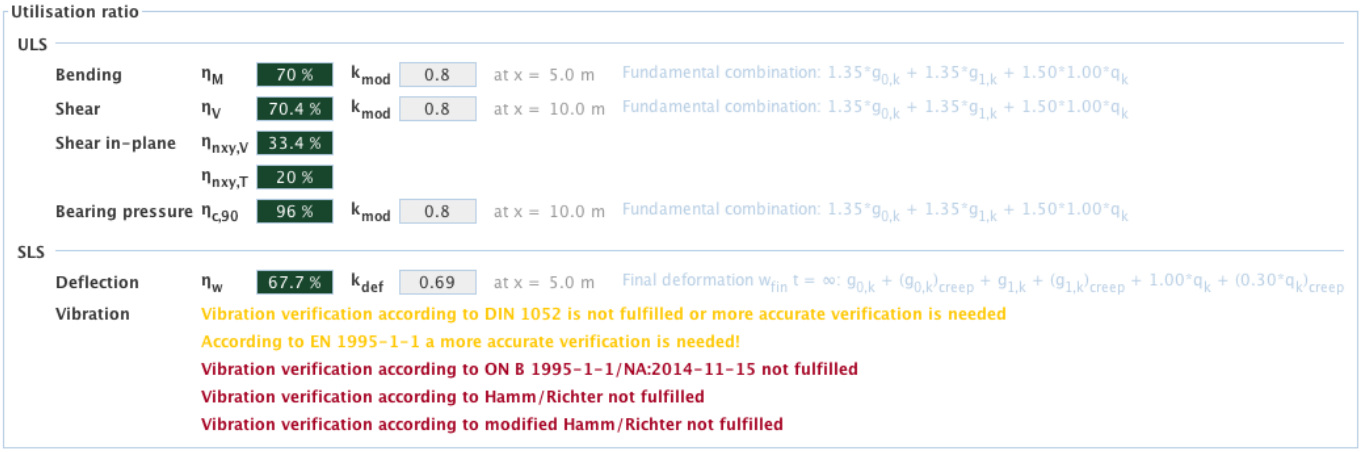


The tab "Deformations" shows the deformed system or the envelope given by the minimum and maximum deformation resulting from the governing SLS verification.



Summary of the results · 2026/08/14 13:37

However, there are differences for ULS - shear, since for the CLT-flange also the in-plane shear has to be considered.



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