High Performance Attics

Meeting California Title 24 2016 Building Energy Efficiency Standards with innovative CertainTeed solutions

SMARTBATT™ with MoistureSense™ Technology
Building Code Updates

CertainTeed has them covered
Keeping up with the codes

Building codes across the country continue to evolve, and meeting energy efficiency goals remains a focus of many code updates and revisions.

CertainTeed understands that building code revisions make your already-challenging job as a builder or contractor that much more challenging.

We’re always paying attention when codes change and immediately get to work devising and innovating to help you meet any new requirements.
Code changes can mean changes for your business

Any time building standards change, you need to:

• Understand every change and how it may impact your business
• Develop a plan to comply with new requirements; considerations may include:
  – Building design
  – The materials you use
  – Your construction or installation procedures
• Implement your plan
  – Communicate new procedures to your contractor/installers
  – Ensure the installers are properly trained
California’s Title 24 Part 6 Building Energy Efficiency Standards were developed to ensure new and existing buildings achieve energy efficiency and preserve outdoor and indoor environmental quality.

By mandate, the California Energy Commission updates these standards approximately every three years. The 2016 update took effect in January 2017.
Title 24: What It Means for You
Insulation Implications
New requirement: High Performance Attics

Title 24 2016 requirements call for the construction of High Performance Attics (HPAs) in new single-family residential buildings.

- An HPA is designed to minimize temperature differentials between the attic and the conditioned air being transported through attic ductwork.
- Title 24 options for HPAs incorporate measures that apply to both vented and unvented attics, including solutions that:
  - Meet the requirements for ducts in conditioned spaces
  - Allow ducts and air handling equipment to be located in the attic
Not building or working in California? Remember ...

When one state ups the ante, others tend to follow.
Meeting Title 24 HPA Requirements

Common Approaches
Achieving HPAs:
Title 24 offers three options

- A: Insulation above the roof deck
- B: Insulation below the roof deck
- C: Ducts in a conditioned space
  - C(1): Truss design change: Dropped ceiling or modified truss design. Keeps radiant barrier at the roof deck and ventilated space above the insulation.
  - C(2): Closed or open cell SPF in an unvented attic
  - C(3): Batts or blown insulation within boxed netting with air-sealed attic and diffusion port
HPA Option A:
Insulation above the roof deck

• **Prescriptive measure:**
  – Insulation installed above the roof rafters in contact with the roof deck and an additional layer of ceiling insulation located between the attic and the conditioned space

• **Common approach:**
  – Rigid insulation below (or sandwiched between) roof sheathing

• **Drawbacks:**
  – Needs to be installed by the roofers
  – Slows down getting the structure under roof
  – Requires changes to the roof deck design/fascia

Source: Building Science Corporation
HPA Option B:
Insulation below the roof deck

• **Prescriptive measure:**
  – Insulation installed between the roof rafters in contact with the roof deck and an additional layer of ceiling insulation located on the attic floor between the attic and the conditioned space

• **Common approach:**
  – Unfaced insulation installed in rafters via metal wires, plates or rope

• **Drawbacks:**
  – Time-consuming installation
  – Insulation can sag around the supports or lose R-value through compression
  – Difficult to pass QII – potential for thermal bridging issues
  – Creates excessive dust for the installer
HPA Option C(1): Modified truss design

**Prescriptive measure:**
- Insulation located between the attic and the conditioned space

**Common approach:**
- Locate the air handler in a closet within the conditioned living space
- Modify the truss design to create an enclosure for ductwork within the attic
- Retain current practice of blown-in on attic floor

**Drawbacks:**
- Must change truss design
- Reduces square footage in the living space of the home
- Provides limited options for HVAC drops positions, creating risk of occupant comfort issues

Source: California Energy Commission
**HPA Option C(2): Spray polyurethane foam**

- **Prescriptive measure:**
  - Insulation located between the attic and the conditioned space

- **Common approach:**
  - Apply open or closed cell spray polyurethane foam (SPF) insulation
  - Benefits of SPF include:
    - Easy installation
    - Closed cell SPF works as a vapor barrier in all directions, in all climates
    - Also provides effective air sealing

- **Drawbacks:**
  - SPF makes it difficult to locate and repair roof leaks
  - Highest-cost option
  - 24-hour wait required before other trades can enter the home
  - Open cell SPF does not serve as a vapor retarder, presenting higher risk in colder climates
HPA Option C(3): Condition the attic space

• **Prescriptive measure:**
  – Insulation located between the attic and the conditioned space
  – Option C(3) conditions the attic space to allow HVAC air handler as well as ducts to be located in attic

• **Common approach:**
  – Sealed roof deck and diffusion port with unfaced batts or blown insulation in boxed netting under the roof deck

• **Drawbacks:**
  – Must air seal roof deck: high pitch creates installation safety concerns
  – Difficult to find and repair air leaks
  – Must install a diffusion port to avoid moisture accumulation at the ridge, especially in regions with cold nights or cold winters (such as Sacramento)

Source: Building Science Corporation
CertainTeed Solutions

High Performance Attics need a high performance insulation:
Option A (above roof deck): CA Title 24

CertainTeed Roofing FlintBoard ISO NB

- Polyiso board with pre-glued OSB (7/16” or 5/8“), with fiber-reinforced felt at the bottom
- Available in R6.3 (1.1”) or R8 (1.4”) – aged R-Values
Use face-stapled SMARTBATT with MoistureSense™ Technology.

- SMARTBATT’s integrated smart vapor retarder helps summertime humidity diffuse to the conditioned space.
- The distinctive blue facing results in a clean, high quality look.
- SMARTBATT is the first kraft-faced insulation to receive the Class A fire rating.
The common approach vs. SMARTBATT

**Common Approach**
Unfaced batts with wires or plates

- Difficulty in passing QII
- Poor quality look
- Can sag and fall down
- More thermal bridging issues
- Doesn’t actively manage moisture
- Multi-step install
- Dustier install
- Compression issues

**CertainTeed Solution**
SMARTBATT

- Easily passes QII
- High quality look
- Will not sag or fall down
- Less thermal bridging issues
- Actively manages moisture
- Easy, simple to install
- Less dust
- Class A fire rated
CertainTeed’s family of SPF insulation products includes two options for creating a High Performance Attic.

**CertaSpray X Open Cell SPF**
- Provides outstanding air sealing and thermal performance
- Meets the requirements of AC377 Appendix X
- Does not require an ignition barrier or additional intumescent coating

**CertaSpray Closed Cell SPF**
- Provides a seamless layer of protection with outstanding thermal performance, air sealing, and vapor protection properties
Option C(3):
The SMARTBATT way

Create a SMARTBATT envelope using our proprietary installation system that maintains ventilation at the ridge and raises the insulation level above the ducts and air handling equipment.

- Insulation, moisture management and air tightness in one simple installation
- Easier, safer, more flexible installation
- No thermal bridging
- Lower volume of conditioned space
- Roof deck remains ventilated at the ridge
- Air sealing is done at the face of the insulation, which is easier to reach and where it is easier to find and fix air leaks
Difference in normal vs. HPAs

**Former code with R38 on the attic floor:**
very high temperature

**Option B:** slight improvement

**Option C boxed netting:** from 80 to 110°F

**CertainTeed:** smaller volume to condition and T<80°F

Modeling done for Palm Springs in summer,
T=75°F in the room below the attic
SMARTBATT: Simple installation, superior result

- **Attic Performance:**
  - Air tightness and moisture management at facing; easily identify and repair air leakage
  - Keep roof ventilation between the insulation and the deck: lower temperatures and less chance for condensation at ducts

- **Ability to create envelope at any height in attic:**
  - Reduce safety concerns
  - Reduce conditioned space for homeowner
  - Less materials

- **Durability:**
  - Clips and rails hold material in place, not staples
  - Tested to over 200°F for expansion and contraction
  - Designed to meet seismic requirements
SMARTBATT:
Simple installation, superior result

• **Aesthetics:**
  – Attractive appearance: customers say, “Just looks nice, very high quality”

• **QII:**
  – Taping and stapling of facing meets insulation in contact with the air barrier requirement
  – Insulation in contact with the air barrier (facing)
In review ...
CertainTeed has innovative solutions for the 2016 Title 24 update that also fully comply with QII requirements.

- **Option B:** SMARTBATT meets the requirements for insulation installed below the roof deck with a faster install and cleaner appearance than common approaches, plus a Class A fire rating.

- **Option C:** Using a proprietary system of rails, clips and tape, SMARTBATT can enclose ductwork and HVAC equipment in a lower volume of conditioned space, providing insulation and air sealing with easier, safer and more flexible installations.

- **QII:** When installed as recommended, SMARTBATT meets QII requirements for six sides of contact and prevents thermal bridging.
Questions?

For more details or to contact a CertainTeed Title 24 specialist, visit certainteed.com/Title24