

ARTICLE

SUSTAINABILITY AND COMFORT THE RE-ACTIVATION OF THE WORKING GROUP

RESEARCH

GRINDOOR MASTER THESIS PROJECT

PROJECTS

DESIGNING NATURE

ASMA GERME
Asma Germe
www.asma-germe.com

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

3M Science Applied to Life
Dyneon
www.dyneon.eu

form TL
Form TL
www.Form-tl.de

techtex
Messe Frankfurt
Techtex
www.techtex.com

Low & Bonar
Mehler Technologies GmbH
www.lowandbonar.com
www.mehgies.com/mta/

Saint-Gobain
Saint-Gobain
www.sheerfill.com

SEFAR
Sefar
www.sefar.com

Serge Ferrari
Serge Ferrari sa
www.sergeferrari.com

SIOEN
Sioen Industries
www.sioen.com

TECHNET
technet GmbH
www.technet-gmbh.com

vector foiltec
Vector Foiltec
www.vector-foiltec.com

VERSEIDAG
Verseidag
www.vsinidutex.de

WinTess
WinTess Software
www.wintess.com

Tensinet NEWS INFO

Editorial Board

Paolo Beccarelli, John Chilton,
Evi Corne, Maxime Durka, Marijke
Mollaert & Carol Monticelli

Coordination

Marijke Mollaert,
info@tensinet.com

Address

iNPA Tensinet Association
Lombeekweg 26, B1740 Ternat,
Belgium

www.tensinet.com
ISSN 1784-5688

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

contents



PAGE

PROJECTS

6 **The Netherlands** DESIGNING NATURE
THE GROWING PAVILION & THE WILGENBORG

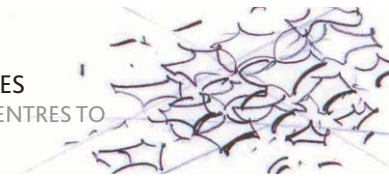


10 **India** TORNASCENT CARE HOSPITAL
ENTRY CANOPY
A SUN AND RAIN PROTECTED AREA

14 **Belgium** INSTALLING OPEN CANOPIES
AN OPPORTUNITY FOR CULTURAL CENTRES TO
ORGANISE AUTUMN EVENTS

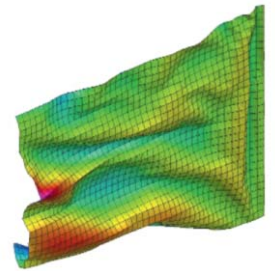


8 **United Kingdom** US EMBASSY IN LONDON
DISTINCTIVE BUILDING ENVELOPE MADE OF ETFE



ARTICLE

4 **FLYING FLAGS**
HOW DO THE WORLD'S LARGEST
FLAGS ACTUALLY FLY?



5 **VINYLPLUS®**
PRODUCT LABEL FOR VERSEIDAG-INDUTEX GMBH

8 **SUSTAINABILITY AND COMFORT**
THE RE-ACTIVATION OF THE WORKING GROUP
AND NEXT ACTIONS

10 **15 YEARS ACADEMIC EDUCATION**
IMS BAUHAUS® IN DESSAU-ROSSLAU



RESEARCH



4 **grINdoor**
MASTER THESIS PROJECT

16 **BUBBLES TO LIVE
AND WORK IN**
LOOKING AT THE PAST ...
AND LOOKING FOR
THE FUTURE?



MISC

Edito

Dear Reader

I am glad to announce that this May the deed of incorporation to transform TensiNet into an international non-profit association has been signed. We are now on our own feet, and thank the VUB very much for being our home since the beginning in 1999.

This TensiNews presents again actual projects, research topics as well as new developments in our industry. The simulation of flying flags, a modular sail concept, a sun and rain protection in India and two projects made of growing material, such as mycelium and willow. Two ETFE projects are shown, one is a second skin in front of a glazing façade, and the other is a master thesis with sliding cushions covering a green court yard.

Back in the history of our industry, we show the temporary pneumatic structure which covered in 1971 a Mies van der Rohe villa in Krefeld. The statement was "survival in a polluted environment". After a longer period the WG Sustainability and Comfort is reactivated. I hope that many of you will join this working group.

The Covid19 pandemic this year changed our live and schedules. Most of the conferences have been postponed to 2021 or even cancelled; only few are still scheduled. So it was hard or almost impossible to meet this year. We hope to be able to meet also physical in the near future.

I hope you enjoy this issue of TensiNews and wish you all the best. Stay healthy.



Yours sincerely,
Bernd Stimpfle

Forthcoming Events

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

Textile Roofs 2020 | Postponed to 10th – 12th May 2021 | Berlin, Germany | www.textile-roofs.com

IASS Annual Symposium and Spatial Structures Conference 2020/2021 - Inspiring the next generation | Postponed to 23-27 August 2021 | University of Surrey, Guildford, UK | <https://www.surrey.ac.uk/iass2021>

VIII Latin American Symposium of tensile structures | Postponed | Buenos Aires, Argentina | <http://www.latensored.org/>

5. Essener Membranbau Symposium | Cancelled | Universität Duisburg-Essen | <https://www.uni-due.de/iml/ems2020.php>

International Conference on Advanced Building Skins | 26 – 27/10/2020 | Bern, Switzerland | www.abs.green

TECHTEXTIL 2011 | 4-7/05/2021 | Frankfurt am Main, Germany | <https://techtextil.messefrankfurt.com/frankfurt/en.html>



CALL IASS Surrey 2021 Expo

Competition and exhibition of innovative lightweight structures: Organized by the new IASS Working Group 21 "Advanced manufacturing and materials" in close cooperation with the IASS Symposium 2021 and the 7th international conference on Spatial Structures in Surrey.

The expo, symposium and conference will take place in Surrey from 23 to 27th August 2021. Deadline for entries is January 31st, 2021. <https://www.jjo33.com/surrey2021>



TensiNet Presentations & Meetings at Advanced Building Skins

26-27/10/2020

TensiNet will be represented at the 15th Conference on Advanced Building Skins with two presentations: "Skins from fabrics and foils" and "Building Membrane Cladding Systems", both designed by our associate partner POLIMI and lastly we will organise the TensiNet Meeting "TensiNet and friends".

TensiNet members receive a reduction on the registration fee. <https://abs.green/registration/>



Centre Pompidou-Metz @ wordpress.

FLYING FLAGS ESI Group

HOW DO THE WORLD'S LARGEST FLAGS ACTUALLY FLY?

Flags are designed to display a message!

Do you ever see an enormously large flag and think to yourself, "how does that flag actually fly?". Ok, maybe you don't – but I bet you do ask yourself how you can save money and time on building lightweight structures. Discover eight of the world's tallest flags and how wind velocity exposure affects flying performance. It is essential that the flag, pole and attachments are designed to ensure optimum display and safe performance in varying natural winds. These studies, performed by SL Rasch, can help save time, energy and cost when deciding how to build similar extraordinary and lightweight structures in the future.

SL Rasch GmbH, a German architecture firm that specializes in extraordinary constructions and lightweight structures, explored the performance of large national flags hoisted on

very tall flag poles flying in the natural winds of their respective locations. A list of the world's tallest flags:



NB PLACE	YEAR	POLE	FLAG SIZE	FLAG WEIGHT
0 Dubai	not built	200m		400kg
1	2014	170m	33x49.5=1633m ²	570kg=0.35kg/m ²
2 Dushanbe Tajikistan	2011	165m	30x60 =1800m ²	700kg=0.39kg/m ²
3 Baku Azerbaijan		162m	35x70=2450m ²	
4 Panmunjom North Korea		160m		270kg
5 Ashgabat Turkmenistan	2008	133m		
6 Dubai Sharjah Airport		123m	70x35=2450m ²	
7 Tashkent Uzbekistan	2018	65m	10x20=200m ²	

Ever-increasingly large flags require even heavier, more tear-resistant fabrics, but nevertheless should present as consistently flying even under moderate winds. In a pilot study, SL-Rasch chose to simulate the behaviour of a tall flag at scale 1:3 to determine the design requirements for the fabric's tensile strength and weight, its attachments, and the flag pole dimensions to guarantee the effective and safe performance of such tall flags both at low and high average wind speeds.

Figure 1. Flying masts
© ESI, 2020

Figure 2. SLR Flying Flag in CFD domain at height 150m © SL Rasch GmbH, 2020

Figure 3 a-b. SLR Flying Flag snapshots at 30m/s wind speed at 150m © SL Rasch GmbH, 2020

Figure 4 a-b. Ashgabat 133m © E. Haug, 2020, Flag and calculated SLR Flying Flag snapshots at winds decreasing to 15m/s, 3.77m/s and 1.25m/s © SL Rasch GmbH, 2020

