

CALIFORNIA ENERGY COMMISSION

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December 1, 2014

TO: HERS Providers and HERS Raters
SUBJECT: QUALITY INSULATION INSTALLATION (QII) AND AIR SEALING

Questions have come to the Energy Commission regarding air sealing of a building's envelope and the type of products that can be used for Quality Insulation Installation (QII). All projects taking QII credit require HERS verification for proper air sealing and insulation installation. The 2013 Residential Reference Appendix RA3 Section RA3.5 lists all of the requirements for QII:

<http://www.energy.ca.gov/2012publications/CEC-400-2012-005/CEC-400-2012-005-CMF-REV3.pdf>

QII requires the building envelope to have a **Continuous Air Barrier**. A **Continuous Air Barrier** is a combination of interconnected materials and assemblies joined **and** sealed together to provide a continuous barrier to air leakage through the building envelope. A continuous air barrier is required at all exterior walls, ceiling, and raised floors of the conditioned space. This includes walls that attach to the garage, attic space attached to walls, chases, and cantilevered floors.

Individual materials must have an air permeance not exceeding 0.004 cfm/ft^2 under a pressure differential of 0.3 in. w.g. (1.57 psf) (0.02 L/s.m^2 at 75 pa) when tested in accordance with ASTM E2178. Products that meet these requirements are listed below.

All joints where individual materials meet must be sealed with caulk, foam, tape, or a material specifically designed for building envelope sealing to prevent air infiltration.

All products used to make up the **Continuous Air Barrier** must be installed according to the manufacturer's instructions. It is the installer's responsibility to ensure the products are installed properly, and it is the HERS rater's responsibility to verify proper installation.

Sealing of joints occurs when two individual materials are installed and then the joint is caulked, foamed, or taped. As an example, a hard cover is installed over a framed drop ceiling. A sealant must then be applied to the perimeter of the hard cover and to the top plate.

A gasket must be used when a sealing product is installed and at a later date an additional air material is installed. In order for a gasket to be used, the gasket must be thick enough to fill any irregularities (approximately 1/4 inch thick) between the two surfaces and the gasket must remain flexible so that it can expand/compress and still seal the two materials together where they meet. As an example, a gasket might be installed along the interior top plates where the drywall will be installed at a later date.

An additional option to meet the air sealing requirements for the envelope is to do a blower door test, not leaking more than 0.40 cfm/ft² at a pressure differential of 0.3 in w.g. (1.57psf)(2.0 L/s.m² at 75 pa) using ASTM E779 or equivalent.

The following products meet the air permeance testing performance levels. This list is provided as an example, but is not meant to be inclusive of all qualifying materials. As a reminder, where these materials come together, a joint is formed that must be sealed or gasketed to meet QII.

- Thermo-Ply
- Plywood - minimum 3/8 inch
- Dimensional lumber
- Oriented strand board - minimum 3/8 inches
- Foil-back polyisocyanurate insulation board - minimum 1/2 inch
- Extruded polystyrene insulation board - minimum 1/2 inch
- Foil backed urethane foam insulation (1 inch)
- Closed cell spray polyurethane foam with a minimum density of 2.0 [lb./cu.ft.](#) and a minimum thickness of 2.0 inches
- Open cell spray polyurethane foam with a minimum density of 0.4 to 1.5 [lb./cu.ft.](#) and a minimum thickness of 5 1/2 inches
- Exterior or interior gypsum board - minimum 1/2 inch
- Cement board - minimum 1/2 inch
- Built-up roofing membrane
- Modified bituminous roof membrane
- Particleboard - minimum 1/2 inch
- Fully adhered single-ply roof membrane
- Portland cement/sand purge, or gypsum plaster minimum 5/8 inch
- Cast-in-place and precast concrete
- Fully grouted uninsulated and insulated concrete block masonry
- Sheet steel or aluminum

By using the proper materials and technique, a Continuous Air Barrier is built that will reduce the amount of unconditioned air, drafts, noise, and moisture that enters the home. Proper air sealing will also minimize temperature differences between rooms and reduce energy bills.

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If you have further questions or comments about this document please contact me at (916) 653- 1598 or Tav.Commins@energy.ca.gov

Sincerely,

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