

REPORT

## TEXTILE ROOFS 2018

PROJECT

## LIGHT ETFE FILM ARCHITECTURE SAVES 1.500 TONS OF STEEL

## LONG LIVE THE MEMBRANE



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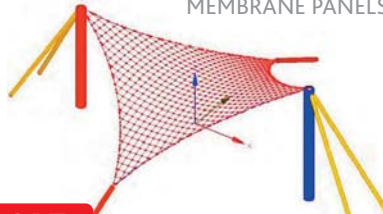


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www.burohappold.com
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www.canobbio.com
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www.ceno-tec.de
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www.dyneon.eu
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www.fabricart.com.tr
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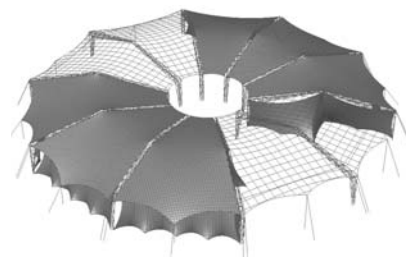
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**E**dito  
Dear Reader

I am glad to present TensiNews 35. It is again full of information about recent projects and research results.

The championship has led our eyes towards Russia this year. Some of the stadiums have been done with structural membranes. One of those, the façade for the stadium in Nizhny Novgorod is presented here. In St. Petersburg a large ETFE roof structure for the Lakhta Centre has been finalized. And Textile Roofs was held this year in Russia. Joseph Llorens was one of the speakers in Moscow, and again he was so kind to prepare the summary for us.

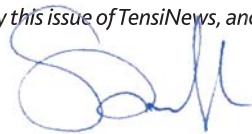
Two projects with coloured ETFE are presented. One single layer façade varying between white and different grades of blue has been realised in Mexico. And also far from Europe, a cushion façade in white, yellow is protecting an urban library from the western sun.

Other topics in this issue of TensiNews are recent research results and actual membrane projects. The 20 year old retractable roof in Tecklenburg has received a new membrane, and a public space in Belgium has been enriched with a light membrane canopy. The research topic knitted membrane structure has been applied for the Danish pavilion on the Biennale this year, and students and teachers from Madrid have finalized within the last eight years the sails under the skylight of their patio. This has already been published twice in our TensiNews.

With large steps we approach our next TensiNet Symposium 2019 "Softening the Habits" in Milan. We have received 65 abstracts in a wide range of interesting topics. The organising committee is working on the final program which will be distributed soon.

I hope you enjoy this issue of TensiNews, and will be glad to meet you soon.

Yours sincerely,  
Bernd Stimpfle



### Working Group EUROCODE SPECIFICATIONS

**Work in progress to broaden the use of lightweight structures  
Up to the publication of the second generation of the Eurocodes**

The final objective of the WG EUROCODE SPECIFICATIONS is to establish a Eurocode for "The Structural Design of Tensile Membranes Structures" as there exists for more conventional materials like steel or concrete. The development started in 2010.

Meanwhile the CEN/TC 250/Working Group 5 made quite some progress. After the European Commission published the JRC Science and Policy report (2016) the focus was laid on the development of the Technical Specifications. To organise the work several subgroups were created and responsible coordinators were appointed: 1. Materials + Durability (Natalie Stranghöner, Heidrun Bögner-Balz); 2. Basis of design (Marijke Mollaert, Bernd Stimpfle); 3. Basis of structural analysis (Nick Gibson, Bernd Stimpfle); 4. Ultimate Limit State + Serviceability Limit State (Bernd Stimpfle, Jörg Uhlemann) and 5. Details + Execution (Alessandra Zanelli, Rogier Houtman).

The Working Group, with Marijke Mollaert as Convenor, will cooperate with a newly established Project Team for the work programme of Phase 3 & 4: Bernd Stimpfle (leader), Peter Gosling, Jean-Christophe Thomas, Ramon Sastre and Jörg Uhlemann are the expert members. They have the specific task to develop the Technical Specifications for the Structural Design of Tensile Membranes Structures.

The Eurocode will not only assist and support the industry and engineering offices but will also encourage potential clients to choose for these sustainable applications.

## Forthcoming Events

**TENSILE INTENSE - Overview in membrane and light-weight structures** | 15–22/09/2018 | IMS e.V. Archi-neer® Institutes Dessau-Rosslau, Germany | <https://www.membranestructures.de/overview-academic-programs-2018/tensile-intense>

**SLTE** | 11-13/09/2018 | Lima, Perú | [www.slte2018.com](http://www.slte2018.com)

**Essener Membranbau Symposium 2018** | 28/09/2018 | University of Duisburg-Essen, Germany / Glaspavillon Campus Essen | [www.uni-due.de/iml/](http://www.uni-due.de/iml/)

**13th International Conference on Advanced Building Skins** 1–2/10/2018 | Bern, Switzerland | <https://abs.green/callforpapers/>

**Aachen-Dresden-Denkendorf International Textile Conference 2018 - Turning Fibers into Value** | 29–30/10/2018 | Aachen, Germany | [www.aachen-dresden-denkendorf.de/en/itc/](http://www.aachen-dresden-denkendorf.de/en/itc/)

**TECHTEXTIL 2019** | 14–17/05/2019 | Frankfurt am Main, Germany | <https://techtexsil.messefrankfurt.com/frankfurt/en.html>

**TEXTILE ROOFS 2019** | International Workshop on the Design and Practical Realisation of Architectural Membrane Structures | 20–22/05/2019. | <http://www.textile-roofs.de>.

**6<sup>th</sup> International TensiNet Symposium "Softening the Habitats: Sustainable Innovations in Minimal Mass Structures and Lightweight Architectures"** | 3–5/06/2019 | Politecnico di Milano, Milan, Italy | [www.tensinet2019.polimi.it/](http://www.tensinet2019.polimi.it/)

**FORM and FORCE 2019** Joined International conference IASS SYMPOSIUM 2019 & STRUCTURAL MEMBRANES 2019 | 7–10/10/2019 | Barcelona, Spain | <http://congress.cimne.com/formandforce2019/frontal/default.asp>

## TensiNet Meetings

**TensiNet Annual General Meeting & Partner Meeting 2/2018** | at Essener Membranbau Symposium 2018 | 28/09/2018

**TensiNet – Eurocode TC 250/WG 5 meeting** | 5/11/2018 | Afnor, Paris, France

Oran Park,  
Australia



# ORAN PARK LIBRARY & RESOURCE CENTRE

## A COLOURFUL ETFE FAÇADE AS AN ARTISTIC SOLAR BARRIER

### Context

Oran Park Library celebrated its grand opening ceremony on Saturday 30th June, 2018! The new Oran Park Library & Resource Centre is now home to a distinctively colourful ETFE façade that was designed to be an artistic solar barrier from the heat of the Western sun. Now, this structure is part of a pretty exciting project for the Oran Park community! The South-West Sydney suburb of Sydney has seen some tremendous economic, social and residential growth in the last 5-10 years, so it was exciting to be a part of the suburbs' development. The new Library & Resource Centre underwent an AUD\$13.8million development in late 2017 as part of a voluntary planning agreement between Urban-Growth NSW, Greenfields Development Company, and Camden Council.

### Concept

Fabritecture was contracted for the design & construction of the ETFE façade at the front of the library. The structure incorporates 2-layer ETFE cushions in a tessellating triangular pattern in red, yellow, white & translucent foils, on a uniquely designed folded plate structural steel framing system that completes with backlighting which makes the structure come alive at night.

### Design & Planning

The development plan had an artwork requirement specified, so the client was after a functional façade that also satisfied the criteria of structural artwork. A structure such as the Oran Park ETFE façade is considered a piece of architectural artwork as it includes elements of creativity amid the constraints of a functional piece of engineering. Designer & architect Brewster Hjorth came up with the design for the unique façade. Engineering was completed by Wade Engineering & Seele.



Apart from offering architectural aesthetic, the façade also provides an effective solar barrier for the library to help regulate temperature behind the glass. It was installed 3m in front of the main glass wall of the library as a barrier from the Western sun (Fig. 2). The purpose is for the ETFE Façade to block a majority of the heat before reaching the main façade of the library and any redundant heat would disappear within the 3m gap. This still maintains high light levels in the building whilst keeping the library cooler.



Figure 1. Colourful ETFE façade as a huge lampshade © Kevin Chamberlain  
Figure 2. ETFE façade as second layer installed 3m in front of the main glass wall © Kevin Chamberlain  
Figure 3. Installation of the colourful ETFE façade as an artistic solar barrier © Kevin Chamberlain

Name of the project:	Oran Park Library
Location address:	Central Avenue, Oran Park NSW 2570, Australia
Client (investor):	Urban Growth NSW & Camden Council
Function of building:	Community library & resource centre
Type of application of the membrane:	Artwork façade
Year of construction:	2018
Architects:	Brewster Hjorth
Multi-disciplinary engineering:	Wade Engineering
Structural engineers:	Wade Engineering
Consulting engineer for the membrane:	Seele
Engineering of the controlling mechanism:	Wade Engineering
Main contractor:	ADCO Constructions
Contractor for the membrane (Tensile membrane contractor):	Fabritecture
Supplier of the membrane material:	PATI Films
Manufacture and installation:	Fabritecture (steel and installation of complete system); Seele (manufacture of ETFE)
Material:	ETFE
Covered surface (roofed area):	199m <sup>2</sup>