HUNTSMAN
BUILDING SOLUTIONS

IECC 2021
COMPLIANCE STUDY

Month by month, states continue to adopt more stringent energy codes, requiring builders to invest in energy improvements to their homes to meet code. Most states have adopted some version of an IECC code, the most recent of which is the 2021 IECC. The 2021 IECC requires significant performance improvements in the envelope. In climate zone 5, for example, the prescriptive path of the 2021 IECC requires R60 attic insulation and R20 + R5 CI or R13 + R10 CI wall insulation. Luckily, these codes also allow flexibility for builders that want to build high performance homes in a smarter, lower cost way. Huntsman Building Solutions commissioned a 3rd party analysis team to evaluate the various ways to meet IECC 2021, with spray foam and without.

This study looked at one sample home in Climate Zone 5B in Mt. Shasta, California. The home was very regular in every way:

- 2,400 s.f., 2 stories + attic, 3 bedrooms, 15% window to floor area ratio, Slab on grade construction

Results

The study identified four different ways to meet the IECC 2021 code, outlined in the table below.

	Base Case	Option 1	Option 2	Option 3
Description	Prescriptive Path (Table R402.1.3)	2x4 R13 + R5 walls	2x6 R20 + R5 walls	2x6 R24 walls
Energy Bill	$1,215	$1,204	$1,211	$1,207
ACH50	3	1.8	1.8	1.8
Wall	2x6 16" OC w/ R20 Cavity and R5 Continuous	2x4 16" O.C. w/ R13 OCSPF Cavity + R5 CI	2x6 16" OC w/ R20 OCSPF Cavity and R5 CI	2x6 24" O.C. w/ R24 OCSPF Cavity only
Ceiling	R60 Blown on Attic Floor	R43 OCSPF under Attic roofdeck-Trusses w/2x4 Top Chords	R25 OCSPF under Attic roofdeck-Trusses w/2x4 Top Chords	R33 OCSPF under Attic roofdeck-Trusses w/2x4 Top Chords
Attic Configuration	Insulation on attic floor, vented	Insulation under attic roofdeck unvented	Insulation under attic roofdeck unvented	Insulation under attic roofdeck unvented
Duct Configuration	Ducts in unconditioned attic, 4 CFM / 100 s.f. leakage to outside	Ducts within thermal boundary, 0.5 CFM / 100 s.f. leakage to outside	Ducts within thermal boundary, 0.5 CFM / 100 s.f. leakage to outside	Ducts within thermal boundary, 0.5 CFM / 100 s.f. leakage to outside
Meets IECC 2021	Yes	Yes	Yes	Yes

In Summary:

leveraging the air sealing benefits of Huntsman polyurethane spray foam solutions allows the builder significant flexibility to reduce the required R values of wall and ceiling insulation. These approaches also provide the benefits of a more comfortable home and a more useful attic encapsulated within the thermal boundary.

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