

Thermal Performance of the Exterior Envelopes of Whole Buildings XIII

Principles Track Program

Plenary Session

Monday, December 5, 2016 – Grand Ballroom
8:00 a.m. – 10:00 a.m.

8:00 a.m. **A building science to-do list**
William Rose – University of Illinois

9:00 a.m. **Trends and challenges in building physics during the last 30 years: A Swedish perspective**
Carl-Eric Hagentoft – Chalmers University of Technology

Principles Session 1: Insulation Performance and Material Properties

Monday, December 5, 2016 – Palm/Bay Room
10:30 a.m. – 12:00 p.m.

Session Chairs:

Andreas Holm – FIW-Munich
holm@fiw-muenchen.de

Manfred Kehrer – SmartSolutions LLC
justsmartsolutions@gmail.com

10:30 a.m. **Wind washing effects on mineral wool insulated sheathings**
Randy Van Straaten – RDH Building Science Laboratories

11:00 a.m. **Improving polyiso thermal performance at low temperature**
John Letts – Firestone Building Products

11:30 a.m. **Determination of linear thermal transmittance of vacuum-insulation panels by measurement in a guarded hot-plate apparatus or a heat-flow meter apparatus**
Christoph Sprengard – FIW Muenchen

Principles Session 2: Material Durability

Monday, December 5, 2016 – Palm/Bay Room
1:30 p.m. – 3:00 p.m.

Session Chair:

Mikael Salonvaara – Owens Corning
mikael.salonvaara@owenscorning.com

- 1:30 p.m.** **Critical property contrasts of fluid-applied air- and water-barrier membranes used for envelope: Chemistries, performance and durability**
Patrick Young – DuPont Innovations
- 2:00 p.m.** **Critical freeze-thaw saturation measurement of in-service masonry**
Randy Van Straaten – RDH Building Science Laboratories
- 2:30 p.m.** **Field study of moisture storage and thermal properties of buried extruded polystyrene**
Leslie Peer – Read Jones Christoffersen Ltd

Principles Session 3: Walls – Moisture and Durability, Part 1

Monday, December 5, 2016 – Palm/Bay Room
3:30 p.m. – 5:00 p.m.

Session Chair:

Diana Hun – Oak Ridge National Laboratory
hunde@ornl.gov

- 3:30 p.m.** **Using fiber insulation as a means of drying internally insulated walls**
Ekaterina Tzekova – University of Toronto
- 4:15 p.m.** **A public domain, transient, experimental database on the hygrothermal performance of durable, energy-efficient, full-basement foundation walls in a cold climate**
Louise Goldberg – University of Minnesota

Special Presentation

Tuesday, December 6, 2016 – Grand Ballroom

8:30 a.m. – 10:00 a.m.

- 8:30 a.m.** **Innovation required for the next generation of building envelopes**
Karma Sawyer – Acting Program Manager for the Department of Energy's Emerging Technologies Program

Principles Session 4: Walls – Moisture and Durability, Part 2

Tuesday, December 6, 2016 – Palm/Bay Room

10:30 a.m. – 12:00 p.m.

Session Chair:

Fitsum Tariku – British Columbia Institute of Technology

fitsum_tariku@bcit.ca

- 10:30 a.m.** **Protocol to evaluate the moisture durability of energy-efficient walls**
Philip Boudreaux – Oak Ridge National Laboratory
- 11:00 a.m.** **A systematic method of assessing the durability of wall assemblies: Towards the limit-states design approach**
Martin Morelli – Danish Building Research Institute
- 11:30 a.m.** **Risk of condensation and mold growth in highly insulated wood-frame walls**
Hamed Saber – National Research Council of Canada

Principles Session 5: Attic and Roof Performance

Tuesday, December 6, 2016 – Palm/Bay Room
1:30 p.m. – 3:00 p.m.

Session Chair:

Bill Rose – University of Illinois
wrose@illinois.edu

- 1:30 p.m.** **Sealed attics exposed to two years of weathering in a hot and humid climate**
William Miller – Oak Ridge National Laboratory
- 2:00 p.m.** **Field study on the thermal and hygrothermal performance of insulated, ventilated nail base system**
Ming Shiao – GAF Corporation
- 2:30 p.m.** **Annual energy and heat flows in vented and sealed attics: Parametric study – climate zone 2A**
Mikael Salonvaara – Owens Corning

Principles Session 6: Indoor Environment and Thermal Comfort

Tuesday, December 6, 2016 – Palm/Bay Room
3:30 p.m. – 5:00 p.m.

Session Chair:

Stanley Gatland – CertainTeed Corporation
stanley.d.gatland@saint-gobain.com

- 3:30 p.m.** **Performance factor for floor heating systems using new analytical formula**
Carl-Eric Hagentoft – Chalmers University
- 4:00 p.m.** **Measured differences of ground and space temperatures for side-by-side slab on grade residences with and without carpet**
Robin Vieira – Florida Solar Energy Center
- 4:30 p.m.** **Characterizing indoor humidity for comparison studies: The moisture balance approach**
William Rose – University of Illinois

Principles Session 7: Rain

Wednesday, December 7, 2016 – Palm/Bay Room
8:30 a.m. – 10:00 a.m.

Session Chair:

Hugo Hens – K.U. Leuven
hugo.hens@kwk.kuleuven.be

- 8:30 a.m.** **Analysis of wind-driven rain exposure based on long-term monitoring**
Fitsum Tariku – British Columbia Institute of Technology
- 9:15 a.m.** **Laboratory study of rates of inward leakage in seven different gaps in a façade exposed to driving rain or water splash**
Lars Olsson – SP Technical Research Institute of Sweden

Principles Session 8: Intentional and Unintentional Airflow

Wednesday, December 7, 2016 – Palm/Bay Room
10:30 a.m. – 12:00 p.m.

Session Chair:

Chris Schumacher – RDH Building Science Laboratories
cschumacher@rdh.com

- 10:30 a.m.** **Duct-leakage repeatability testing**
Iain Walker – Lawrence Berkeley National Laboratory
- 11:00 a.m.** **Airflow through lightweight wall assemblies: Influence of size and location leakages**
Philipp Kolsch – Fraunhofer Institute of Building Physics
- 11:30 a.m.** **Simulating air leakage in walls and roofs using indoor and outdoor boundary conditions**
Simon Pallin – Oak Ridge National Laboratory

Principles Session 9: Thermal Performance and Thermal Bridging

Wednesday, December 7, 2016 – Palm/Bay Room
1:30 p.m. – 3:00 p.m.

Session Chair:

Jan Kosny – Fraunhofer USA CSE
jkosny@fraunhofer.org

- 1:30 p.m.** **Potential and limitations of infrared thermography on unventilated walls**
Katrien Maroy – Ghent University
- 2:15 p.m.** **Thermal analysis of curtain wall systems: A parametric study**
Nathan Van Den Bossche – Ghent University

Principles Session 10: Innovative Approaches

Wednesday, December 7, 2016 – Palm/Bay Room
3:30 p.m. – 5:00 p.m.

Session Chair:

Carl-Eric Hagendoft – Chalmers University
carl-eric.hagendoft@chalmers.se

- 3:30 p.m.** **Alternative core materials for vacuum insulation**
Boyce Chang – Iowa State University
- 4:00 p.m.** **Big- area additive manufacturing applied to buildings**
Kaushik Biswas – Oak Ridge National Laboratory
- 4:30 p.m.** **Economic efficiency of thermal insulation aimed at saving energy: A critical assessment**
Andreas Holm – FIW Muenchen

Principles Session 11: Whole Building Performance

Thursday, December 8, 2016 – Palm/Bay Room
8:30 a.m. – 10:00 a.m.

Session Chair:

Katrin Klingenberg – U.S. Passivehouse
katrin@passivehouse.us

- 8:30 a.m.** **Using the thermal mass of a building to reduce the magnitude of the peak power demand of the primary heating system: A whole-building simulation with parametric analysis**
Victor Fransson – Lund University
- 9:00 a.m.** **Implementation and validation of a longwave heat exchange model**
Florian Antretter – Fraunhofer Institute of Building Physics
- 9:30 a.m.** **A new approach for analysis of complex building envelopes in whole-building energy simulations**
Jan Kosny – Fraunhofer USA CSE