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STATE OF CALIFORNIA

INSULATION INSTALLATION

CEC-CF2R-ENV-03-E (Revised 09/18) CALIFORNIA ENERGY COMMISSION

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Medium and light density SPF manufacturers claim various R-values per inch. In California the maximum R-value that can be claimed for ccSPF is an R-value of 5.8 per inch, and for ocSPF is an R-value of 3.6 per inch, unless documentation is provided showing that the product and/or manufacturer has a current ICC Evaluation Service Report (ESR) that shows compliance with Acceptance Criteria for Spray-Applied Foam Plastic Insulation-AC377.

***NOTE**: The Energy Standards Section 110.7 requires that "all joints, penetrations and other openings in the building envelope that are potential sources of air leakage shall be caulked, gasketed, weather stripped, or otherwise sealed to limit infiltration and exfiltration". In areas where spray foam (SPF) insulation is used, the SPF can be considered the air barrier. Other than rigid board insulation, all other forms of insulation are not considered as an air barrier.*

A. Roof/Ceiling Insulation

01	02	03	04	05	06	07	08	09	10
I.D.	Manufacturer & Brand	Assembly/ Framing Material	Assembly Thickness (inches)	Framing Size & Spacing	Insulation Type	ESR Number	Core/Cavity Insulation R-value	Insulation Depth (inches)	Continuous Insulation R-value

B. Wall Insulation

01	02	03	04	05	06	07	08	09	10
I.D.	Manufacturer & Brand	Assembly/ Framing Material	Assembly Thickness (inches)	Framing Size & Spacing	Insulation Type	ESR Number	Core/Cavity Insulation R-value	Insulation Depth (inches)	Continuous Insulation R-value

C. Mass Insulation

01	02	03	04	05	06	07	08	09
I.D.	Manufacturer & Brand	Walls Above Grade	Mass Thickness (inches)	Exterior Furring Strip Type/ Depth (inches)	Interior Furring Strip Type/Depth (inches)	Insulation Type	Exterior Insulation R-value	Interior Insulation R-value

D. Raised Floor Insulation

01	02	03	04	05	06	07	08	09
I.D.	Manufacturer & Brand	Framing Material	Framing Size & Spacing	Insulation Type	ESR Number	Cavity Insulation R-value	Insulation Depth (inches)	Exterior Floor Insulation R-value

E. Slab Floor/Perimeter Insulation (See Section F. for Insulation Requirements for Heated Slabs)

01	02	03	04	05	06	07	08
I.D.	Manufacturer & Brand	Floor Type	Insulation Type	Insulation Depth (inches)	Insulation R-Value	Vertical Insulation Length (inches)	Horizontal Insulation Length (feet)

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F. Heated Slab Insulation	
01	All heated slabs shall be insulated as required by Section 110.8(g). Footings must meet required insulation levels.
02	Insulation shall be installed from the top of the slab, down 16 inches or to the frost line, whichever is greater. Climate zones 1-15 requires R-5, climate zone 16 requires R-10.
03	Alternatively, vertical insulation from top of slab at inside edge of outside wall down to the top of the horizontal insulation. Horizontal insulation from the outside edge of the vertical insulation extending 4 feet toward the center of the slab in a direction normal to the outside of the building in plain view. Climate zones 1-15 require R-5, and climate zone 16 requires R-10 vertical and R-7 horizontal.
The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.	

G. Minimum Mandatory Measures	
01	**Insulation** - 110.8(a): All installed insulation is certified and listed with the Department of Consumer Affairs, "Standards for Insulating Material."
02	**Insulation** - 110.8(b): Urea formaldehyde foam insulation is protected by 4 mil polyethylene vapor retarder.
03	**Insulation** - 110.8(c): Flame spread and smoke density requirements of CBC are met.
04	**Raised Floor** - 150.0(d): All raised wood-frame floor have a minimum R-19 insulation or equivalent U-factor.
05	**Slab Floor/Perimeter** - 150.0(f): Water absorption rate for the insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch, and perimeter insulation is protected from physical damage and UV light deterioration.
06	**Above Grade Exterior Wall** - 150.0(c)1: All 2x4 wood-frame walls have a minimum R-13 insulation or equivalent U-factor.
07	**Above Grade Exterior Wall** - 150.0(c)2: All 2x6 wood-frame walls have a minimum R-19 insulation or equivalent U-factor.
08	**Ceiling/Rafter Roof** - 150.0(a)1: All wood-framed ceilings have a minimum R-22 insulation or equivalent U-factor.
09	**Vapor Retarder** – 150.0(g)1: In Climate Zones 1 through 16, the earth floor of unvented crawl space shall be covered with a Class I or Class II vapor retarder, This requirement shall also apply to controlled ventilation crawl space for buildings complying with the Exception to Section 150.0(d).
10	**Vapor Retarder** – 150.0(g)2: In Climate Zones 14 and 16, a Class I or Class II vapor retarder shall be installed on the conditioned space side of all insulation in all exterior walls, vented attics and unvented attics with air-permeable insulation.
11	**Heated Slabs** - 110.8(g): All heated slabs shall be insulated as required. ▪ Insulation shall be installed from the top of the slab, down 16 inches or to the frost line, whichever is greater. Climate zones 1-15 require R-5, and climate zone 16 requires R-10. ▪ Alternatively, vertical insulation from top of slab at inside edge of outside wall down to the top of the horizontal insulation. Horizontal insulation from the outside edge of the vertical insulation extending 4 feet toward the center of the slab in a direction normal to the outside of the building in plain view. Climate zones 1-15 require R-5, and climate zone 16 requires R-10 vertical and R-7 horizontal.
The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.	

H. Installed Insulation	
01	Installed insulation R-values are the same or greater than listed on the CF1R.
02	No gaps or voids between the insulation and framing.
03	No gaps between the sides or ends of batt insulation.
04	Loose-fill insulation must be installed to the minimum installed weight per square foot (density) of the manufacturer's cut sheet for the proposed R-value.
05	Batt insulation is not compressed (no stuffing of the insulation into the cavity) and is installed to its full thickness.
06	Insulation is cut around obstructions such as electrical boxes.
07	Batt insulation is delaminated around all plumbing and electrical lines in ceilings, walls, and floors.
08	Band joists are insulated to the same R-value as the wall.
09	In all narrow cavities the insulation shall be cut to fit or filled with expanding foam.
10	Insulation was installed per manufacturer instructions.
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I. Wall Insulation	
01	When allowed by the manufacturer, low expanding foam shall be used to fill gaps and voids around windows and doors. If not, the cavity must be airtight and filled completely with insulation. Batt insulation must be cut to width. No stuffing allowed.
02	Install wall insulation before installing tubs, showers, and fireplaces.
03	Electric panels on walls separating conditioned and unconditioned space are sealed and insulated behind the panel with rigid insulation or expanding foam.
04	All walls of interior closets vented to the outside for HVAC or water heating equipment have the same R-value and air barrier as the exterior walls and ceiling. Doors are insulated and weather stripped.
05	Ducting is not allowed in exterior walls unless it is insulated to R-6 or greater, and the insulation and ducting are not crushed. Ducting is not allowed in 2x4 wall assemblies.
06	Corner channels, wall intersections, and double sided shear walls are insulated to the required R-value before enclosing the wall.
07	Insulation that does not fill the cavity is placed against the exterior air barrier.
08	Band joists are insulated to the same R-value as the walls.
The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.	

J. Ceiling/Roof Insulation	
01	Insulation extends to the outside edge of the exterior top plates and is flush against any ventilation dams/baffles.
02	Insulation is in direct contact with ceiling, so there are no gaps between the ceiling and the insulation.
03	For chimneys and flues, the insulation is in contact with the sheet metal collar.
04	Can lights are covered with insulation to the same depth as required by the CF1R for ceiling insulation. If not, an area weighted calculation is required to be turned in with this compliance document (CF1R-ENV-02-E).
05	Walkways and mechanical platforms are insulated to the same R-value as required for the ceiling. If not, an area weighted calculation is required to be turned in with this compliance documents (CF1R-ENV-02-E).
06	Insulate soffits by adding an air barrier and covering with insulation, or insulate the entire soffit including floor and walls.
07	Knee walls and skylight shafts are insulated to the wall R-value and in full contact with the interior air barrier. If framing on these surfaces is laid flat batt insulation is cut to fit around the framing. Batt insulation is not allowed to be draped over the framing.
08	Attic access doors are insulated to the same R-value as the ceiling. The insulation is permanently attached using adhesive or mechanical fasteners.
09	Attic access must be surrounded with a dam at least the same depth as the insulation to prevent loss of ceiling insulation.
10	Batt insulation is cut to fit around cross bracings and truss webs in the attic.
The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.	

K. Raised Floor Insulation	
01	Insulation is in full contact with subfloor.
02	Insulation hangers are spaced at 18 inches or less; insulation hangers must not compress insulation.
03	If netting or mesh is used, the cavity under the floor is filled and in contact with the subfloor.
04	If the basement is conditioned, the walls adjacent to the crawlspace must meet minimum wall R-value requirements. This includes framed stem walls, and vertical concrete retaining walls.
05	If access to the crawl space is from the conditioned area, the raised floor must have an airtight insulated access hatch.
The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.	

L. Floor Above Garage Insulation	
01	Insulation must be in full contact with the subfloor if the air barrier is at the band joist at the garage/house wall.
02	Insulation hangers spaced at 18 inches or less; insulation hangers must not compress insulation.
03	If netting or mesh is used, the cavity under the floor is filled and in contact with the subfloor.
04	If the air barrier is at the perimeter of the garage, below the conditioned subfloor, the insulation is placed on the garage ceiling. The perimeter of the subfloor is also insulated.
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M. Cantilevered Floor Insulation	
01	Insulation is in full contact with the cantilevered subfloor. Insulation hangers are spaced at 18 inches or less; insulation hangers do not compress insulation.
02	If netting or mesh is used, the cavity under the floor is filled and in contact with the subfloor.
03	Sealed blocking is installed between joists where a wall rim joist would be located in the absence of a cantilever. Insulation is placed on both sides of this block.
The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.	

N. Attached Porch Roof Insulation	
01	The exterior insulated wall at the intersection with the porch roof is fully insulated above, below, and behind the roof line.
02	Where truss framing is used, airtight blocking is installed at the top and bottom of each wall/roof section and insulated.
The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.	

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Installation documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/HERS Certification Identification (If applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I will ensure that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

CF2R-ENV-03-E User Instructions

A. Roof/Ceiling Insulation

1. I.D.: A label from the plans (e.g., A1.4 or Roof) documenting the location of the installed insulation.
2. Manufacturer and Brand: Indicate the manufacturer and brand of the product being installed.
3. Assembly/Framing Material: Wood, Metal, SIP OSB, SIP I-Joist, SIP Single 2x, SIP Double 2x, see JA4 for guidance.
4. Thickness: Thickness in inches.
5. Framing Size & Spacing: Indicate the framing size and spacing (e.g., 2x4 @ 16 in O.C).
6. Insulation Type: Select the type of insulation used, such as cellulose, fiberglass, or SPF.
7. ESR Number: If using a non-standard R-value for SPF insulation, complete an ICC Evaluation Service Report and document the ESR number.
8. Core/Cavity Insulation R-value: Indicate the core/cavity insulation R-value.
9. Insulation Depth: Indicate, in inches, the amount of insulation installed.
10. Continuous Insulation R-value: Indicate the R-value of continuous insulation, having no framing penetration, installed.

B. Wall Insulation

1. I.D.: A label from the plans, (e.g., A1.4 or Wall1) documenting the location of the installed insulation.
2. Manufacturer and Brand: Indicate the manufacturer and brand of the product being installed.
11. Assembly/Framing Material: Wood, Metal, SIP OSB, SIP I-Joist, SIP Single 2x, SIP Double 2x, see JA4 for guidance.
3. Thickness: Thickness in inches.
4. Framing Size & Spacing: Indicate the framing size and spacing (e.g., 2x4 @ 16 in O.C.).
5. Insulation Type: Select the type of insulation used; such as Cellulose, Fiberglass, or SPF.
6. ESR Number: If using a non-standard R-value for SPF insulation, complete an ICC Evaluation Service Report and document the ESR number.
7. Core/Cavity Insulation R-value: Indicate the core/cavity insulation R-value.
8. Insulation Depth: Indicate, in inches, the amount of insulation installed.
9. Continuous Insulation R-value: Indicate the R-value of continuous insulation, having no framing penetration, installed.

C. Mass Insulation

1. I.D.: A label from the plans (e.g., A1.4 or Wall1) documenting the location of the installed insulation.
2. Manufacturer and Brand: Indicate the manufacturer and brand of the product being installed.
3. Location: Indicate the location of the insulation; such as above grade, below grade, wall, or roof.
4. Mass Thickness: Indicate the thickness of the mass, in inches, the insulation is applied to.
5. Exterior Furring Strip Type/Depth: Indicate the type and thickness of furring material installed, such as wood/1.0 inch thick.
6. Interior Furring Strip Type/Depth: Indicate the type and thickness of furring material installed, such as wood/1.0 inch thick.
7. Insulation Type: Select the type of insulation used; such as SPF, EPS, or EPDM.
8. Exterior Insulation R-Value: Indicate the R-value of continuous insulation, having no framing penetration, installed on the outside of the assembly.
9. Interior Insulation R-Value: Indicate the R-value of continuous insulation, having no framing penetration, installed on the inside of the assembly.

D. Raised Floor Insulation

1. I.D.: A label from the plans (e.g., A1.4 or Floor1) documenting the location of the installed insulation.
2. Manufacturer and Brand: Indicate the manufacturer and brand of the product being installed.
3. Framing Material: Wood or Metal.
4. Framing Size & Spacing: Indicate the framing size and spacing (e.g., 2x4 @ 16 in O.C.).
5. Insulation Type: Select the type of insulation used; such as cellulose, fiberglass, or SPF.
6. ESR Number: If using a non-standard R-value for SPF insulation, complete an ICC Evaluation Service Report and document the ESR number.
7. Cavity Insulation R-value: Indicate the cavity insulation R-value.
8. Insulation Depth: Indicate, in inches, the amount of insulation installed.
9. Exterior Floor R-Value: Indicate the R-value of continuous insulation, having no framing penetration, installed on the outside of the floor.
10. Interior floor R-Value: Indicate the R-value of continuous insulation, having no framing penetration, installed on the inside of the floor.

E. Slab Floor/Perimeter Insulation

1. I.D.: A label from the plans (e.g., A1.4 or Slab Floor1) documenting the location of the installed insulation.
2. Manufacturer and Brand: Indicate the manufacturer and brand of the product being installed.
3. Floor Type: Indicate the type of floor type the insulation is being applied to; such as Heated Slab or Slab on Grade.
4. Insulation Type: Select the type of insulation used; such as EPDM, Polyisocyanurate, or Polystyrene.
5. Insulation Depth: Indicate, in inches, the depth of insulation installed. Refer to F02 for additional information.
6. Insulation R-Value: Indicate the insulation R-value being installed vertically and horizontal horizontally (if applicable).
7. Vertical Insulation Length: Indicate in inches the length of the insulation being installed. Refer to F03 for additional information on installing both vertical and horizontal slab insulation
8. Horizontal Insulation Length: Indicate, in feet, the length of the insulation installed from the outside edge of the vertical insulation to the center of the slab.