How to Prepare for High Performance Windows
Agenda

- Introductions (15 min)
- High Performance Enclosures (20 min)
- High Performance Windows (20 min)
- Break (5 min)
- The Installation Process - design to verification (50 min)
- Break (10 min)
- Mock-up (50 mins)
- Closing Remarks (10 min)
Introductions
Where the Blower Door is King
And spray foam is not the solution.
The Passive House standard is part of the solution

Crew of the Cornell Passive House Tower
Passive House Renovations

- Architect & Building Science Consultant
Knowledge Resources

475 CAD Details
Showing all 5 results

**Historic Masonry**
Deep Energy Retrofit (DER): Historic Masonry, Climate Zones 4-8 (DWG Files)

CAD drawings can be cut, pasted, edited, and customized to form the basis of a complete approach to air-tightness and vapor control required by your next high performance construction project.

**Wood Frame**
Deep Energy Retrofit (DER): Wood Frame, Climate Zones 4-8 (DWG Files)

CAD drawings can be cut, pasted, edited, and customized to form the basis of a complete approach to air-tightness and vapor control required by your next high performance construction project.

**2x6 Framing**
Climate Zones 4-8 (DWG Files)

CAD drawings can be cut, pasted, edited, and customized to form the basis of a complete approach to air-tightness and vapor control required by your next high performance construction project.
Interior air sealing & vapor control

pro clima®

TESCON PROFIL
To connect to windows, doors and corners

CONTEGA FC
To connect to plaster and building components

ROFLEX
Pipe gaskets for secure sealing around large services

INSTAABOX
Installation box for airtight seals to cables surrounding outlets when a service cavity is not possible

KAFLEX monoduo
Gaskets for airtight seals around cables and small pipes

Protection in winter
Drying to interior in summer
Exterior air sealing & vapor control
Wood fiber insulation boards/WRB

- Functions as weather resistive barrier
- Very vapor open
- Low embodied energy production
- Carbon sink
- Renewable resource material
  Roofs and walls
Sheep’s Wool Insulation

[Havelock Wool logo]

[Images showing sheep's wool insulation in a building and a person standing behind a pile of wool]

[Images of a child standing in front of wool insulation panels]
CompaCFOam Insulation
BEWISO

Best Window Solution

THERMAL TRANSMITTANCE
Uw max 0.11 btu/h ft²°F

NOISE PROTECTION
35 dB

TRIPLE-GLAZING

ISO-GLASS THICKNESS
Up to 79mm
Roof Daylighting
Heat Recovery Ventilation

LUNOS
energy-efficient

**e²**

- 90.6% efficient
- Very quiet
- Through wall, ductless HRV
Quality Control: PHI Software & Retrotec Testing
High Performance Enclosures
High performance enclosures are the basis for low-energy and Passive House buildings.

Enclosure performance is based on robust handling of:
1. water control
2. air control
3. vapor control
4. thermal control

With all penetrations fully integrated with control layers and control layers protected.
Water control - shed it
Optimal Airtightness...

Surround the building interior with airtightness, but also the insulation.
Primary air barrier inboard of insulation

1. Keeps conditioned air within the conditioned space.
2. Better protection against condensation risk.
3. Places the components of the air control layer in a climate controlled location.
4. Leaks can often be more readily found and easier to repair.
5. The air control layer can/should double as a vapor control layer.
inboard or outboard of framing
...always inboard of insulation

OUTBOARD OF FRAMING

- Airtight sheathing inboard of continuous fiberboard insulation.
- Airtight WRB inboard of continuous mineral wool insulation.

INBOARD OF FRAMING

- Airtight smart vapor control membrane inboard of cellulose insulation.
- Airtight sheathing inboard of I-Joist cellulose cavity.
Historic masonry too...

STO Gold at Masonry

Airtight smart membrane inboard of insulation & framing
Safety from moisture damages...

Drying Capacity > [unanticipated] Moisture Stress

= Freedom from Damages

Stuff Happens. So, help the drying.
Maximize the Drying: vapor diffusion
vapor drive outward in winter...

Outside  
Vapor open

Winter  
Drying Out

Inside  
Vapor Retarding (variable)  
How variable?  
Minimize potential Wetting from Inside
drying inward in summer...
...make a safety buffer (you don’t tailgate...)

As insulation levels rise, airtightness and vapor control should rise too.