Dlubal

Software for Structural Analysis and Dynamics

www.dlubal.com

Dipl.-Ing. (FH) Andreas Hörold
Organizer

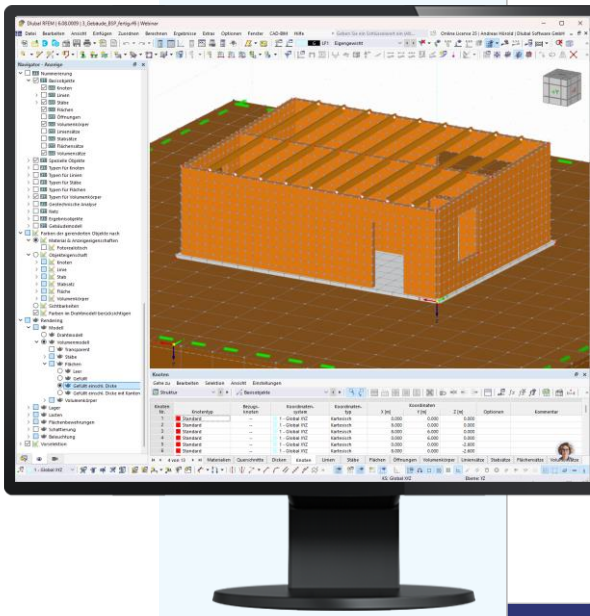
Marketing & Public Relations
Dlubal Software GmbH

Michelle Rosin, B.A.
Co-Organizer

Marketing & Public Relations
Dlubal Software GmbH

Webinar

News in RFEM 6 and RSTAB 9

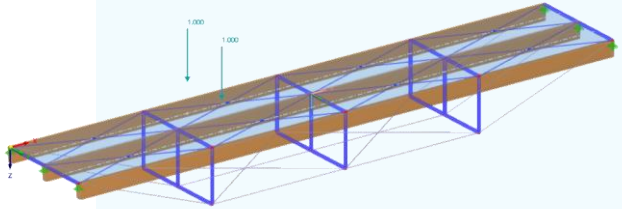


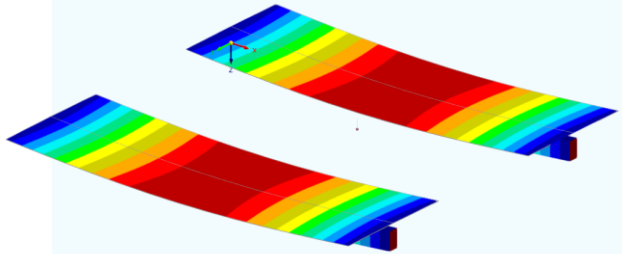
Questions During the Presentation

GoToWebinar Control Panel
Desktop

E-mail: **info@dlubal.com**

CONTENT





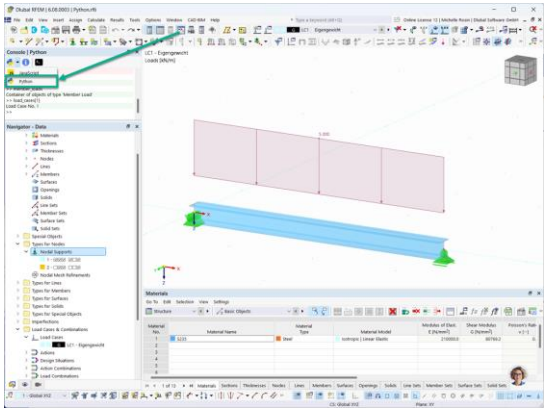
Webinar

Features

Console with Python Option

- Python high-level functions are available in the console for in-app scripting

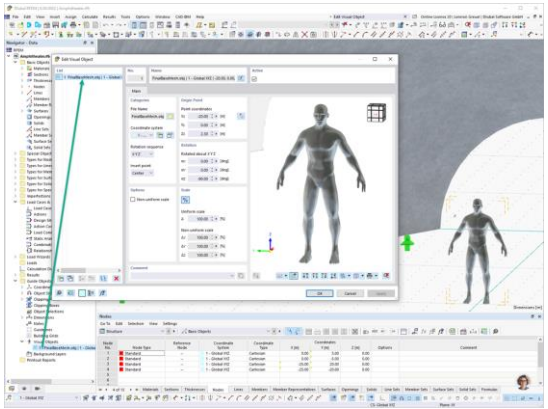
→ More information



Visual Objects

- Importing guide objects in .3ds and .obj file formats

→ More information

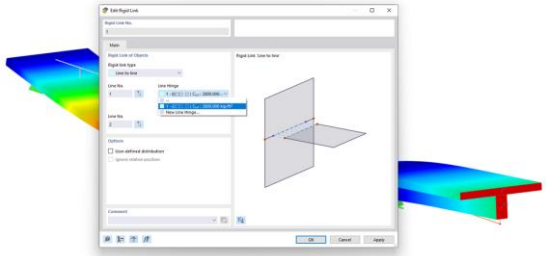


Features

Line Hinges for Rigid Links

- For hinged couplings of different elements
- Modelling of the elements in their actual position
- E. g. Connection ceiling - joist

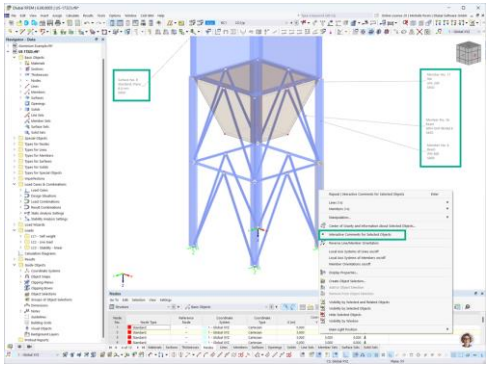
→ More information



Interactive Comment

- Display interactive comments including obejct properties for members, surfaces and so on
- Comments can be moved or hidden at any time

→ More information

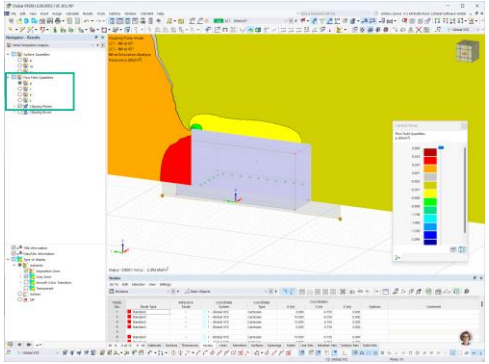


Features

Flow Field Quantities

- Visualisation of the flow field quantities pressure, velocity, turbulence kinetic energy and turbulence dissipation rate

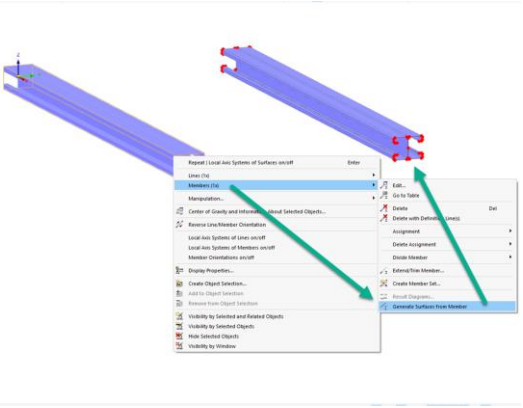
→ More information



Generating Surfaces from Member with RSECTION Cross-Section

- Splitting the bars with RSECTION cross-section into surfaces

→ More information

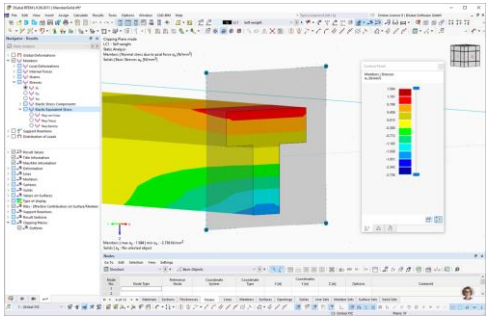


Features

Stresses Within Members via Clipping Planes

- Improved visualisation of the stress distribution within the member cross-sections by using clipping planes

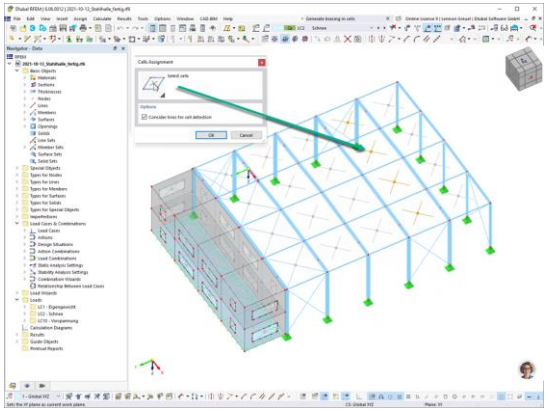
→ More information



Generate Bracing in Cells

- Generation of diagonal braces in cells
- Tools → Generate Model – Members → Bracing in Cells

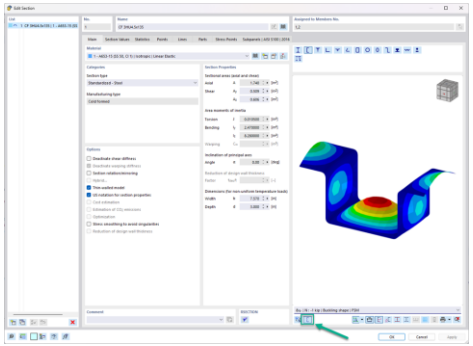
→ More information



Features

3D Display of FSM Results

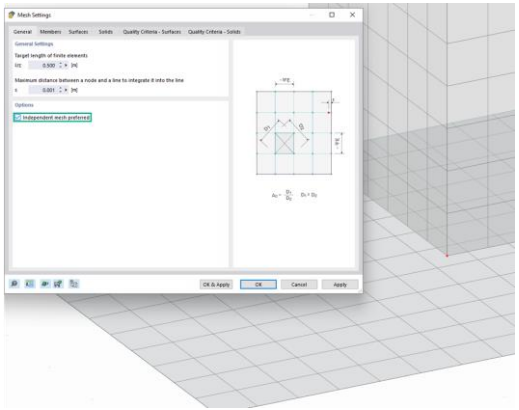
- Output of the buckling figures of the finite strip method as 3D graphics via cross-section dialogue



➞ More information

Independent FE Mesh

- Creation of independent FE meshes for integrated objects
- Allows to generate a significantly more detailed and precise FE mesh

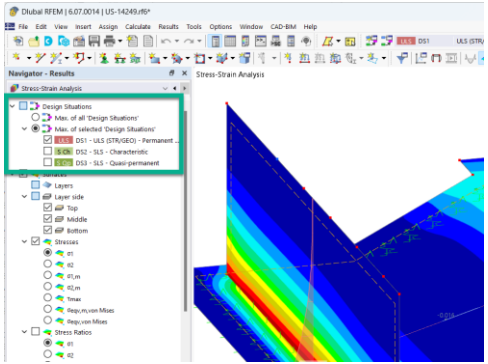


➞ More information

Features

Graphical Add-on Result Display by Design Situation

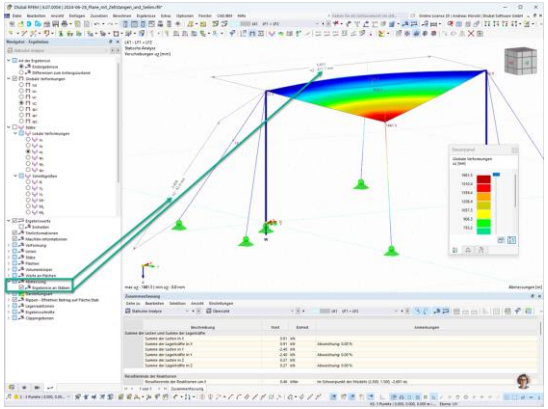
- Individual selection of the design situation for the add-on results in the ‘Results’ navigator



→ More information

Dimensioning with Result Function

- Display of sags or extreme results of the dimensioning objects
- Display of results on members for specific areas



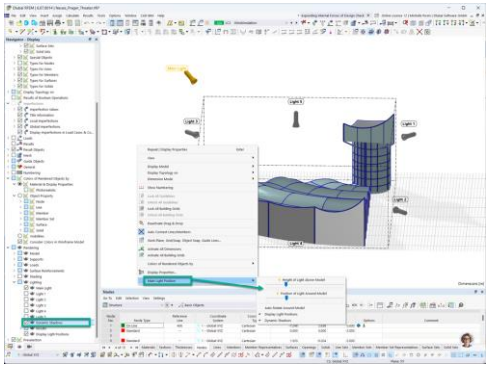
→ More information

Features

Dynamic Shadows

- Improvement of the visual representation by dynamic shadows
- Shadows can be added in rendering mode
- Position of the main light can be changed in the context menu via slider

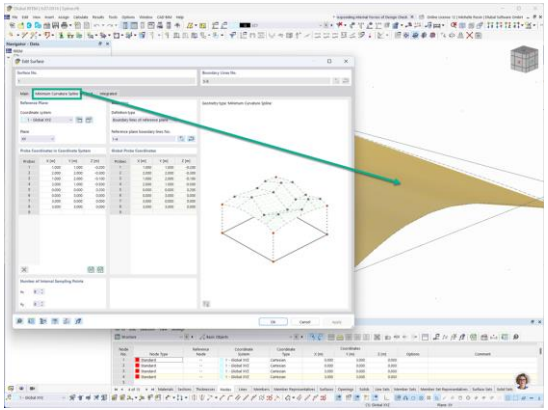
→ More information



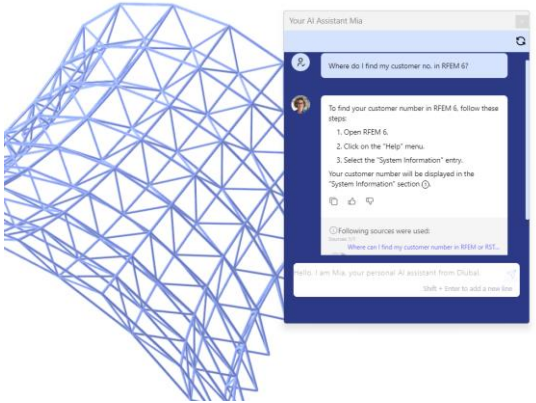
Spline Surface with Minimum Curvature

- Facilitates the creation of complex surface geometries with minimal curvature
- E. g. for modelling terrain surfaces

→ More information



Features



Mia - your AI assistant for structural analysis and Dlubal software

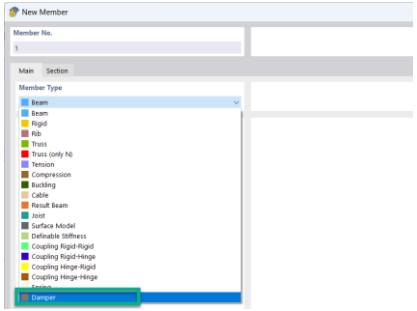
- Support with questions about Dlubal software and civil engineering topics
- Trained with the knowledge of the Dlubal website and ChatGPT
- Directly available in the RFEM, RSTAB and RSECTION programs
- Honored as Innovation of the Year 2024 with the Construction Computing Award 2024

→ **More information**

"Damper" Member Type

- Enables the definition of damping coefficient, spring constant and mass
- Similar to the Kelvin-Voigt model in terms of viscoelasticity

→ **More information**



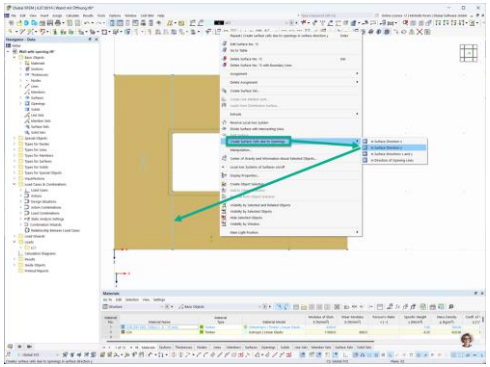
Webinar

Features

Creating Surface Cells Due to Openings

- Surface cells can be created due to openings via the surface shortcut menu
- E. g. to create lines for columns of timber panel walls

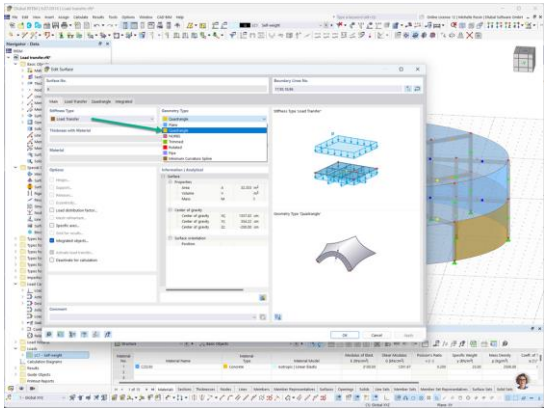
→ More information



Curved Load Transfer Surfaces

- New geometry types for surface stiffness types 'Load Transfer':
  - Quadrangele
  - NURBS
  - Rotation
  - Pipe

→ More information

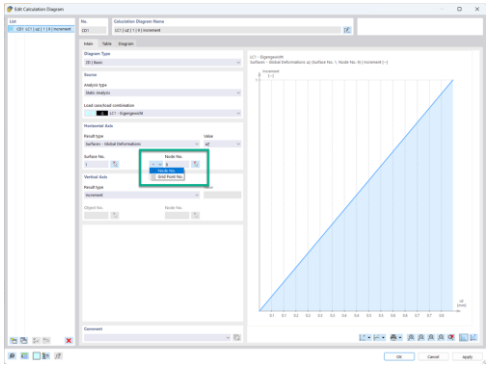


Features

Diagram Evaluation for Surface Result Points

- Output results for calculation diagrams at surface result points, surface grid points and nodes

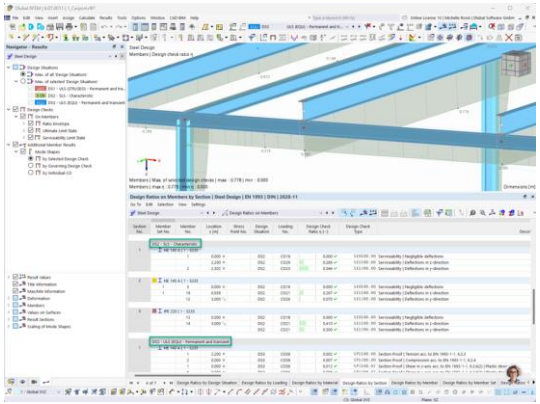
→ More information



Displaying Design Results in Table by Design Situation

- Display design results of the add-ons by design situation in table
- More detailed evaluation of the results

→ More information

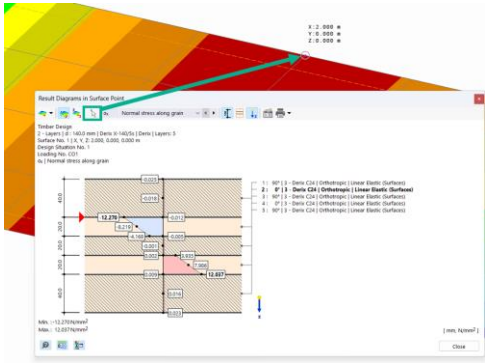


Features

Design Check Details on Mesh Node Selection in Graphics

- Enables the display of detailed results directly at the selected mesh nodes
- Mesh nodes can be easily selected in the graphic

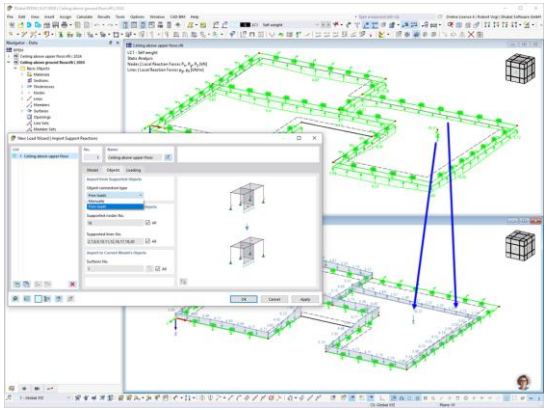
More information



Transfer of Support Reactions to Free Loads

- New object connection type in the 'Import Support Reaction' load wizard
- In addition to 'Manually' the type 'Free Loads' is available
- No need to manually assign support reactions to nodes and lines
- Support forces of the connected model are applied as free loads

More information

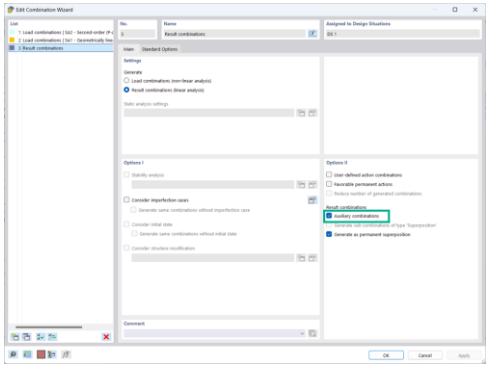


Features

Final Result Combination via Auxiliary Combinations

- Generation of final result combinations via auxiliary combinations
- Clearer and easier to check result combinations for models with many load cases
- E. g. moving loads for bridges

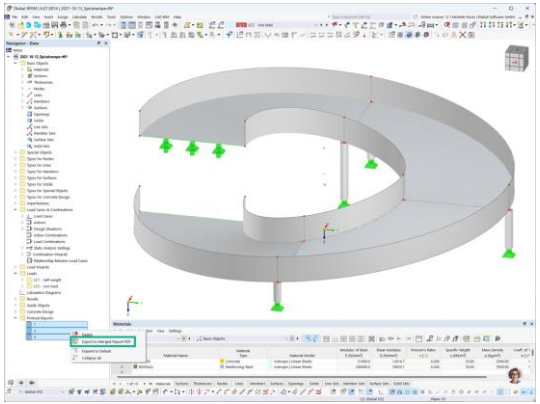
→ More information



Combined PDF Report

- Exporting multiple printout reports to a PDF file in RFEM and RSTAB
- Function in the Navigator – Data

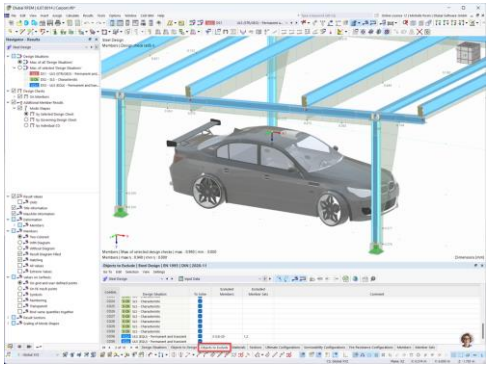
→ More information



Features

Exclude Objects from Design by Combination

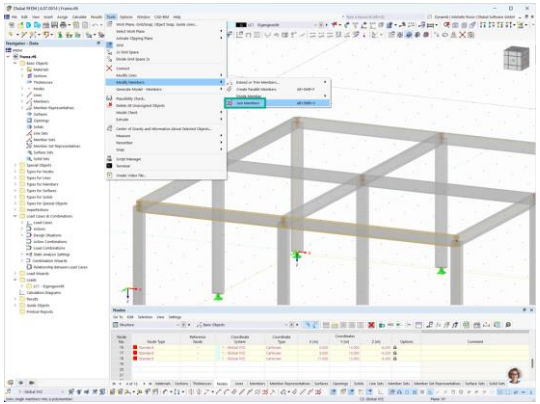
- Exclude objects such as members, surfaces, etc. from the design by load combination (CO)/result combination (RC)
- Input in the 'Objects to Exclude' table tab
- Design of certain objects only with certain load combinations
- Available in all design add-ons with the exception of the 'Steel Joints' add-on



→ More information

Join Lines, Join Members

- Combine several lines/ members into one line or member without deleting the common nodes



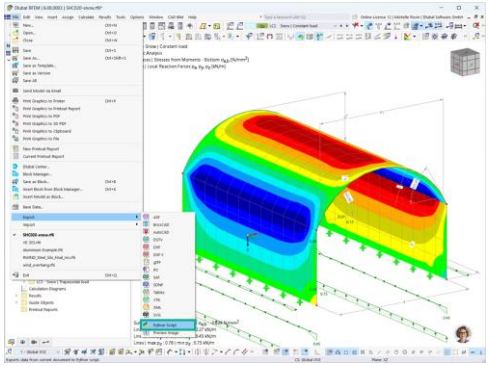
→ More information

Features

Import/Export of Python Scripts

- Import Python scripts and export Python scripts of the models

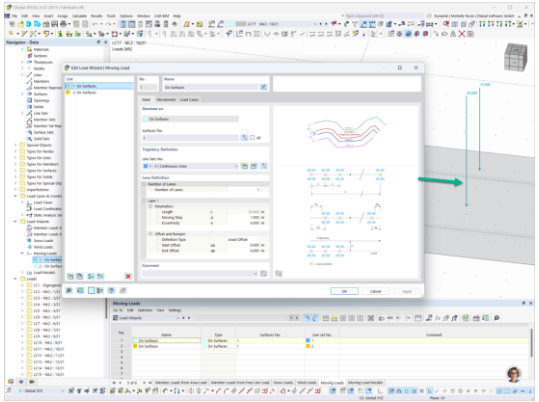
→ More information



Load Wizard for Moving Loads

- Enables generation of moving loads
- Application of single loads or load models from several loads to the system
- Automatic generation of load cases according to moving step, start and end offset
- Integrated RFEM, no separate licence required

→ More information

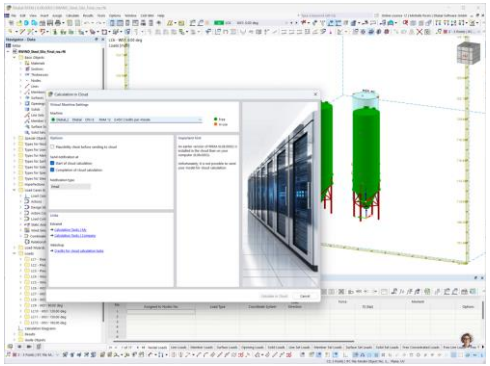


Features

Cloud Calculation 2.0

- Calculation of RFEM 6 and RSTAB 9 models with wind simulation load cases
- Analysis speed-up by about 20%

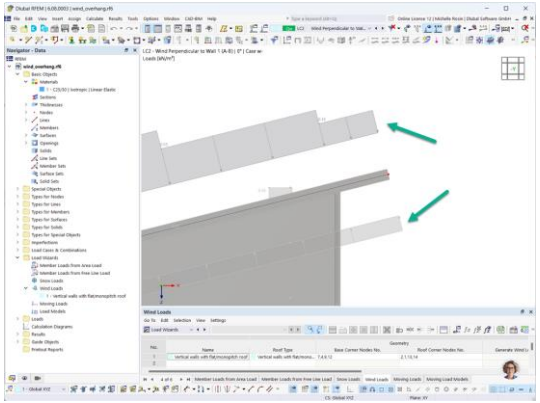
→ More information



Wind Loads on Roof Overhangs

- onsiders wind loads on roof overhangs in the 'Wind loads' load wizard

→ Moe information



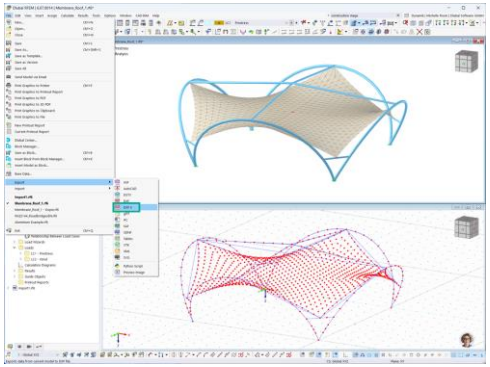
Features

Interfaces

- Direct BricsCAD interface
- SDNF interface
- DXF-II import and export

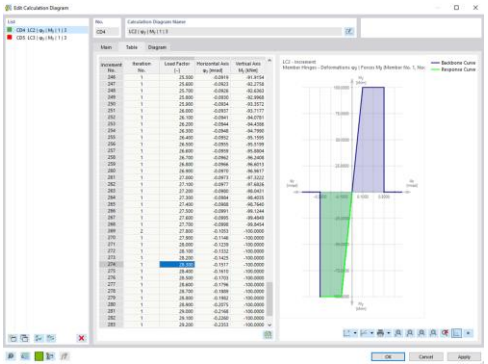
BricsCAD®

SDNF



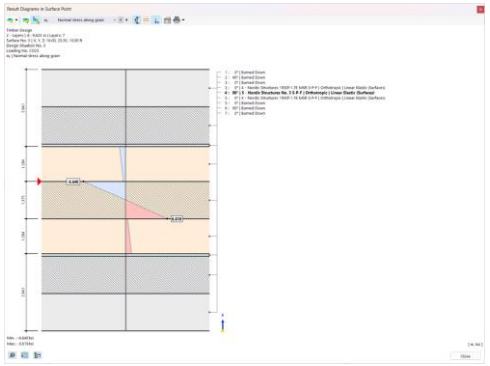
Hinge Diagram

- Hinge response of load situations for nonlinear hinges
- E. g. for calculations with several load situations, such as pushover analysis



→ More information

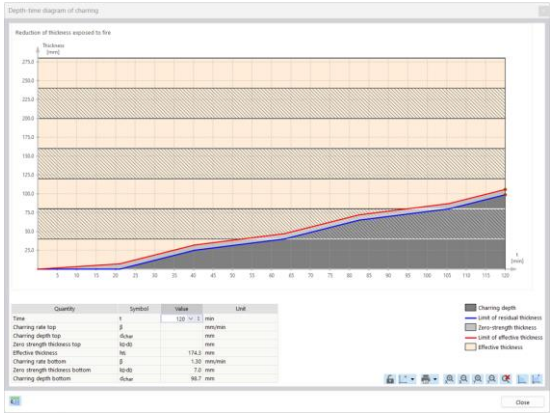
Add-on Timber Design



Fire Resistance Design of Surfaces for EN 1995, SIA 265, NDS, and CSA O86

- Fire resistance design for surfaces with the reduced cross-section method possible (reduction via surface thickness)
- Design checks can be performed for all designable timber materials
- For cross laminated timber: Option to consider the fall-off of individual carbonized layer parts (depending on the adhesive) → increased charring in certain layer areas

→ More information



Charring Diagram

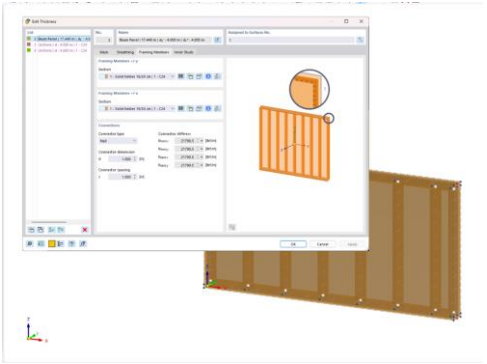
- Display a charring diagram depending on the time of fire exposure for fire resistance design of timber surfaces
- Transfer to printout report possible

→ More information

Add-on Multilayer Surfaces

Timber Panel Element

- Modelling of timber panel elements in 3D space using the 'beam panel' thickness type
- Generation via internal member surface construct including simulation of the connection stiffness
- Advantages:
  - Single-sided or double-sided sheathing
  - Automatic calculation of a semi-rigid coupling between studs and sheathing
  - Representation as a complete geometric 3D object (frame, studs, surfaces, etc.) including eccentricity and automatically calculated stiffness between elements
  - Consideration of openings via surface cells
  - Design of the individual structural elements utilizing the Timber Design add-on
  - Other material options available (e.g., particle board, gypsum, or fiberboard sheathing with cold-formed steel sections)



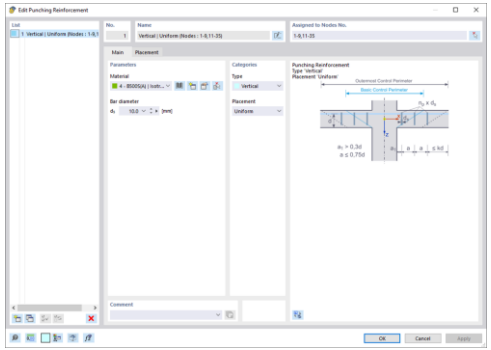
→ **More information**

Add-on Concrete Design

Punching Shear Reinforcement

- Definition of existing vertically orientated punching shear reinforcement
- Consideration during punching shear design

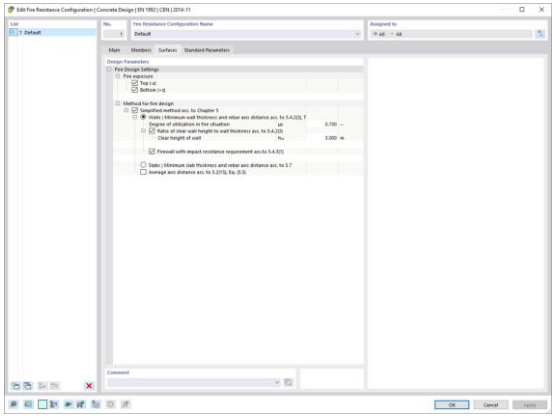
More information



Fire Design of Slabs and Walls According to Simplified Table Method

- Fire design according to the simplified table method for reinforced concrete slabs and walls
- According to EN 1992-1-2, section 5.4.2 and tables 5.8 and 5.9

More information

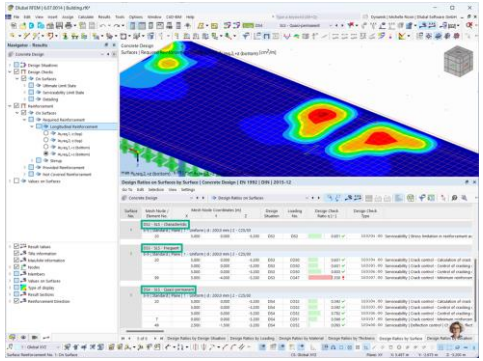


Add-on Concrete Design

Reinforcement Results in Tables by Design Situation

- Display of the tabular reinforcement results separately according to design situations

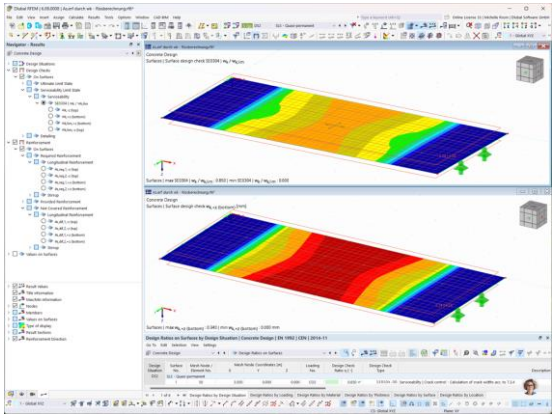
More information



Determination of Required Longitudinal Reinforcement for Direct Crack Analysis

- Determination of the required longitudinal reinforcement for crack width analysis

More information

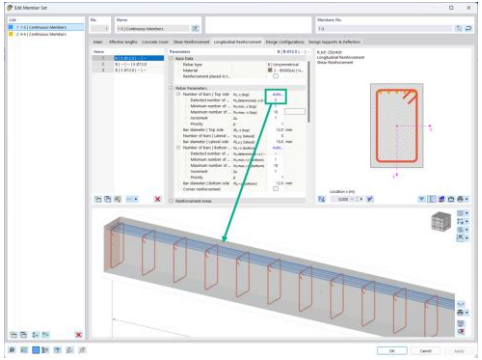


Add-on Concrete Design

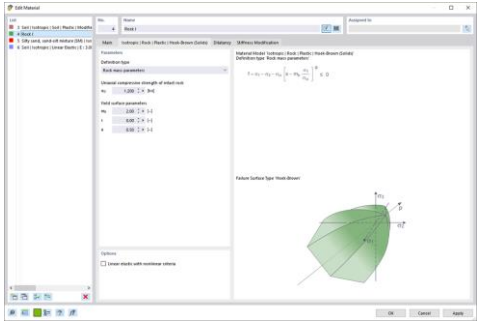
Automatic Function of Longitudinal Reinforcement for Members

- Automatic determination of the number or diameter of rebars for the design of reinforced concrete members

More information



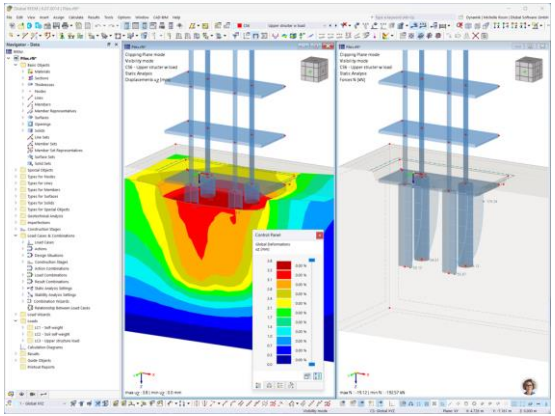
Add-on Geotechnical Analysis



"Hoek-Brown" Material Model

- 'Hoek-Brown' model for linear-elastic ideal-plastic material behaviour is available
- Nonlinear strength criterion is the most commonly used failure criterion for rock and stone
- Input via rock parameters or GSI classification

→ More information

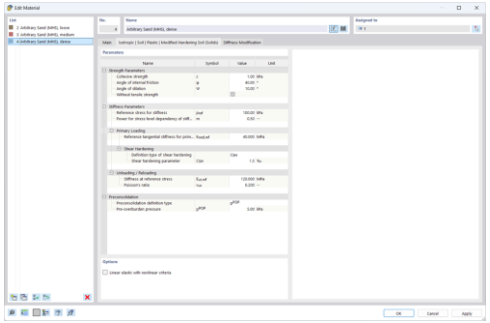


Member Type "Pile"

- New member type 'Pile' available
- Creation of pile resistance types with characteristic values for skin friction and pile peak pressure
- Embedding of the pile in soil, considering the resistance properties

→ More information

Add-on Geotechnical Analysis



Soil Material Model "Modified Hardening Soil Model"

- Material model 'Modified Hardening Soil Model' available
- Suitable for a variety of soils
- Represents the following properties of the soil:
  - Stress dependence of soil stiffness
  - Load path dependence of soil stiffness
  - Plastic strains even before reaching the limit condition
  - Increasing shear resistance with increasing mesh refinement
  - Increasing yield strength with increasing stress until reaching the limit yield condition
  - Failure criterion according to Mohr-Coulomb

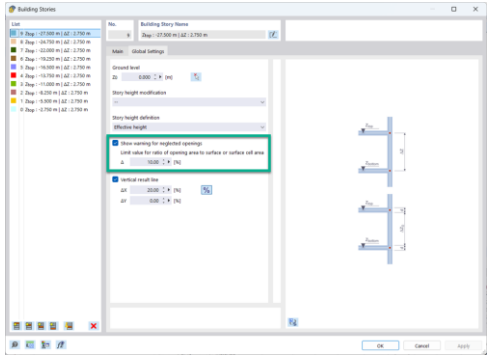
→ **More information**

Add-on Building Model

Neglecting Openings

- Negligence of openings with a certain area in building model calculation possible
- Function can be activated in the global settings of the building stories
- Warning message indicates that openings have been neglected

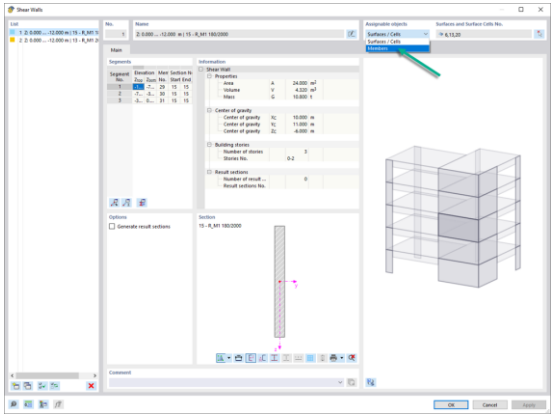
→ More information



Shear Walls and Deep Beams Consisting of Members

- Assignment of members possible when generating shear walls and deep beams

→ More information

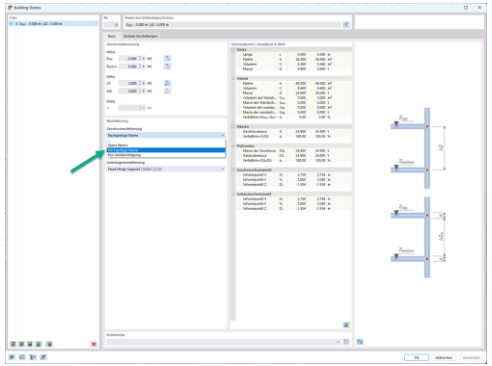


Add-on Building Model

Semi-Rigid Diaphragm for Modeling Stories

- Identical approach as for 'Rigid Diaphragm', but without node coupling from the center of mass to each FE node
- Takes into account the flexibility of the slab

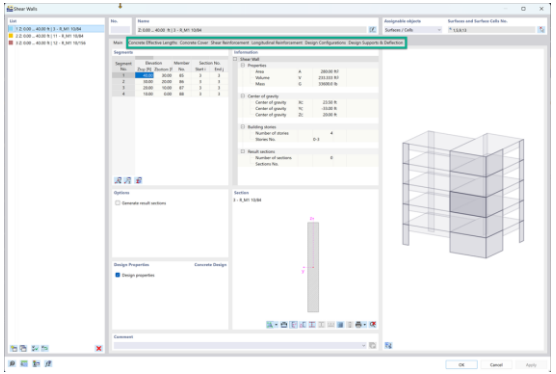
→ More information



Design Properties of Shear Walls and Deep Beams

- Design properties for shear walls and deep beams can be defined for the respective add-ons

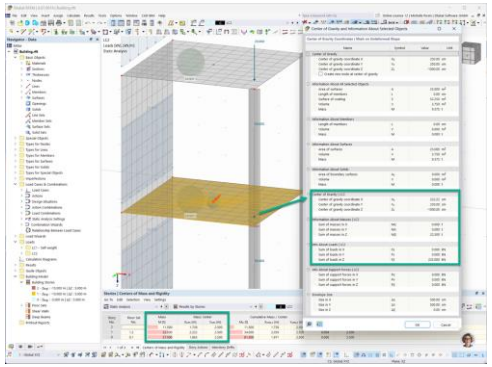
→ More information



Add-on Building Model

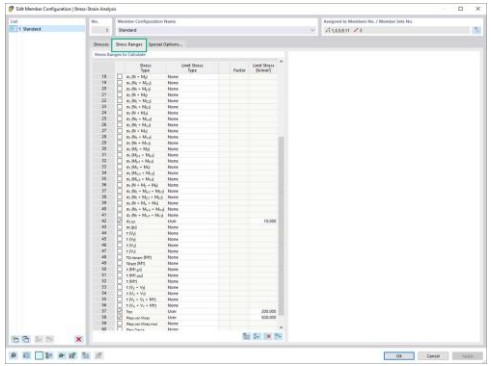
Calculating Center of Gravity Considering Loads of Load Cases and Load Combinations

- Results table 'Results by Story' shows center of gravity for load cases and load combinations
- Takes into account self-weight and vertical loads of the respective load cases and combinations
- The centre of gravity can also be displayed in the ' Center of Gravity and Information About Selected Objects' dialogue for selected loads



→ More information

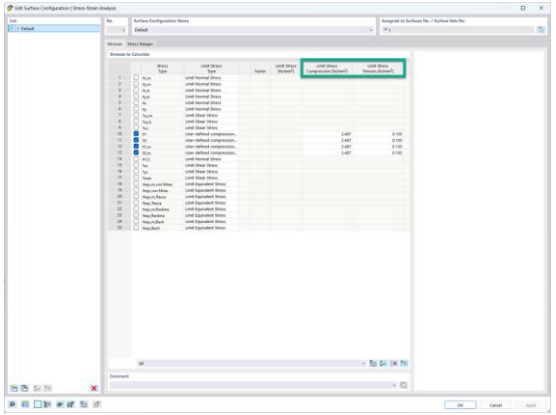
Add-on Stress-Strain Analysis



Specification of Component-Dependent Limit Stress Cycle

- Definition of a component-dependent limit stress cycle and consideration in the design

→ More information

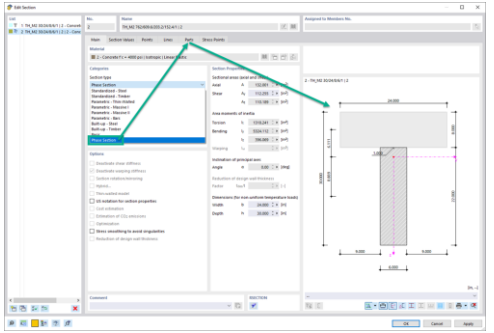


Sign-Dependent Stress Analysis

- Sign-dependent limit stresses can be defined by each component

→ More information

Construction Stages Analysis (CSA)



Phase Sections

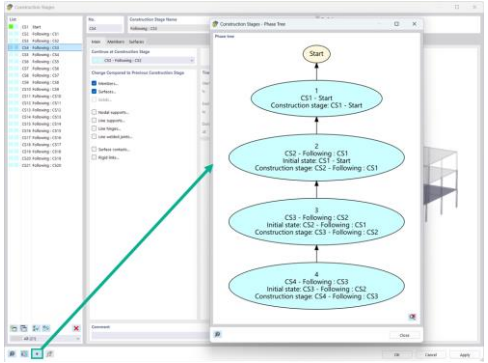
- Use of built-up cross-sections by means of phase cross-sections possible
- Activation/deactivation of parts of the cross-section of type 'Parametetric – Massive II' across the construction stages

→ More information

Flow Graphs for Construction Stages

- Graphical representation of the relationships between the construction stages possible using a flowchart

→ More information

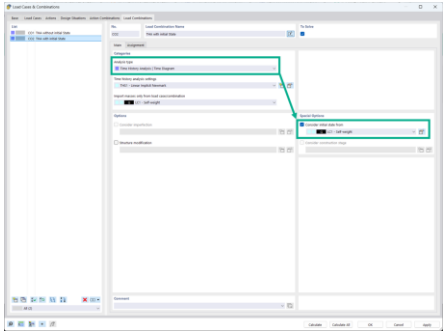


Time History Analysis

Considering Initial States for Time History Analysis

- Possibility of considering initial states in the time history analysis
- RFEM and RSTAB allow to specify different initial states (e.g. prestress, form-finding, strain) for target combinations

→ More information

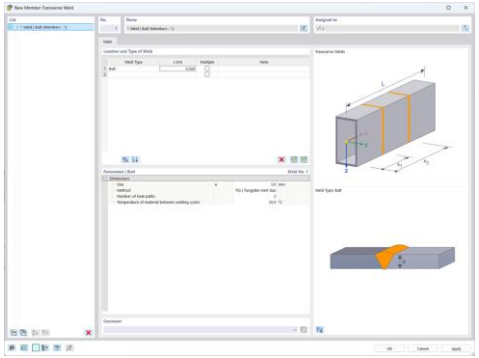


Add-on Aluminum Design

Softening (HAZ) due to Transverse Welds

- Consideration of the local reduction in strength caused by transverse seams in the heat-affected zone (HAZ)
- For the design according to EN 1999-1-1
- Calculation of the effective cross-section taking into account the transverse weld in RSECTION (Add-on Effective Sections)

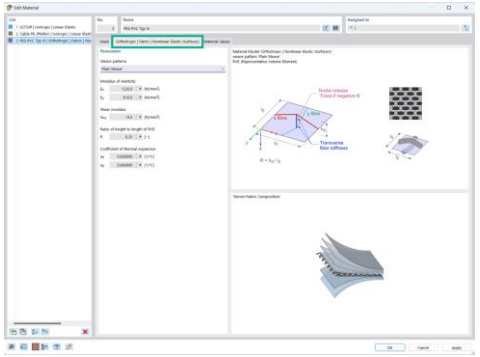
→ More information



Add-on Form-Finding

Nonlinear Material Behavior | Orthotropic | Fabric | Nonlinear Elastic (Surfaces)

- Material model for prestressed fabric membranes based on representative microstructure-solid element model (RVE)
- Enables realistic simulation of fabric geometry and transverse strain effects
- Suitable for all force conditions in the membrane



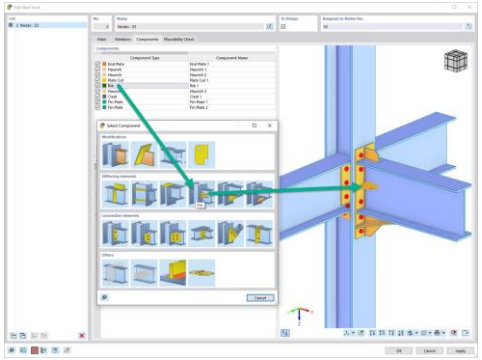
→ More information

Add-on Steel Joints

Component "Rib"

- Quick definition of any number of longitudinal ribs on the member plate with the 'Rib' component
- Automatic specification of welds using reference object
- Ribs can also be arranged on circular hollow sections

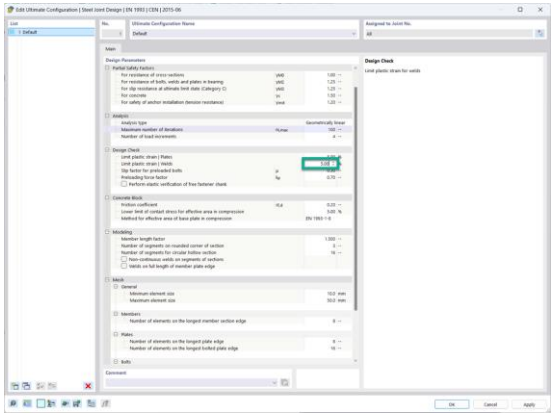
→ More information



Limit Plastic Strain for Welds

- Modifying the plastic limit strain for welds
- Processing in ultimate configuration for steel joint design

→ More information

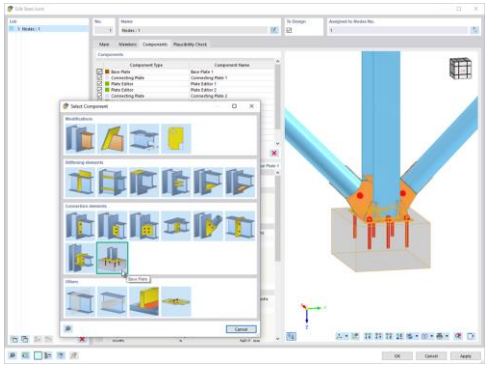


Add-on Steel Joints

New: Component "Base Plate" for Foundation Block Connections

- 'Base plate' component for the design of base plate connections with cast-in anchors
- Analysis of plates, welds, anchorages and steel-concrete interaction

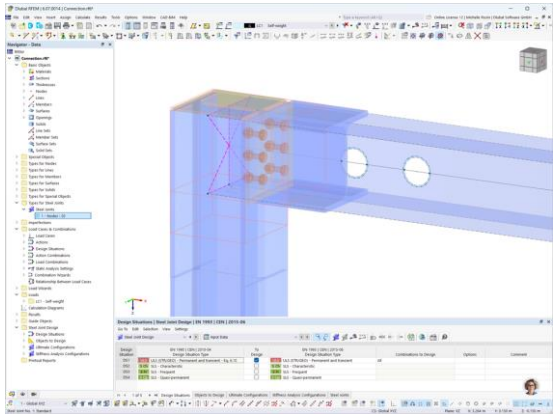
→ More information



Steel Joint Design on "Result Beam" Member Type and Surface Models

- Additional member type 'Result Beam' and cross-sections from surface elements available
- Selection of a suitable cross-section for the result member
- Definition of member openings in the surface model using the member editor

→ More information

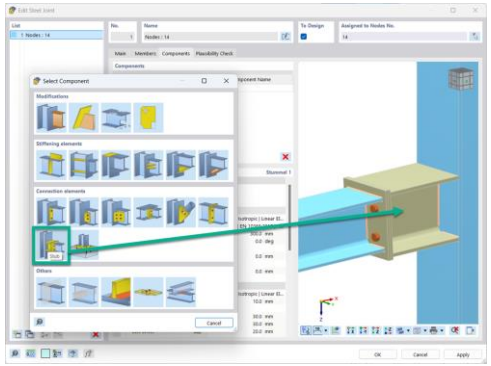


Add-on Steel Joints

Component "Stub"

- Enables extension of a member via plate joint with another member (stub)
- Connection with a reference component

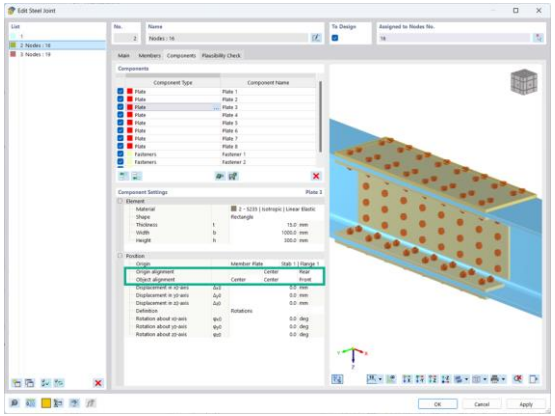
→ More information



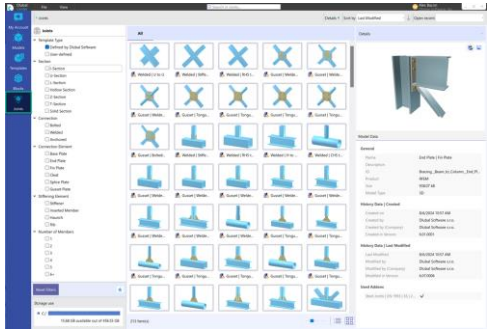
Relative Placement of Objects

- Possibility to arrange objects with a relative reference to other objects

→ More information



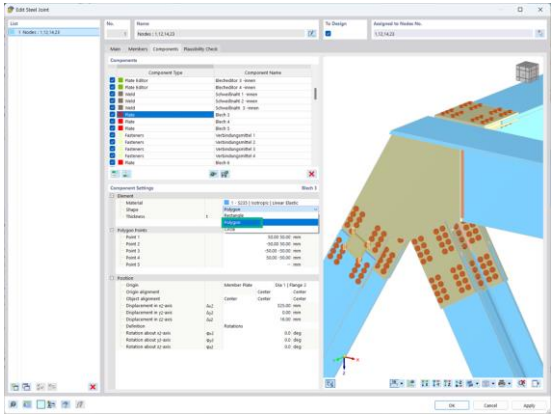
Add-on Steel Joints



Connection Library in Dlubal Center

- Extensive connection library for the 'Steel Joints' add-on in the Dlubal Center
- Direct access from the add-on to assign predefined connections to nodes
- Option to save user-defined connections in the library in the Dlubal Center

→ More information



"Plate" Component with Polygonal Geometry Shape

- Arrangement of plates in various geometric shapes
- Available shapes: Rectangle, circle and polygon
- Polygonal shape can be defined by entering point coordinates

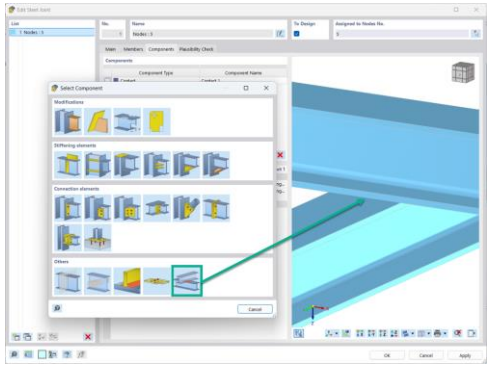
→ More information

Add-on Steel Joints

Component "Surface Contact"

- Consideration of pressure contact between two parallel plates/member plates
- Optimum consideration of the friction between the surfaces

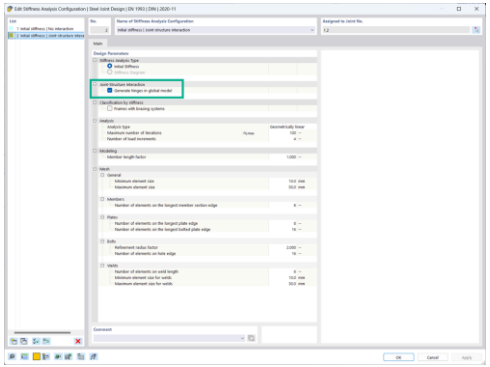
→ More information



Joint-Structure Interaction

- Automatic consideration of the stiffness of steel joints
- Activation in stiffness analysis via 'Joint-Structure Interaction'
- Generation of hinges with springs in the global model
- Consideration of the hinges in subsequent calculations

→ More information

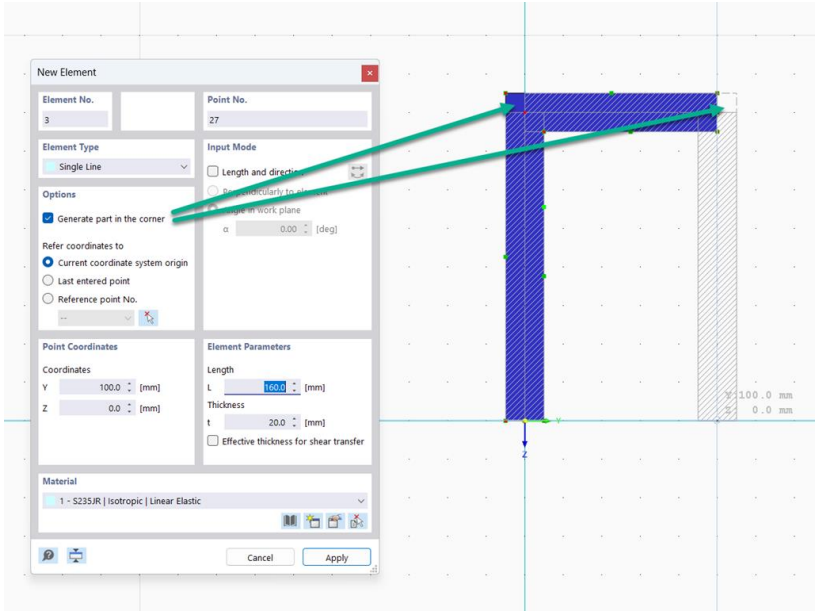


RSECTION 1

Generating Part in Corner

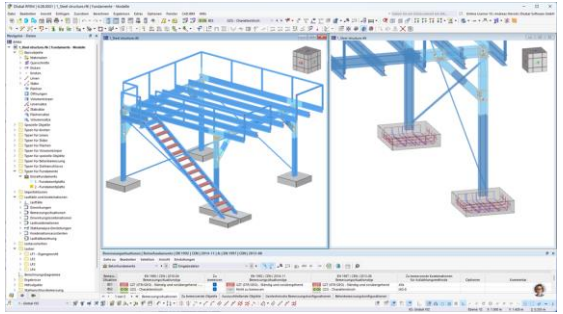
- Generation of parts in the corner when creating new elements in RSECTION

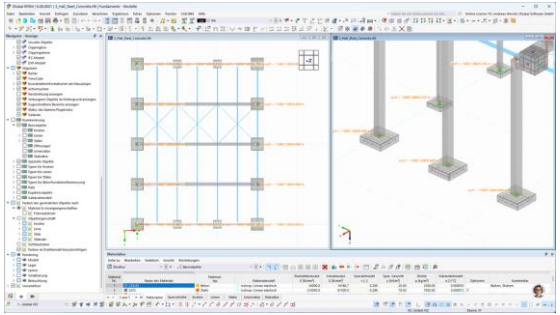
→ More information



Add-on Concrete Foundations

- Design of reinforced and unreinforced shallow foundations
- Fully integrated within RFEM 6
- Geotechnical design according to Eurocode 7:
  - Design of sliding
  - Equilibrium limit state
  - Uplift limit state
  - Highly eccentric loading
  - Eccentric loading in core
- Reinforced concrete design according to Eurocode 2:
  - Bending design
  - Punching
  - Minimum reinforcements
- Graphical and tabular output of the required reinforcement amount
- Detailed ultimate and serviceability limit state design checks and structural details





→ More information

Planned Features (from 2024)

- Nonlinear concrete analysis
- Foundation design
- Glass design
- Determination of cutting patterns for membranes
- Design of timber frame wall assemblies
- Python console
- Steel joints: dimensioning and labeling tools, stiffness consideration, footing
- Partial deletion of results
- Moved loads
- Support load transfer to free loads
- Bridge combinatorics
- Damping elements
- Pulley members
- RWIND results completely in RFEM
- Hinge result diagrams
- Nonlinear time step analysis
- Scaffolding support
- Ground linearization
- Fire protection of timber surfaces
- Semi-rigid diaphragms
- Timber connections
- Independent mesh
- Concrete design: pushover hinges, automatic reinforcement layout for members, fire protection: zone method, definition of existing punching shear reinforcement
- RSECTION: welds
- Shear wall design + coupling beam design
- Enhanced plasticity design
- New standards for steel and timber structures
- Wind analysis using cloud computing
- Python: interface with BricsCAD, Excel, DSTV, SDNF
- AI chatbot
- and much more

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- AI chatbot
- and much more

Planned Features (from 2025)

- Nonlinear concrete analysis
- Completion of foundation design
- Glass design
- Determination of cutting patterns for membranes
- Cable pulley members
- Nonlinear time history analysis
- Scaffolding supports
- Soil linearization
- Pushover hinges (concrete and new AISC standard)
- Fire protection: zone method for concrete design
- Enhanced plasticity design
- APIv2 – Extension and acceleration of WS interface
- CAD add-on (layers, CAD lines and surfaces, sketches)
- Design strips
- Model type "Plane Strain"
- Prestressed beam elements
- Design of timber panel elements
- Mixed combinatorics
- Components - User-Defined Design add-on
- Stability analysis for subsoil geometries
- Performance increase through additional independent meshing forms
- Welds in RSECTION and RFEM
- Timber connection design
- Expansion of metal designs with surfaces and welds
- SSO login technology
- RFEM in cloud for WebService codes
- 3D window in RFEM with DXF export
- Bentley DGN export
- Python coding with Mia
- Completion of column base design
- Joints as standalone solution
- Composite cross-sections in RSECTION
- Wind rose definition for wind comfort analysis
- Plate buckling
- Craneway
- Tower modeling and design
- Design of curved timber beams

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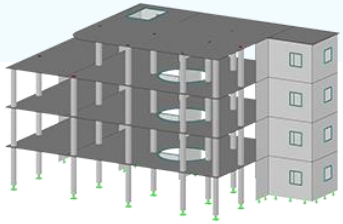
Webinar



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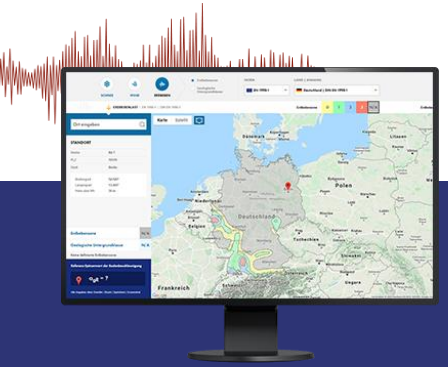

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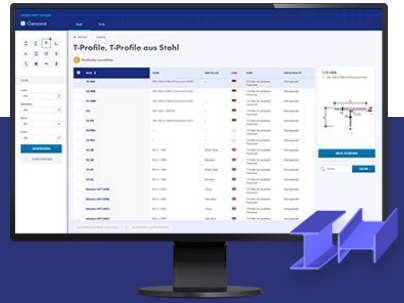

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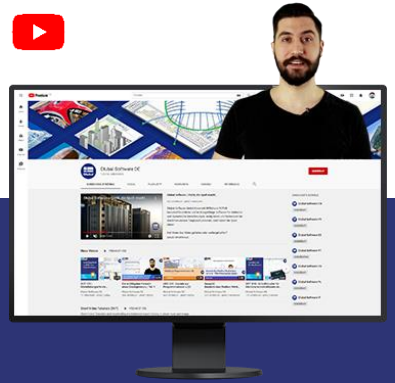

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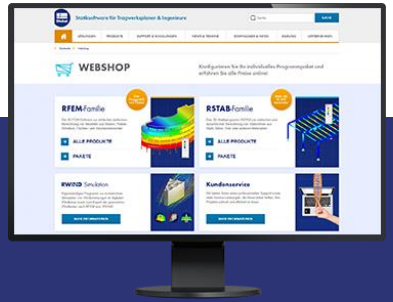

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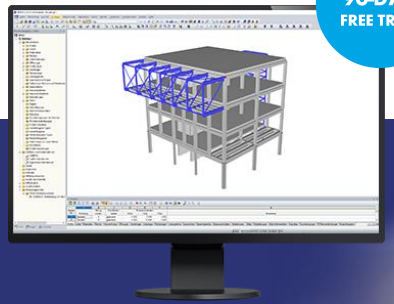

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Dlubal Software GmbH
Am Zellweg 2,
93464 Tiefenbach, Germany

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