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TEXTILE ROOFS 2024

RESEARCH

Vegetation on tensioned cables
and membrane structures

PROJECTS

Renovation of the Dresden
Central Station roof

Oude Marie



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TensinewsINFO

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VEGETATION on tensioned cables
and membrane structures

MISC 20 **Marc Malinowsky**

Edito

Dear Reader

I hope this finds you well. Just after the summer we present you here the next TensiNews, where you find again various information from our network.

Having participated in Textile roof this year, where we held our annual general meeting we have seen the broad variety in our industry. Many of our members were present and enjoyed the days in Berlin. This year a very special venue was chosen, the conference took place on a boat on the river Spree. Josep Llorens was so kind to prepare also this year a very detailed report hereof, summarizing the highlights of the different topics such as history, design, projects, research and much more.

Beside this you find fresh information about different tensile projects, such as a knitted installation in Oregon, a canopy covering a stand in Germany and about the refurbishment of the large membrane roof of Dresden station. Tensile architecture is an ideal partner to support green façades or shading elements. One contribution shows different applications of vegetation architecture.

The IASS symposium in Zurich has just closed its doors, but there are even more opportunities this year to exchange within our network. In September and October, we can meet in Essen, Dessau and Bern.

Meanwhile please enjoy this issue of TensiNews.



Yours sincerely,
Bernd Stimpfle

Forthcoming Events

6 Essener Membranbau Symposium 2024

| 20/09/2024 | University of Duisburg-Essen, Germany | www.uni-due.de/iml

IMS BAUHAUS® Symposium 2024

| 27-29/09/2024 | Anhalt University of Applied Sciences in Dessau-Rosslau, Germany | <https://www.ims-institute.org/symposium/>

19th Advanced Building Skins Conference & Expo 2024

| 28-29/10/2024 | Bern, Switzerland

| <https://abs.green/home>

XII International Conference on Textile Composites and Inflatable Structures

| 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>

Techtextil and Texprocess 2026

| 21-24/04/2026 | Frankfurt, Germany |

<https://techtextil.messefrankfurt.com>

Thinking sustainable

A filtering textile façade made of 4.400 recycled PET bottles



© Stiftung "Lebendige Stadt"

A pilot project was realised this spring by the city of Cologne, the 'Lebendige Stadt' foundation and the company Schüco to clean the nitrogen oxide-polluted air in the centre of Cologne by adding a 'filtering' textile facade on the north facade of the Volkshochschule, located on the Neumarkt. Harmful nitrogen oxides are converted into harmless nitrates using active substances. Commendably, the printed membranes (2 strips of 8x20m) are made of recycled material using more than 4.400 recycled PET bottles. The R-PET membrane VALMEX TF 400 ECO F is produced

by Mehler Technologies. The aluminium substructure has a 75% recycled content. No adhesives have been used to optimise the future dismantling and recycling process. To analyse and document the performance of the air purification filter, the air quality in front of and behind the membrane is measured continuously.

This innovative project is sure to become a pioneering example for other cities!

references: https://lebendige-stadt.de/web/view.asp?ti=news_ansicht&sid=291&nid=207&cof=183

<https://www.mehler-technologies.com/en/sustainable-mesh-fabric-for-textile-architecture/>

TensiNet Symposium 2026

Shaping the pathway to future – tensioned membrane design

mid-September 2026

Institute for Metal and Lightweight Structures,
University of Duisburg Essen, campus Essen,
Germany

Initiators are Natalie Stränghoner
and Jörg Uhlemann, supported by their team
and TensiNet.

The main topics are
Design, Modelling and simulation
of structural membranes;
Materials and executions;
Sustainability and building physics.

TEXTILE ROOFS 2024

Textile Roofs 2024, the twenty-sixth International Workshop on the Design and Practical Realisation of Architectural Membranes, took place on 28–30 May 2024 at the Orca Ten Broke Seminar Ship, Berlin, and was chaired by Prof. Rosemarie Wagner (Karlsruhe Institute of Technology) and Dr.-Ing. Bernd Stary (Academus GmbH). It was attended by 93 participants from 22 countries covering three continents. Once again, the attendance demonstrated the success of the event, which has become firmly established since it was first held in 1995.

History

Frei Otto - The cradle of the modern tent construction

Dipl.Ing Martin Kunz

The special guest lecture reviewed the work of Frei Otto and his team from his archive at the "saai/KIT" (Archive for Architecture and

Civil Engineering, Karlsruhe Institute of Technology) that contains 420 models, 20.000 plans and sketches and 90.000 pictures. A significant selection was presented and commented on, showing the model-based design method (figs. 1 to 9).

Brief history of ETFE design and technology in architecture

Torsten Balster

After introducing the new lightweight architecture with the dome over Manhattan (1960), the Biosphere and the German Pavilion (both in Montréal, 1967), the main characteristics of ETFE were listed: high transparency, UV stable, extremely flexible, low weight, long lifetime, self-cleaning, outstanding fire performance, 100% recyclable, high chemical resistant and acoustic comfort. While the first applications in architecture were ephemeral, a permanent structure was built for the Burger's Zoo in Arnhem, 1982, which is an evidence of the durability of the material, confirmed by weathering tests (fig. 10).

Successive developments have been:

- the printing with high reflectivity for solar control introduced in the Schlumberger Research Institute, Cambridge 1992 (fig. 11).
- the variable shading system controlled by pressure difference of the Hannover Cycle Bowl, 2000 (fig. 12).
- the breakthrough of the Eden Project, Cornwall, in 2001 for its size, frames and nodes.
- the incorporation of photovoltaic cells initiated in the classroom for the future, at the Royal Borough of Kensington and Chelsea, London 2003, revealing the need for avoiding overheating and condensation.
- the 1st permanent cable supported curtain wall structure of the Unilever Building in Hamburg, where re-adjustment of pre-tension was needed to recover losses due to the high temperature.
- the Thermocap joint, to reduce heat losses for the Graft Therme, Delmenhorst, 2011 (fig. 13).
- the 2011 Environmental Product Declaration EPD-VND-2011111-D (ISO 14025).
- Design issues related to the ultimate and serviceability limit states according to PD CEN TS 19102 were also discussed.
- the coupled movement joints of the Allegiant Stadium, (Las Vegas 2020) to allow for movements between the supporting cable net and the ETFE cushions (fig. 14).

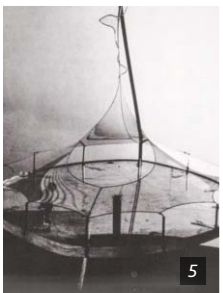
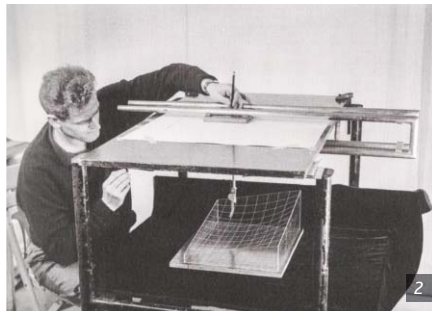


Figure 1. Taking photographs.

Figure 2. Measuring models.

Figure 3. "Tanzbrunnen", Cologne, 1957: soap film model.

Figure 4. "Tanzbrunnen", Cologne, 1957 as built.

Figure 5. IL, Stuttgart, 1967: soap film model.

Figure 6. IL, Stuttgart, 1967: cable net.

Figure 7. IL, Stuttgart, 1967: as built.

Figure 8. Sports hall, Jeddah 1981: suspended chain model.

Figure 9. Sports hall, Jeddah 1981: cable net.