

STT+

Single-span Steel Beam

The *STT+* application performs structural safety analyses in accordance with the equivalent member method for single-span beams of steel profile sections as per EN 1993-1-1. The regulations of the National Annexes are taken into consideration.

Standards

- DIN EN 1993
- ÖNORM B 1993
- BS EN 1993

Supporting conditions / Lateral support

The supporting conditions correspond to the statically determined, fork-mounted single-span beam. These supporting conditions are always valid for both main axes.

In addition you can define lateral supports against stability failure:

- continuously supported
- supported in the middle of the span
- supported in the third points
- supported in the quarter points
- supported at an ordinate x_0 .

For more complex supporting conditions an interface to the program BTII+ is available.

Analyses

The following verifications are performed:

- elastic or plastic cross sectional resistance
- resistance of the system according to the equivalent member method
- serviceability

Cross sections

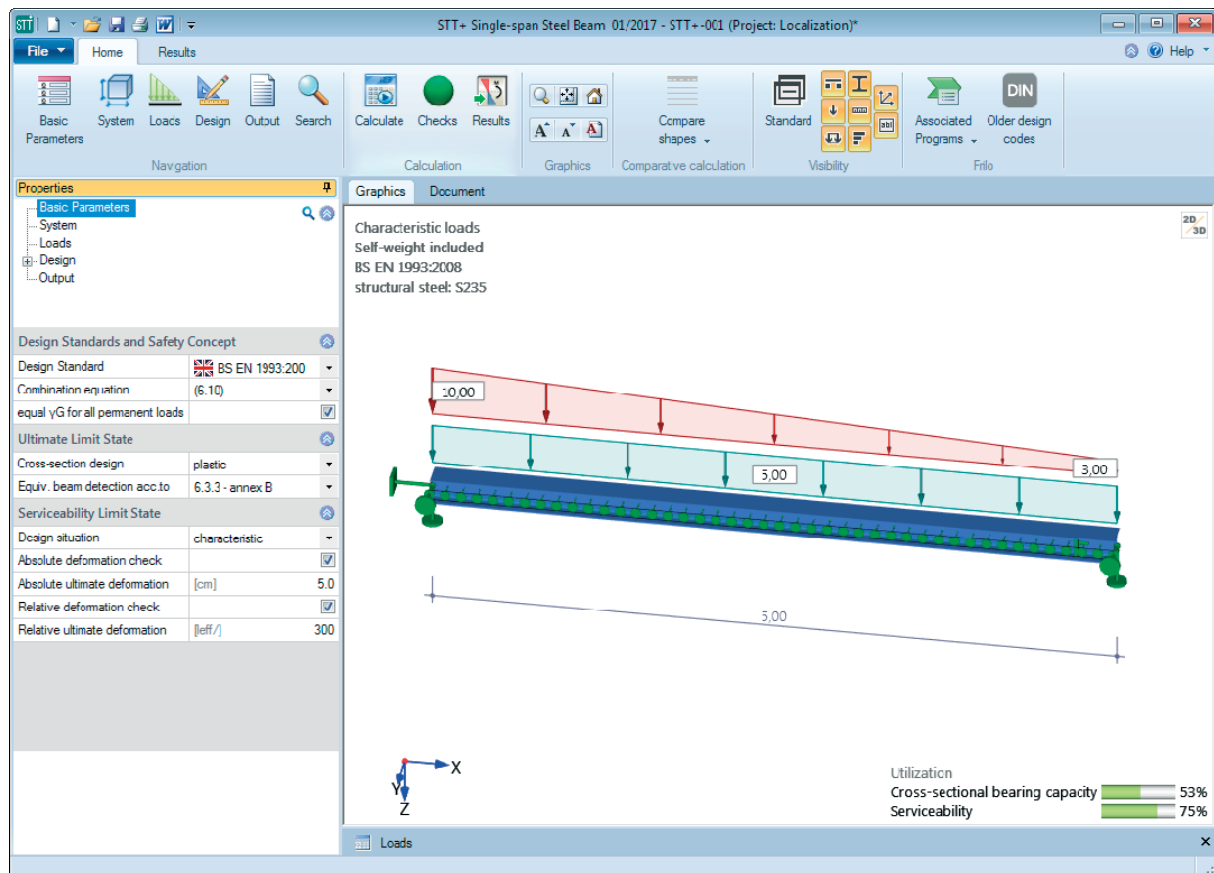
- Standard I-sections
- User-defined doublesymmetrical I-sections
- Standard round- and square hollow sections
- User-defined round- and square hollow sections

Actions

You can expose the beam system to vertical and horizontal loading and define bending moments. However, you cannot define loading that produces planned torsion.

Calculation

According to the defined actions *STT+* automatically determines the corresponding load cases and load case combinations and performs the necessary



verifications - the decisive load case combination to each limit state is determined.

Interfaces to other applications

The characteristic bearing forces can be transferred to the applications


- STS+ Single-span Steel Column
- B5 Reinforced Concrete Column

Design values and characteristic bearing forces to


- ST4 Steel Girder Support
- B9 Reinforced Concrete Corbel

For more complex supporting conditions

- BTII+ Lateral Torsional Buckling Analysis

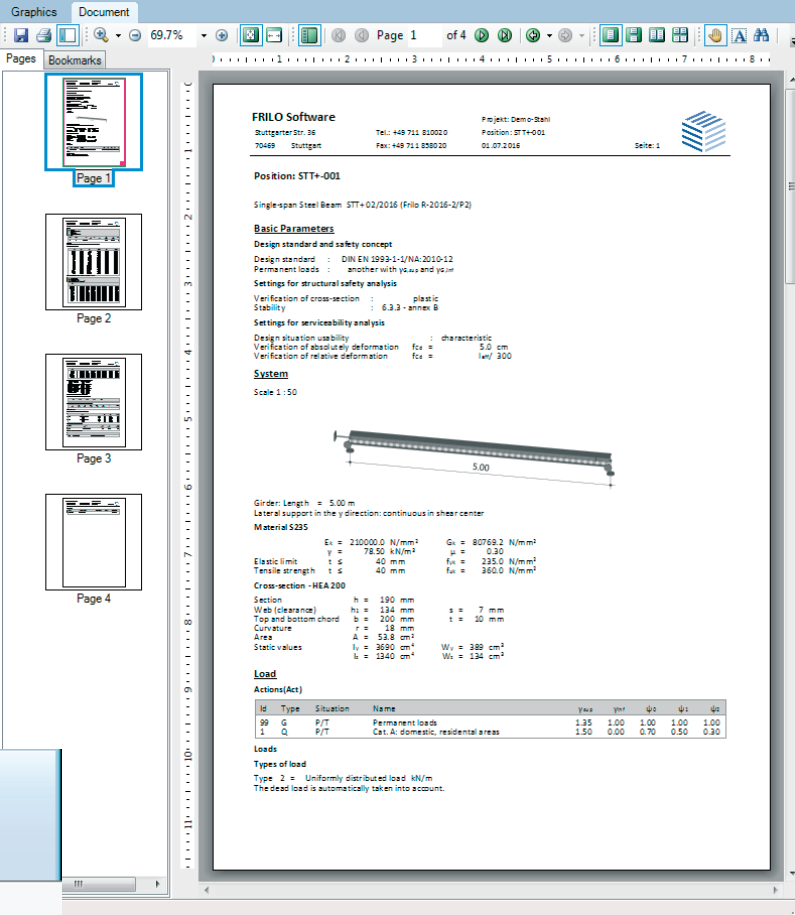


Associated Programs



Older design codes

- BTII BTII+
- R.5 Left support: Reinforced column
- R.5 Right support: Reinforced column
- R15* Left support: Steel column
- R15* Right support: Steel column
- ST4 Left support: Beam support
- ST4 Right support: Beam support
- R.R. Left support: Reinforced concrete console
- R.R. Right support: Reinforced concrete console



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Position: STT+001

Single-span Steel Beam: STT+02/2016 (Filo R-2016-2/P2)

Basic Parameters

Design standard and safety concept
 Design standard: DIN EN 1993-1-1/NA:2010-12
 Permanent loads: another with y_{0,us} and y_{0,im}

Settings for structural safety analysis

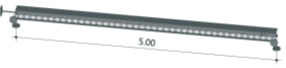
Verification of cross-section: plastic
 Stability: 6.3.3 - annex B

Settings for serviceability analysis

Design situation usability: characteristic
 Verification of absolute deformation: f_{ca} = 5,0 cm
 Verification of relative deformation: f_{ca} = lev. 200

System

Scale 1: 50



Girder: Length = 5.00 m
 Lateral support in the y direction: continuous in shear center

Material S235

E_s = 210000,0 N/mm² | G_s = 80769,2 N/mm²
 ν = 0,30
 Elastic limit: f_s = 235,0 N/mm² | f_{yk} = 235,0 N/mm²
 Tensile strength: t_s = 360,0 N/mm² | f_{tk} = 360,0 N/mm²

Cross-section - HEA 200

Section: h = 190 mm
 Web (clearance): h_w = 124 mm | s = 7 mm
 Top and bottom chord: b = 200 mm | t = 10 mm
 Curvature: c = 18 mm
 Area: A = 53,8 cm²
 Static values: I_y = 3690 cm⁴ | W_y = 389 cm³
 I_x = 1340 cm⁴ | W_x = 134 cm³

Load

Actions(Act)

Id	Type	Situation	Name	Y _{0,us}	Y _{0,im}	ψ ₂	ψ ₁	ψ ₀
99	G	P/T	Permanent loads	1,35	1,00	1,00	1,00	1,00
1	Q	P/T	Cat. A: domestic, residential areas	1,50	0,00	0,70	0,50	0,30

Types of load

Type 2 = Uniformly distributed load: kN/m
 The dead load is automatically taken into account.