



# DEMYSTIFYING THE CALIFORNIA ENERGY CODE



RESIDENTIAL › COMMERCIAL › HIGH RISE RESIDENTIAL › HOTELS



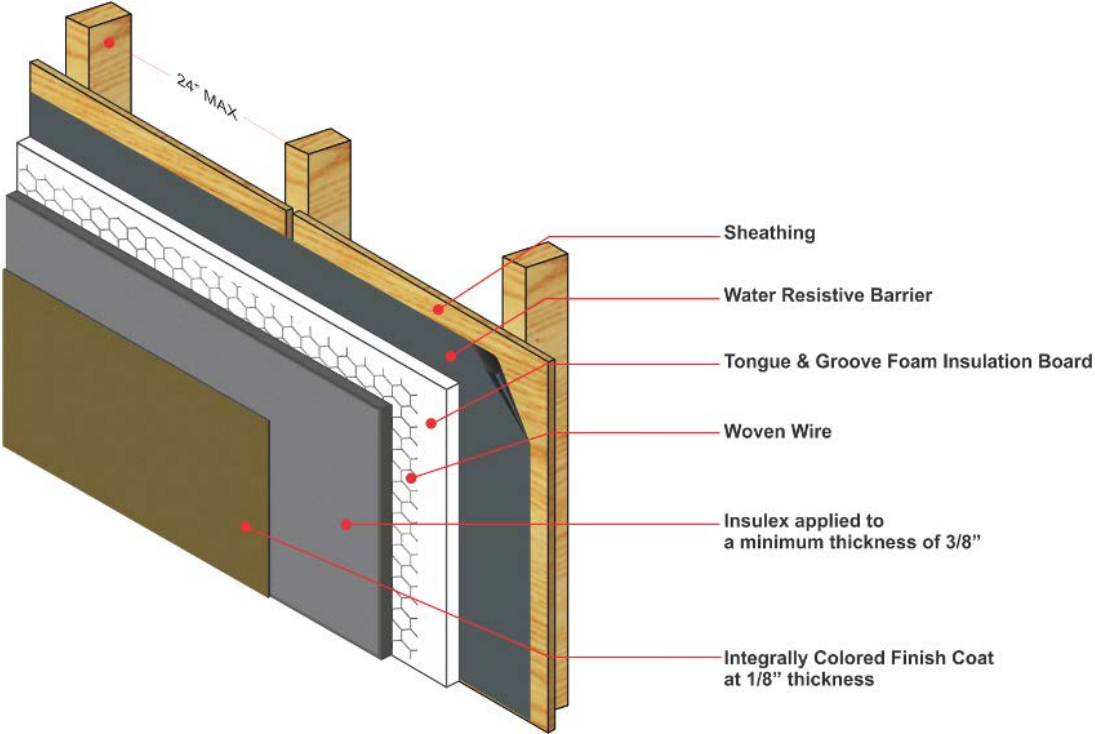


**CALIFORNIA TITLE 24: EXECUTIVE SUMMARY**

California's Title 24 standards were updated effective with all plans submitted after January 1, 2010. These standards govern the energy efficiency of all commercial and residential buildings in the State, and the latest round of changes will require builders to change how they build – from insulation to HVAC systems to lighting and plaster.

**CLIMATE ZONES**

Requirements vary by climate zone and type of construction. For instance, coastal residential construction (zones 2-10) comply with Title 24 if they use R-13 insulation between 2x4 wood studs. Homes built in the Central Valley (zones 11-13) require R-19 batts between 2x6 wood studs. And homes in the most extreme desert and mountain zones (1,14,15, and 16) must have R-21 insulation between 2x6 studs. It is important to understand that tradeoffs between systems are allowed. As long as the house will use the same amount of energy as the specified designs, you can trade off insulation against windows, HVAC systems, etc.



## TABLES OF TITLE-24-COMPLIANT WALL SYSTEMS

**TABLE 1: RESIDENTIAL WOOD FRAMING**



Merlex Insulex allows for the use of continuous foam insulation (CI) over the outside of the studs to achieve insulation in the wall system that is equivalent to Title 24 requirements or better. For instance, a home in Palm Springs could choose to use R-21 insulation between 2x6 wood studs OR R-13 batts between 2x4 wood studs with 1-1/2 inches of foam board and the Insulex plaster system. See Table 1 for more details on residential CI systems.

Climate Zone	Compliant System	Effective R-Value	Equivalent CI System
2-10 (coastal)	R-13 & 2x4	9.8	Not needed
11-13 (Central Valley)	R-19 & 2x6	13.5	R-13, 2x4, & 1" CI
1, 14-16 (desert, mountain, NoCal coast)	R-21 & 2x6	14.5	R-13, 2x4, & 1.5" CI

**TABLE 2: COMMERCIAL METAL FRAMING<sup>1</sup>**



In commercial buildings using metal framing, the reasons to use Insulex CI systems are even more compelling. Because metal studs permit the transfer of more energy out of the building, their performance is improved more than wood-framed buildings by the use of foam insulation outside the studs. It would be difficult to comply with Title 24 building with metal studs without foam insulation in many climate zones, unless other significant energy upgrades were made in other parts of the building. For instance, building with the Insulex CI system in San Francisco, Los Angeles, or San Diego, a builder can achieve Title 24 compliance with 1-1/2" of CI foam over 4" metal studs and R-13 batt insulation. That same building in Riverside or Sacramento would require 2.5 inches of CI foam over 6" metal studs, spaced 24" on center with R-21 batts, and could require an EIFS system. See Table 2 for details on code-compliant CI systems with metal framing.

Climate Zone	U-factor to Comply	Compliant CI System
1, 6, & 7 (LA, SD, coastal NoCal)	0.098	R-13, 4" studs, 1.5" CI
3 (Central coast)	0.082	R-13, 4" studs, 2" CI <b>OR</b> R-21, 6" studs, 24" O.C., 1.5" CI
All others (non-coastal, SoCal)	0.062	R-21, 6" studs, 24" O.C., 2.5" CI

**TABLE 3: HIGH-RISE RESIDENTIAL & HOTEL<sup>1</sup>**



Metal-framed hotels and high-rise residential have the same standards state-wide, which can be met with 1 inch of CI foam over 4" metal studs with R-13 batts. Over wood framing, the requirements are stricter, and can be met in most climate zones with 2x8 framing and R-25 batts without CI. Use of foam insulation in these zones can allow savings on 2x4 framing and R-13 batts. See Table 3 for details for use with hotels and high-rise residential projects.

Climate Zone	U-factor to Comply	Compliant System	Compliant CI System
METAL FRAMED: All zones	0.105	R-38, 10" studs	R-21, 6" studs, 1" CI <b>OR</b> R-21, 6" studs, 24" O.C., ½" CI
WOOD FRAMED: 1-10, 12, & 13 (coastal and interior)	0.059	R-25, 2x8 studs	R-13, 2x4, 2" CI
11, 14, 15, & 16 (mountains and deserts)	0.042	None	R-21, 2x6, 2.5" CI

<sup>1</sup> Note that a qualified energy consultant should be employed for the proper Building Department approvals of any CI wall system. Differences in wall systems, insulation materials, and many other factors affect the performance of the building. These figures are provided as guidelines only. Assumes an R-value of 4 per inch of CI foam.

### **INSULEX CI SYSTEM KEY FEATURES**

Projects using Insulex Continuous Insulation systems will have questions. Merlex representatives are well-informed on California energy codes, green building rating systems, and building codes, and will be happy to assist you with your specific needs. Some areas you'll need to consider include:

- Available sanded or in concentrate form, to be mixed with sand on the job
- Allows for accelerated job scheduling due to reduced wait time between plaster base coats
- Contains 10% post-industrial recycled content
- Optional recycled aggregate for 33% recycled content and LEED credit
- Available One-hour Fire Rating with specified assemblies in ICC ESR-1607 report
- Provides crack- and water-resistance
- Economical and low-maintenance
- May be used over a variety of substrates, giving architects and builders design flexibility
- May be trowel- or spray-applied



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