ST15

Base Flange

The application ST15 allows the calculation of pipe flange connections and bases of annular components as well as single flange connections.

The design of the flange connections is performed in accordance with Petersen Stahlbau, 2nd edition, p. 506 et seq. and p. 952 et seq.

The calculation is based on the evaluation of the maximum tensile stress on the pipe and/or the tension plate.

Cross section geometry

In the verifications of the pipe flange and the base point, only round pipes are considered.

Safety concept

The partial safety coefficient γ_M for steel can be edited; the internal forces, stresses (flange/pipe flange) and/or superpositions at the base are entered with their γ_F-fold value.
In accordance with DIN 41337, Para. 7.1.1, the elastic limit internal forces may be increased by 10 % in order to take the higher load bearing capacity in the plastification state into account.

A utilization of plastic load bearing capacities is not allowed.

The software application increases the permissible stresses by 10 % at this point, the static values (resistance moments) remain unaffected in the output.

Service strength verification as per DIN 4133

If the service strength verification is performed, the stress calculated from the loading is considered as alternating stress and compared to the permissible values for the service strength.

$$\text{Max } \Delta\sigma \leq \Delta\sigma_R$$

The user can preset these values as a reference for the service strength.

$\Delta\sigma_A$ of the construction detail is determined in accordance with the notch class as per table 1 of DIN 4133 for screws, reinforcing steel, base, flange, webs, pipe and the ring stiffness.

The factor *n* for the calculation of the service strength $\Delta\sigma_R$ results from the alternating stress values and the border conditions in accordance with DIN 4133, Annex B, Item 3 and should be preset.

$\Delta\sigma_R=\Delta\sigma_A \cdot$ as per Eq. (B.3) DIN 4133.
With a sheet thickness $t > 25$ *mm*, $\Delta\sigma_R$ can be reduced in accordance with Eq. (B.4) in DIN 4133.