

IDEA Connection

Release „September 2014“

New and improved functions

There are a lot of new functions in the current version of IDEA Connection. Download it at our website <http://www.idea-rs.com/downloads/>.

Manufacturing operations

- Connections with bolted splice plates
- Connections of hollow core sections (tube, rectangular)
- Thin walled sections
- Auto-checking of correct design of the joint

Loads

- Improved drawing of internal forces on joint members
- Load tables according to member types
- New table for check of load balance in the joint

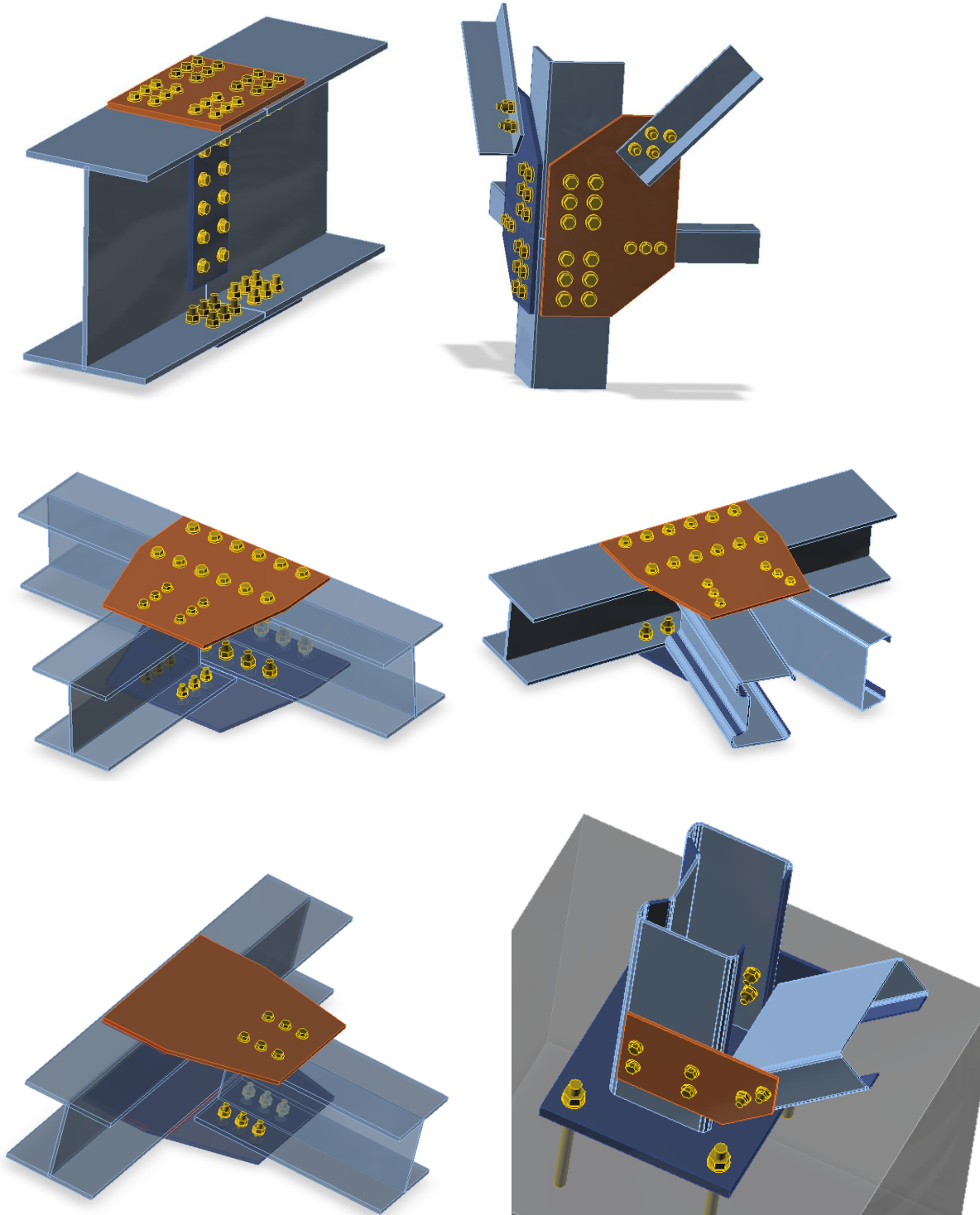
Analysis and checks

- Improved model of bolts in shear (boreholes in mesh, contact stress in borehole)
- Mortar joint
- Drawing of results and rendering of tables according to load cases or extremes
- Drawing of shear forces in bolts

New manufacturing operations

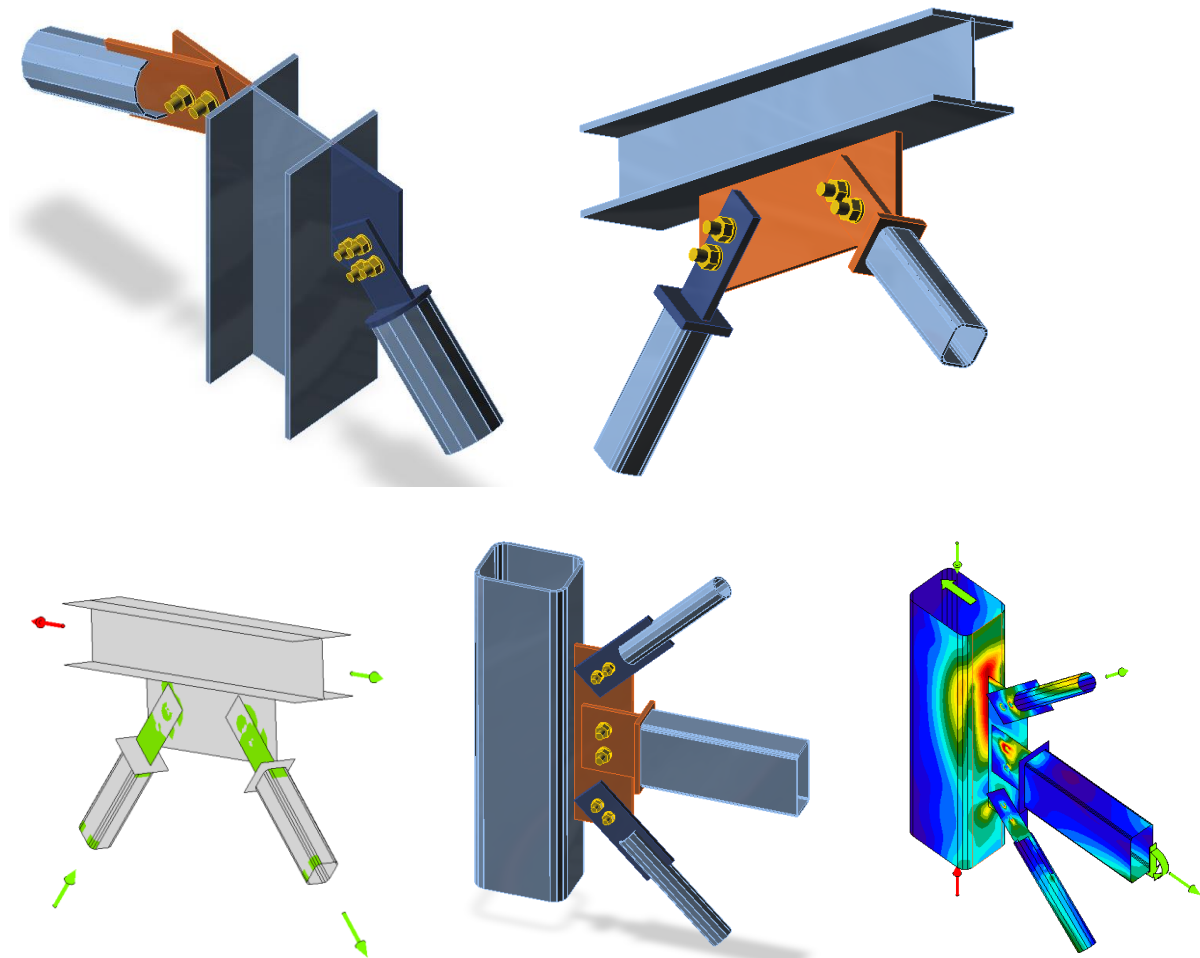
Connections with bolted splice plates

Bolted or welded splices for connection of flanges or webs of members. It can also be used for complex gusset plates.



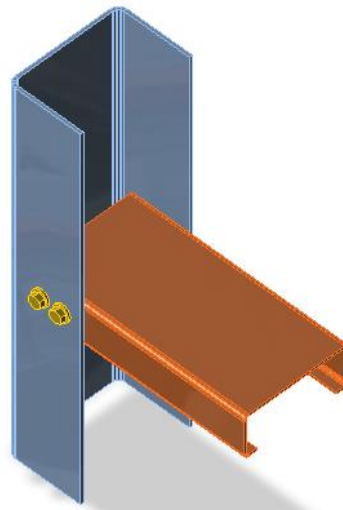
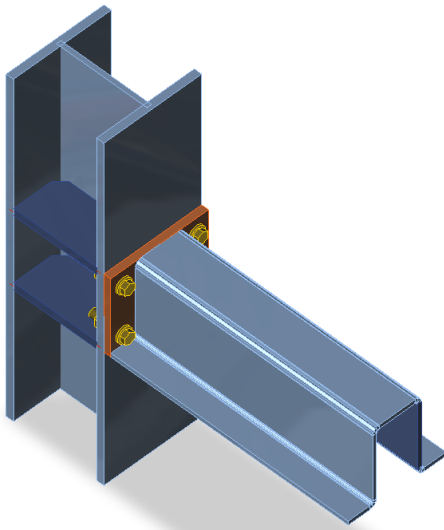
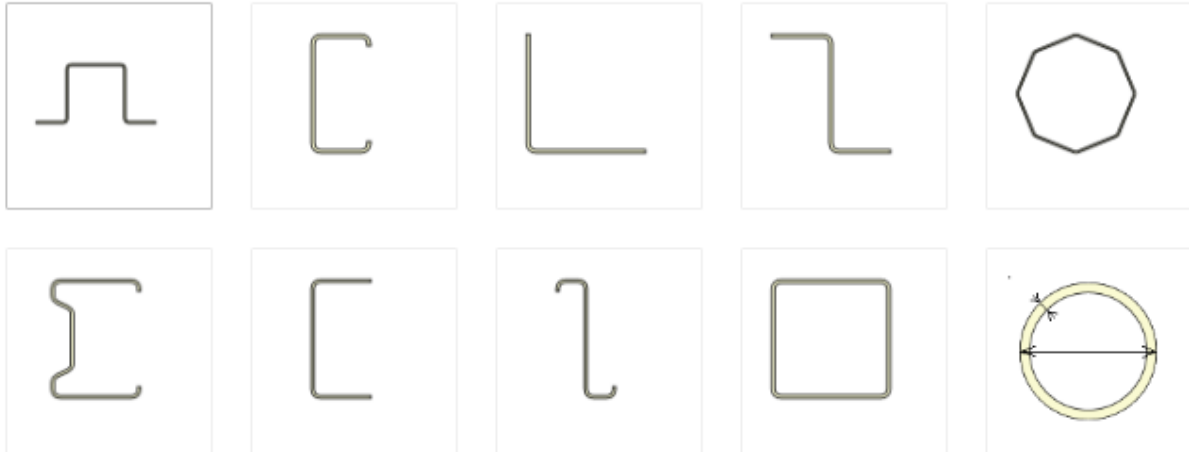
Connections of hollow core sections (tube, rectangular)

Bolted or welded connection of member with hollow core cross-section with a new gusset plate or any existing plate/flange of any member.



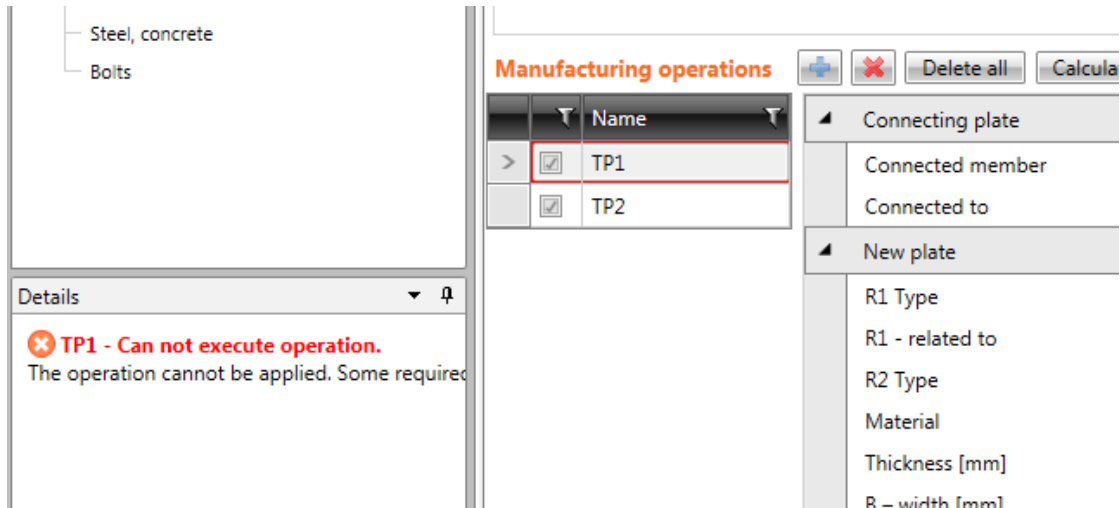
Thin walled section

Cross-member selection offers 10 new thin-walled profiles. All of them can be used for the same manufacturing operation which can be applied on rolled or welded sections.



Auto-checking of correct design of the joint

Everybody can make a mistake during the joint composition. We added variety of checks which warn you and help you to find the right solution.



The screenshot displays the IDEA Connection software interface. On the left, a tree view shows 'Steel, concrete' and 'Bolts'. The main area features a 'Manufacturing operations' table with two rows: TP1 and TP2, both with checked boxes. Below the table, a 'Details' panel shows an error message: 'TP1 - Can not execute operation. The operation cannot be applied. Some required...'. To the right, a panel lists properties for 'Connecting plate' and 'New plate', including 'Connected member', 'Connected to', 'R1 Type', 'R1 - related to', 'R2 Type', 'Material', 'Thickness [mm]', and 'B - width [mm]'.

	Name
<input checked="" type="checkbox"/>	TP1
<input checked="" type="checkbox"/>	TP2

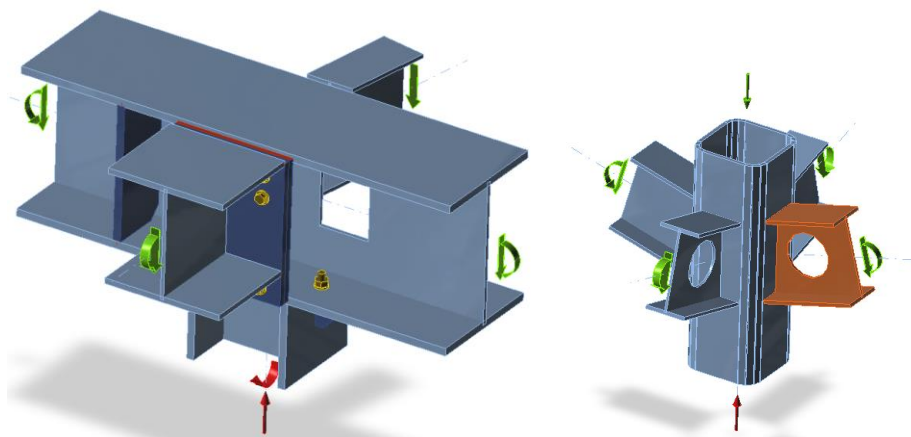
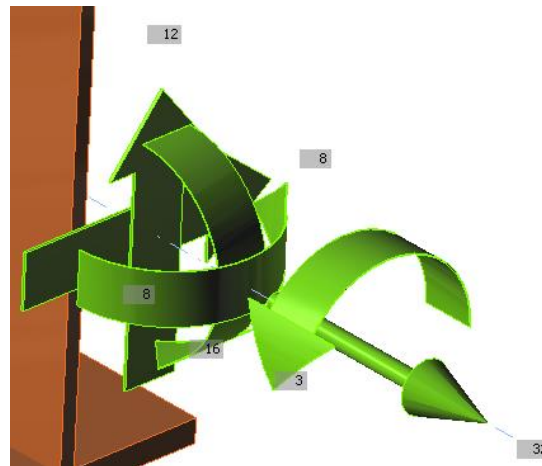
TP1 - Can not execute operation.
The operation cannot be applied. Some required...

- Connecting plate
 - Connected member
 - Connected to
- New plate
 - R1 Type
 - R1 - related to
 - R2 Type
 - Material
 - Thickness [mm]
 - B - width [mm]

Loads

Improved drawing of internal forces on joint members

Correct input of loads is necessary for successful joint design. Joint is loaded by end internal forces of connected members. We improved drawings and labels. Input of loads is much easier now.



New table for check of load balance in the joint

Joint in the frame steel structure is in load balance. It means that loads of CBFEM model of joint must be balanced as well. There is a new table in the section of load input which shows resulting forces of applied loads. This makes inputting correctly balanced loads very easy.

Unbalanced forces

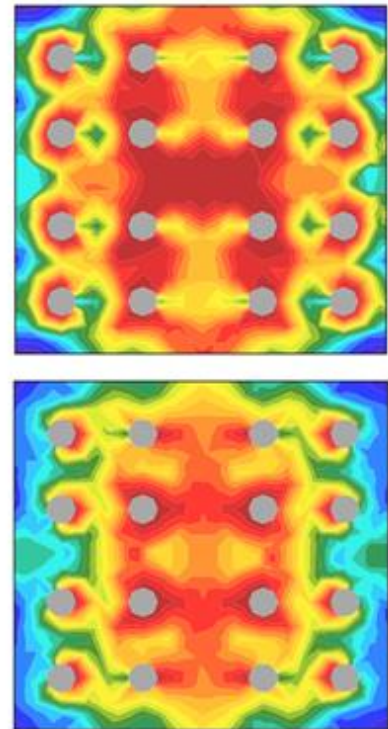
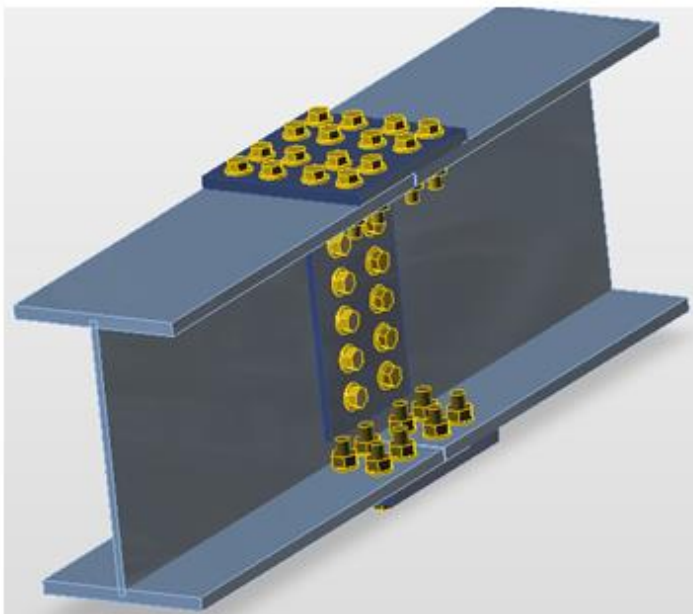
	X	Y	Z	Mx	My	Mz
>	0,000	0,000	0,000	3,000	0,000	8,000

Analysis and checks

Improved model of bolts in shear (boreholes in mesh, contact stress in borehole)

We improved the model of behavior of bolts in shear. The real boreholes are inserted in steel plates – this helps to find the critical section in the plate. Moreover, we implemented a new model of transfer of forces from bolt to plate. Bolt is in contact with borehole edge only on pressured side.

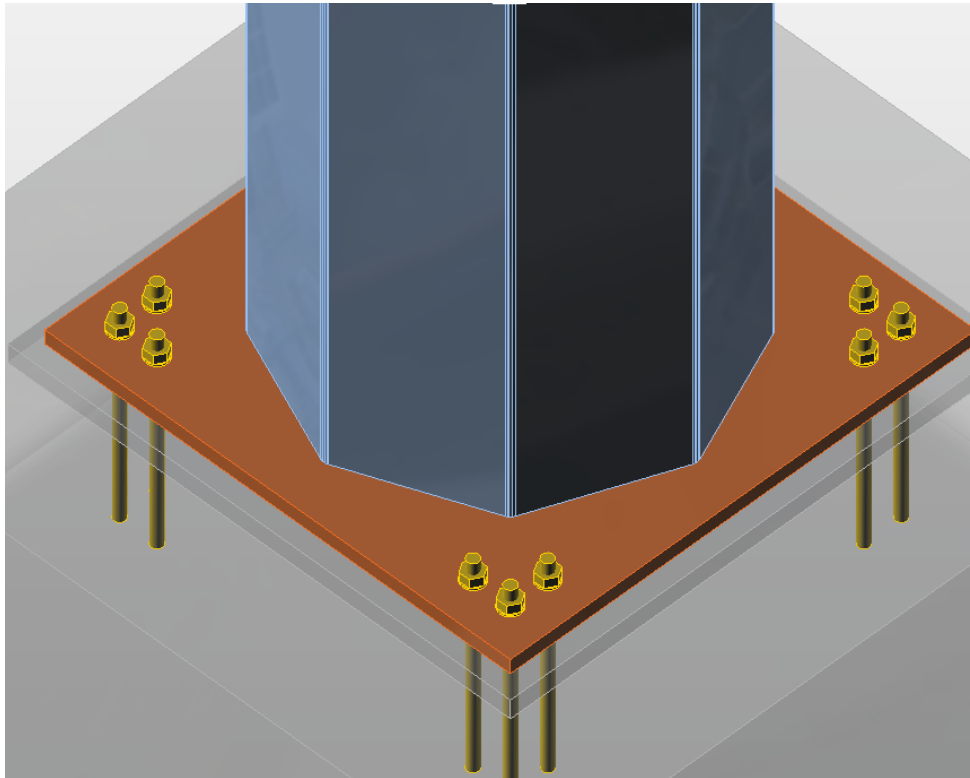
Following picture shows the development of plastic zones on tensioned upper splice plate and on bottom splices plate which is in pressure.



Mortar joint

More users asked for the analysis of mortar joint under the base plate of column. It is implemented now.

Picture shows the mortar joint on column with octagonal cross-section.



Drawing of shear forces in bolts

New graphical presentation of shear forces clearly shows how the bolts are loaded. See enclosed example of group of bolts in torsion:

