

Seattle Permits

— part of a multi-departmental City of Seattle series on getting a permit

Spray-Applied Foam Insulation

Updated August 27, 2021

Spray foam insulation can serve as a useful energy conservation tool. Although spray foam is sometimes more expensive than conventional fiberglass batts, some foam types provide almost double the insulating value of fiberglass. Spray foam can fill odd-shaped spaces, and certain varieties can also function as an air barrier and vapor retarder. However, the spray foam products on the market each have different characteristics and may increase fire hazards, so it is important to determine the correct spray foam for your project.

SDCI will accept use of spray-applied foam insulation products within wall, floor and ceiling assemblies, if they comply with conditions of an up-to-date testing evaluation report from ICC-ES (Evaluation Service) or other certified testing lab, and provisions of the Seattle Residential Code (SRC) or the Seattle Building Code (SBC), and the Seattle Energy Code (SEC).

Code Requirements

- The conditions of use for each spray-applied foam insulation product are unique. A copy of the ICC-ES report is required at the job site.
- The building plans included in the permit application shall identify:
 - The areas where spray-applied foam insulation product will be used
 - The R-value of the foam designated for each location
- The installer must provide the SDCI field inspector with a letter certifying that the installation was in accordance with the manufacturer's instructions and the testing evaluation report, and include the date, product name, installer's name and address, company name, and project address.

- The product shall have a maximum flame-spread index of 75 and a maximum smoke-developed index of 450 (SRC R316.3, SBC 2603.3).
- A thermal barrier, at least equivalent to 1/2-inch gypsum board, shall separate foam insulation from interior spaces (SRC R316.4, SBC 2603.4).
- Where fire-rated assemblies are required, spray-applied foam may only be used if the testing evaluation report includes details for tested fire-rated assemblies.
- The substitution of spray-applied foam for other types of insulation in tested assemblies is not allowed.
- For Types I, II, III and IV construction, the testing evaluation report must specifically address provisions of SBC 2603.5 regarding exterior walls and 2603.6 for roofs. See also the "special approval" exception in Section 2603.9.
- Building envelope assemblies shall have vapor retarders in accordance with SRC R702.7 or SBC 1404.3, unless the testing evaluation report states that the insulation has a perm rating of 1.0 or less.
- Foam plastic board and spray foam insulation must comply with 2019 state law HB 1112 that restricts the type of blowing agents used to manufacture the insulation to those with lower global warming potential (GWP).

What is an "unvented attic" or "unvented enclosed rafter space" and what do they have to do with spray foam insulation?

A ventilation space is normally required between roof insulation and the roof deck above. Without this ventilation space, moisture migrating through the insulation can condense or freeze on the roof sheathing above, and this has "rotted out" many roofs in Seattle. However, if you use a type of insulation that doesn't allow air and water vapor to pass through to the roof deck (or if you keep the roof deck warmer with additional insulation above the sheathing) then condensation is unlikely



and the ventilation space is not required. An attic without ventilation is known as an “unvented attic.” If the roof/ceiling assembly is formed by rafters with the roof sheathing and the ceiling materials attached directly to the rafters, this is an “enclosed rafter space” (commonly called a “cathedral ceiling”). If no ventilation is provided through the cavity created by the assembly, this is known as an “unvented enclosed rafter space.”

Spray foam insulation products are categorized as either “air-impermeable” or “air-permeable” depending on the installed thickness. Closed-cell types may be rated as “air-impermeable” with less than an inch of thickness, whereas the less-expensive open-cell types may require 4 inches or more, or may not be “air-impermeable” at any thickness. Check the testing evaluation report (see below) for each specific product.

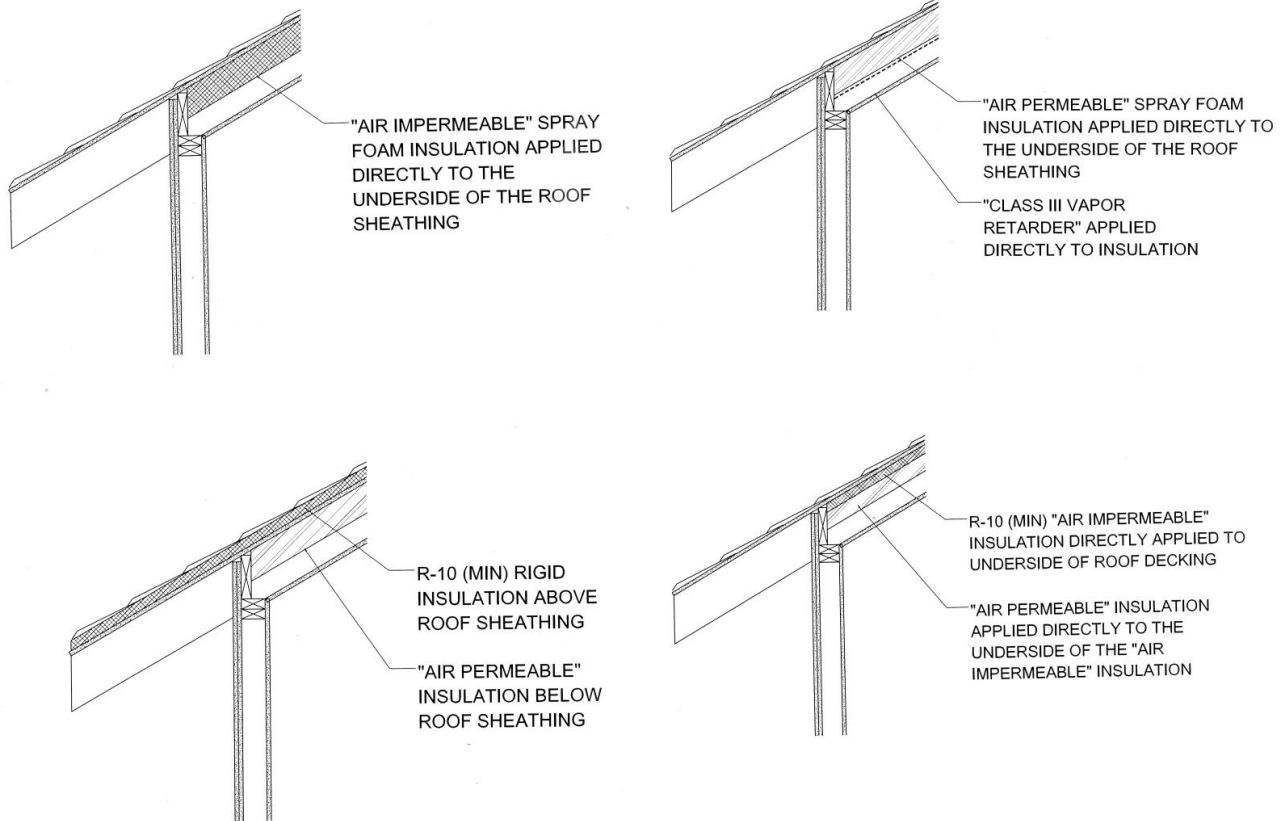
The Seattle Residential Code and Seattle Building Code provide several options for unvented attic or unvented enclosed rafter space assemblies. Spray foam insulation may be used in some of those options, but it is

critical to first determine whether “air-permeable” or “air-impermeable” insulation is required.

Four configurations of unvented attics or unvented enclosed rafter spaces are allowed (SRC Section R806.5 and SBC Section 1202.3). See Figure 1.

1. “Air-impermeable” insulation applied directly to the underside of the roof sheathing.
2. “Air-permeable” insulation between the roof joists, with a Class III vapor retarder coating or covering applied directly to the underside of the insulation. (A Class III vapor retarder might be as simple as a coat of latex paint, but any coating applied must be specifically recognized by the spray foam manufacturer’s written instructions.)
3. “Air-permeable” insulation applied to the underside of the roof deck, with minimum R-10 rigid insulation above the roof deck.

Figure 1 - Spray Insulation Application



4. “Air-permeable” insulation applied to the underside of minimum R-10 “air-impermeable” insulation (spray foam or rigid board), which is applied directly to the underside of the roof deck.

ICC Evaluation Service Reports (ICC-ES)

ICC Evaluation Service (ICC-ES) produces testing evaluation reports for many construction-related products. Their reports for spray foam insulation summarize the product characteristics and limitations for the use of the products. They can be downloaded from www.icc-es.org. Test reports from other certified testing agencies are also acceptable.

Important elements to check in the ICC-ES report for your product:

- Section 3.0 (or sometimes Section 4.1) to check the allowable temperature ranges for storage and application. These temperatures are sometimes quite restrictive.
- Section 3.2 to determine the maximum allowable installed thickness. The maximum allowable thickness varies between products, from as little as 2 inches to as much as 14 inches.
- Section 3.3 to determine the actual R-value of the thickness you plan to install.
- Section 3.4 for the installed thickness required to be considered “air impermeable.” (If the report doesn’t identify this, the product is considered to not be “air impermeable” at any thickness.)
- Section 4.2 for special restrictions on application temperatures or thicknesses.
- Section 4.2 for the “thermal barrier” required to protect the building interior from the spray foam insulation for fire safety. Generally this is ½-inch thick gypsum board or equivalent.
- Section 5.0 for any limitations on construction types, such as “only for Type 5B construction.”
- Section 5.0 for required qualifications of installers. Many products can only be installed by installers that are trained and certified by the manufacturer.

For Further Information

- Further information on the Seattle Residential Code and Seattle Building Code requirements is available online at [www.seattle.gov/sdci/codes/codes-we-enforce-\(a-z\)](http://www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)).

- Further information on the Seattle Energy Code requirements is available online at the energy code website at [www.seattle.gov/sdci/codes/codes-we-enforce-\(a-z\)/energy-code](http://www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)/energy-code).
- Further information regarding on Washington state HFC blowing agent GWP limitations is available at 1112-S2.SL.pdf (wa.gov)

Access to Information

Links to electronic versions of SDCI **Tips**, **Director's Rules**, and **Forms** are available on the "Tools & Resources" page of our website at www.seattle.gov/sdci. Paper copies of these documents are available from our Public Resource Center, located on the 20th floor of Seattle Municipal Tower at 700 Fifth Ave. in downtown Seattle, (206) 684-8467.