

Title 24, California Code of Regulations



Sto Offers Proven Solutions to Meet the Newest Title 24 Standards.

Title 24 is the section of the California Code of Regulations that sets the Building Standards Code for the State of California. It is divided into 12 parts. Part 6 is the Energy Efficiency Standards that apply to both residential and non-residential construction. Cities and counties are required to enforce CCR Title 24. New, stricter regulations are set to take effect on January 1, 2017.

These standards were established in 1977 as a response to a legislative mandate to reduce California's energy consumption. According to the California Energy Commission, these standards, along with those for energy efficient appliances, have saved the state more than \$74 billion in electricity and natural gas costs since 1977.

The state of California is divided into 16 different climate zones. Each zone has a different energy efficiency requirement shown as a "U-factor". Wall energy performance criteria in Title 24 require meeting certain R-values and U-factors. "R-value" is the resistance to heat conduction. The higher the R-value the better a wall conserves energy. "U-factor" is the heat conductivity of a wall. A larger U-factor means worse energy conservation. U-factor is the inverse of the sum of R-values of a combination of materials. So how do "U-factors" and "R-values" impact building design and construction? U-factors account for thermal "short circuits" in a wall assembly and R-values do not. A thermal "short circuit" is also known as "thermal bridging". This thermal short circuiting occurs in areas of the wall assembly that are made up of materials that have low insulative value. This mainly occurs in the framing portion of the wall in wood framing, and even moreso for metal framing, which has poor insulation qualities. Energy can infiltrate or escape a wall assembly with ease at each break in insulation where a framing member is present.



Building with conscience.

A Sto Solution for Every Climate Zone.

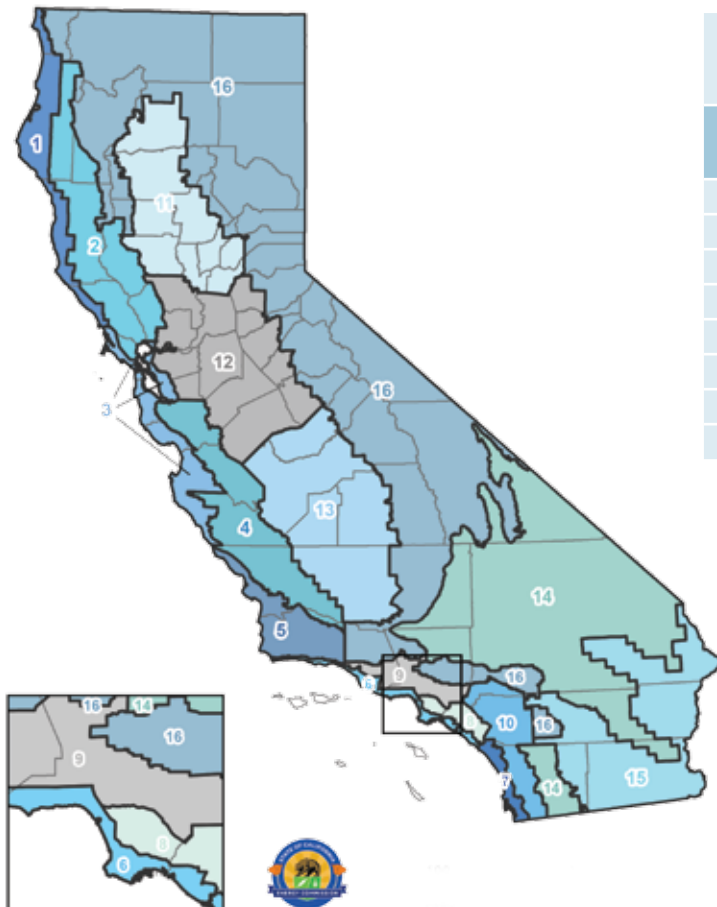
U-Factor Requirement Per California State Climate Zone For Non-Residential

FRAMING TYPE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Wood-framed Walls	0.102	0.059	0.11	0.059	0.102	0.11	0.11	0.102	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059
Metal-framed Walls	0.098	0.062	0.082	0.062	0.062	0.098	0.098	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062

Heat loss and thermal bridging in buildings is affected by the type of system used. Using an insulated stud cavity system such as commonly used batt insulation has poor insulation qualities as energy can infiltrate or escape the wall assembly at each break in insulation.

Using metal instead of wood framing increases thermal bridging and the U-factor due to its lower conductivity. Continuous insulation systems such as Sto EIFS or Stucco systems can significantly decrease thermal bridges and increase your building's energy efficiency.

StoGuard Air and Moisture Barrier can achieve up to 36% annual energy savings through air leakage reduction¹ and StoTherm ci Systems with StoGuard and continuous insulation can achieve up to 45% annual energy savings.²



Building Climate Zones

California, 2015

Building Climate Zone		County Boundary	
CZ 1:	Arcata	CZ 9:	Pasadena
CZ 2:	Santa Rosa	CZ 10:	Riverside
CZ 3:	Oakland	CZ 11:	Red Bluff
CZ 4:	Sunnyvale	CZ 12:	Sacramento
CZ 5:	Santa Maria	CZ 13:	Fresno
CZ 6:	Los Angeles	CZ 14:	China Lake
CZ 7:	San Diego	CZ 15:	El Centro
CZ 8:	El Toro	CZ 16:	Mount Shasta

Source: California Energy Commission

Meet Title 24 Requirements and Get an Extra Layer of Energy Efficiency.

Insulation Type	ASTM Type	Minimum Density (lbs/ft ³)	R-value per thickness (deg F-ft ² -h/BTU)					
			1.0 in.	2.0 in.	3.0 in.	4.0 in.	5.0 in.	6.0 in.
EPS	Type I	0.90	3.6	7.2	10.8	14.4	18.0	21.6
XPS	Type X	1.30	5.0	10.0	15.0	20.0	25.0	30.0

Sto Solutions will help you meet and even exceed Title 24 requirements, regardless of your climate zone. But we don't stop there. Sto even has the solutions that allow you to literally build in an extra layer of energy efficiency. Locate your climate zone, look up your Sto Solution and you're on your way to compliance and an energy-saving design.

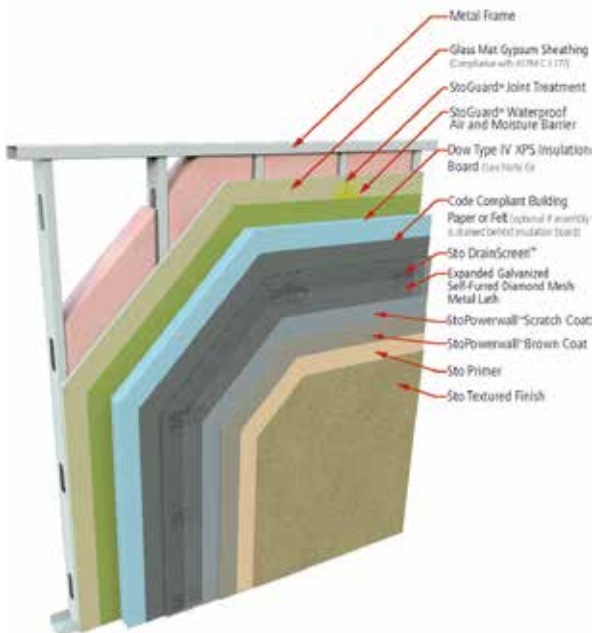
Our proven systems let you enhance curb appeal with a wide selection of finish textures and colors — no need to compromise between choosing aesthetically pleasing design and building performance. Sto systems achieve both and can be used with multiple types of insulation.

Sto Insulated Wall Systems And Used Insulation Board Type

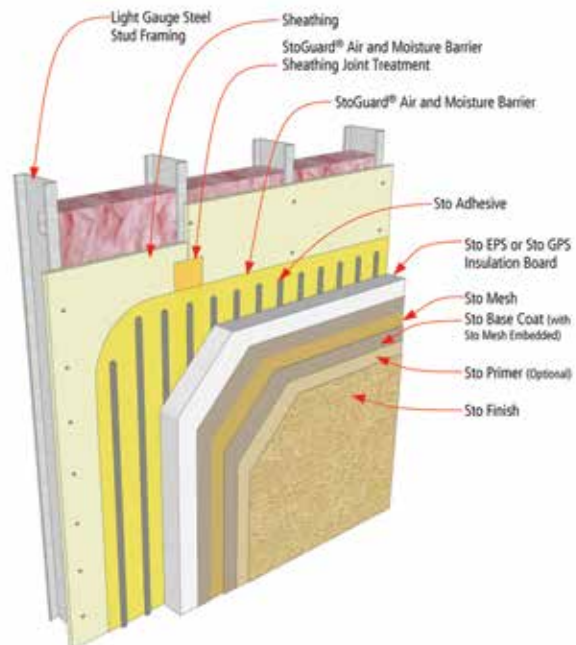
	XPS (Type IV)	XPS (Type X)	EPS (Type I)
Min. density (lb/cu. Ft.)	1.45	1.30	0.90
StoTherm ci	-	•	•
StoPowerwall ci	•	-	-
StoPanel ci	•	•	•

See below how our proven Sto Systems are incorporating insulation materials.

StoPowerwall ci system



StoTherm ci system



More Proven Solutions for Compliance Without Compromise.

Sto offers more solutions to help you meet and exceed these new energy standards. StoTherm® ci Systems, StoPowerwall® ci Systems and StoPanel® ci Systems are helping architects meet new standards without compromising theirs.

StoTherm® ci Systems

Complying with rapidly changing energy standards and mandates can be a major obstacle to any building project. With StoTherm ci, you have peace of mind knowing that the system design makes it possible to meet or exceed today's energy standards for exterior walls, including ASHRAE design standard 90.1-2013, the IGCC/IECC energy code requirements for continuous insulation, and the Title 24 requirements for energy efficiency.

StoPowerwall® ci Systems

StoPowerwall® ci Systems combine portland cement stucco with a fluid-applied air and moisture barrier, advanced cavity wall design, continuous insulation and Sto high-performance finishes. StoPowerwall® ci Systems components include:

- StoGuard® Air and Moisture Barrier
- Sto DrainScreen™ Drainage Mat
- Type IV XPS Rigid Insulation
- StoPowerwall and Sto Powerflex® High Performance Textured Finishes (and primers as applicable)

When required by code, Dow STYROFOAM™ Type IV XPS rigid insulation—backed by Dow Chemical's 50-year thermal performance warranty—serves as the continuous insulation (ci) component.

StoPanel® ci Systems

Sto, the leader in wall cladding systems, now offers the most advanced technology in prefabricated insulated wall panel solutions. Our systemized approach to panelized construction offers many benefits over traditional precast panels, including speed, value and superior performance. Sto Panels are lightweight, energy efficient and durable, and are available in a wide variety of aesthetic options. This solution approach results in higher quality and dependability verified by third party testing and Title 24 code compliance.

To learn more about StoTherm® ci, StoPowerwall® or StoPanel® ci Systems, visit stocorp.com or call 800-221-2397.



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Sources

- ¹ Norris, Chris, Morrison Hershfield, *Energy Conservation Benefits of Air Barriers Sto Guard*, pp. 8.
- ² Norris, Chris, Morrison Hershfield, *Benefits of Continuous Insulation and Air Barriers StoTherm and StoTherm NEXT*, pp. 8.