

REPORT

## STRUCTURAL MEMBRANES 2019

PROJECTS

FROM AZERBAIJAN, CYPRUS, ITALY,  
JAPAN, SPAIN, SWEDEN, UK...



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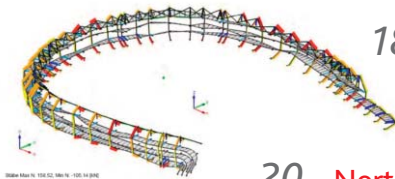
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ISSN 1784-5688

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# Edito

Dear Reader

I hope this finds you well. We are all struggling under the actual situation, not knowing how big the impact will be for us personally, as well as for our industry.

The idea of TensiNet became reality in 1999 as a proposal for a European research project, which ran till 2004. TensiNet continued the established network of experts of our industry under the wings of Vrije Universiteit Brussel. Last year we decided to get on our own feet, and to transform TensiNet into an international non-profit association.

This TensiNews was meant to be the first issue published by the new founded association, and we wanted to present this here. But due to COVID-19 the appointment at the notary to sign the deed of incorporation had to be postponed till next month.

I wish you all the best, stay healthy, and enjoy meanwhile this issue of TensiNews.



Yours sincerely,  
Bernd Stimpfle

## Forthcoming Events

Please verify if events hasn't been cancelled or been replaced by a tele-conference due to COVID 19 virus

**Textile Roofs 2020** | 18–20/05/2020 | Berlin, Germany | [www.textile-roofs.com](http://www.textile-roofs.com)

**IASS Annual Symposium and Spatial Structures Conference 2020 - Inspiring the next generation** | 24–28/8/2020 University of Surrey, Guildford, UK | <https://www.surrey.ac.uk/iass-annual-symposium-and-spatial-structures-conference-2020>

**VIII Latin American Symposium of tensile structures** | 30/09–2/10/2020 | Buenos Aires, Argentina | <http://www.latensores.org/>

**International Conference on Advanced Building Skins** | 26-27/10/2020 | Bern, Switzerland | [www.abs.green](http://www.abs.green)

## TensiNet Meetings

**TensiNet WG5 eurocode – meeting** 27/05/2020 | Afnor, Paris

**"TensiNet and Friends" at Advanced Building Skins** | 26-27/10/2020 |



Fig. 1: Harry as we knew him: passionately explaining to students how membranes work

Fig. 2: One of Harry's signature projects: the innovative and renowned Marquee-modules

### Harry Buskes

Founder of Carpro, 19/12/1955 - 16/11/2019

An impressive man

If you have met him  
You will not forget him  
A centipede making plenty of plans  
A creative mind that stimulates  
Coming up with a multitude of original ideas  
Weaving ingenuity with beauty  
Always willing to learn  
Always sharing his vast practical knowledge  
And friendship

He appreciated what you were trying to reach  
Working with him always added an extra dimension

A few months ago  
He showed a model 'to do something with it'  
It will remain a dream  
And whatever could happen to it  
It will always be elaborated with a lot of appreciation  
Huge appreciation  
For whom we miss

Marijke Mollaert, Niels De Temmerman and Lars De Laet, Vrije Universiteit Brussel



Fig. 3: Harry contemplating the behaviour of a test sample  
Fig. 4: Beauty and simplicity designed by Harry with Maxime Durka (Sioen) and Marijke Mollaert (VUB) for Architect@Work

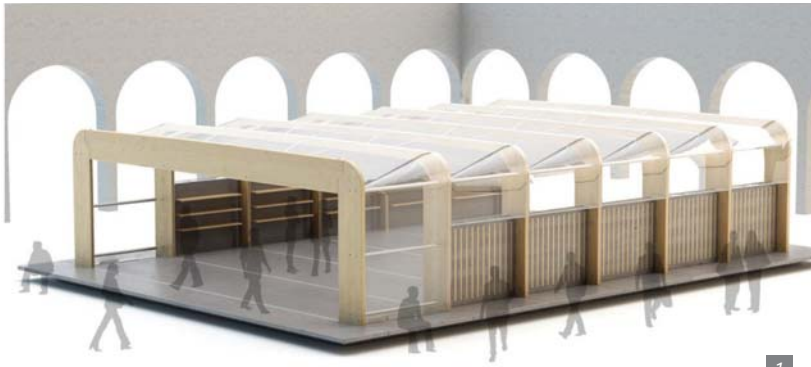


Figure 1: Prospective 3D render of the pavilion © Monica Armani Architects

The idea of a bespoke pavilion for the Trento Economics Festival. The first edition of the Trento Economics Festival has been organized for the first time in 2006 with the ambition of providing a link between economists and the general public through a series of events, meetings and interviews designed to make economics understandable to people from a different background. The first editions of the festival has been hosted using commercial temporary structures such as marques and commercial products able to provide a cost-effective protection from the weather.

After ten years, it became clear that the solutions adopted became inadequate to the size and reputation of the event which attracts famous international speakers and thousands of visitors every year. The numbers for the last edition includes 204 invited speakers and 114 events available in live streaming.

Autonomous Province of Trento asked to Monica Armani to design a pavilion able to meet the growing expectations and requirements. The result is an innovative concept based on a temporary architecture to be installed and disassembled in few hours and to provide an identity to the international event. After the successful collaboration for the engineering and detailing of the pneumatic façade of the RCS pavilion for EXPO 2015, Monica Armani, Maco Technology srl and the University of Nottingham joined their experience in this field to develop an innovative concept based on rigid loadbearing portals and a pneumatic envelope.

### Design concept

The design concept developed by Monica Armani is based on a construction system traditionally used for saw-tooth roofs and adapted to the temporary architecture in order to provide a practical way to create modular structures with accurate details obtained by means of a competent mix between technical innovations and building materials linked to the local traditions and to innovative manufacturing companies. The architect successfully designed a large design object which became a "special place" to be used to present people and stories to the public in the beautiful landscape of Trento and its province. Originally designed for the Trento Economics Festival 2016, the pavilion is currently used to host several other cultural events across the entire year.

The peculiar design is characterized by a set of timber portal frames linked to the local timber industry and by saw-tooth roofs and inflated membrane cladding inspired by the alpenglow which paints the Dolomites with a reddish glow after sunset or before sunrise.

The pavilion is the last achievement of the project TEMPO, a collection of products, exposition stands and buildings designed by Studio Armani for temporary applications in order to address the contemporary trends in architecture characterized by rapid social changes with the consequent rapid evolution of the users' requirements which hardly fit the traditional approaches in construction.

Trento, Italy

# ECONOMY FESTIVAL PAVILION 2016

### Load bearing structure

The structure has an overall cuboid shape which measures 11,84mx24,72m in plan with a maximum height of 4,16m. The seven loadbearing portals are arranged on an orthogonal grid and maintained at a prefixed distance (5.12m) by means of a set of purlins. Each portal measures 11,84mx4,16m and it is made of a steel truss realized with steel (S275) square hollow sections welded together and reinforced with steel plates 10mm and 15mm thick. The top and bottom cords are obtained using a profile 90mmx90mm with a thickness of 5mm, the diagonals are made of a profile 30mmx30mm, 3mm thick. The portals are connected to the basement through pinned connections aligned with the orthogonal direction of the structural grid in order to help the installation of the portals which are assembled at ground level and then lifted from the horizontal to the vertical position. The steel trusses are clad with a timber finish with a thickness variable between 15mm and 20mm. There are 24 purlins in total, 4 between each pair of portal frames. Each purlin is obtained using steel hollow circular tubes (Ø101,6mm, 5 and 6mm thick; Ø70mm, 4mm thick) and has a peculiar Y fork at each end designed to increase the lateral stability of the structure. The lateral stability is also increased by a set of sandwich panels made of timber (20+54+20mm) bonded (polyurethane adhesive) with corrugated metal sheets (A55-P770-G6 HI-BOND 0,8mm thick) placed along the longitudinal lateral walls.

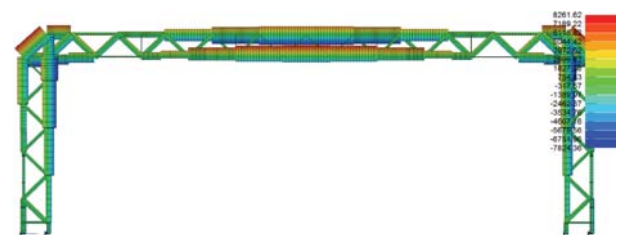
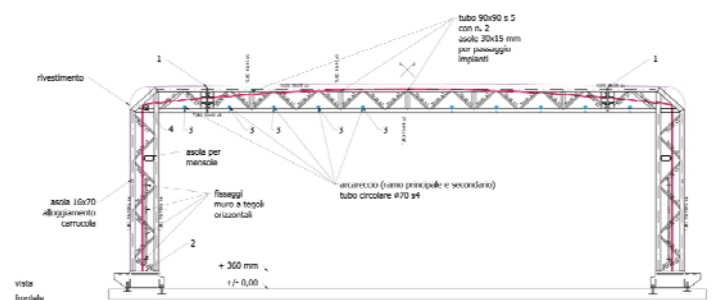


Figure 2: Cross section of the loadbearing portal frame © Monica Armani Architects.

Figure 3: Axial stress distribution in the loadbearing portal frame © Maco Technology srl.