

REPORT

TEXTILE ROOFS 2015

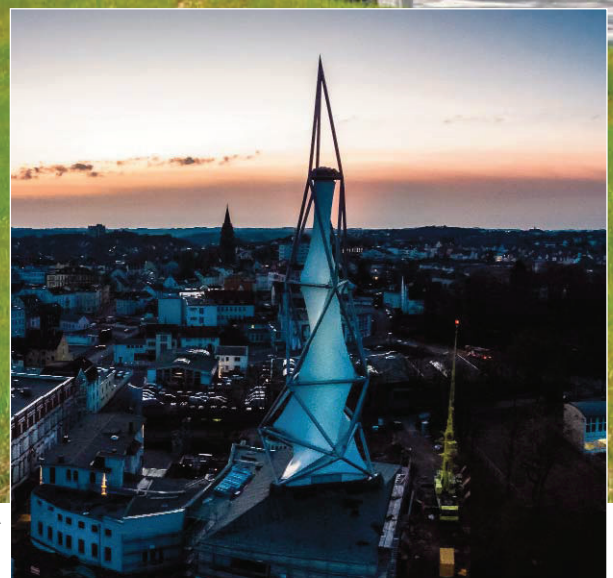
EXPO 2015 MILANO

FEEDING THE PLANET, ENERGY FOR LIFE

PROJECTS

THE SWAROVSKI CRYSTAL WORLDS
"NEW ERA OF WONDER"

PHÄNOMENTA
A TOWER MADE FROM (ALMOST)
NOTHING BUT GEOMETRY!



 Buro Happold
www.burohappold.com

 Canobbio S.p.A.
www.canobbio.com

 CENO Membrane
Technology GmbH
www.ceno-tec.de

 Dyneon
www.dyneon.eu

 FabricArt
Membrane Structures
www.fabricart.com.tr/

 Form TL
www.Form-tl.de

 Heytex Bramsche GmbH
www.heytex.com

 MEHLER
Technologies
www.mehler-
technologies.com

 Messe Frankfurt
Techtextil
www.techtextil.com

 Saint-Gobain
www.sheerfill.com

 Sefar
www.sefar.com

 Serge Ferrari sa
www.sergeferrari.com

 Sioen Industries
www.sioen.com

 Taiyo Europe
www.taiyo-europe.com

 technet GmbH
www.technet-gmbh.com

 Verseidag
www.vsinidutex.de

TensinetnewsINFO

Editorial Board

John Chilton, Evi Corne,
Peter Gosling, Marijke Mollaert,
Javier Tejera

Coordination

Marijke Mollaert,
phone: +32 2 629 28 45,
marijke.mollaert@vub.ac.be

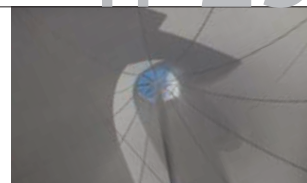
Address

Vrije Universiteit Brussel (VUB),
Dept. of Architectural Engineering,
Pleinlaan 2, 1050 Brussels, Belgium

ISSN 1784-5688

All copyrights remain by each
author
Price €15
postage & packing included

contents



PROJECTS

PAGE

- 4 **Bangladesh** TENSILE CONES
RADISSON BAY VIEW HOTEL
- 5 **Austria** THE SWAROVSKI CRYSTAL WORLDS
"NEW ERA OF WONDER"
- 6 **Switzerland** RETRACTABLE MEMBRANE ROOF
AN ADAPTABLE WEATHER PROTECTION
- 7 **Azerbaijan** BAKU 2015 EUROPEAN GAMES PARK
- 10 **Germany** PHÄNOMENTA
A TOWER MADE FROM (ALMOST) NOTHING BUT GEOMETRY!
- 10 **Germany** MEHLER REPLACES MEHLER AFTER 37 YEARS
ELSPE GRANDSTAND CANOPY

18



FEEDING THE PLANET, ENERGY FOR LIFE

REPORT

- 8 POLITECNICO DI MILANO
RESEARCH AND EXPERIMENTATIONS



16
**TEXTILE ROOFS
2015**

- 17 "TEXTILE STRUCTURES FOR NEW BUILDING" 2015
SPECIAL GRANT FOR THE 13TH STUDENT COMPETITION
- 24 INTERNATIONAL MEMBRANE SYMPOSIUM 2015 IMS
E.V. ANHALT UNIVERSITY, GERMANY
- 26 FISHING FOR FORM
FORM-RULE|RULE-FORM SYMPOSIUM 2015
- 28 UNIVERSITY OF NOTTINGHAM END OF YEAR SHOW
PAVILION 2015

ARTICLE

- 24 **WELD YOUR IDEAS** AT FORSSSTROM'S
NEW HF WELDING CENTER, SWEDEN

CALL

- 16 **TENSINET - COST ACTION TU1303 SYMPOSIUM 2016**
NOVEL STRUCTURAL SKINS 26-28 OCTOBER 2016

MISC

- 25 **BOOKREVIEW**
FABRIC STRUCTURES IN ARCHITECTURE
LIGHTWEIGHT LANDSCAPE

Edito

Dear Reader,

This TensiNews gives a short description of a few recent membrane projects built for the 'Radisson Bay View Hotel' (Bangladesh), the 'European Games Park' (Azerbaijan) and 'Phänomena' (Germany). An 'Adaptable Weather Protection' (Switzerland) is presented, a renewed structure 'Elspe Grandstand Canopy' (Germany) and the very poetic installation for the 'Swarovski Crystal Worlds' (Austria).

This issue also includes the reports of (1) Fishing for Form, Rule-Form symposium 2015 organised by KOGE, University of Innsbruck, (2) the International Membrane Symposium 2015 organised by Anhalt University and (3) the international workshop Textile Roofs 2015 held in Berlin. There is also a description of the research and experimentation possibilities at Polimi Textiles' HUB.

Till the end of October the Expo 'Feeding the planet, energy for life' takes place in Milano. Several TensiNet members were involved in the realisation of some of the pavilions and shading systems (page 18-23).

The TensiNet Association is active in the COST Action TU1303 'Novel structural skins' (www.novel-structuralskins.eu). This COST Action had a meeting on the 8th and 9th of September at the University of Minho (Guimarães, Portugal). The plenary lecture by Martin Tamke from CITA (DK), entitled 'The Tower – an interdisciplinary collaboration in the framework of COST', showed innovative results emerging from the collaboration between various COST Action partners. Raul Fanguero (UMinho, PT) introduced the Fibrenamics International Platform for the knowledge transfer between universities and companies as well as some new developments. In addition, the five Working Groups of the Action discussed during parallel sessions various aspects and future challenges related to Novel Structural Skins, like new applications, aspects related to LCA and acoustics, and the development of case studies and physical models as 'educational pack'.

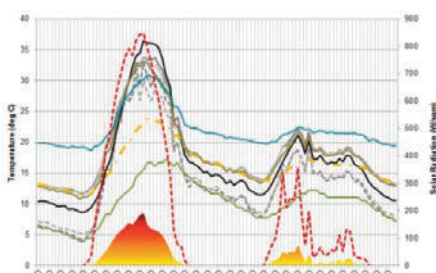
The Eurocode working group CEN TC250 WG5 finalised and submitted the Scientific and Policy (SaP) report 'Guideline for a European Structural Design of Tensile Membrane Structures made from Fabrics and Foils'. The TensiNet Eurocode working group, CEN TC250 WG5 and the COST Action TU1303 WG5 'From material to structure and limit states: codes and standardisation' will further cooperate to establish the Technical Specifications, which is the second step in obtaining a Eurocode for 'Membrane structures'. The COST Action TU1303 WG5 also decided to organise a Round Table session for experts in the domain of tensile surface structures to raise awareness for the development of this Eurocode. The aim is to discuss the importance of the specific Eurocode and to increase involvement.

The COST Action TU1303 WG5 organises the training school 'EUOMEM - From uncertainties to partial safety factors calibration: application to tensile membrane structures, discover the birth of a Eurocode', at the University of Nantes from the 29th of September till the 1st of October 2015. More information can be found at <http://euomem.sciencesconf.org/>

The TensiNet/COST TU1303 Symposium will have the same theme as the COST 'Action Novel structural skins' and will take place at Newcastle University, from the 26th till the 28th of October 2016. Several interesting keynote speakers have already confirmed their presence, such as Patrik Schumacher (Zaha Hadid Office), Julian Lienhard (structure GmbH), Carl Maywald (Vector Foiltec), Raul Fanguero (Minho University), Martin Tamke (Royal Danish Academy of Fine Arts, School of Architecture), Gordon Mungal (ARUP), Al Fisher (Buro Happold), Jan Knippers (Institut für Tragkonstruktionen und Konstruktives Entwerfen) and Jürgen Wacker (Wacker Ingenieure). If you are interested to present a paper, please submit your abstract before the deadline on October 15th (see also <http://conferences.ncl.ac.uk/tensinet2016> and page 16-17).

We hope you enjoy this issue and look forward to see you at one of the tensile structures related events, perhaps already at Structural Membranes 2015?

Yours sincerely, Marijke Mollaert



CORRECTION TensiNews 28

Apology: in the n° 28 of TensiNews, the figure 8 on page 11 should have been attributed to Paolo Beccarelli, John Harding and John Chilton.

Forthcoming Events

Structural Membranes 2015

Barcelona, Spain | 19-21/10/ 2015
<http://congress.cimne.com/membranes2015/frontal/default.asp>

9th Aachen-Dresden International Textile Conference 2015

Aachen, Germany | 26-27/11/2015
www.aachen-dresden-itc.de

Textile Roofs 2016

Berlin, Germany | 2-4/05/2016
<http://www.textile-roofs.com/>

IASS 2016

Tokyo, Japan | 26-30/09/2016
<http://www.textile-roofs.com/>

TENSINET - COST ACTION TU1303 SYMPOSIUM 2016 Novel structural skins

Newcastle, UK | 26-29 Oct 2016

Forthcoming Meetings

Partner Meeting 2 and Annual General Meeting

Tuesday 20 October 2015 at 18:45
 Location: Master room, Building A3, Campus Nord of the Technical University of Catalonia (UPC), Jordi Girona 1-3 (08034) Barcelona
<http://congress.cimne.com/membranes2015>

CALL Cost Action TU1303 TRAINING SCHOOL EUOMEM

From uncertainties to partial safety factors calibration: application to tensile membrane structures, discover the birth of a Eurocode.

This training school will be organized at the University of Nantes from the 29th of September till the 1st of October 2015. The number of places is limited.

Registration will be free for members of the Cost Action TU1303 (registration fee is 200€ for researchers and 400€ for industrial participants). Only about 10 early career researchers from the Cost Action can be reimbursed.

Joined to the training school a WG4 and WG5 meeting is scheduled. As this meeting is not foreseen in the Work and Budget Plan for 2015, again only a few participants/early stage researchers will be reimbursed.

More information can be found at <http://euomem.sciencesconf.org/>



CHOUDHURY RANA

RADISSON BAY VIEW HOTEL

Tensile cones

Chittagong, Bangladesh

Introduction & context

Radisson Bay View Hotel (RBVH) is situated in Chittagong, which is the largest port city in Bangladesh. RBVH is an ambitious five star hotel to serve Chittagong as an international business and cultural center to host international seminars, symposiums, conferences, events and expos etc. as well as a resting place for business travelers, entrepreneurs, transit passengers and visitors. The tensile membrane roof is situated upon the main entry between annex block and 20 storied tower block with an area of 665m². It will serve as main entry porch to the building.

Structural system

Chittagong city is located close to the sea and is quite windy. The structural design of the 8 tensile cones are done according to BNBC code considering 260km/hr wind speed. The membrane roof is consisted of 8 cones of 8mx8m sizesize, 20m above ground level and 15m above entry porch level. Each cone is supported by a flying mast of 4m height which is suspended by 4 PVC coated 12mm wire cables. The membrane material of the cones is PVDF coated white polyester fabric. The profile of the supporting steel structure is H which acts as a gutter to drain out rain water to adjacent terraces. The supporting steel structure is painted in black while the flying mast and top ring are painted in white color. The top ring of the flying mast is weather protected by acrylic transparent sheet which allows daylight and air circulation into the space beneath it. There is a 65mm air gap between the acrylic sheet and the top ring to allow air flow. Acrylic sheet is extended 150mm to protect interior from rain water.

Impact and impression

The 15m high and 24m wide entry porch gives a grand impression while entering the building. The translucency of the white fabric creates an excellent impression. The shadow of the concrete beam frames from background creates an ever changing play of shadow from morning to afternoon on the tension fabric of the entry porch. At night LED lights illuminate the Tensile Membrane which is also very pleasing to see. In terms of thermal quality the white color and conical shape of the membrane reflects most of the solar radiation and keep the interior cool.

Also due to the height of the entry porch, which is 15m above the floor, a gentle, cool, airy environment is created in the entry lobby.



Construction & Erection

Construction of the steel is done locally. The erection procedure was labor intensive since labor is cheap and the location of the inner cones were very difficult to be reached by heavy crane since there was little effective work space for crane. The steel scaffolding was done on the entire lobby area. A temporary deck was built on the scaffolding 13.5m above the floor level. With the help of chain pulley and temporary scaffolding the steel and fabric was erected in place. It took about a week to fit and erect all 8 cones.

Conclusion

The tensile Membrane Entry Roof is the largest tensile membrane structure ever constructed in Bangladesh. As tensile structures are quite new as system in Bangladesh it was difficult to manage and to coordinate this project. After all it is successfully completed. People who were involved in this project are delighted to see the happy faces of the visitors while entering the building.

| | |
|----------------------|--|
| Project Name | Tensile Membrane Entry Roof in Radisson Bay View |
| Location | Chittagong, Bangladesh |
| Client | Sena Hotel Development Ltd. (SHDL) |
| Year of Construction | October, 2014 |
| Consultant | Vistaara Architects Pvt Ltd. |
| Project Architect | Ar. Golam Morsalin Choudhury Rana |
| Contractor | Paradigm-Drishik Consortium |
| Steel & Membrane | ALM Steel Building LTD. |
| Material | PVDF coated PES fabric |
| Covered Area | 665m ² |

 Ar. Golam Morsalin Choudhury Rana, Archineer
 rana_2103@yahoo.com
 www.tensogroup.blogspot.com
 www.alm-tmsl.com