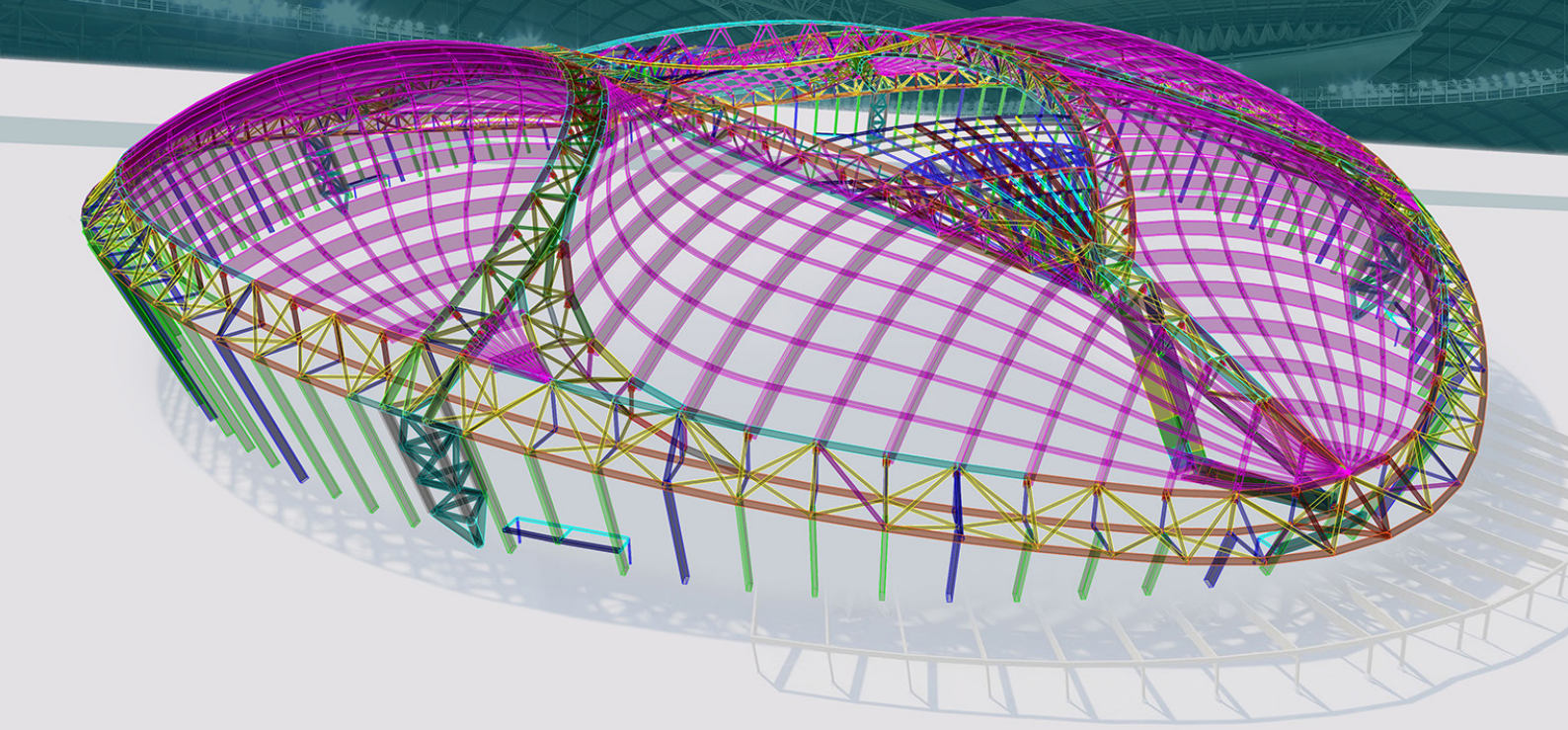
SCIA ENGINEER 22.0

SUPER POWERED. SUPER EASY.

WHAT'S NEW IN SCIA ENGINEER 22

SCIA ENGINEER 22 WILL MAKE YOUR WORK THRIVE

With time efficiency in mind, we sped up lots of commonly used actions performed in the software: numerous input operations now require less clicks, while others benefit from newly added templates or automation. What's more, version 22 offers better, clearer and, if required, more compact presentations of both input data and results. And, not unimportant in the current economic conditions, with SCIA Engineer 22 you'll have a better insight in the economy of the design, helping you save material.



USABILITY ENHANCED

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We proudly present the improvements of SCIA Engineer 22.

GENERAL ENHANCEMENTS

Input improvements

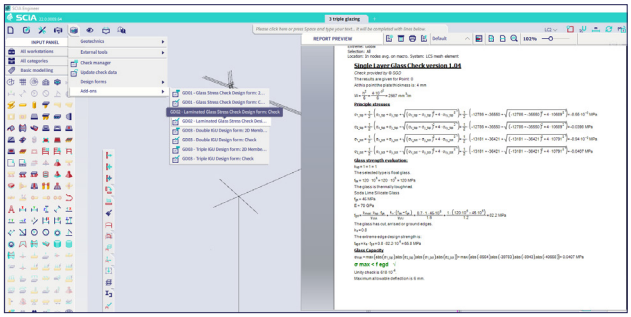
- using arrow keys to switch load case
- using formulas when inputting a numerical value (e.g. a coordinates)
- using parameters to input values
- better visibility of guiding tips in SCIA Spotlight
- direct access to SCIA Spotlight from keyboard (without clicking there first)
- changing multiple cells in Table Input at once

Results improvements

- hotkey for refresh of results
- user-assigned hotkey to repeat last command
- easier way to close the Results panel
- clear indication whether any results are available
- filtering in Table Results

Integrated Design Forms

- integration of tailor-made Design Forms into the new SCIA Engineer UI
- possibility to integrate your own calculations into SCIA Engineer menu
- easy way to run specific bespoke checks or other calculations

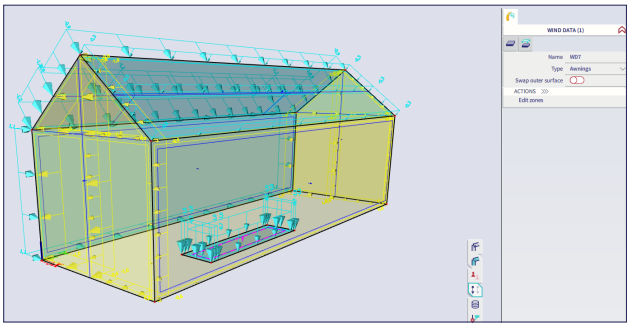


Surface load viewer

- transparent visualisation of applied surface loads
- easy way to check e.g. the generated loads
- useful for loads like soil pressure, free loads, traffic loads, wind load
- diverging colour maps to immediately indicate the sign (direction) of the load

3D wind data visualisation

- two-colour visualisation (indicating pressure and suction zones)
- transparent verification of generated wind loads
- labels for applied net pressure and peak velocity pressure

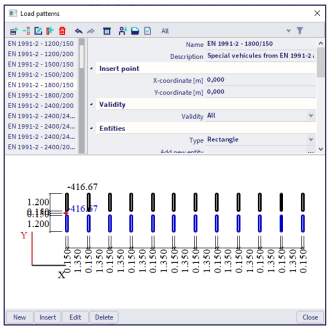


New 3D wind load engine

- generating wind loads on structures with openings based on EN 1991-4
- support of mono-pitch and duo-pitch canopy roofs based on EN 1991-4
- generating wind load on awnings based on German NA/V of EN 1991-4, French CNC2M guidelines and British PD6688-1-4-2015 guidelines

Traffic load patterns

- extended library of traffic load patterns
- code-based loads from EN1991-2,
- loads specified in French SETRA guidelines and French Fascicule 61 guidelines



Belgian NA for EN 1990

- proper consideration of category H loading rule for the Belgian NA, allowing the user to consider the beneficial effects without needing manual load combinations
- consistent and clear handling of reliability classes as indicated by the Belgian NA

Tabel A1.2 (A) ANB - Rekenwaarden van de belastingen (EQU) (Groep A)

Blijvende en tijdelijke ontwerpsituaties	Blijvende belastingen		Overheersende veranderlijke belasting	Gelijktijdige veranderlijke belastingen
	Ongunstig	Gunstig		
Verg. 6.10	$\gamma_{G,j,sup}\, G_{k,j,sup}$	$\gamma_{G,j,inf}\, G_{k,j,inf}$	$\gamma_{Q,1}\, Q_{k,1}$	$\gamma_{Q,i}\, \psi_{0,i}\, Q_{k,i}$

Partiële factor	Gereduceerde veiligheid Klasse CC1	Normale veiligheid Klasse CC2	Verhoogde veiligheid Klasse CC3
$\gamma_{G,j,sup}$	1,05	1,1	1,15

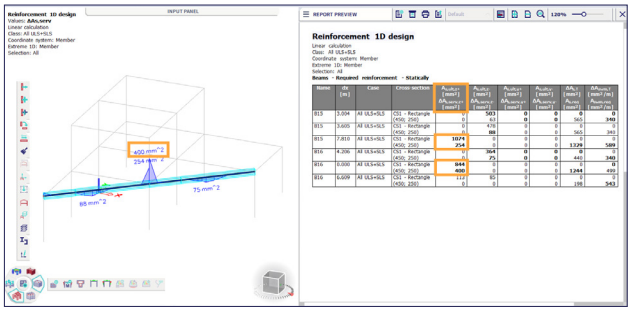
CONCRETE

Automated Member data

- member data automatically generated for every new 1D/2D member
- modification of member data for a group of members with just two clicks
- clear, graphical indication of locally modified data

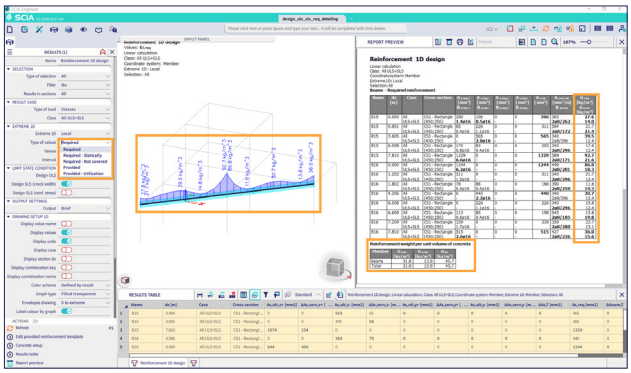
Reinforcement AutoDesign for ULS+SLS

- automatic design of reinforcement with SLS requirements taken into account
- both crack control and stress limitations can be considered
- no need for additional SLS checks after the design is performed
- clear and comprehensive documentation of the calculations



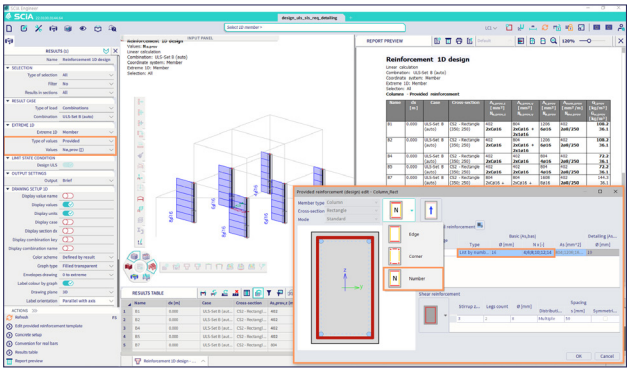
Extended AutoDesign report

- evaluating the economy of the design via the weight of reinforcement per cubic meter of concrete
- overall utilisation ratio of provided reinforcement
- unified and transparent output of results for both 1D and 2D members



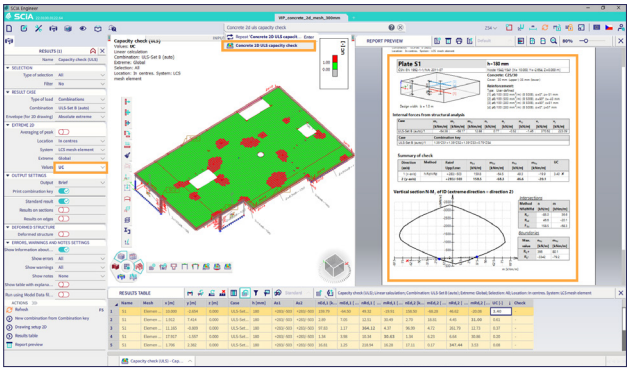
New reinforcement templates for columns

- an extended set of design templates for rectangular and square columns
- templates with preferred number of bars and uniform distribution along the edges
- templates combining bars of different diameter for corners and intermediate bars



ULS check for 2D members

- ULS capacity check for manually defined reinforcement
- arbitrary arrangement of reinforcement in one or two layers
- interaction diagram is composed for each direction



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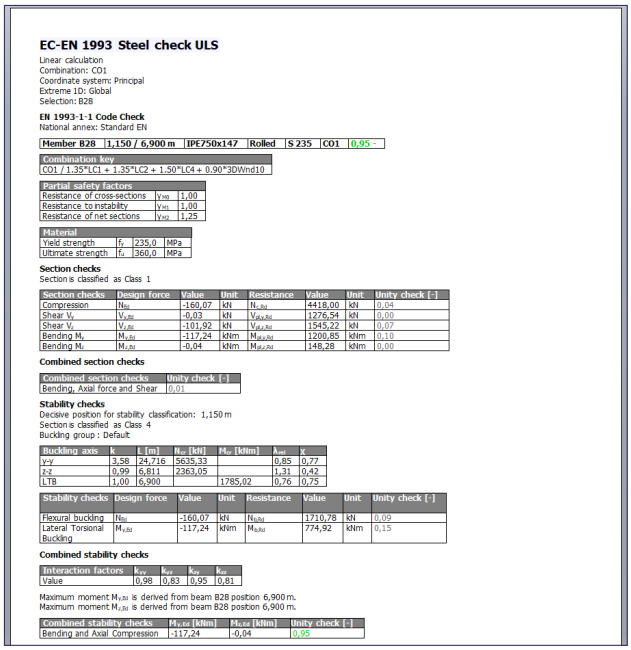
STEEL

New summary output for Eurocodes

- a clear report for easy verification of the calculation
- colour coding for fast detection of important values
- report always fits into an A4 page



EC-EN 1993 Steel check ULS

Linear calculation
Combination: CO1
Coordinate system: Principal
Extreme 1D: Global
Selection: B28

EN 1993-1-1 Code Check
National annex: Standard EN

Member B28	1,150 / 6,900 m	IPE750x147	Rolled	S 235	CO1	0,95 -

Combination key
CO1 / 1.35*LC1 + 1.35*LC2 + 1.50*LC4 + 0.90*3DWnd10

Partial safety factors

Resistance of cross-sections	γ_{M0}	1,00
Resistance to instability	γ_{M1}	1,00
Resistance of net sections	γ_{M2}	1,25

Material

Yield strength	f_y	235,0	MPa
Ultimate strength	f_u	360,0	MPa

Section checks
Section is classified as Class 1

Section checks	Design force	Value	Unit	Resistance	Value	Unit	Unity check [-]
Compression	N_{Ed}	-160,07	kN	$N_{c,Rd}$	4418,00	kN	0,04
Shear V_z	$V_{z,Ed}$	-0,03	kN	$V_{pl,z,Rd}$	1276,54	kN	0,00
Shear V_y	$V_{y,Ed}$	-101,92	kN	$V_{pl,y,Rd}$	1545,22	kN	0,07
Bending M_z	$M_{z,Ed}$	-117,24	kNm	$M_{pl,z,Rd}$	1200,85	kNm	0,10
Bending M_y	$M_{y,Ed}$	-0,04	kNm	$M_{pl,y,Rd}$	148,28	kNm	0,00

Combined section checks

Combined section checks	Unity check [-]
Bending, Axial force and Shear	0,01

Stability checks
Decisive position for stability classification: 1,150 m
Section is classified as Class 4
Buckling group : Default

Buckling axis	k	L [m]	N_{cr} [kN]	M_{cr} [kNm]	λ_{rel}	χ
y-y	3,58	24,716	5635,33		0,85	0,77
z-z	0,99	6,811	2363,05		1,31	0,42
LTB	1,00	6,900		1785,02	0,76	0,75

Stability checks	Design force	Value	Unit	Resistance	Value	Unit	Unity check [-]
Flexural buckling	N_{Ed}	-160,07	kN	$N_{b,Rd}$	1710,78	kN	0,09
Lateral Torsional Buckling	$M_{y,Ed}$	-117,24	kNm	$M_{b,Rd}$	774,92	kNm	0,15

Combined stability checks

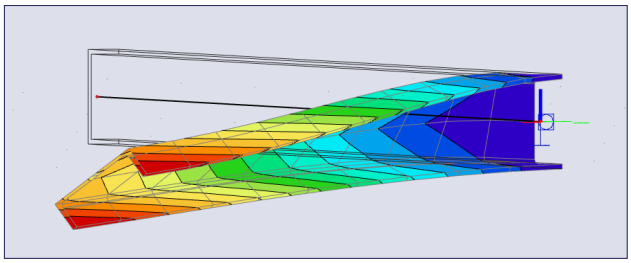
Interaction factors	k_{yy}	k_{yz}	k_{zy}	k_{zz}
Value	0,98	0,83	0,95	0,81

Maximum moment $M_{y,Ed}$ is derived from beam B28 position 6,900 m.
Maximum moment $M_{z,Ed}$ is derived from beam B28 position 6,900 m.

Combined stability checks	$M_{y,Ed}$ [kNm]	$M_{z,Ed}$ [kNm]	Unity check [-]
Bending and Axial Compression	-117,24	-0,04	0,95

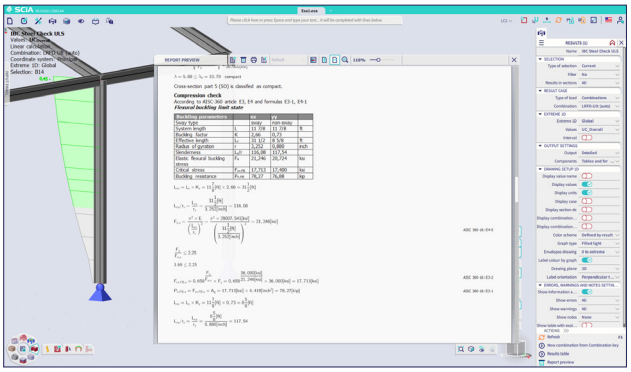
Shear centre eccentricity

- additional torsion effects from the shear centre eccentricity considered in all code checks
- option to neglect shear eccentricity for all or just specific elements
- considered in all types of calculations, including non-linear, dynamic and stability analysis



AISC 360 code checks

- ULS and SLS combinations generated automatically for both ASD and LRFD
- detailed output of every check component including formulas
- automatic recognition of symmetrical profiles, even for general cross-sections



ALUMINIUM

Aluminium SLS Design in 64bit

- separate, adjustable limits can be set for the variable and total loading
- limits for deflection can be set for every member in the buckling data
- lnput and design of camber

TIMBER

Orthotropy for CLT panels

- fast input of orthotropic behaviour for CLT panels
- automatic calculation of the stiffness parameters
- accurate force distribution in the full structure