TensiNews

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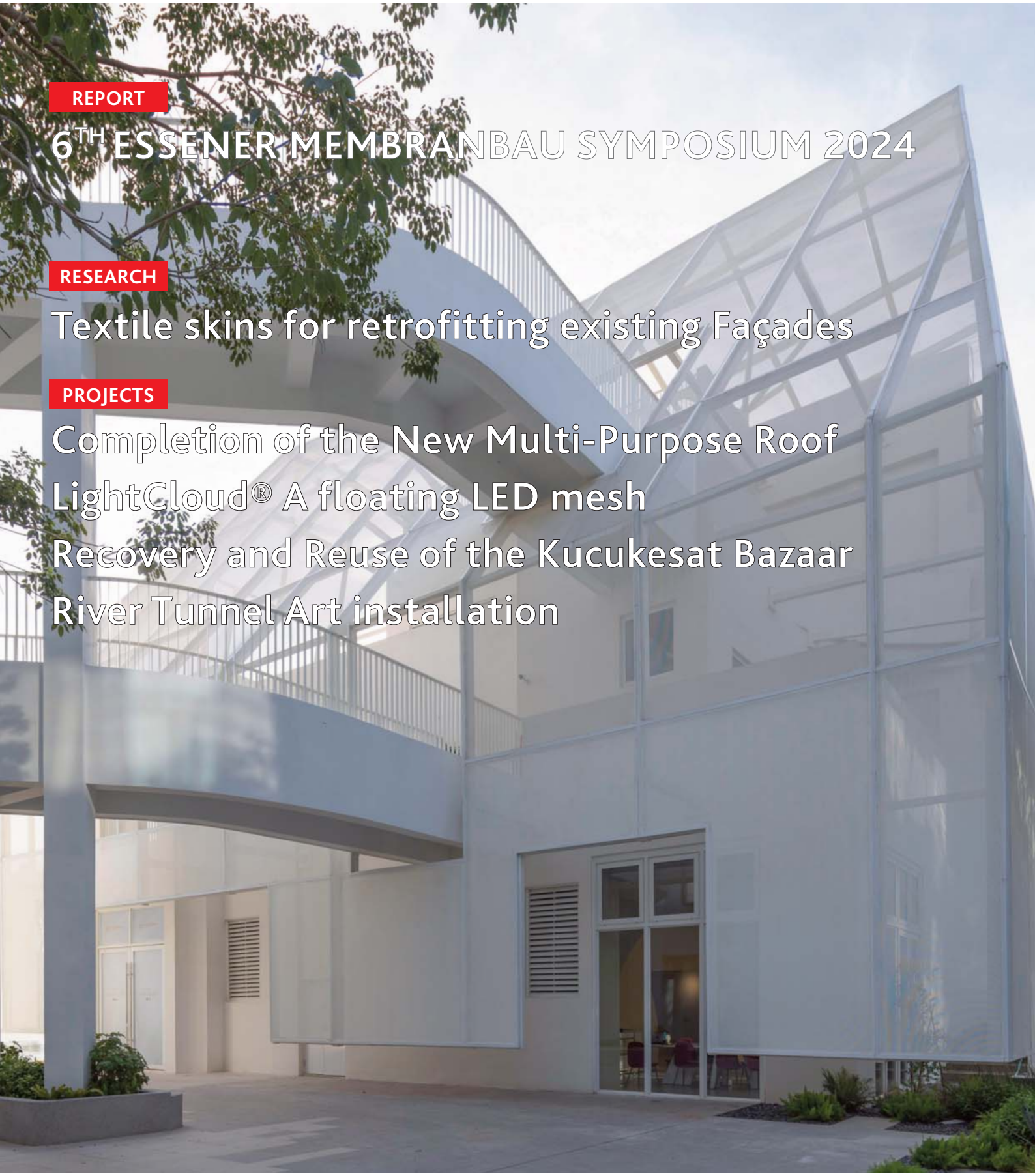

REPORT

6TH ESSENER MEMBRANBAU SYMPOSIUM 2024

RESEARCH

Textile skins for retrofitting existing Façades

PROJECTS

Completion of the New Multi-Purpose Roof

LightCloud® A floating LED mesh

Recovery and Reuse of the Kucukesat Bazaar

River Tunnel Art installation

Wutopia Lab: Flickering Peak CP·SUN RIVER Art in China © LIU Guowei

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Edito

Dear Reader

In a bit more than a year from now our next TensiNet Symposium in collaboration with the University Duisburg-Essen will take place at the Campus Essen. It is a joint event being at the same time the 8th edition of our TensiNet symposium and the 7th edition of the Essen Membranbau Symposium. The title is "Shaping the pathway to future tensioned membrane design" with topics arranged around the current development within our industry. The conference website is now online, and you find herein the call for abstracts, and more details on the symposium.

You find in this issue of TensiNews again a big variety of inspiring projects, such as a multipurpose roof in northern Italy and the recovery and reuse of a structure in Turkey. A stage roof with LED integration in the UK is shown, but also a big almost transparent enclose in China, and a sculptural installation in the US. The Politecnico di Milano presents a research project about tensile skins used to retrofit existing buildings. This approach plays an important role towards the sustainable future development in our cities. The Faculty of Architecture in Leuven presents two structural sculptures being the result of a student project.

Incredible how fast time went by. It is now 25 years since the start of TensiNet. We are proud of all we have achieved over the years. One initial idea, to develop of a common European guideline in our industry became meanwhile reality with the published technical specification on its way to become Eurocode 12 soon. Beside this we established many other rules and guidelines which helped to have membrane structures recognised as an established building technology. Just below you find a personal note from our initiator and secretary Marijke Mollaert looking back at these 25 years.

While we are just 25 years, in Stuttgart at the ILEK, 100 years of Frei Otto will be celebrated with a symposium. We take the opportunity to meet there for our annual general meeting, and invite you to a cocktail party taking place directly after the symposium.

I hope you enjoy this issue of TensiNews, and will be glad to meet you soon in Stuttgart, in Berlin at Textile Roofs, or later this year in Munich at Structural Membranes.

Yours sincerely,
Bernd Stimpfle

Forthcoming Events

Textile Roofs Workshop | *25-27/05/2025* | Berlin, Germany | **www.textile-roofs.com**

FREI OTTO 100 The spirit of lightweight construction | *5-6/06/2025* | Stuttgart, Germany | **www.ilek.uni-stuttgart.de**

TENSINET 25 We invite you to a **cocktail party** and the **General Assembly Meeting** of the TensiNet Association. It will be held after the Frei Otto 100 symposium on Friday 6th June! |
16.00 Cocktail party | 16.45-17.45 General assembly
Please register in advance: info@tensinet.com

XII International Conference on Textile Composites and Inflatable Structures – Structural Membranes 2025 |
8-10/10/2025 | München, Germany |
https://structuralmembranes2025.cimne.com/

IASS Annual Symposium 2025 |
27-31/10/2025 | Mexico City, Mexico |
https://iass2025.unam.mx/

Techtextil and Texprocess 2026 |
21-24/04/2026 | Frankfurt, Germany |
https://techtextil.messefrankfurt.com

8th TensiNet Symposium 2026 & 7th Essener Membranbau Symposium 2026 | Shaping the pathway to future tensioned membrane design | *30/09-02/10/2026* | Institute for Metal and Lightweight Structures, University of Duisburg Essen, Germany |
www.uni-due.de/iml/tensinet-ems2026.php

Looking 25 years back
a personal note …

Figure 1. Meeting at Structural Membranes 2023, with Bernd Stimpfle, Zehra Eryuruk, Giulia Procaccini, Marijke Mollaert, Fevzi Dansik, Meltem Sahin, Caglar Samat, Carol Monticelli, Peter Gosling, Lukasz Dlucik © form TL

The networking around textile architecture in Europe began with the TensiNet Thematic Network (1999), which was funded as part of the EU Growth programme. Work was done in teams. It was Roberto Canobbio who said: "When you design a membrane structure, you have to involve everyone from the beginning: the membrane producer, the designer, the engineer, the fabricator and the installer. If the design incorporates the creativity and expertise of each, while respecting everyone's craft, the project is more likely to succeed. Being able to learn from each other during the design process is fantastic.

Textile architecture is a separate discipline. It is indispensable to understand the relationship between pre-stress, form and force action. On the one hand simple, because only normal stresses occur. On the other hand, complex, because of the non-linear behaviour, the curved shape and the cutting patterns required to achieve this, the large deformations, and the difficulty of correctly estimating the wind load, snow or even rainwater. Every project is unique, and research is always needed in the design process. It remains fascinating.

Membrane structures are temporary … some iconic realisations visited in the early eighties (Atlanta Georgia Dome, Florida Festival Hall, interior courtyard of the Marquis building …) have since been dismantled. This explicit transience brings with it a certain modesty.

There are also challenges. For the past forty years, the focus has been on design and new projects. Now that we know that resources are finite, we need to be more careful with them. What happens when a project is decommissioned? Does it increase the amount of waste? Can we recycle? If we want to take responsibility for future generations, we should commit to this.

In all that we do, there is always a downside. Recently, it has been discovered that harmful substances may have been carelessly released during the production of materials, so we should check this and find solutions.

Looking back, as the TensiNet Association approaches its twenty-fifth anniversary, a lot of friendships have developed over the years. There is a common interest in creativity, openness and humanity alongside purely scientific issues.

Frei Otto was the architect who inspired a whole generation. Let us hope he will live on for many generations to come. Peter Lim, director at Tensys, wrote on Linkedin: 'Lightness against brutality - that was Frei's motto: man at peace with nature, with our buildings floating like a whisper in the breeze. A vision we should think about, contemplate, practice and pass on.'

Marijke Mollaert

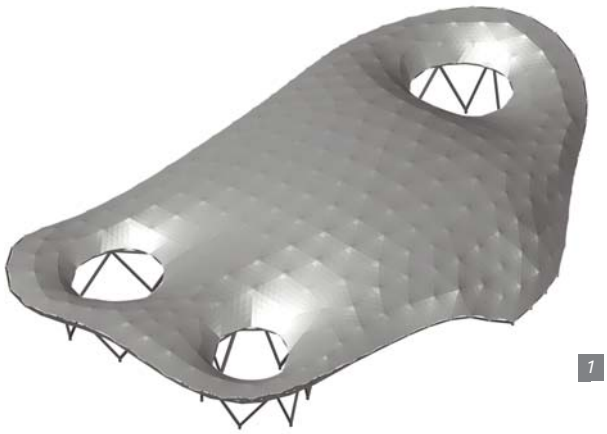
CANOBBIO TEXTILE

formTL

Completion of the New Multi-Purpose Roof in Urban Park

Abano Terme, Italy

The new multi-purpose roof structure in the heart of the Urban Thermal Park of Abano Terme has been successfully completed, replacing the former Teatro Magnolia. Funded as part of the National Recovery and Resilience Plan (PNRR), the project stands as one of the most significant urban regeneration efforts in the region, with strong architectural, environmental, and social value.



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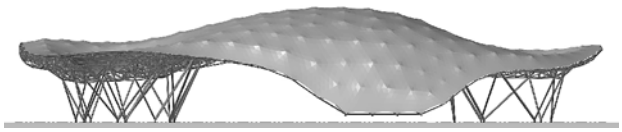

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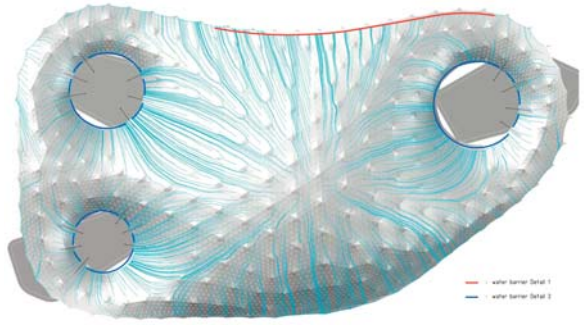

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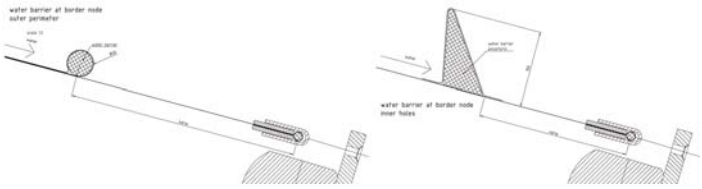

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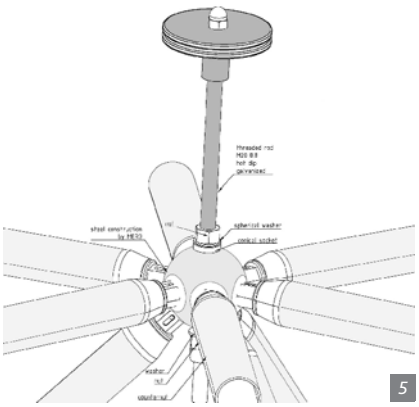

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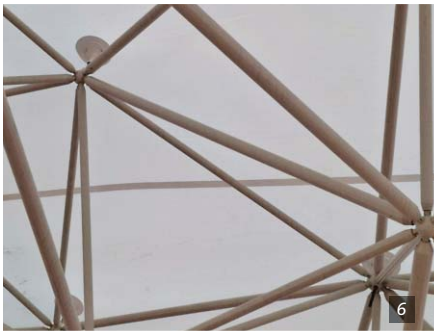

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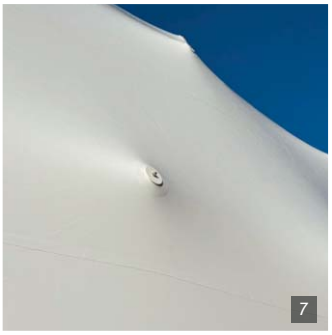

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Designed by Incide Engineering, the structure is light, elegant, and seamlessly integrated into the natural surroundings. It features a high-quality membrane roof supported by a state-of-the-art Mero spaceframe. The overall geometry has been carefully studied to ensure a high level of surface uniformity and optimal distribution of membrane tension, made possible by the use of nodal supports and pre-tensioned perimeter cables.

One of the most innovative aspects is the rainwater management system. Three central openings have been designed to collect and channel rainwater to the buildings below. Soft upstands integrated into the membrane guide the water in these openings, and structural ring cables allow the structure to absorb local stresses and efficiently transfer vertical loads to the main frame.

Unlike the initial design, which called for the roof to be divided into four panels, the membrane was instead produced as a single continuous piece, completely eliminating joints. This solution significantly enhanced the overall aesthetic, giving the structure a smooth, uninterrupted appearance.

The design and development of the membrane, tensioning systems, and cable layout were entrusted to Canobbio Textile, in collaboration with the engineering office formTL. Together, they meticulously addressed every technical detail related to the fixing systems, pre-tensioning, and the interface between the membrane and the steel structure, devising highly innovative solutions to ensure perfect alignment between fabric reinforcements and suspension points of the framework. The entire process was supported by advanced simulations and physical testing. All details were interactively developed and integrated in the Mero system. The Cutting pattern geometry has been derived from a smoothened surface. The nodal supports create then the local geometry by elastic strain. An analysis proved this concept prior to the final cutting pattern. The installation was carried out by a team of highly skilled technicians, who tackled the logistical and operational challenges of such a complex structure with precision and expertise. The membrane was carefully unfolded, stretched and tensioned section by section, ensuring perfect alignment of every connection point.

Figure 1. Isometric view cladding and supporting structure
Figure 2. Side view cladding and supporting structure
Figure 3. Drainage analysis
Figure 4. Drainage detail
Figure 5. Nodal detail