

Inspecting Attic Insulation

There are several factors to consider when inspecting loose fill, blown-in attic insulation. These include the type, depth and density of the insulation.

Types of blown-in insulation

The two commonly used types of blown-in attic insulation are cellulose and fiberglass. Blown-in rock wool insulation is also available but its use in the Pacific Northwest is not common.

Cellulose is a natural wood product and is made primarily from recycled newspaper. A fire retardant chemical is added to meet flame-spread and smoke-development requirements of today's building codes. Fiberglass insulation is the same type of material that is in batts or rolls of fiberglass insulation except it is chopped or cubed so that it can be installed with an insulation blowing machine. Fiber glass insulation typically contains 20% to 30% recycled glass¹.

The R-value of loose fill cellulose is R-3.2 to 3.8 per inch². Loose fill fiberglass has an R-value of R-2.2 to 2.7 per inch³. Achieving the desired R-value depends on both the depth of the insulation and its density.

Insulation depth

Depending on your climate, energy codes require varying R-values for ceiling insulation. Code requirements may also vary for attics and single rafter or joist vaulted roof assemblies. The Washington State Energy Code (WSEC) requires that all attics be insulated to R-38 in both Climate Zones 1 and 2. Using the known R-values per inch of each type of insulation, we know that to install R-38 you need from 10" to 12" of cellulose and 14" to 17" of fiberglass. For an accurate depth for a given type of insulation there is a chart on the insulation bag noting the required depths for various R-values.

To assist an inspector and the installer in verifying the depth of the insulation, the WSEC requires that depth markers be placed in the attic space. The depth markers must be installed for every three hundred square feet of attic area and must face toward the attic access.

¹ Percentages of recycled content from USDOE, EERE

² R-values obtained from Cellulose Insulation Manufacturers Association

³ Loose fill fiberglass R-values from USDOE, EERE



Insulation depth marker

Insulation density

Checking the depth of the insulation is essential but the density of the insulation is equally important. Blown-in insulation can be “fluffed up” when installed so that it appears to meet the depth requirement without achieving the desired R-value. Over time the insulation may settle, resulting in a lower R-value.

The easiest way to document the amount and R-value of installed blown-in insulation is to install an attic card. These are usually stapled to the truss or rafter near the attic access. The card should contain the following information cited by the Federal Trade Commission.

If you are an installer, you must give your customers a contract or receipt for the insulation you install. For loose-fill, the receipt must show the coverage area, initial installed thickness, minimum settled thickness, R-value, and the number of bags used.⁴

The following is a chart for Owens Corning *ThermaCube Plus*[®] blown-in fiberglass insulation.

⁴ Code of Federal Regulations (CFR) 460.17

Attic/Ceiling Guidelines

R-Value	Minimum Bags/1,000 Sq. Ft.	Maximum Coverage/Bag (Net Sq. Ft.)	Minimum Weight/Sq/ Ft. (lbs.)	Minimum Thickness (inches)
R-49	25.0	40	0.878	19.50
R-44	22.2	45	0.786	17.75
R-38	19.2	52	0.676	15.50
R-30	15.2	66	0.531	12.25
R-26	13.2	76	0.459	10.75
R-22	11.1	90	0.388	9.25
R-19	9.5	105	0.334	8.00
R-11	5.5	182	0.193	4.75

Manufacturers provide similar charts on their insulation bags. The chart states the minimum number of bags that need to be installed per 1000 square feet of area to obtain a specific R-value. For example, to install R-38 in an attic with 3200 square feet of area use the following formula:

$$3200 \text{ ft}^2 \div 1000 = 3.2$$

$$19.2 \text{ (bags per 1000 ft}^2 \text{ for R-38)} \times 3.2 = \underline{61.4 \text{ bags}}$$

Building inspectors typically check the insulation depth to verify compliance with local codes. Making sure the correct amount of insulation is installed requires a bag count, or a comparison with the recommendations on an attic card.

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