

S7+

Portal Frame

The S7+ application is suitable for the calculation of single-bay portal frames

The available roof types are double-pitch, single-pitch and flat roofs.

Projections and asymmetrical frames can also be defined.

Standards

- DIN EN 1993
- ÖNORM EN 1993

Structural system

After the definition of the outer dimensions, the roof shape and the cross sections, the software generates the structural system. The column bases can be defined as pinned or restrained by spring values. The frame corners and the ridge can be pinned or resistant to bending. The rotational stiffness

of the connections in the structural system can be considered by defining torsion springs.

Haunches can be defined on the horizontal and vertical members and eaves overhang haunches to brace the frame corners.

Loads

The generation of standard load cases is done automatically. Subsequent modifications of the structural system are taken into account.

The self-weight of the roof structure and the wind and snow load zones of the location are used to generate member load cases. The DIBT (German Center of Competence in Civil Engineering) tables are available for the zone assignment of the location. Load cases with line loads, concentrated

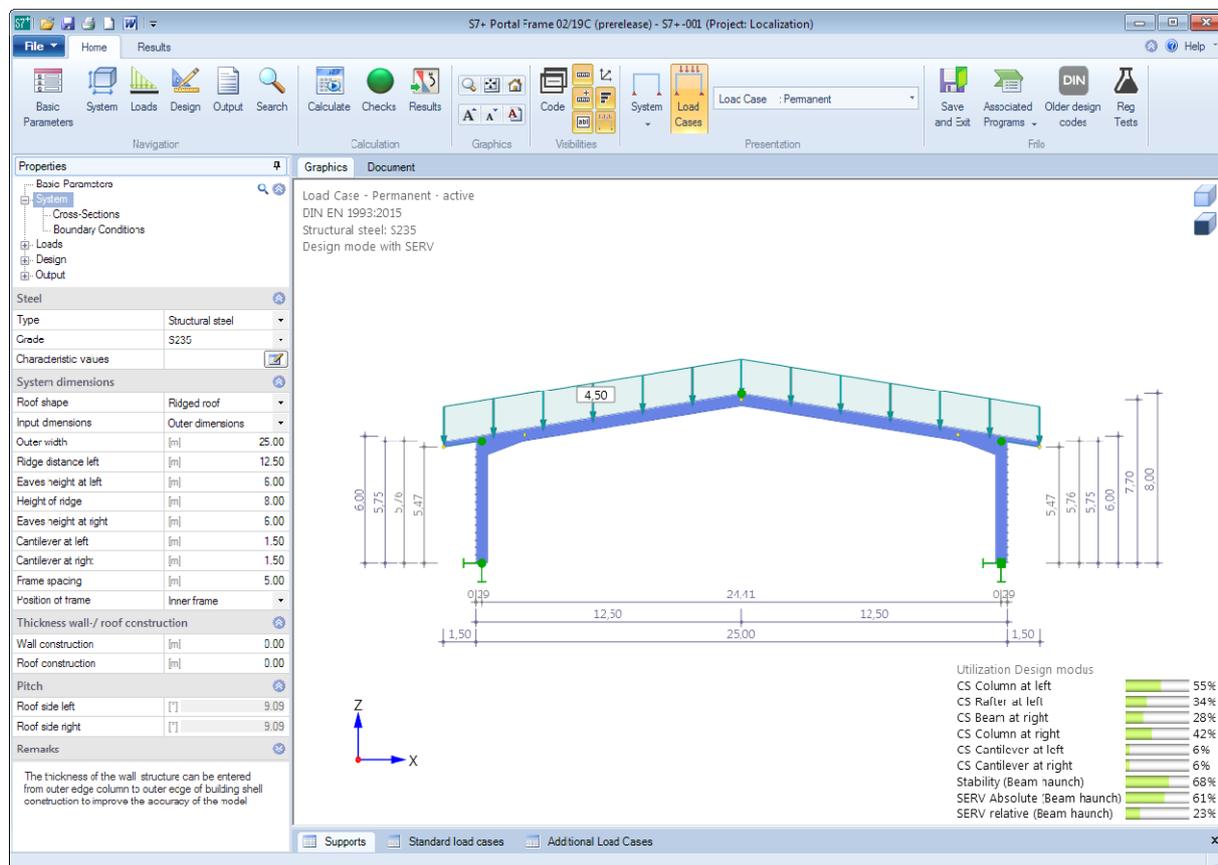
loads and moments can be defined in addition.

In comparison to a framework application, where the user must enter the system and the loads, the definition work in S7+ is considerably reduced. The user can define the geometry and the loading quickly and easily.

Verifications

The internal forces are determined with the help of the elastic frame method. The load combinations decisive for the design are calculated in a second-order analysis with consideration of the initial sway imperfection.

All necessary combinations of actions are automatically taken into account in accordance with the safety concept set forth in DIN EN 1990.



The verification of the cross-sectional resistance is based on the internal plastic limit forces. You can optionally select the theory of elasticity as verification basis.

In the examination of components perpendicular to the frame plane, you can take lateral supports, rotational and translational beddings, e. g. bracings, purlins or trapezoidal sheets, into account. The software calculates the deformation of the structural system as well as the relative deformation of the individual components in the serviceability limit state in accordance with the selected design situation. The support reactions are put out separately for each load case by indicating the characteristic loads and the design loads of the second-order analysis.

Load transfer and interfaces

Interfaces to the software applications listed below are available for the design of the ridge point and the frame corner connections:

- ST9 Bolted Steel Connection,
 - ST10 Bolted Beam-to-Column Connection and
 - ST14 Welded Beam-to-Column Connection.
- BTII+ Detailed (extended) verifications of stability with the application Lateral Torsional Buckling Analysis BTII+.

Load transfer to

- ST3 Steel Column Base and
- ST6 Pocketed Steel Column Base.

