September 2008

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Dear eNews reader,

The holidays have passed and we hope you enjoyed them… We surely did and once again we have a lot of interesting news for you. In this September edition we will go into the white papers of Scia;, we will take a look at the design of aluminum structures and present a new functionality within Scia Engineer. A lot of reading pleasure!

Corporate News: White papers from Scia, to read or not to read?

Regularly Scia engineers are publishing **white papers on the website** to explain technical issues on the software. Engineers are interested to understand the **background of the software** they are daily using. By explaining the research & development behind products in a non-commercial format, Scia engineers are reaching a broad public beyond the user base of its products.

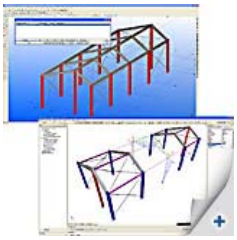
Innovation needs explanation to be of value to the community. At the same time the effort of **explaining algorithms, architecture or theories** helps the writer himself to have more discipline in presenting new technologies.

In recent years the following subjects were treated:

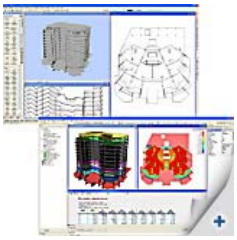
- Interoperability for BIM: a structural engineering viewpoint, May 2008
- Template analysis in practice, December 2007
- Optimal Design of Structures – AutoDesign and Parametric Structural Optimisation Breakthrough, October 2007
- Parametric Modelling, a basic BIM property implemented in Scia Engineer 3D Modeller, September 2007
- Round-Trip Engineering step-by-step, July 2007
- Resolving the nonsense and the misunderstanding on the Eurocodes, April 2007
- Overall Optimal Design of Structures, October 2006
- Round-Trip Engineering in Construction, March 2006

► All Engineering White Papers can be read and / or downloaded here...

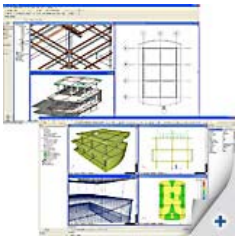
In the last white paper "Interoperability for BIM - a structural engineering viewpoint", the difficult term **"interoperability"** gets the focus. It is essential to understand how the design of structures gains productivity if engineering design & detailing offices can master the workflow. New working methods result in major cost reductions if well managed. **Examples are given of how Scia Engineer operates together with CAD products such as Revit Structure, Tekla Structures, Allplan, Archicad or VectorWorks**.
Also the gaining importance of the **IFC** (Industry Foundation Classes) neutral format is explained



Interoperability between
Tekla and Scia Engineer



Round-Trip between
Allplan and Scia Engineer



Interoperability between
Revit and Scia Engineer

We invite you to read the papers and to react with suggestions and proposals for future themes by email to marketing@scia-online.com. Join us in making the profession more understandable.

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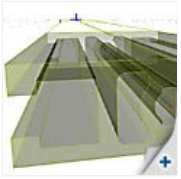
Product News: Design of aluminium structures - EN1999 (Module esaad.01.01)



The design of aluminium structures according to EN1999 is providing aluminium designers with a powerful **integrated tool** to check and (Auto)Design 2D and 3D structures as per EN1999.
The Aluminium code check is implemented similarly to the steel code routines (EC3, DIN18800,AISC ASD, AISC LRFD…).

With this new module, it is possible to design any graphical cross-section or import it directly from dxf, dwg or IFC. It can be a typical cross-section as delivered by the well-known Scia Engineer library.

The user defines the section, (bow) imperfections, transverse welds, HAZ data and can use the existing tools as provided by the steel design modules. The design of aluminium is easy to learn and to understand for all existing and new users, as the approach is similar to the "Steel Design Module".

You will find all new aluminium materials in the Scia Engineer material database.

Latest News

► It's easy to **improve** both your company's as well as Scia's **visibility** by putting links to each other's websites. We invite you to use this **exchange form** to make this trade possible.

► Please read about the successful technical **seminar** hold on the **"Position of the Structural Engineer in BIM"** on 29th July 2008 in Dubai.
more ...

► Our **new Scia Steel brochure** is now available in the free download section. more ...

► We are looking for engineers with a background in construction and structural engineering wishing to pursue a career as **support or sales engineers** based **in the UAE** and other locations throughout Asia. Please contact Mr. Charles Wilby for more details.

► **Nemetschek Scia values your feedback**. Please use this form for sending us your remarks, ideas and suggestions which help us improve our services.

Events

► Scia organizes a **free 'initiation day' Scia Engineer** on 30th September 2008 in Herk-de-Stad (B).
Note it down!

Software update

► Customers can download the following **service packs** in our secured download section.
- **Scia Engineer 2008.0.111**
- **ESA-Prima Win 3.100.230**
- **Allplan 2008.0c1**

Training

► **Scia Engineer**
- Basis course
- Concrete
- EC 3, theory and practice
- Finite elements
- Non-lineair calculation

► **Allplan BIM 2008**
- Basis course
  (13th & 14th October 2008)
  (22nd & 23rd October 2008)

► Online training calendar 2008 & online registrations ...

► "Did you post your question in our Scia Forum?" Register today...

Jobs

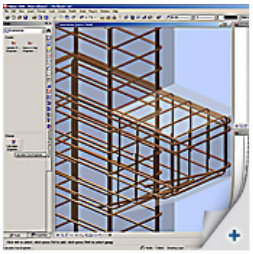
► Scia's customers are invited to add their job vacancies **free of charge** in

our 'Scia Jobs Network'.

Please also check Nemetschek Scia's Job Openings. Good luck!

Software Gallery

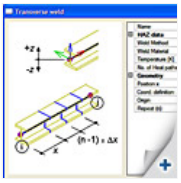
- Round-Trip Engineering between Scia Engineer and Allplan Engineering - **Clash Check of Reinforcement Bars**



Main Features:

General environment:

- Standard definition of the buckling data and the LTB data
- Standard warping check, performed as an elastic stress check
- Standard setup
- Aluminium member data (equivalent for actual steel member data)
- Standard definition of LTB restraints
- Standard definition of stiffeners
- Standard definition of diaphragms
- Standard output facilities
- Optimization



General cross-sections design (module 'graphical section')
With thin-walled representation overlay for general cross-sections, showing the analytical section, that can be completely defined by the user by import dxf, dwg, IFC.

Transverse Welds
Transverse welds locally weaken a member and can thus have a large impact on the Combined Section/Stability Check. They can be defined as additional data.

Support for slender sections and HAZ data
The support for slender sections (class 4 sections) and HAZ data, is realized by the definition of the Initial Shape and reduced section properties.

Classification of Cross-Sections
A classification of the cross-section is realized by the definition of the initial shape and is performed for each loading components separately.

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Market news: Dynamic Tower in Dubai

Now you can reserve your apartment, putting your name on the reservation list for the **first "Rotating Skyscraper" in Dubai**.
The Dynamic Tower is the first "Building in Motion" to be constructed in the world. It will herald a new era of architecture and become a symbol of Dubai, the city of the future.

Created by revolutionary architect Dr. David Fisher, the mixed use Dynamic Tower offers infinite design possibilities, as each floor rotates independently at different speeds. This results in a unique and ever evolving structure that introduces a fourth dimension to architecture.

The Dynamic Tower in Dubai will have 80 floors and will be 420 meters (1,380 feet) tall. Apartments will range in size from 124 square meters (1,330 square feet) to villas of 1,200 square meters (12,900 square feet) complete with a parking space inside the apartment.

The first 20 floors will be offices, floors 21 to 35 will become a luxury hotel, floors 36 to 70 are meant as residential apartments and the top 10 floors will be luxury villas. The Tower is located in a prime location … It is destined to become the most prestigious building in the city.

The Dynamic Tower in Dubai will be the first skyscraper to be entirely constructed in a factory from prefabricated parts; it will require only 600 people in the assembly facility and 80 technicians on the construction site instead of 2,000 workers on a similar size traditional construction site. **The construction is scheduled to be completed by 2010**.

His Highness Sheikh Mohammed Bin Rashid Al Maktoum, ruler of Dubai and Vice President of the United Arab Emirates, **is considered by many to be a true visionary of the future**. Dr. Fisher's dreams for the Dynamic Tower in Dubai were inspired by His Highness who said **"Do not wait for the future to come to you… face the future." Wise words that we at Nemetschek Scia, fully support.**

Source: www.dynamicarchitecture.net

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Customer Project: Landmark Residential Building in Bournemouth by Reuby & Stagg

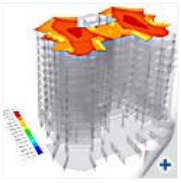
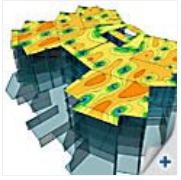
Last May, the Nemetschek Engineering User Contest 2009 was launched. One way of putting participating projects in the highlights is the publication of the User contest book, but also the **appearance in the Nemetschek Scia eNews letter** is highly appreciated by our customers.

Pictured here is **Graham Bedford** of Reuby & Stagg (UK), who submitted two projects in the previous contest. His company has an extensive experience in a wide range of structures covering residential, institutional, commercial, industrial, medical and retail building. Notwithstanding the fact that his projects did not win they have gone on to feature in the promotion of Scia Engineer (**SMART Modeller** in the UK).

The building in question has thirteen stories above ground plus a basement level. **Piled foundations** were provided using continuous flight auger with a contiguous piled retaining wall to the perimeter of the basement where boundary constraints prevented the use of a conventional concrete retaining wall.

The presence of a 1000mm diameter surface water sewer crossing the footprint of the building made the **design complicated**.

Position piles were indispensable to avoid surcharging the sewer with loads from the construction.

The analysis needed to take account of the **transfer of load** from out of line columns above and below the first floor slab together with the enforced irregular pile locations. The arrangement of these stepped supports resulted in varying degrees of support to the upper floor slabs. Scia's software enabled the whole structure to be modelled to provide an **accurate and true reflection of the overall structural behaviour**. Experienced engineers used the software to interpret the resulting **distribution of moments in floor slabs** and **vertical load in columns** to provide economic steel reinforcement quantities. Accurate values for **punching shear** were available to ensure all loads were safely transferred to foundation level where an economic arrangement of piled foundations was established.

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2D-elements module "Pressure Only (esas.44)", a new functionality in Scia Engineer

Scia Engineer 2008 provides a new functionality for 2D-elements: **"Pressure Only"**.
This can be applied for both **reinforced concrete walls** and also more specifically on **masonry**.
The principle is as follows:

In the FEM model properties, there is a new option; "Press only". (image 1)

Notice that this has to be combined with a non-linear calculation.

So, during the iteration, the occurring tensile forces will be eliminated. More specifically, the stiffnesses will be adapted in the direction of the principal stresses for each individual element. Summarising, orthotropic parameters will be used.


image 1

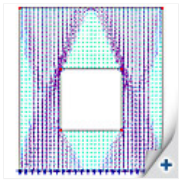
image 2

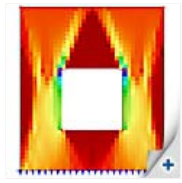
image 3

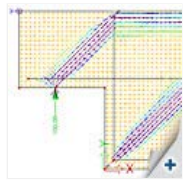
image 4

After the calculation, the principal stresses can be verified. **The following examples illustrate the principle of pressure only** (image 2 and image 3). Another application is a haunch support. In this case steel beam members are applied to simulate the reinforcement bars (remark: in this way, we can also simulate reinforcement in concrete walls). (image 4)

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