

## Infosteel: EC EN in Scia Engineer

### Eurocodes and NAs

The transition to the **Eurocodes** takes place in 2010 and gradually the national codes will be withdrawn. The coexistence period in Belgium officially ends March 2010. It relates to the general part together with the National Annexes. These concern the local differences regarding geographical, climatical and traditional building practice provided in the form of Nationally Determined Parameters (NDPs), which can be found in the **National Annex (NA)** of each country.

Since years Nemetschek Scia has been wide awake with regard to the Eurocodes. Scia Engineer supports EC0, EC1, EC2, EC3, EC4 and EC9. Some parts of the EC8 (earthquake) are already available and soon EC5 (wood) will be adapted from ENV to EN. Recent developments also include EN 1993-1-3 for cold-formed sections and the EC 7 (geotechnical design).

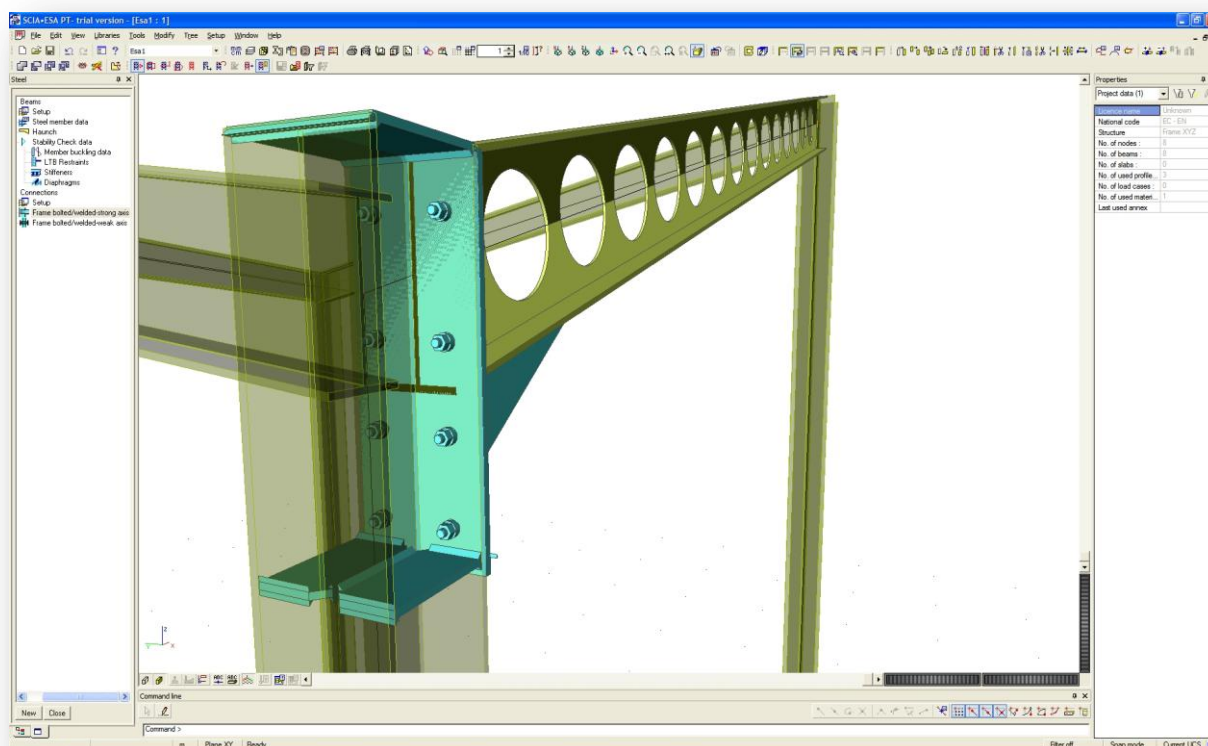
It is very important to implement the NAs in a simple and transparent way. The recommended values of the NAs are suggested as 'standard'; if no NA is available, the recommended value of the Eurocode will be chosen. If necessary, the user can enter alternative values.



### Calculation methods for steel design

It is important to mention that the Eurocodes comprise criteria by which calculation methods are determined. Through a stability analyses for an entire construction will be determined if **either a linear or a geometrical non-linear analysis** has to be performed, in the course of which - surely for steel - the concept "buckling length" will get a different interpretation. With Scia Engineer these analyses can be carried out in a simple way, the programme includes possibilities for: non-linearity's, stability, dynamics and second order.

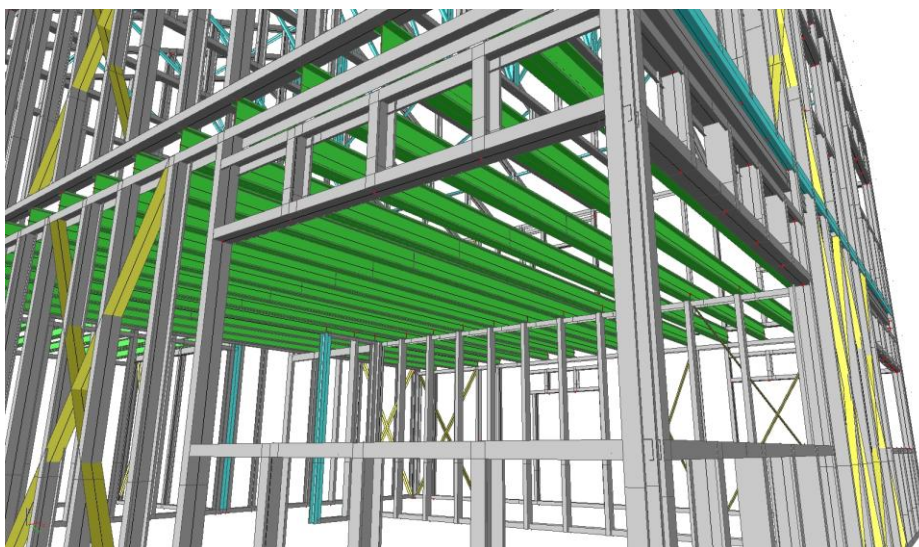
The steel design includes the **stress and stability check** as well as an Autodesign feature for the **optimization** of sections. The graphical representation of the results immediately shows where the weak or overdimensioned parts are situated. The buckling lengths are calculated automatically. All profile classes are checked, including **class 4 thin-walled profiles**. All stress and instability effects are checked: **buckling, torsional buckling, local bending** ... The output contains the reference to the used articles from the code. The user can interactively optimize the structure by using e.g. buckling restraints, steel deck ...



The **fire resistance check** is based on the chosen (or imported) fire curve in the domain of resistance or temperature time. The choice for **insulation** is made out of the following possibilities: sheet protection, spray material and foaming paint. Here again the calculation note includes a detailed output showing the consulted articles from the code.

Besides the bar checks, the programme also calculates **various steel connections**: bolted and welded moment-fix connections, hinged frame connections, bolted diagonals, floor connections.

In addition, the following **other codes** are available: ENV 1993, NEN 6770/6771, DIN 18800, CSN 73-1401, STN 73-1401.98, Önorm 4300, CM 66, SIA 263, BS 2000, ANSI/AISC 2005, IS 800, EAE.



## Other steel related applications

The following other steel related applications are available:

- ✚ **Cellular beams:** these are loaded from a library and checked according a similar method as the steel code checks.
- ✚ **Cold formed sections** according to **EC-EN 1993-1-3** and **AISI NAS 2007**, including the **calculation of the actual section** (with distortion buckling of the stiffeners).
- ✚ **Check and fire resistance** of **composite steel-concrete beams**, columns and plates according to EN 1994.
- ✚ **Scaffolding constructions** according to the EN 12811.
- ✚ Various **exchange possibilities:** Tekla, Revit, Prosteel, SDF, ETABS...

**General arrangement drawings** and **detailed drawings of connections** also provide for a complete as well as an impressive 3D representation in the calculation report.

In compliance with your wishes it is possible to **combine mutually**, within the same project, the **various Eurocodes**. For bars as well as for plates and for any kind of material: steel, concrete, aluminium. This way, constructions are analyzed in one go, e.g. in a 3D model. Also **switching to other design codes** (e.g. EC ENV, NEN, DIN, ...) is possible. This allows the user to compare design codes or to convert older projects to the Eurocode EN and vice versa.