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 more so 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.
A Sto Solution for Every Climate Zone.

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

<table>
<thead>
<tr>
<th>FRAMING TYPE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood-framed Walls</td>
<td>0.102</td>
<td>0.059</td>
<td>0.11</td>
<td>0.059</td>
<td>0.102</td>
<td>0.11</td>
<td>0.11</td>
<td>0.102</td>
<td>0.059</td>
<td>0.059</td>
<td>0.059</td>
<td>0.059</td>
<td>0.059</td>
<td>0.059</td>
<td>0.059</td>
<td></td>
</tr>
<tr>
<td>Metal-framed Walls</td>
<td>0.098</td>
<td>0.062</td>
<td>0.082</td>
<td>0.062</td>
<td>0.062</td>
<td>0.098</td>
<td>0.098</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
<td></td>
</tr>
</tbody>
</table>

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 savings².

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¹ Source: California Energy Commission
² Source: California Energy Commission
Meet Title 24 Requirements and Get an Extra Layer of Energy Efficiency.

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.

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

<table>
<thead>
<tr>
<th>Insulation Type</th>
<th>ASTM Type</th>
<th>Minimum Density (lbs/ft³)</th>
<th>1.0 in.</th>
<th>2.0 in.</th>
<th>3.0 in.</th>
<th>4.0 in.</th>
<th>5.0 in.</th>
<th>6.0 in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS Type I</td>
<td>0.90</td>
<td>3.6</td>
<td>7.2</td>
<td>10.8</td>
<td>14.4</td>
<td>18.0</td>
<td>21.6</td>
<td></td>
</tr>
<tr>
<td>XPS Type X</td>
<td>1.30</td>
<td>5.0</td>
<td>10.0</td>
<td>15.0</td>
<td>20.0</td>
<td>25.0</td>
<td>30.0</td>
<td></td>
</tr>
</tbody>
</table>

**Sto Insulated Wall Systems And Used Insulation Board Type**

<table>
<thead>
<tr>
<th>Min. density (lb/cu. Ft.)</th>
<th>XPS (Type IV)</th>
<th>XPS (Type X)</th>
<th>EPS (Type I)</th>
</tr>
</thead>
<tbody>
<tr>
<td>StoTherm ci</td>
<td>-</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>StoPowerwall ci</td>
<td>●</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>StoPanel ci</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>
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.

Sources
2. Norris, Chris, Morrison Hershfield, Benefits of Continuous Insulation and Air Barriers StoTherm and StoTherm NExT, pp. 8.