

18th Advanced Building Skins Conference & Expo

30-31 October 2023, Bern, Switzerland



International event on innovative building envelopes for architects, engineers, scientists and the construction industry



Conference Day 1 - 30 October 2023

13:30 Welcome Message: Dieter Moor, arconsol, Austria; Member of the Committee, Advanced Building Skins Conference

13:35 Opening: Christine Lemaitre, CEO, German Sustainable Building Council

14:00 Keynote: Thom Mayne, Morphosis, Los Angeles, United States

14:30
A1 **Architectural Membranes and Energy**
Chair: Robert Roithmayr, Formfinder, Vienna, Austria

14:30
B1 **Façade Design Optimization**
Chair: Fabian Ochs, University of Innsbruck, Austria

15:30 Coffee Break

16:15
A2 **Integrating Photovoltaics into the Building Skin**
Chair: Dieter Moor, arconsol, Austria

16:15
B2 **Performance of the Building Envelope**
Chair: Brian Koh, Integra, Seoul, South Korea

17:45 Evening Reception

Conference Day 2 - 31 October 2023

8:30
A3 **Fire Safety of Façades**
Chair: Chantal Chalouhi, Jensen Hughes, Milan, Italy

8:30
B3 **Innovative Products and Technologies for Facades**
Chair: Leo Lau, Beijing Univ. of Science & Technology

10:00 Coffee Break

10:45
A4 **Glass for Sustainable Construction**
Chair: Matthew Fineout, Director AE7, Dubai, UAE

10:45
B4 **Solar Façades - Academic Viewpoint**
Chair: Leo Lau, Beijing Univ. of Science & Technology

12:30 Lunch

14:00
A5 **Advanced Building Skin Design**
Helmut Hohenstein, Hohenstein Consultancy, Germany

14:00
B5 **Models and Simulations for Sustainable Buildings**
Chair: Fabian Ochs, University of Innsbruck, Austria

15:30 Coffee Break

16:15
A6 **Design for High-Performing Timber Building**
Chair: Jason D'Altroy, DIALOG, Toronto, Canada

16:15
B6 **Natural Ventilation and Passive Cooling**
Chair: Flourentzos Flourentzou, Estia, Switzerland

30 October 2023, CONFERENCE DAY 1

14:30 Architectural Membranes and Energy

Session A1

Chair: Robert Roithmayr, Formfinder, Vienna, Austria

Design of membrane structures, including PV cells

- » Advantages of tensile membranes in architecture
- » Integration of flexible PV cells in facade systems
- » Membrane design and engineering

Robert Roithmayr, Formfinder, Vienna, Austria

Research on membrane structures, including flexible PV cells

- » Latest research and developments in PV cells on membranes
- » Engineering aspects of facade systems, including membranes
- » Practical implementation of membrane systems

Bruce Danziger, Danube University, Krems, Austria

Energy-generating textile-based building skins

- » Energy generation
- » Energy efficiency
- » PV and textile

Marina Chernyshova, RWTH Aachen, Germany



15:30 Coffee Break



30 October 2023, CONFERENCE DAY 1

14:30 Façade Design Optimization

Session B1

Chair: Fabian Ochs, University of Innsbruck, Austria

Design and performance evaluation of a double-skin glazed façade

- » Renovation of the MacKimmie Tower, Calgary
- » Active double façade concept
- » Operational strategy and performance evaluation

Christian Oberdorf, Transsolar, Munich, Germany

Thermal and visual characterization of semi-transparent façade components

- » In-situ measurement of thermal façade performance
- » Goniophotometer measurements on complex glazings
- » Open innovation services for enhancing façade performance

Martin Hauer, University of Innsbruck, Austria

Digital design in the essence of decision making for human comfort

- » Digital analysis to ensure human comfort
- » Data processing to produce informing metrics for facades
- » Case study: Parametrically designed rooftop pavilion

Rafailia Ampla, Eckersley O'Callaghan, London, United Kingdom

BRIEF PRESENTATIONS

- » **Façade optimization design integrating airflow network and daylighting**
Byungyun Lee, Soongsil University, Seoul, South Korea
- » **Steady-state calculation versus dynamic energy simulations during the early design phase**
Emanuele Pepe, Skanska, Malmö, Sweden



15:30 Coffee Break

30 October 2023, CONFERENCE DAY 1

16:15 Integrating Photovoltaics into the Building Skin

Session A2

Chair: Dieter Moor, arconsol, Australia

From first sketch to a fully installed solar façade

- » Case study of a specially designed solar façade
- » On the way to grid-connection: Insights into the planning
- » Reducing the carbon footprint with a solar façade

Sven Schreiner, Grenzebach Envelon, Germany

Coloured solar façades and textures

- » Recommendations for architects and façade designers
- » How to optimise project costs
- » Examples of realised projects

Andrius Stonkus, Intelligent Solar, Lithuania

Special applications of Building-Integrated Photovoltaics (BIPV)

- » PV façades don't have to be flat
- » 3D solar façades with computational design
- » Movable and shading solutions with BIPV

Augustin Rohr, Avancis, Germany

New generation of colored PV

- » Building integration
- » Tests
- » Advantages

Frederic Clauss, Solaxess, Switzerland

Preparing solar tiles for mass application

- » Solar tiles as a building product
- » The roofer's point of view
- » Versatility and user friendliness

Cornelius Paul, Autarq, Germany

Merging aesthetics and sustainability in solar technology

- » Nordic BIPV design with nearly invisible solar cells
- » Lightweight solar roofing for modern and historic buildings
- » Metal solar roofs resistant to environmental influences

Marc Lüllmann, Roofit Solar / SmartSmallHouse, Switzerland

BRIEF PRESENTATIONS

- » **Case study of a plus-energy modular building with colored-BIPV**

Qinghui Deng, Guangdong Zanlu Technology Co, China

- » **Transforming traditional building materials to BIPV: innovative solutions for building skins**

Adolis Jančiauskas, Metsolar, Vilnius, Lithuania

- » **Energy rehabilitation: BIPV on social housing**

Büşra Yılmaz, Kameleon Solar, Netherlands

- » **Platform with Revit tool and products for energy generation in building skins**

Ralph Dankers, BIPV.world, Netherlands



17:30 – 19:30 Evening Reception

30 October 2023, CONFERENCE DAY 1

16:15 Performance of the Building Envelope

Session B2

Chair: Brian Koh, Integra, Seoul, South Korea

Design guidelines for additive manufactured performative façade

- » Geometric design for sustainable high-performative façade
- » Optimized fabrication for integrative façade
- » Shading informed façade design

Ina Cheibas, ETH Zürich, Switzerland

Bio-adaptive building skins for better building performance

- » Relationship between biomimicry and adaptive skins
- » Translation of biomimicry processes into architectural skins
- » Geometries and performance of bio-adaptive building skins

Maryam Alfadhel, University of Bahrain

Classrooms walls and mean radiant temperature in Mediterranean climate

- » Classroom wall retrofits in coastal Mediterranean climate
- » Retrofitting methods to improve MRT and student comfort
- » Construction materials to improve wall performance

Aram Yeretian, American University of Beirut, Lebanon

Phase change material system for improving housing in Ulaanbaatar, Mongolia

- » Modelling of PCM
- » Simulation in EnergyPlus
- » Optimal location of PCM wallboard

Tsovoodavaa Gantumur, Mongolian University of Science and Technology, Ulaanbaatar

nZEB renovation with a smart hybrid envelope system

- » Research overview
- » Results from the testbed
- » nZEB renovation - Case study

Hyun-Hwa Lee, Korea Institute of Civil Engineering and Building Technology, South Korea

BRIEF PRESENTATIONS

- » **Renovation variants of historical box-windows and their energy performance**
Konstantin Thurow, HTW Berlin, Germany
- » **Model-based evaluation of architectural heat mitigation strategies**
Michael Schmutz, Meteotest, Bern, Switzerland



17:30 – 19:30 Evening Reception

8:30 Fire Safety of Façades

Session A3

Chair: Zomraude Chantal Chalouhi, Jensen Hughes, Milan, Italy

Fire risk related to the use of PV systems in building skins

- » Code overview
- » Risk analysis
- » Fire spread

Giovanni Cosma, Jensen Hughes, Milan, Italy

Fire prevention in building envelopes with photovoltaics

- » Quality aspects and fire prevention
- » Guideline for PV façades in high-rise buildings
- » Fire safety for photovoltaic in-roof installations

Urs Walter Muntwyler, Dr. Schüpbach & Muntwyler, Bern, Switzerland

Limiting fire spread on wood cladding without fire-retardant treatment

- » Limitations of use of non fire-retardant treated wood cladding
- » Test observations of wood façade fires
- » Fire modeling for optimization of façade construction

Karlis Livkiss, Institute of Fire and Security Technology, Denmark

Effects of fire in a house façade: A case study

- » Concrete surface degradation during internal fire breakout
- » Steel rebar passive protection through concrete
- » External façade thermal insulation weakness

Christian Paglia, Supsi, Switzerland

Saving lives through non-combustible membranes

- » Non-combustible breather and vapor barrier membranes
- » Customization: Solving complex details in high-end projects
- » Importance of consulting and detailing

Ricardo Teixeira, Effsus, Portugal



10:00 Coffee Break

31 October 2023, CONFERENCE DAY 2

8:30 Innovative Products and Technologies for Building Skins

Session B3

Chair: Leo Lau, University of Science and Technology Beijing, China

Texoversum – A robotically-produced fibre composite façade

- » Carbon and glass fibres
- » Robotic winding process
- » Multi-layered appearance

Sebastian Thomas, allmannwappner, Munich, Germany

Thermal and structural performance of translucent aerogel glass bricks

- » Properties of aerogel glass bricks
- » Structural and thermal performance
- » New aesthetic possibilities of a new component

Michal Ganobjak, Empa, Switzerland

Ecology of lime on the skin of contemporary Spanish architecture

- » Cordoba Bus Station. Architect: Cesar Portela
- » Panorama homes in Madrid. Architect: Jerónimo Junquera
- » Caruncho studio in Madrid. Architect: Fernando Caruncho

María Dolores Robador-González, University of Sevilla, Spain

Lightweight building components made of 3D textiles in combination with 3D printing

- » Lightweight design
- » 3D printing and 3D textile technologies
- » Monomaterials

Claudia Lueling, Frankfurt University of Applied Sciences, Germany

Reducing the concrete carbon footprint in building and construction

- » Carbon footprint of calcium carbonate 15 times lower than Portland cement
- » Effectively reducing carbon footprint of concrete & mortars
- » Improving performance of technical cement-based recipes

Philipp Mueller, Omya, Switzerland

BRIEF PRESENTATIONS

» Application of color pigments for architectural concrete

Jean-Marc Casu, Harold Scholz, Germany

» Replacing aluminum with bio-based carbon fiber in curtain wall

Eric Davis, University of Cambridge, Chicago, United States

» Flexible manufacturing of lightweight façade structures

Lisa-Marie Reitmaier, Aachen University, Germany

» Digitization of construction: Automated prefabrication and robot-compatible final mounting

Julian Berchtold, Institute for Independent Studies, Zurich, Switzerland



10:00 Coffee Break

10:45 Glass for Sustainable Construction

Session A4

Matthew Fineout, Director AE7, Dubai, UAE

Sustainable glazing solutions

- » Creating livable places
 - » Development of glass technology
 - » Glass as a recyclable material
- Gizem Güngör, Sisecam, Istanbul, Turkey*

Engineering transparency sustainably

- » Sustainable use of glass in buildings
 - » Lifecycle consideration
 - » Recycling: design for reuse of glass
- James O'Callaghan, Eckersley O'Callaghan, London, UK*

Changing our expectations of insulated glass

- » Improving the life expectancy of insulated glass
 - » Using high performance warm edge technology
 - » Replacing insulating glass at what cost?
- Chris Davis, HB Fuller - Kömmerling, Germany*

Combining bird protection with glass coatings in laminated safety glass

- » Overview of test protocol
 - » Approaches to bird-friendly glazing solutions
 - » Glass design: 3D modeling and implications
- Wim Stevels, Eastman, Belgium*

Dynamic liquid crystal glazing to enhance buildings' performance

- » Beyond energy consumption and visual comfort
 - » Sustainability and value creation
 - » Achieving sustainable goals with liquid crystal glazing
- Natalie Carrick, eyrise BV, Netherlands*

Glass solutions for sustainable façades

- » Low-carbon glass
 - » Circularity approach
 - » Digital services to support sustainability
- Jérôme Rousselet, Saint-Gobain Glass, Paris, France*

Wood meets glass

- » Sustainability
 - » Recyclability
 - » New renewable materials
- Dominik Betz, Okalux, Germany*

BRIEF PRESENTATIONS

- » **The bioclimatic glass prism of the Gaumont-Pathé cinema, Paris**
Pierre Chassagne, AIA Ingénierie, Lyon, France
- » **Performance of radio frequency transparent insulation glazing**
Thomas Kroyer, Fraunhofer Institute for Solar Energy Systems ISE, Germany
- » **Improving energy efficiency of buildings with thermochromic smart windows**
Daniel Mann, TNO, Netherlands



12:30 Lunch

10:45 Solar Façades - Academic Viewpoint

Session B4

Chair: Leo Lau, University of Science and Technology Beijing, China

BIPV for downtown Toronto and its impact on peak demand profile

- ›› Impact of BIPV on peak demand profile at an urban scale
- ›› Resilience assessment of city-scale deployment of BIPV
- ›› Monte Carlo simulations

Soukaina Jazouli, University of Waterloo, Canada

Performance, aesthetics and weight aspects of BIPV technologies

- ›› Aesthetic and versatile multi-wire interconnection
- ›› Laminations on curved surfaces
- ›› Approaches for light-weight PV applications

Jonathan Govaerts, imec-EnergyVille, Belgium

Economic impact of aesthetic PV integration for retrofitting listed properties

- ›› BIPV aesthetic integration in protected contexts
- ›› Economic profitability of innovative BIPV solutions
- ›› Extra cost of BIPV aesthetic integration

Martina Pelle, EURAC Research, Bolzano, Italy

Solar envelope design optimization for energy efficiency and energy flexibility

- ›› Selection between BIPV and BIPV/T
- ›› Optimization of BIPV/T placement and sizing
- ›› Solar envelopes for energy efficiency vs flexibility

Anna-Maria Sigounis, Concordia University, Montreal, Canada

Structural timber-glass façade systems with integrated photovoltaics

- ›› Increasing stiffness of a façade with structural glass
- ›› Building integrated photovoltaics
- ›› Numerical model validated with experiments

Tine Engelen, Hasselt University, Belgium

BRIEF PRESENTATIONS

- ›› **Fiber-reinforced composite materials for building envelopes with BIPV**

Paolo Giussani, Studio di Ingegneria Rigone, Milan, Italy

- ›› **Revisions of a plus-energy modular building**

Yue Hao, University of Science and Technology Beijing, China



12:30 Lunch

31 October 2023, CONFERENCE DAY 2

14:00 Advanced Building Skin Design

Session A5

Chair: Helmut Hohenstein, Dr. Hohenstein Consultancy, Germany

Engaging in operational and end-of-life phases of building façades

- » Design for disassembly and reuse in unitized façade
- » Disassembly rating to measure circular potential
- » Digital twin to enable component's replacement and reuse

Anastasiya Popova, Staticus, Zürich, Switzerland

Aulikki Sonntag, Staticus, Basel, Switzerland

Beyond sustainable building envelopes

- » Aluminium in buildings
- » Recycling of aluminium
- » Circularity and design

Anne-Christine Roulet, Hydro Building Systems, Paris, France

Development of a sustainable façade

- » New features of the NEST STEP² Unit
- » Closed cavity façades: realized projects
- » Next generation Aepli Air Control façade

Josua Villiger, Aepli Metallbau, Switzerland

The new hype in high-end architecture: Double curved and 3D glass

- » Bubble-tempered glass
- » 3D and multi-curved tempered glass
- » Super-high and small radius tempered curved glass

Holly An, Tianjin Northglass, China

Helmut Hohenstein, Dr. Hohenstein Consultancy, Germany

Parametric rationalization and construction of complex façades

- » Optimization of curvilinear forms for buildability
- » Delivering architectural design intent within a set budget
- » Ziraat Bank Headquarters

Mustafa Chehabeddine, Kohn Pedersen Fox, New York, USA

BRIEF PRESENTATIONS

- » **Decarbonizing the building envelope: Analysis and optimization strategies**

Alessio Esposito, Biff SA, Lausanne, Switzerland

- » **Incremental unitary design and user-friendly controls**

Brian Koh, Integra, Seoul, South Korea



15:30 Coffee Break

31 October 2023, CONFERENCE DAY 2

14:00 Models, Tools and Simulations for Sustainable Buildings

Session B5

Chair: Fabian Ochs, University of Innsbruck, Austria

Façade simulation tool based on 2D detailed calculation methods

- » Fast easy-to-use multi-physics simulation of façade system
- » Intuitive user interface and parametric geometry
- » Robust and consistent thermofluid dynamic and optical model

Ingrid Demanega, Eurac Research, Bolzano, Italy

Building's performance simulation versus its post-occupancy performance

- » Iterative performance simulations for small buildings
- » Customizing a post-occupancy monitoring system
- » Improving a building's energy efficiency at limited budget

Jörg Rügemer, University of Utah, Salt Lake City, United States

Metrics for communicating effects of operable shading on daylight

- » Static light transmittance of glazing
- » Light transmittance and deployment hours
- » Improving fenestration comparison and daylight performance

Anton Hendrix, ACC Glass and Facade Consultancy, Stockholm, Sweden

Renovation of an office building with double skin façade

- » Double skin façade design and modeling
- » Multicriteria evaluation of renovation of office building
- » Design support tool

Hugo Guyomard, Coveris, France

Retrofitting renewable energy systems in existing community

- » Energy sharing between buildings in an existing community
- » Simulations conducted to achieve energy balance
- » Building-integrated PV and PV/thermal systems

Minhwi Kim, Korea Institute of Energy Research

AI-assisted workflow for design of sustainable tall buildings

- » Parametrically integrated architectural and structural model
- » Machine learning-based procedure for early-stage design
- » Semi-automatic assessment of key parameters of tall buildings

Pooyan Kazemi, Politecnico di Milano, Italy

BRIEF PRESENTATIONS

- » **Decentralized HVAC system integrated into a window frame using CFD simulations**

Joel Philippe Karolin, Bern University of Applied Sciences, Switzerland



15:30 Coffee Break

31 October 2023, CONFERENCE DAY 2

16:15 Indigenous Design for a High-Performing Timber Building

Session A6

Chair: Jason D'Altroy, DIALOG, Toronto, Canada

Going beyond the Ontario building code

- » Alternative solutions for timber structures above code limit
- » Energy savings
- » Bird collision deterrence

Jason D'Altroy, DIALOG, Toronto, Canada

Delivering a zero-carbon academic building

- » High-performance enclosure detailed design
- » Airtightness testing prior to building occupancy
- » Lifecycle analysis

Sarah Gray, RDH, Toronto, Canada

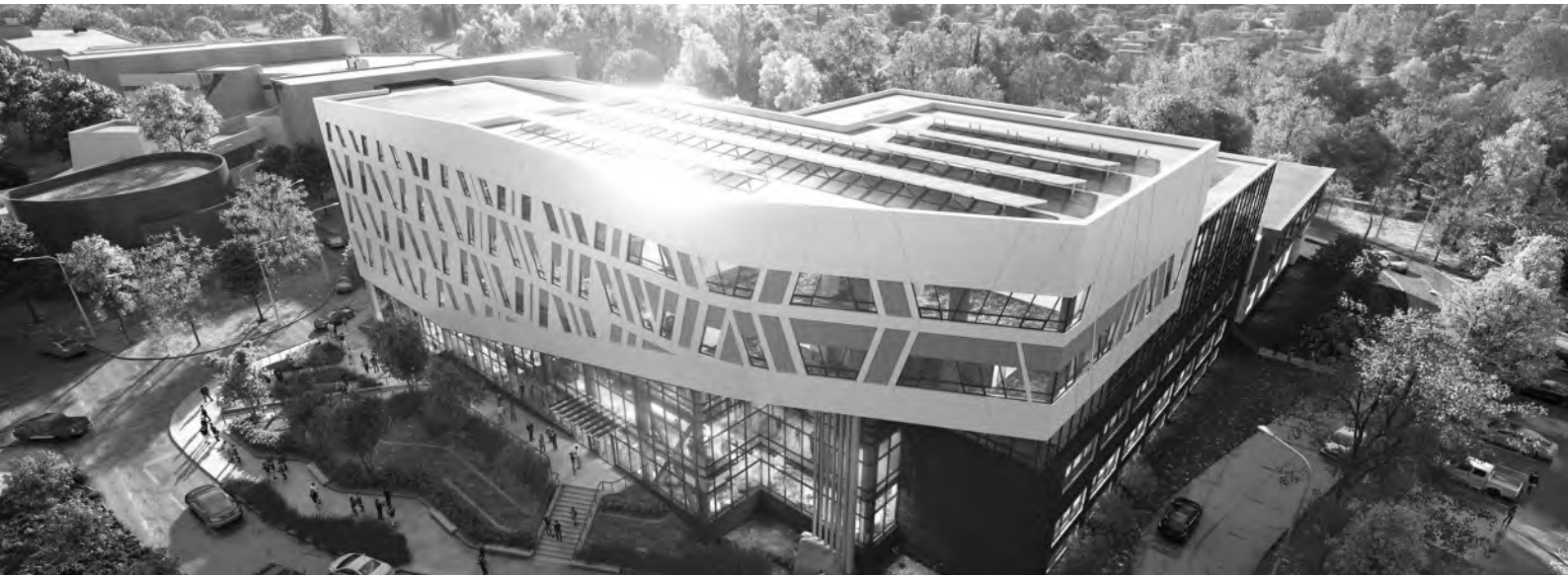
Design towards inclusive and sustainable building environments

- » Integrated project delivery team to go beyond high performance
- » Early integration of diverse perspectives, art, storytelling
- » Delivering an indigenous inspired envelope design

Juan Carlos Portuese, DIALOG, Toronto, Canada



17:30 End of Conference



16:15 Natural Ventilation and Passive Cooling for Low-tech Buildings

Session B6

Chair: Flourentzos Flourentzou, Estia, Lausanne, Switzerland

Energy efficiency of complex architectural solar shading systems

- » Architectural solutions for solar shading
- » Performance of complex solar shading
- » Characterization of solar shading systems

Flourentzos Flourentzou, Estia, Lausanne, Switzerland

Energy efficiency and architectural cost of passive bioclimatic strategies

- » Bioclimatic design
- » Passive strategies
- » Passive buildings in hot climates

Maria Loizou, Estia, Lausanne, Switzerland

Ventilative cooling potential under climate change

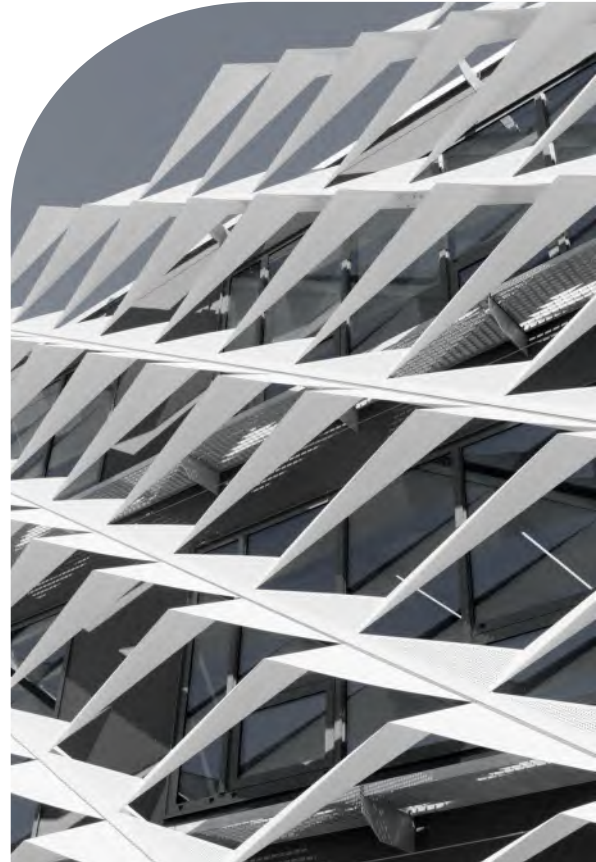
- » Integrating geo-climatic indicators and building effects
- » Preliminary results of a new calculation tool: Predyce
- » Climate-change vision based on Copernicus databases

Francesca Fasano, Polytechnico di Milano, Italy

Naturally ventilated office buildings and dusty outdoor environments

- » Dust in naturally ventilated buildings
- » Occupant perception of air quality
- » Naturally ventilated buildings with low energy use

Evangelos Belias, EPFL, Lausanne, Switzerland



Keynote speaker: Thom Mayne, Morphosis, Los Angeles

The Advanced Building Skins Conference & Expo is the premier international event for innovative building envelopes. Attracting architects, engineers and representatives from the construction industry makes this event the ideal place for productive networking with a wide mix of industry specialists from more than 40 countries across the world. The event is held in English and will take place 30-31 October 2023 at the Kursaal Conference Center in Bern, Switzerland.



Keynote speaker at this year's Advanced Building Skins Conference will be **Thom Mayne**, founding partner of Morphosis (Los Angeles), an interdisciplinary architecture and planning practice. Mayne was honored with the Pritzker Prize and the Gold Medal of the American Institute of Architecture (AIA). With Morphosis, he has been the recipient of over 120 AIA awards and numerous other design recognitions.

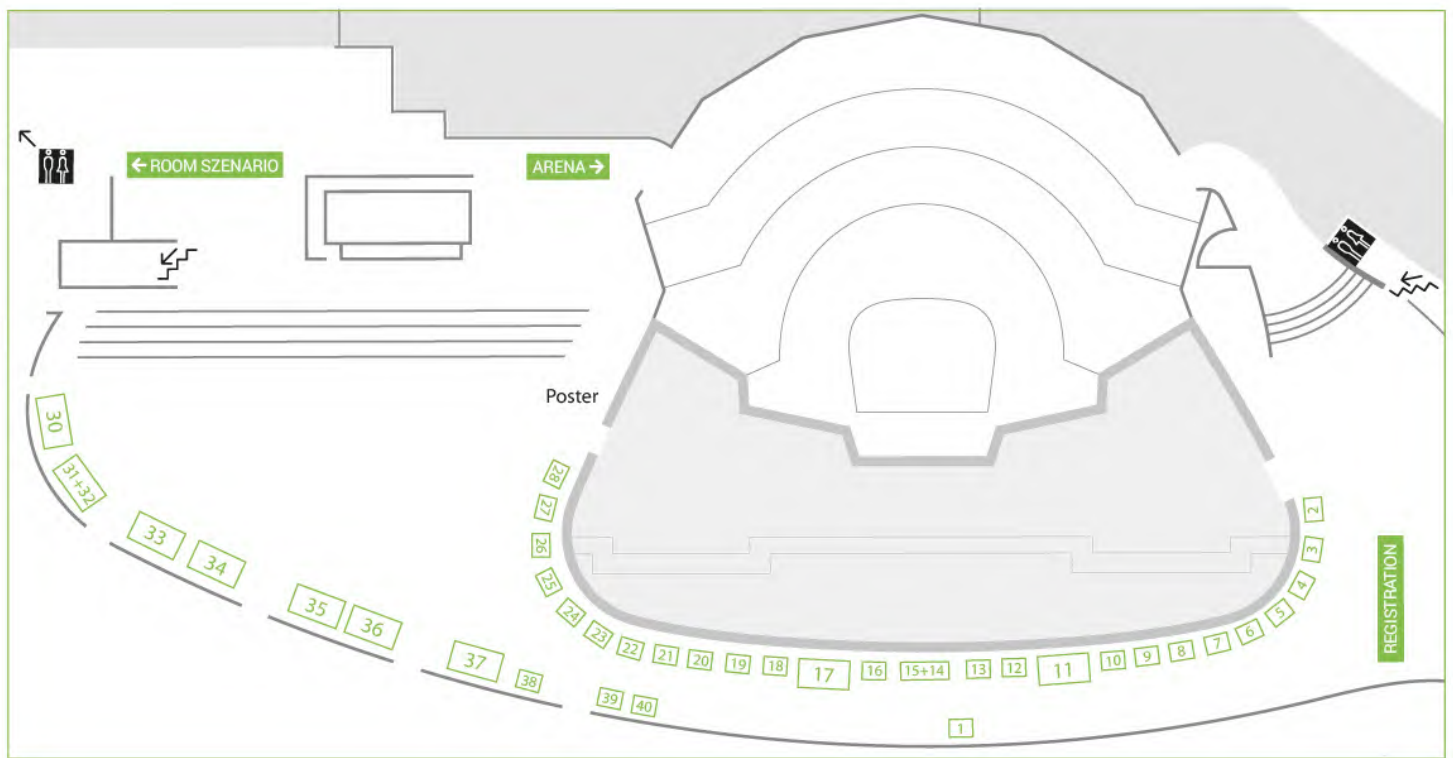
The registration fee of €680 includes lunches and the conference documentation. Early birds who register by 30 June will receive a **10% discount**. To register, please visit our website: www.abs.green



Kanton Bern
Canton de Berne



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|----------------------------------|------------------------|----------------------------|----------------------|
| 1. ISD | 10. BIPV.world | 21. Media | 30. Aluron |
| 2. Iso-Chemie | 11. Autarq | 22. eyrise | 31+32. Envelon + SFT |
| 3. Jensen Hughes | 12. MetSolar | 23. GlasTrösch | 33. Saint-Gobain |
| 4. Omya | 13. arconsol | 24. Sisecam | 34. Effisus |
| 5. Armatherm | 14. Roofit | 25. Hydro Building Systems | 35. Avancis |
| 6. Guangdong Zanlu Technology Co | 15. NRG | 26. Jansen | 36. IIS Zürich |
| 7. Sunage | 16. Solaxess | 27. Aepli | 37. Eastman Saflex |
| 8. Kameleon Solar | 17. Intelligent Solar | 28. Lignum | 38. Halio |
| 9. Steinfort Glas | 18. Hachtel | 29. Heliobus | 39. Heliobus |
| | 19. Tianjin Northglass | | 40. Sefar |
| | 20. Kömmerling | | |