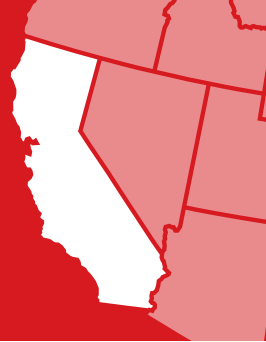




California Minimum Insulation Requirements for Nonresidential and Multifamily Building Roofs Effective Jan. 1, 2023



RECOVER, REROOF — MINIMUM ROOF INSULATION ASSEMBLY REQUIREMENTS

When Do the Title 24 Requirements for Minimum Roof Insulation Levels Apply to Roof Alterations?

- Roof alterations that affect more than 50 percent of the roof area or more than 2,000 square feet of roof, whichever is less, must comply with the minimum insulation requirements.
- Insulation requirements for alterations apply to both roof replacements and roof recovers.
- Note: Hospitals and other healthcare facilities are exempt from the alteration requirements (see Title 24 Section 141.0, exception).

Nonresidential and Hotel/Motel Buildings (Section 141.0(b)2Bii)

- **Minimum Insulation Requirements:** Roof alterations (both replacements and recovers) must comply with the minimum R-values or U-factors in Table 141.0-C as follows:

Insulation Requirements for Roof Alterations

Climate Zones	R-value	U-factor	Table
1 – 5, 9 – 16	R-23 Continuous Insulation (ci)	U-0.037 with at least R-10ci above deck	141.0-C
6 – 8	R-17 Continuous Insulation (ci)	U-0.047 with at least R-10ci above deck	141.0-C

ci - continuous insulation

- **Exceptions and Backstops:** Recovers are not required to meet the levels specified in Table 141.0-C if at least **R-10ci** of new insulation is installed above the roof deck.

When existing mechanical equipment located on the roof will not be disconnected and lifted as part of the roof alteration, insulation added shall be the greater of **R-10ci** or the maximum installed thickness that will allow the distance between the height of the roof membrane surface to the top of the base flashing to remain in accordance with the manufacturer's installation instructions.

Note: Compliance with Table 141.0-C without exception is required if adding R-10ci necessitates lifting the equipment in order to comply with the manufacturer's recommendations for flashing heights.

Tapered insulation with a thermal resistance less than that prescribed in Table 141.0-C may be used at the drains and other low points, if insulation thickness is increased at the high points of the roof so that the average thermal resistance equals or exceeds the value specified in Table 141.0-C.

The area of the existing roof that is recoated is not required to be insulated. However, it is important to note that the code does not define "recoat." Typically, it is the application of a new coating over an existing coating. A new roof coating or liquid-applied roof system installed over an existing BUR, modified bitumen, or single-ply roof membrane may not be considered a recoat. Consult the authority having jurisdiction for their interpretation.

Multifamily Buildings (Section 180.2(b)1Aiii)

- **Minimum Insulation Requirements:** Roof alterations shall be insulated to **R-14** continuous insulation or a U-factor of U-0.039 in Climate Zones 1, 2, 4, and 8 through 16. Note: There are no insulation requirements for multifamily building roof alterations in the other climate zones.
- **Exceptions and Backstops:** Roof recovers with new **R-10ci** of insulation added above the roof deck are not required to meet the minimum requirements for other roof alterations.

When existing mechanical equipment located on the roof will not be disconnected and lifted, the insulation added may be limited to the greater of **R-10ci** or the maximum installed thickness that will allow the distance between the height of the roof membrane surface to the top of the base flashing to remain in accordance with the manufacturer's installation instructions.

Tapered insulation with a thermal resistance less than **R-14** may be used at the drains and other low points if insulation thickness is increased at the high points of the roof so that the "average thermal resistance" equals or exceeds **R-14**.

The area of the existing roof that is recoated is not required to be insulated. However, it is important to note that the code does not define "recoat." Typically, it is the application of a new coating over an existing coating. A new roof coating or liquid-applied roof system installed over an existing BUR, modified bitumen, or single-ply roof membrane may not be considered a recoat. Consult the authority having jurisdiction for their interpretation.

GAF Solutions

	Without Cover Board	With Polyiso Cover Board
R-10	1.75"	1.4" (R-8.0) + 1/2" EnergyGuard™ HD Barrier Polyiso Cover Board R-2.5 = total R-10.5
R-14	EnergyGuard™ Polyiso Insulation 2.5" = R-14.4	2.1" (R-12) + 1/2" EnergyGuard™ HD Barrier Polyiso Cover Board R-2.5 = total R-14.5
R-17	EnergyGuard™ Ultra Polyiso Insulation 3" = R-17.4	2.6" (R-15.0) + 1/2" EnergyGuard™ HD Barrier Polyiso Cover Board R-2.5 = total R-17.5
	EnergyGuard™ Barrier Polyiso Insulation 2 layers of 1.5" = R-17.4	2 layers of 1.3" (R-7.4) + 1/2" EnergyGuard™ HD Barrier Polyiso Cover Board R-2.5 = total R-17.3
R-23	2 layers of 4" = R-23.6	2 layers of 2.4" (R-13.8.) + 1/2" EnergyGuard™ HD Barrier Polyiso Cover Board R-2.5 = total R-30.1
	2 layers of 2.1" = R-24	2 layers of 1.8" (R-10.3.) + 1/2" EnergyGuard™ HD Barrier Polyiso Cover Board R-2.5 = total R-23.1

GAF Insulation Options

Cost Effective



EnergyGuard™ Polyiso Insulation

Polyiso insulation with glass fiber reinforced facers (GRF) on both sides. Polyiso offers the highest R-value per inch of any board insulation.

Panel Characteristics

- Flat Thickness: 1" – 4.6"
- Tapered Thickness: 1/2" – 4.5" (various slopes)
- PSI: 20 or 25

Higher Performance



EnergyGuard™ Ultra

Polyiso insulation with coated glass fiber reinforced facers (CGF) for added durability and moisture and mold* resistance. Achieves an ANSI/UL 790 Class A roofing fire-resistance rating over C-15/32 deck without the use of a gypsum board or slip sheet when installed at a minimum 3" (76 mm) thickness. Refer to UL Product iQ for actual assemblies.*

Panel Characteristics

- Flat Thickness: 1" – 4.6"
- Tapered Thickness: 1/2" – 4.5" (various slopes)
- PSI: 20 or 25

Fire Rating



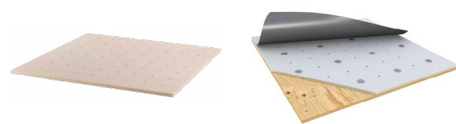
EnergyGuard™ Barrier Polyiso Insulation

Polyiso insulation with coated glass fiber reinforced facers (CGF) for added durability and moisture and mold* resistance. Achieves an ANSI/UL 790 Class A roofing fire-resistance rating over C-15/32 deck without the use of a gypsum board or slip sheet when installed at a minimum 1/2" (13 mm) thickness. Refer to UL Product iQ for actual assemblies.*

Panel Characteristics

- Flat Thickness: 1/2" – 4.6"
- PSI: 20

GAF HD ISO Cover Board Options



EnergyGuard™ HD Barrier Polyiso Cover Board

High-density 1/2" polyiso insulation with coated glass fiber reinforced facers (CGF). Achieves an ANSI/UL 790 Class A roofing fire-resistance rating over C-15/32 deck without the use of a gypsum board or slip sheet when installed at a minimum 1/2" (13 mm) thickness. Refer to UL Product iQ for actual assemblies.*

Cover Board Characteristics

- R-value: 2.5
- PSI: 80 psi min to 109 psi max

Options Available to Meet Sustainability Goals

All of the above products are available in non-halogenated formulations to facilitate sustainable certifications and the DECLARE Label. For more information on the products in this document, please go to the individual product data sheet on gaf.com.

Useful Links

- The California Energy Commission's web-based tool for locating the Climate Zone applicable to a specific project can be accessed [here](#).
- The California 2022 Energy Code, Reference Appendices (including JA4), Climate Zone Maps, and the 2022 Multifamily and Nonresidential Compliance Manual can be accessed [here](#).
- Energy Code Ace tools, training, and resources (including fact sheets) can be accessed [here](#).

* GAF warranties and guarantees do not provide coverage against mold or other biological growth. Refer to gaf.com for more information on warranty and guarantee coverage and restrictions.



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