

New Jersey Home Performance with Energy Star Renewable Energy Air Sealing Installation & Material Standards

I. Eligibility

Low-rise (three floors or less) wood framed construction single family or multi-family buildings (IBC 2006 Type V construction) are eligible for the Subsidized Air Sealing Incentive. Approval by local jurisdiction for multi-family dwellings is required prior to air sealing.

II. SUMMARY OF MEASURES

Air sealing

Objective: obstruct airflow through leaks and bypasses found in the attic, basement, living space, and exterior as indicated by the blower door and air sealing guidelines, to cost-effectively and safely control air leakage. Combustion safety screening and/or testing is required before and after air sealing, according to the *BPI Standard*.

III. HEALTH & SAFETY SPECIFICATIONS

A. Occupant

Any negative impact an installation may cause upon the health and safety of the occupants and the structural integrity of the building should be avoided to the extent that industry, BPI, and CSG standards are breached. The contractor/s will evaluate existing conditions and communicate potential problems with the customer so that problems will be rectified before beginning work. This includes the identification of possible indoor air contaminants, severe moisture problems, and potential back-drafting of combustion appliances.

Blower door tests will not be conducted if asbestos is present or suspected. If potential hazards cannot be rectified, the contractor may elect not to do the work.

IV. INSTALLATION AND MATERIAL STANDARDS

A. Air Sealing

The contractor/s will use an instrumented blower door and pressure diagnostics to locate air leakage paths and seal leaks in a dwelling. A fully instrumented blower door will be used in accordance with manufacturer's instructions and BPI specifications.

Pre- Air Sealing Assessment Standards:

- 1) If not previously completed, the assessor or technician will perform a general safety and mechanical check of the premises which will include:
 - a) Air Sealing Safety Requirements:
 - i) No unvented fossil fuel appliances (exception –oven/ ranges)
 - ii) No asbestos like materials in loose form (vermiculite, loose fill insulation, crumbling pipe/ duct wrap)
 - iii) No indoor pools, hot tubs, or large fountains (unless physically separated with an air barrier from main body of home- no adjoining duct work.
 - iv) No visible signs of active mold (exception small amount close to shower/ bath)
 - v) No standing water in basement or crawl space (except in sump pit)
 - vi) No roof leaks
 - vii) No plumbing leaks
 - viii) No exhaust fans vent to attic
 - ix) Clothes dryer vented to outside (no plastic or foil flex, must be at least semi-rigid metal)

New Jersey Home Performance with Energy Star Renewable Energy Air Sealing Installation & Material Standards

- x) At least one existing operational CO alarm
- b) No air sealing will be done in the event the above conditions are not investigated and corrected if necessary. Mechanical ventilation may be offered as a measure to mitigate moisture loads in the building.
- c) The technician will perform a combustion safety test before offering/ beginning air sealing, which will include:
 - i) Gas cooking stoves
 - ii) Gas water heaters
 - iii) Gas boilers and furnaces
 - iv) The combustion safety test will follow BPI's combustion safety testing procedures:
 - (1) Zone pressures created by exhaust appliances
 - (2) Zone pressures created by the duct system when the air handler is operating
 - (3) Flue gas spillage under worst-case conditions
 - (4) Carbon monoxide levels in flues (undiluted) at worst-case conditions
 - (5) Draft pressure checks of venting systems of space and water heaters under worst-case conditions
- d) If there is any failure in the combustion safety pretest, NO air sealing will be performed until the problem has been remedied.
- e) Notwithstanding these prior inspections, work will not proceed if it will result in a dangerous or unhealthy situation.

Installation Standards:

1. Upon arrival, the air-sealing technician will prepare the house for a blower door pretest and conduct the test according to BPI Standards.
2. The air sealing crew will perform blower door guided air sealing in the following areas:
 - a. The attic plane must be sealed as thoroughly as possible including:
 - i. Partition wall top-plate to drywall connections (includes gaps along firewalls in attached dwellings- requires local jurisdiction preapproval)
 - ii. Partition wall top-plate penetrations
 - iii. Chimney and flue chases with sheet metal and high temp caulk
 - iv. Drop soffits, drop ceilings, and chases with rigid durable materials
 - b. Attached garage partition walls and ceiling (if heated room over).
 - c. If the dwelling does not have an accessible attic (vaulted ceilings), the following areas, if applicable, must be air sealed:
 - i. Vented crawlspace, penetrations in subfloor above
 - ii. Basement and un-vented crawlspace, sealing of rim joist penetrations, sill plate to foundation wall, and foundation wall penetrations. (Note: DO NOT seal air leaks in any combustion appliance zone that includes an atmospheric draft appliance.)
 - iii. Other significant leaks in the sidewalls
 1. Windows and doors
 2. Baseboards, trims, or moldings
 3. Electrical outlets and switches
3. Air sealing technicians are to lift faced batt insulation in a manner to tear the facing only along the stapled edges.
4. The technicians will reinstall all displaced attic insulation and/ or level any blown-in materials. Proper clearance to non-IC rated light fixtures, exhaust fans, chimneys, and flues shall be maintained.
5. Conditions unfavorable to CFM50 reductions will be identified and documented.

New Jersey Home Performance with Energy Star Renewable Energy Air Sealing Installation & Material Standards

6. Air sealing technicians will conduct a blower door post-test after air-sealing work is complete. The results of these measurements and the results of the initial measurements will be provided to CSG upon completion of work.
7. The air sealing technician will perform post combustion appliance testing when air-sealing work is complete and documentation will be provided to CSG. The testing will include the following:
 - a. Gas water heaters
 - b. Gas boilers, furnaces
 - c. The combustion safety test will follow BPI's combustion safety testing procedures:
 - i. Worst-case Zone pressures created by exhaust appliances and/ or air handler
 - ii. Spillage
 - iii. Carbon monoxide levels in flues (undiluted)
 - iv. Draft pressure checks of venting systems of space and water heaters

B. Materials, Caulks, and Sealants

Sealants and Blocking Materials

The selected sealant materials must be suitable for the working surfaces to which it is applied and able to maintain a durable seal. Typical sealants include:

1. One-part and two-part urethane foam
2. Fireblock rated foam meeting ASTM E 84 and ASTM E 814
3. Plywood, foam board, waxed cardboard, foil bubble-wrap, or similar to block large bypasses
4. Siliconized latex and silicone caulks
5. Flashing materials
6. Drywall or rigid insulation (typically polystyrene "blue board") with joints sealed
7. "RCD #6" Mastic fibrous adhesive sealant or equivalent
8. Glass or mineral fiber insulation as a backer for other sealants
9. Backer rod (foam rope) as a backer for other sealants
10. All caulking materials must be rated for a minimum 20-year life
11. Siliconized acrylic caulks must be paintable ("Silicone" refers to 100% silicone caulk, clear or pigmented—not acrylic)

Material Installation Standards:

1. The proper sealant will be matched to the location where it is applied. Consideration will be given to durability, paintability, adherence, color, toxicity, flammability, etc.
 - a. Air spaces along and penetrations in Firewalls in multi-family dwellings will be air sealed with materials acceptable by the local jurisdiction, at a minimum all materials are to meet ASTM E 814.
 - b. Siliconized acrylics will generally only be used in interior locations or where paintability is important. When used in visible areas, customer must approve the application, and see a sample before continuing. Clear acrylics, due to their shiny appearance, must be used only where appropriate, and should be approved by the customer prior to use in visible areas. Clear acrylics should be avoided where possible due to greater shrinkage.
 - c. Pure silicone will generally be used in exterior applications, unless paintability is needed. Pure silicone will be used anywhere that sealants are needed between wood and metal, wood and concrete, or other materials with differential expansion as moisture and temperature vary, or where greater flexibility is needed.
2. Dimensional limits:
 - a. Siliconized acrylic shall not be used in openings or cracks over 3/16" without a backer, and generally should not be used in openings or cracks more than 3/8".
 - b. Pure silicone shall not be used in openings or cracks over 3/8" without a backer, and generally should not be used in openings or cracks more than 1/2".

New Jersey Home Performance with Energy Star Renewable Energy Air Sealing Installation & Material Standards

- c. 1-part Foam shall not be used to span gaps or openings more than 1 ½" without a backer material.
3. High temperature sealants (not foam) will be used on and around chimneys, flues, "pie plates," cleanouts, etc.
4. Foam sealants and spray foam insulation will not be used in the finished living spaces, left exposed in the garages or unfinished basements, or where exposed to sunlight or other ultraviolet sources. It will not be used near any heat-producing device.