

B2 - Uniaxial and Biaxial Reinforced Concrete Design

The B2 application allows you to perform cross-section analysis for bending with longitudinal force, as well as with shear force. Additionally, you can produce crack width evidence (loading), perform stress analysis or calculate effective rigidity and run an analysis of shear joints.

Design

- EN 1992-1-1:2004
- NEN EN 1992-1-1/NA:2007
- NBN EN 1992-1-1/NA:2010
- ČSN EN 1992-1-1/NA:2007

The use of reduced material factors for precast components is optional. These material peculiarities can also be considered in accidental and earthquake design situations.

The given exposure classes allow you to calculate the durability requirements (minimum concrete class, concrete cover and requirement class for crack width evidence) in dialogs.

You can optionally consider tension rigidity and the effects of creep and shrinkage in the calculation of effective rigidity.

When performing a bending design calculation, you can optionally include the concrete area displaced in the compression zone of the steel, which is of particular importance where high-strength concretes are concerned. The calculation includes several combinations of action-effects that you enter via table-input.

You can prepare N/M-design diagrams for the uniaxial symmetric design of circular and rectangular cross sections.

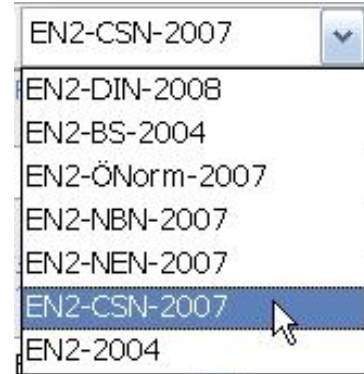


Table of available cross sections

Cross section	Effect of actions	ULS bending + longitud. force	ULS/SLS effective rigidity	ULS shear force + torsion	Stress analysis steel/ concrete	Crack width evidence
T-beams	Uniaxial	X	X	X	X	X
Rectangle 1	Uniaxial	X	X	X	X	X
Rectangle 2/ box	Uniaxial and biaxial	X	X	-	X	-
Circle/ annulus	Uniaxial and biaxial	X	X	X	X	X
Layers cross section	Uniaxial	X	X	X	X	X
General cross section	Uniaxial and biaxial	X	X	-	-	-

durability and creep modulus acc. DIN EN 1992 1-1

durability

attributes of the concrete and component

air-entrain. concrete Quality control dh = 0,0 mm

arth humid concrete dq = 0,0 mm $\phi_s = 8$ mm

aggregate for wear slowly hardening concrete bottom side = top side

top

$\phi_s, m = 14$ mm $\Delta\Delta_{cdev} = 0$ mm

bottom

$\phi_s, m = 14$ mm $\Delta\Delta_{cdev} = 0$ mm

attack on reinforcement: XC1
attack on concrete: X0

minimal concrete class: C 16/20

aval. C 25/30

$c_{min,j} = 10$ mm $\Delta c_{dev} = 10$ mm

dist.reinf. (cmin,j) decisive $d_{top} \geq 35$ mm

XC1 all.wk=0,40 mm

proof decompression: not required

user defined all.wk= 0,40 mm

modulus of creep+shrinkage

calculate values air humidity LU= 50 % cementtyp N,R

normal weight concrete fck = 25,0 h0 user defined $h_0 = 2 \cdot A_c / u = 15,7$ cm

t0 = 28 days t=infinite : $\epsilon(t_0, t) = 2,74$ $\epsilon_{cs}(t) = -0,51$ o/oo

OK Cancel

user defined concrete

Defaults

fck = 25 N/mm2 light-weight concrete light-weight sand

Rho = 2200 kg/m3

according selected norm Name Vrij

$\alpha = 0,85$

$\gamma_c = 1,50$

$\epsilon_{c2} = 2,00$ o/oo

$\epsilon_{c2u} = 3,50$ o/oo

Exp n = 2,00

$f_c = 22,00$ N/mm2

$\epsilon_{c1} = 2,10$ o/oo

$\epsilon_{c1u} = 3,50$ o/oo

$f_{ctm} = 2,56$ N/mm2

$E_{cm} = 31000$ N/mm2

$f_{cd} = f_{ck} \cdot \alpha_{ft} / \gamma_m$
 $Sig = f_{cd} \cdot (1 - \epsilon_{ps} / \epsilon_{sc2})^2$
 $f_{ctd} = 0,85 \cdot \alpha_{ft} \cdot f_{ctm} / \gamma_m$
 $Sig = f_{ctd} \cdot (1 + n \cdot \epsilon_{ps} / (1 + (k-2) \cdot n))$

OK Cancel