

SJ MEPLA

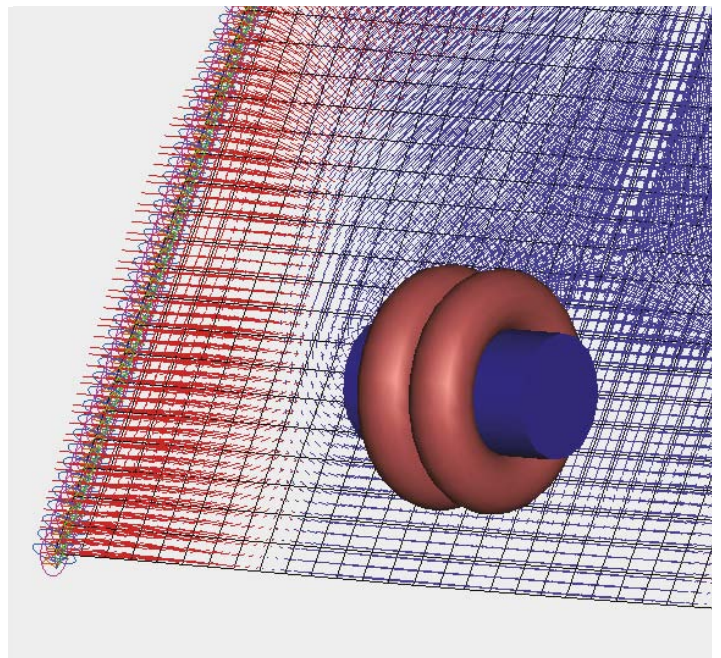
Stress calculation and dimensioning for glass constructions



The dimensioning and stress calculation of glass structures under widely varying conditions is a standard task in routine engineering work.

Geometrical configurations which deviate from a rectangular shape cannot here be calculated using tables or rules of thumb, but must instead be evaluated with the method of finite elements.

In this respect new formulations for calculating the stresses in laminated glass, insulation glass, point-supported glass as well as dynamic formulations (pendulum impact, pressure shock) have been specially integrated for the glass construction field.



Geometry and Layers

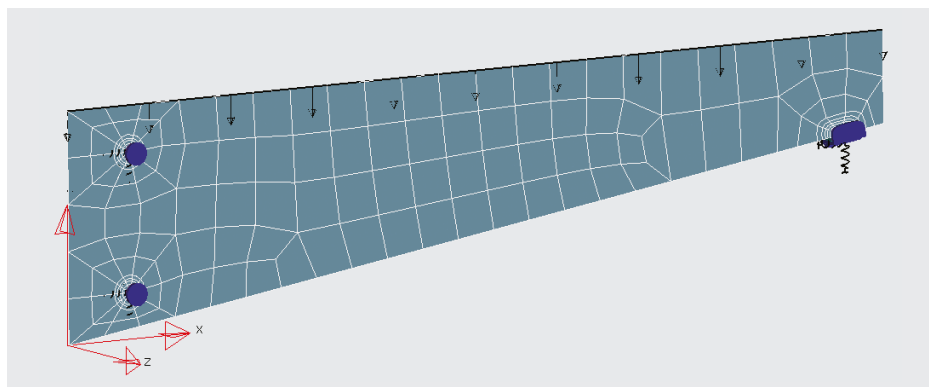
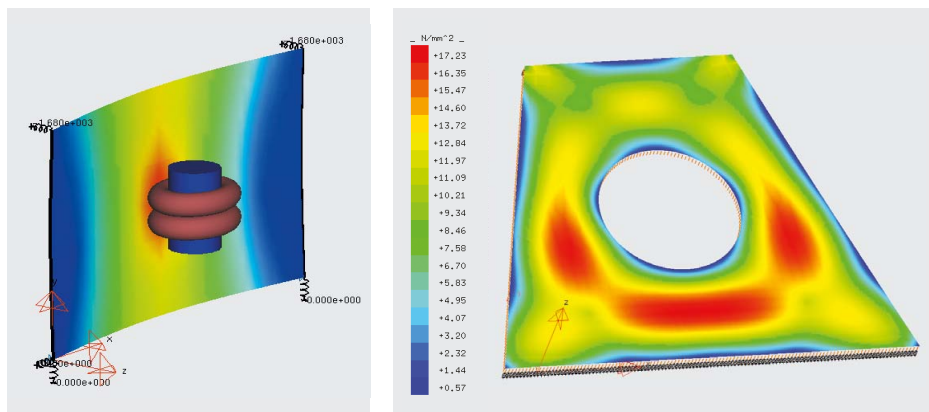
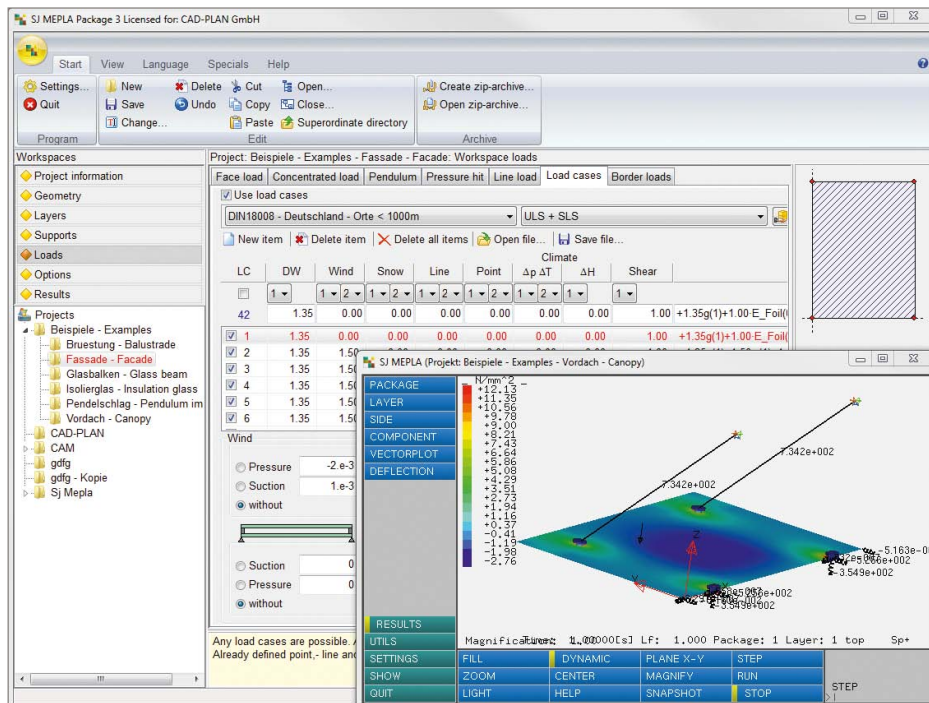
- Generation of any plate shapes with straight and curved edges, also segments and holes
- Description of the pane geometry by input of the corner points
- Automatic mesh generation
- Adjustable density of the element mesh
- Any pane structure by input of the layer sequence (laminated safety glass)
- Insulation glass units with multiple cavities (also in laminated safety glass version)
- Consideration of the gas pressure laws

Loads, Options and Result

- Face loads and concentrated loads with defined area distribution
- Definition of linearly increasing area loads
- Border loads (line loads along borders)
- Freely definable climatic loads
- Line loads and climatic loads for insulation glass units running in any direction
- Temperature differences in the layers of insulation glass
- Loading case combinations (output of results to each loading case including maximum values)
- Automatic load-case generation according to preset standards: DIN 18008, TRLV or rudimentarily ASTM E1300
- Additional log of all loading cases with verification
- Dynamic simulation of the pendulum impact test according to DIN EN 12600 (also for insulation glass and point fixings)
- Pressure shock stresses, e.g. wind gusts
- Linear and non-linear geometric calculations
- Application of the loads in single steps
- Any results output at freely definable points
- Free selection of additional stress and deformation outputs
- Factor of shear within load combinations
- Representation of the comparative stresses in the graphical interface
- Computation log with all basic data, specifications and results
- Graphical display of curve with adjustable x and y axes

Supports

- Predefined types of support for the plate edges to ensure fast input
- Point fixing elements for countersunk and disk fixings
- Applying loads or moments at point fixings
- Freely selectable position of the point fixings by coordinate input with automatic fitting
- Elastic support of point fixings using springs or bars
- Clamp fixing with round or angular shape (can also be used as glass shoe)
- Hold-down clamp with round or angular shape
- Bonded disk fixing without hole formation
- Elastic edge support and also bonding
- Elastic line support transversely through the plate
- Bonded or elastically supported glass edges
- Formulation of any spring support
- Reinforcing edge beams
- Distance fixing in insulating glass
- Contact conditions for most supports



General remarks

- User interface and results reports in several languages (German, English, French, Dutch, Italian, Spanish, Portuguese, Polish, Czech)
- Expandable databases for materials, climatic loads and standard specifications
- Apart from the linear computational formulation, calculation can take place alternatively according to the non-linear computational formulation.

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