

TABLE R402.1.3  
INSULATION MINIMUM R-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT<sup>a</sup>

CLIMATE ZONE	FENESTRATION U-FACTOR <sup>b,1</sup>	SKYLIGHT <sup>b</sup> U-FACTOR	GLAZED FENESTRATION SHGC <sup>b,e</sup>	CEILING R-VALUE	WOOD FRAME WALL R-VALUE <sup>g</sup>	MASS WALL R-VALUE <sup>h</sup>	FLOOR R-VALUE	BASEMENT <sup>c,g</sup> WALL R-VALUE	SLAB <sup>d</sup> R-VALUE & DEPTH	CRAWL SPACE <sup>c,g</sup> WALL R-VALUE
0	NR	0.75	0.25	30	13 or 0&10ci	3/4	13	0	0	0
1	NR	0.75	0.25	30	13 or 0&10ci	3/4	13	0	0	0
2	0.40	0.65	0.25	49	13 or 0&10ci	4/6	13	0	0	0
3	.30	0.55	0.25	49	20 or 13&5ci <sup>h</sup> or 0&15ci <sup>h</sup>	8/13	19	5ci or 13 <sup>f</sup>	10ci, 2 ft	5ci or 13 <sup>f</sup>
4 except Marine	.30	0.55	0.40	60	30 or 20&5ci <sup>h</sup> or 13&10ci <sup>h</sup> or 0&20ci <sup>h</sup>	8/13	19	10ci or 13	10ci, 4 ft	10ci or 13
5 and Marine 4	0.30 <sup>i</sup>	0.55	0.40	60	30 or 20&5ci <sup>h</sup> or 13&10ci <sup>h</sup> or 0&20ci <sup>h</sup>	13/17	30	15ci or 19 or 13&5ci	10ci, 4 ft	15ci or 19 or 13&5ci
6	0.30 <sup>i</sup>	0.55	NR	60	30 or 20&5ci <sup>h</sup> or 13&10ci <sup>h</sup> or 0&20ci <sup>h</sup>	15/20	30	15ci or 19 or 13&5ci	10ci, 4 ft	15ci or 19 or 13&5ci
7 and 8	0.30 <sup>i</sup>	0.55	NR	60	30 or 20&5ci <sup>h</sup> or 13&10ci <sup>h</sup> or 0&20ci <sup>h</sup>	19/21	38	15ci or 19 or 13&5ci	10ci, 4 ft	15ci or 19 or 13&5ci

For SI: 1 foot = 304.8 mm.

NR = Not Required.

ci = continuous insulation.

- R-values are minimums. U-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed R-value of the insulation shall be not less than the R-value specified in the table.
- The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
 

**Exception:** In Climate Zones 0 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.
- "5ci or 13" means R-5 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "10ci or 13" means R-10 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "15ci or 19 or 13&5ci" means R-15 continuous insulation (ci) on the interior or exterior surface of the wall; or R-19 cavity insulation on the interior side of the wall; or R-13 cavity insulation on the interior of the wall in addition to R-5 continuous insulation on the interior or exterior surface of the wall.
- R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs, as indicated in the table. The slab-edge insulation for heated slabs shall not be required to extend below the slab.
- There are no SHGC requirements in the Marine Zone.
- Basement wall insulation is not required in Warm Humid locations as defined by Figure R301.1 and Table R301.1.
- The first value is cavity insulation; the second value is continuous insulation. Therefore, as an example, "13&5" means R-13 cavity insulation plus R-5 continuous insulation.
- Mass walls shall be in accordance with Section R402.2.5. The second R-value applies where more than half of the insulation is on the interior of the mass wall.
- A maximum U-factor of 0.32 shall apply in Climate Zones 3 through 8 to vertical fenestration products installed in buildings located either:
  - Above 4,000 feet in elevation, or
  - In windborne debris regions where protection of openings is required by Section R301.2.1.2 of the *International Residential Code*.

R-value for other building materials or air films. Where insulated siding is used for the purpose of complying with the continuous insulation requirements of Table R402.1.3, the manufacturer's labeled R-value for the insulated siding shall be reduced by R-0.6.

**R402.1.5 Total UA alternative.** Where the total *building thermal envelope* UA, the sum of U-factor times assembly area, is less than or equal to the total UA resulting from

multiplying the U-factors in Table R402.1.2 by the same assembly area as in the proposed *building*, the *building* shall be considered to be in compliance with Table R402.1.2. The UA calculation shall be performed using a method consistent with the ASHRAE *Handbook of Fundamentals* and shall include the thermal bridging effects of framing materials. In addition to UA compliance, the

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