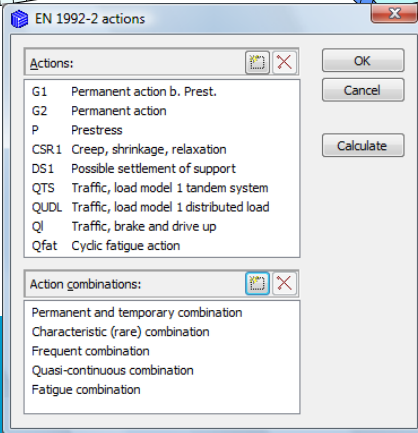
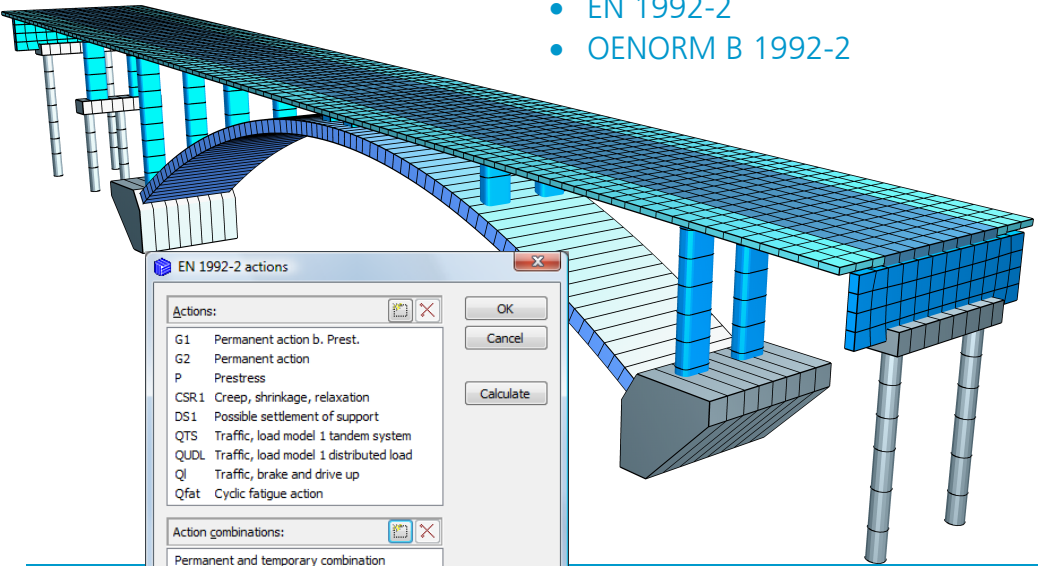




Bridge Design

- DIN Technical Report 2009-03
- EN 1992-2
- OENORM B 1992-2



InfoCAD 10.0

Update Information January 2010

Please note: This is the last program version which supports Windows 2000.

Important information on the current version of the program can be found in the InfoCAD online help. New program versions are posted regularly on the service page of our web server at www.infograph.eu.

InfoGraph® is a registered trademark of InfoGraph GmbH, Germany.

© 2010 InfoGraph GmbH, Aachen, Germany. All rights reserved.

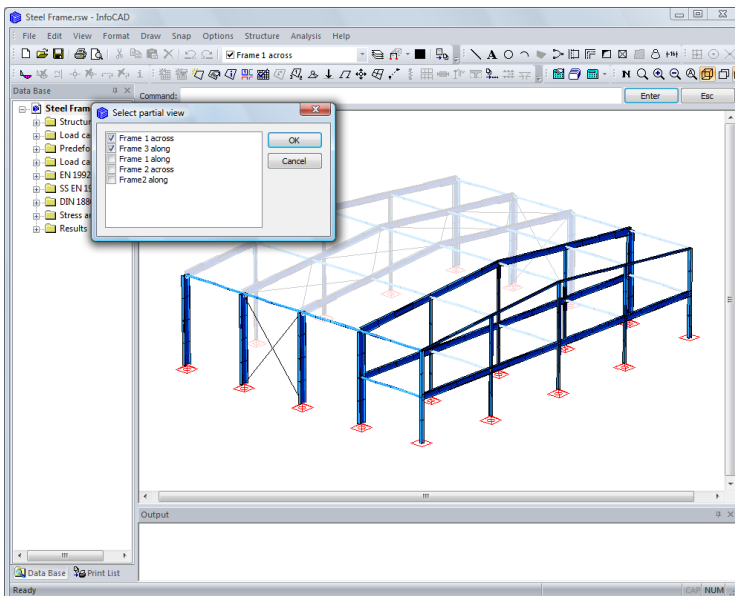
Title image: Federal motorway A 44, bridge construction near Hessisch Lichtenau.
Courtesy of MEHLHORN und VIER Ingenieurgesellschaft mbH, Kassel, Germany.

News in InfoCAD 10.0

The following chapters provide you with the latest information on the InfoCAD program system and the most important changes with respect to the previous version 8.0 from November 2008.

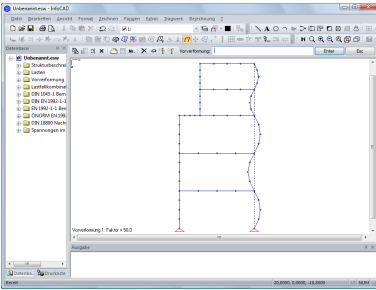
General Information

- The user interface was newly arranged. Functions of the view and context menus allow the following settings:
 - Moving, adding and deleting icons in the toolbars
 - Definition of shortcut keys for faster access to commands
 - Modification of menus
 - Free positioning of the dialog bar
 - Enlargement of the representation area by fading out the output bar and the data base/print list automatically.

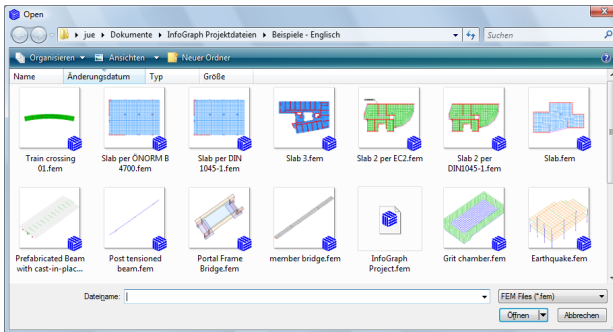


- In order to allow structured representations of large systems, you can now use so-called partial views. This feature enables representations which cannot be achieved by use of the layer technique.
- The function "Arrange Elements" now allows the user to define the zero level.
- The cone object can now be defined by edge objects. Additionally, the meshing of cones has been improved.
- A new function of the options menu allows to import and export the system file IGRAPH.DAT which contains the page frame and other user specific settings.
- For frameworks within the FEM mode, the function "Predeformation" has been supplemented.

InfoCAD 10.0 Update Information



- The function "Predeformation" has been extended with a method to define sinusoidal precurvatures.



- The project files are now enhanced with a miniature view of the structure which can be displayed in the Windows Explorer. This allows a fast project overview without opening the files.
- The quality of reinforcing steel of beam cross-sections can be changed for a whole group of elements now.
- The node and element related result curves of a direct time step integration (dynamic or thermal analysis) can be exported using the clipboard.

Link Elements and Spring Elements

- For simplified input of special beam connections a shared node is divided automatically, if
 - in case of point links the dependent node and the reference node are identical,
 - in case of springs the start and the end node are identical.

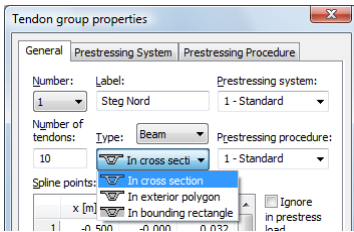
Parallel Sparse Solver

- If the system is relocatable, the solver now reports the corresponding node and degree of freedom.

Dynamics

- The masses can be activated separately for each degree of freedom.
- For the alternative response spectrum method can also be specified a vertical range.

Prestressing



- Optionally, tendon groups can now be assigned to beams even if they are not positioned exactly within the beam cross-section.
- The DXF-Export function also transfers the tendon group geometry and marks the spline points.

DIN 4227

- The analysis settings were extended to define the permitted principal tensile and compressive stress and the shear stress according to table 9 more detailed.
- The shear check of combined loads was modified, the output was revised and supplemented.

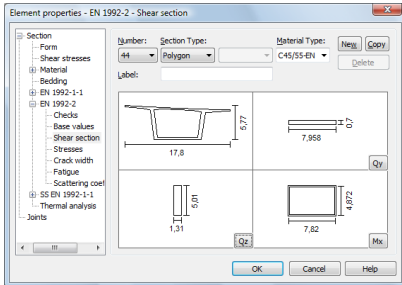
DIN 1045-1

- The crack width check for thick components according to chapter 11.2.2 (8) is now available.
- For the fatigue check three stress-strain curves for concrete are offered to determine the stress ranges.
- In the fatigue combination the cyclic and non-cyclic actions are now superposed separately. In existing projects the previous fatigue action has to be exchanged with the new fatigue action Qfat.
- Alternatively, the simplified fatigue check under the frequent combination can be carried out.
- For sections with the mode "compression member" the robustness reinforcement is not checked anymore, because minimum reinforcement is already determined during the design for bending with longitudinal force.

EN 1992-1-1 with National Annexes Germany, Austria and Sweden

- The fatigue checks for concrete, for longitudinal, lateral and torsional reinforcement as well as for prestressing tendons have been supplemented.
- Optionally, you can either carry out the simplified check for the frequent combination or the check with damage equivalent stress ranges.
- The checks have been adapted to the draft of the German National Annex of January 2010.
- The crack width check for thick components according to chapter 7.3.2 (5) is now available (NA Germany).

DIN 1045-1, OENORM B 4700, SIA 262, EN 1992-1-1



- The selected shear and torsion section is now visualized in the dialog.
- With the help of new design groups, selected members of the entire structure can be designed for specific action combinations and traffic loads.

DIN Technical Report 102

- The selected shear and torsion section is now visualized in the dialog.
- For the fatigue check three stress-strain curves for concrete are offered to determine the stress ranges.
- In the fatigue combination the cyclic and non-cyclic actions are now superposed separately. In existing projects the previous fatigue action has to be exchanged with the new fatigue action Qfat.
- Alternatively the simplified fatigue check under the frequent combination can be carried out.
- The crack width check for thick components according to chapter 4.4.2.2 (9) is now available.
- For prestressed components with subsequent bond the tendons can be set ungrouted for every situation.
- For sections with the mode "compression member" the robustness reinforcement is not checked anymore, because minimum reinforcement is already determined during the design for bending with longitudinal force.

In the settings function the 2003-03 or 2009-03 edition of the standard can be selected. The following checks have been adapted to the new edition:

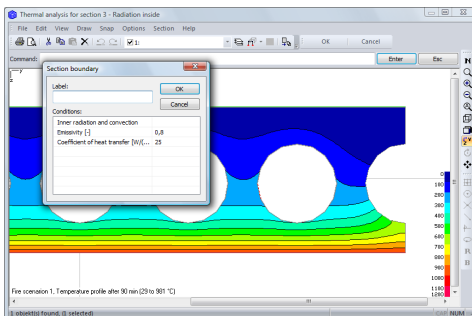
- Check of the maximal lateral load-bearing capacity $VR_{d,max}$ (Chapter 4.3.2.2.(4)P).
- Determination of the lateral load-bearing capacity $VR_{d,ct}$ without lateral force reinforcement (Chapter 4.3.2.3(1)*P).
- Limitation of the strut angle $\cot \theta$ (Chapter 4.3.2.4.4(1)*P).
- Definition of the permitted characteristic stress range $\Delta \sigma R_{sk}$ (Chapter 4.3.7.7, Tab. 4.117).
- Calculation of the crack width (Chapter 4.4.2.3).

Bridge Checks according to EN 1992-2 and OENORM B 1992-2

This new modul offers bridge checks for beam and shell structures according to Eurocode 2. Elements with no prestress as well as prestressed elements with subsequent bond, without bond, with external prestressing and in mixed construction can be analyzed. The licensing is provided in conjunction with the DIN Technical Report 102 bridge checks.

- Consideration of any loads and load positions
- Special preparation of load model LM 1
- Automatic combination of the actions
 - Construction and final stages for all action combinations
 - Optional user-defined actions
- **Checks at the ultimate limit state**
 - Minimum reinforcement against failure without warning
 - Bending with or without normal force or normal force only
 - Lateral force under consideration of the minimum level of reinforcement
 - Pure torsion and torsion with lateral force
 - Checks against fatigue for concrete, bending, lateral force and torsion reinforcement as well as for tendons
- **Checks at the serviceability limit state**
 - Minimum reinforcement for the crack width limitation
 - Limiting the crack width via direct calculation
 - Decompression check
 - Limiting the concrete compressive stresses
 - Limiting the reinforcing steel stresses
 - Limiting the prestressing steel stresses

Structural Analysis for Fire Scenarios



- Within cavities of cross-sections, heat transfer by radiation and convection can now be taken into account.

IFC Data Transfer

- The IFC data transfer now supports the import of structural face members.

InfoGraph GmbH
Kackertstrasse 10
D-52072 Aachen, Germany
Tel. +49-241-889980
Fax +49-241-8899888
E-Mail: info@infograph.de
www.infograph.de

InfoGraph 
Software für die Tragwerksplanung