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March 2010

### Latest News & Events

- ▶ Free Technical Sessions on hot topics are being organised in the Benelux (Dutch - French)
- ▶ Nemetschek Scia will be present at the **Kaltenbach IPS exhibition** in Lörrach (D)
- ▶ Read this Scia Engineer product review of **AECbytes...**
- ▶ Visit our **Webshop** and take advantage of our **special offers!**
- ▶ All you need to know on the Eurocodes... Visit [www.eurocodes-online.com](http://www.eurocodes-online.com)
- ▶ Join our **new IQ Platform** and contribute to the **future evolution of Scia Engineer!**
- ▶ Scia invites you to participate in the survey: **"Users of Software for Design and Engineering"**
- ▶ Are you a **student or professor?** Download **Scia Engineer for free...**

### Software Updates

- ▶ Customers can download the **latest service packs** from our **secured download section**.
  - Scia Engineer 2010.1.556
  - Scia Steel 2010 SP2
  - Allplan 2011 HF4
  - Allplan Precast 2010.1-1
- ▶ Get an automatic notify through RSS when a new **Scia Engineer Service Pack** is available. 

### Training & Support

- ▶ **Free interactive eLearning.**



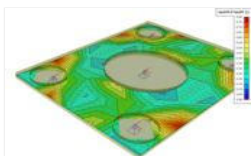
- ▶ Group trainings for **Scia Engineer, M Series, Allplan...** Consult our **training agenda** and register online...



- ▶ Interested in an individual customized training at your offices? **Please contact Mrs. K. Verhille.**
- ▶ Any questions? Put it on the **Scia Forum!** [Register...](#)

### Software Gallery

- ▶ **Voided Slabs in Scia Engineer**



Dear eNews reader, we are happy to bring you the following topics:

- **News from Prague: new National Technical Library and new Scia Office**
- **Rotterdam's "Container Origami" modelled in Scia Engineer - IMD Raadgevende Ingenieurs**
- **Tips & Tricks: Creating nonlinear combinations in Scia Engineer**

### News from Prague: new National Technical Library and new Scia Office

The **National Technical Library** (open since October 2009) in Prague is a remarkable landmark for engineers. The building, situated nearby the Technical University, is full of creative ideas; in fact it is a technological open schoolbook with a lot of information on the architecture, the structural aspects and on energy saving.

This nine-storeyed building (6 aboveground floors) with 12.000 m<sup>2</sup> of floor space has the following concept: post-tensioned slabs with a 15 m span are supported by columns with a mushroom shape. The architectural design is by **Projektil architekti**, 4 young architects from Prague; the engineering design was done by **Helika a.s.**, a Scia software user. The proof of engineering can be read in the colourful floor coverage (image 2); the colours represent the predicted deformations as calculated by Scia Engineer (earlier version ESA-Prima Win). The artwork on the concrete walls is by the Romanian artist **Dan Perjovschi**.

More news on Prague: **Scia Cz has moved on 1st March to a new building** situated in Dejvice, Evropská 33E, not far from the Technical University and close to the airport. With over 700 m<sup>2</sup> entirely renovated space, it is hosting our Prague development team as well as sales & customer services. Modern facilities are available for seminars & trainings, inviting our present and future clients to attend a Scia activity.



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### Rotterdam's "Container Origami" modelled in Scia Engineer - IMD Raadgevende Ingenieurs



#### About IMD Raadgevende Ingenieurs

IMD Raadgevende Ingenieurs is an organisation situated in the Netherlands with a great core of highly qualified employees, who have been applying their experience, know-how and expertise for many years with regard to advising about, designing and working out main structures for buildings.

#### Introduction

A few years ago, the Rotterdam exposition follyDOCK was opened. This international folly competition was intended for artists, designers and architects, who created a wide variety of 'useless' folly constructions. IMD designed two of these constructions, and acted as the project's sponsor as well. FollyDOCK was part of 'Rotterdam 2007 - City of Architecture'. Participants were to design a folly, which was to surmount the restrictions of actual practice, and which stretches the boundaries between fantasy and reality.

#### About the project

IMD Raadgevende Ingenieurs has created a model for "Container Origami". The idea behind the folly is a simple one: take a steel sea container, cut it open, and 'fold' it like a piece of paper, according to the Japanese technique of origami. This leads to a completely different shape of the object. From the cardboard model, and in a later stage, the steel one, it was concluded that the planned object, measuring eight-and-a-half metres in height, proved to be rather frail when exposed to (wind) pressure. IMD suggested an extra connection on two places, which led to a much more solid object. This meant that the amount of steel could be reduced.

After the initial manual calculations, a 3D-drawing was made of the final shape. This was then used to compute a Scia Engineer model of the eccentric object. The model was first drawn up as a wire-frame model, after which the steel slabs were added as discs. After that, the model was used to optimise the steel edge moulding, which was welded alongside the sea container's slabs.

Ultimately, "Container Origami" was manually constructed, using a carefully cut-open sea container. The entire work of art was then moved, by special transport, to its final position. The folly, which initially was to be a temporary construction, was adopted by the city of Rotterdam, and thereby gained its permanent status as a work of art. Since October 2008 it can be admired in the Rotterdam Heijplaat harbour area.

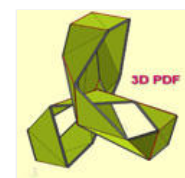
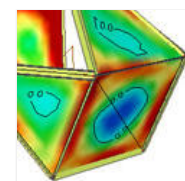
- ▶ **More folding images of IMD's "Container Origami" can be found here...**

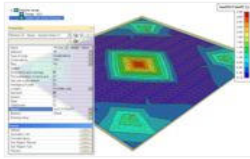
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### Tips & Tricks: Creating nonlinear combinations in Scia Engineer

If you want to take a local, geometric and/or physical nonlinearity into account in a Scia Engineer project, it is necessary to execute a **nonlinear calculation**.

A few examples:





- **Local nonlinearities:** tension only beam (wind bracing), pressure only support, initial stress in a beam, pressure only 2D member...
- **Geometric nonlinear calculation** = 2nd order calculation
- **Physical nonlinear calculation** = taking a nonlinear stress-strain diagram into account for the materials

A nonlinear calculation in Scia Engineer can only be executed after nonlinear combinations have been created. This is possible via the Main menu > Load cases, Combinations > Nonlinear combinations. The available types for Nonlinear combinations are only 'Ultimate' and 'Serviceability'. This is because for Linear combinations can be chosen from 3 types, each time for ULS and SLS: Linear (Simple) – Envelope – Code (e.g. EC-EN). (Image 1)

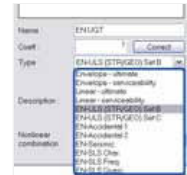


Image 1

For a fact, all Nonlinear combinations have as type 'Linear' (Simple)! This means a considerable effort is often required to create all Nonlinear combinations manually. The next steps show how to simplify this process:

1. Open the window Combinations. Suppose that 2 Code combinations have been created, EN ULS and EN SLS. Execute for both the action "Explode to linear". By doing so the underlying Linear combinations are generated (Image 2).

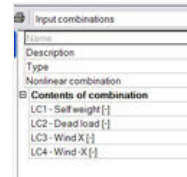


Image 2

2. Open the window Nonlinear combinations. Choose here for the option "New from linear combinations". The window Combinations opens automatically. Now all (or part of) the linear combinations can be selected. Click [Close] afterwards. The selected combinations are then automatically converted to nonlinear combinations; the content and coefficients of the linear combinations are maintained. (Image 3)

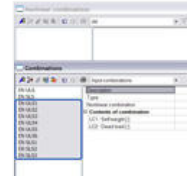


Image 3

3. To be able to ask the envelope result of the nonlinear combinations, result classes have to be defined. Go to the Main menu > Load cases, combinations > Result classes. Create here e.g. the classes RC NL ULS and RC NL SLS, which contain respectively the nonlinear ULS and SLS combinations. (Image 4)

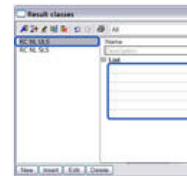


Image 4

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