A Park Slope Rowhouse Reno
...with a vented dryer

Cramer Silkworth, PE
Baukraft Engineering
cramer@baukraft.com
'Typical’ PH Renovation

• Typical single-family, 3-storey, Brooklyn rowhouse
• Pursuing EnerPHit certification
Insulated & Air-sealed

- Cellulose, EIFS on the back
- Sto Emerald Coat on party walls & Intello on front back & roof for air barrier
Mech Systems

- 2-ton Mitsubishi heat pump for heating & cooling
- Zehnder CA350 ERV
Where it gets interesting

- Vented dryers require a 4” hole to the outside
- This is a big air leak
- And you can’t tape it shut for the blower door test
- Few good options for unvented dryers (right now)
- What to do, what to do...
The Creative Process
The Solution Already Exists!

American Aldes Dryer Vent Wall Hood:

• Simple aluminum flap w/ 2 magnets
• Non-mechanical, non-electrical “damper” (ok for code)
• Stays shut until around 75 Pa (blower door test is 50 Pa)
• Most dryers should be able to easily generate well over 75 Pa
The Solution Already Exists!

• Once open, magnets exert no force and thus no backpressure on dryer (unlike other spring- or gravity-dampered vents)
• Needs a bit of weather stripping though, and tweaking of magnet position
• $50, shipped.
www.iaqsource.com
Caveats

Make-up (Replacement) Air:

• Smaller, tighter houses have less leakage which dryer uses as makeup air

• Makeup air damper may be required in houses smaller than 20,000 cuft internal air volume and/or tighter than 1.0 ach50 – consult your local friendly engineer
Caveats

Energy Penalty:

• The air that replaces the exhausted air needs conditioning

• \~100 cfm in a big house will go unnoticed by occupants (as long as it’s not one big whole), but not by the heating & cooling system
Caveats

Energy Penalty, cont’d:

• 100 cfm, 1 hour a day, 365 days a year, in a 2,500 sf TFA (net floor area) house in NYC:
  = 0.20-0.25 kBtu/sfyr additional heating demand
  = 2.5-3% of EnerPHit limit, 4-5% of new PH
  = $40-50* a year if heated w/ electrical resistance
  = $15* a year on a heat pump

* @ 0.27 $/kWh$_{elec}$ and excluding energy used by dryer itself
Caveats

What else?

• Where is that leakage coming through?
• Could force H/ERV out of balance
• Competing against range hood, other things?
• Backdrafting fireplaces/etc – BAD!
Just 5 Pa Depressurization

Building Leakage Curve

Pressure (Pa) vs. Leakage (cfm)