Seeking Perfection
In Air-Sealing
August 13, 2020 · 3:00 pm

Presenters:
Jason Taylor (Byggmeister, Green Jobs Academy, HEEET), jasontaylor727@gmail.com
Ross MacPherson (New England Air Barrier)
• Everyone is somewhere between those 2 extremes
How do you get perfection...

...from the people who do the work?
• 1. Tell them you seek perfection
• 1. Tell them you seek perfection
• 2. Tell them it will be checked so feedback available
• 1. Tell them you seek perfection
• 2. Tell them it will be checked so feedback available
• 3. Tell them why perfection is important
6 Feet
1. Tell them you seek perfection
2. Tell them it will be checked so feedback available
3. Tell them why perfection is important
4. Check their work
Checking Big Foam
Checking with Tracer Smoke
Zonal Pressure Diagnostics
Checking Cellulose Densepack
Another Way...?

...to get to air-sealing perfection?

Ross?

Is there?
Utilizing Atomized Air-Sealing

BuildingEnergy Boston

Ross MacPherson
What is Atomized Air-Sealing?

Sealant + Compressed Air + Pressure
Best uses

• New Construction
• Gut Renovations
• Multi-Family Compartmentalization
• Program Air-Sealing Requirements
Challenges

• Adjoining lived-in units
• Finished spaces
• Underperforming build-quality
• Ventilation discussions
Sealant

- Acrylic Based
- Ultra-Low VOC
- Non-Flammable
- ILFI Red List Free
- SDI – 0
- Flame Spread – 0
- UL Listed as an air barrier for all L500, M500, P500, U300, V300, and W300 series assemblies
Preparation

- Windows
- HVAC
- Exhaust Fans
- Central Vacuum
- Attic Hatches
- Plumbing Lines
- Manual Air-Sealing
Is This A RESNET Test?

No. There are a few differences.
Seal
Interior Conditions
Results
Post Seal

• No Off-Gassing
• Slightly Tacky Floor
• Simulated 50 year Durability
• Cured in 24 – 72 Hrs
• Testing with Retrotec Fans
Uxbridge New Home

• Pre-Insulation
• Start 7,823 CFM
• Finish 1,073 CFM
• Under 2 Hours
Mt. Pleasant School

11 Units

- Built in 1905
- R0 Exterior Walls – Exposed Brick
- Replaced Windows
- Ducted Heat Pumps
- Electric Resistance H2O Tanks
- Atomized Air-Sealing – reduced average air leakage by 54%

MassSave R&A Rebate $73,000
Send Me Your Questions

ross@neairbarrier.com  800-916-5895  neairbarrier.com
Typical Air Barrier
Contractor Spectrum
Case Study Starting Number: 4,000 CFMs (-50)
- Cathedral ceiling
- Propa-vents with ridge vent
- 3 inches of recycled extruded polystyrene (R-15)
- 1 inch of Foam-it-Green 2 part foam (R-7)
- 5 ½ inch rafters (R-5.5)
- 2 Sky Lights (R-2?)
Skylights Suck...

...the heat out of a house.
You can get good skylights...

...but how much?
Thermal Weak Spots Suck...

...the heat out of a house
Rafter Issues

- R-5.5 on 10% of thermal boundary because of rafters...
- R-22 on the rest (not including sky lights)
- R-2 on Sky lights

- All other things being equal: heat loss on sky lights per square foot is 11 times worse than the rest (not including rafters)
- 4 times as much heat loss through rafters than in between the rafters
- (Jason will give wall void example)
Cheap ways...

...of bumping up the thermal weak spots with foam board
6 Mil Plastic Air barrier?
Do Windows Matter?
After closing up ridge vent and...

...blindly* foaming with 2 part spray foam...

* No blower door
...blower door number down to...

- 1882 cfms (-50)
Blower door guided air-sealing

• video
After blower-door-guided air-sealing:

- 758 CFMs (-50)
Beverly Craig sends me an email:

• Aero-barrier.
• Passiv Haus air-sealing standard reachable using this new technique
• I offer my entire bill as an incentive to try this new technique
Money Vs. This Future?
Sticky Feet
182 CFMs

| 13.5 | Envelope Leakage (Square Inches) |
| 112  | Envelope Leakage (CFM @ 50Pa)    |
| 1.3  | Envelope Leakage (ACH50)        |
| 182  | Fan Flow (CFM)                  |
| 104.6| Envelope Pressure (Pa)          |
| -64.6| Fan Flow Sensor Pressure (Pa)    |
After Removing Plastic and...
Replacing Door
Average Windows and...
6 Mil Plastic Air Barrier at the Bottom
Help me get more workers!!!