

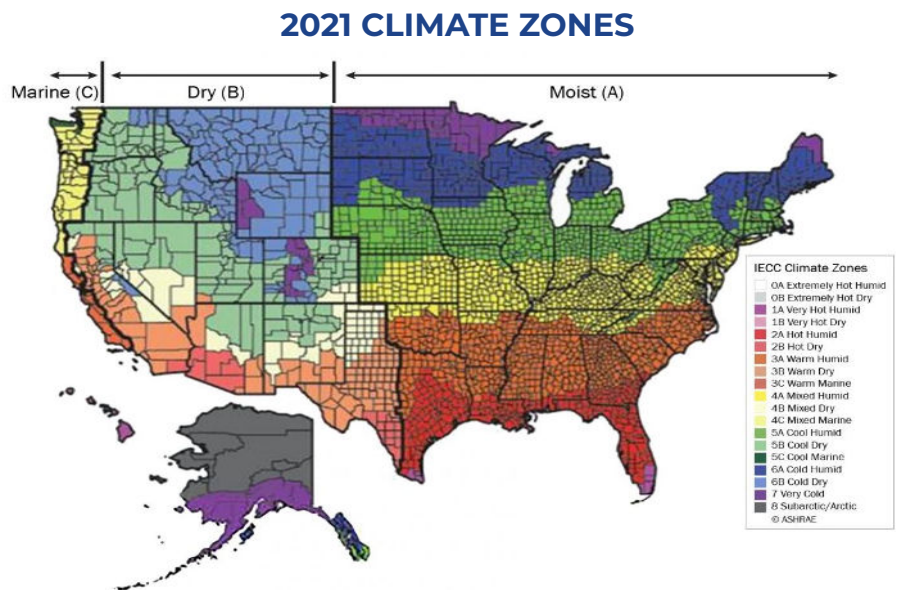
SUBJECT: IECC INSULATION U-FACTOR REQUIREMENTS

Extreme SIPs are a versatile construction material used as walls, ceilings/roofs, and floors of buildings. Extreme SIPs provide both structural capacity and insulation for building envelopes and are available in a wide range of thicknesses to ensure that building owners can meet the most advanced energy code requirements – such as those published by the International Code Council (ICC). This technical bulletin provides a summary of the prescriptive U-factor requirements of the 2021 edition of the International Energy Conservation Code (IECC) published by the ICC. Please refer to the 2021 IECC for further detailed information.

The IECC is a leading energy code that is applicable to both commercial and residential buildings and is often adopted as a code requirement at the state level. State adoption of IECC may also be to the prior versions of the IECC issued in 2015 and 2018.

The tables within this bulletin provide the U-factor requirements of the 2021 IECC Table R402.1.2 (residential) and Table C402.1.4 (commercial) detailed by climate zone (map below) and demonstrate which Extreme SIPs thickness meets or exceeds the requirements for each climate zone. The U-factor is the rate of heat transfer per unit area and per unit temperature difference, and the units are BTU/hr•ft²•F. The lower the U-factor, the greater resistance to heat flow. U-factors equal to or less than those specified in the tables are permitted as an alternative to the R-value requirements of the 2021 IECC Table R402.1.2 or Table C402.1.4.

Alternative paths for conformance through comparison to 2021 IECC “R-value Tables” and detailed analysis are also available within the standard. Extreme recommends that the U-factor path be followed since this most appropriately accounts for insulation performance of SIPs in comparison to lumber framing with traditional insulations.



2021 IECC TABLE R402.1.2 EQUIVALENT U-FACTORS ¹							
Residential Walls							
Zone	Wood-Framed Wall Requirement	Extreme SIPs					
		4 ½"	Comply?	6 ½"	Comply?	8 ¼"	Comply?
0 - 1	0.084	0.060	Yes	0.041	Yes	0.033	Yes
2	0.084	0.060	Yes	0.041	Yes	0.033	Yes
3	0.060	0.060	Yes	0.041	Yes	0.033	Yes
4	0.045	0.060	No	0.041	Yes	0.033	Yes
4 Marine	0.045	0.060	No	0.041	Yes	0.033	Yes
5	0.045	0.060	No	0.041	Yes	0.033	Yes
6	0.045	0.060	No	0.041	Yes	0.033	Yes
7	0.045	0.060	No	0.041	Yes	0.033	Yes
8	0.045	0.060	No	0.041	Yes	0.033	Yes

¹Extreme SIPs U-Factors include inside air film, ½" gypsum wallboard, Extreme SIPs & outside air film. Values are calculated at 75 degrees.

2021 IECC TABLE R402.1.2 EQUIVALENT U-FACTORS ¹							
Residential Roof/Ceilings							
Zone	Roof/Ceiling Requirement	Extreme SIPs					
		8 ¼"	Comply?	10 ¼"	Comply?	12 ¼"	Comply?
1	0.035	0.032	Yes	0.026	Yes	0.022	Yes
2	0.026	0.032	No	0.026	Yes	0.022	Yes
3	0.026	0.032	No	0.026	Yes	0.022	Yes
4	0.024	0.032	No	0.026	No	0.022	Yes
4 Marine	0.024	0.032	No	0.026	No	0.022	Yes
5	0.024	0.032	No	0.026	No	0.022	Yes
6	0.024	0.032	No	0.026	No	0.022	Yes
7	0.024	0.032	No	0.026	No	0.022	Yes
8	0.024	0.032	No	0.026	No	0.022	Yes

¹Extreme SIPs U-Factors include inside air film, ½" gypsum wallboard, Extreme SIPs, asphalt singles & outside air film. Values are calculated at 75 degrees.

2021 IECC TABLE C402.1.4 EQUIVALENT U-FACTORS ¹							
Commercial Walls							
Zone	Wood-Framed Wall Requirement	Extreme SIPs					
		4 ½"	Comply?	6 ½"	Comply?	8 ¼"	Comply?
0 - 1	0.064	0.060	Yes	0.041	Yes	0.033	Yes
2	0.064	0.060	Yes	0.041	Yes	0.033	Yes
3	0.064	0.060	Yes	0.041	Yes	0.033	Yes
4	0.064	0.060	Yes	0.041	Yes	0.033	Yes
4 Marine	0.051	0.060	No	0.041	Yes	0.033	Yes
5	0.051	0.060	No	0.041	Yes	0.033	Yes
6	0.051	0.060	No	0.041	Yes	0.033	Yes
7	0.051	0.060	No	0.041	Yes	0.033	Yes
8	0.051	0.060	No	0.041	No	0.033	Yes

¹Extreme SIPs U-Factors include inside air film, ½" gypsum wallboard, Extreme SIP & outside air film. Values are calculated at 75 degrees.

2021 IECC TABLE C402.1.4 EQUIVALENT U-FACTORS ¹							
Commercial Roof/Ceilings							
Zone	Roof/Ceiling Requirement	Extreme SIPs					
		8 ¼"	Comply?	10 ¼"	Comply?	12 ¼"	Comply?
0 - 1	0.039	0.032	Yes	0.026	Yes	0.022	Yes
2	0.029	0.032	Yes	0.026	Yes	0.022	Yes
3	0.035	0.032	Yes	0.026	Yes	0.022	Yes
4	0.032	0.032	Yes	0.026	Yes	0.022	Yes
4 Marine	0.032	0.032	Yes	0.026	Yes	0.022	Yes
5	0.032	0.032	Yes	0.026	Yes	0.022	Yes
6	0.032	0.032	Yes	0.026	Yes	0.022	Yes
7	0.028	0.032	No	0.026	Yes	0.022	Yes
8	0.028	0.032	No	0.026	Yes	0.022	Yes

¹Extreme SIPs U-Factors include inside air film, ½" gypsum wallboard, Extreme SIP, asphalt shingles & outside air film. Values are calculated at 75 degrees.