

## IT'S OK TO SKIMP ON INSULATION, ICYNENE SAYS

# Musings of an Energy Nerd

Contemplating residential energy use

## IT'S OK TO SKIMP ON INSULATION, ICYNENE SAYS

**A manufacturer of open-cell spray foam advises building officials to approve insulation that doesn't meet minimum R-value requirements**

POSTED ON FEB 5 BY **MARTIN HOLLADAY, GBA ADVISOR**

While energy experts often advise builders to exceed minimum code requirements for insulation, Icynene Incorporated, a manufacturer of open-cell spray polyurethane foam, is swimming against the tide. Surprisingly, Icynene is trying to convince builders to install *less* insulation than the code requires.

Icynene's bizarre campaign against thick insulation is the second controversial move by the Canadian company. Last year, Icynene ruffled energy experts' feathers by waging a spirited (and successful) **lobbying campaign** to defeat a widely supported effort (the so-called "Thirty Percent Solution") to raise the stringency of insulation requirements in the International Residential Code.

The motive for Icynene's current effort — let's call it the "it's OK to skimp" campaign — appears to be economic. The company has apparently decided that the only way Icynene can compete with less-expensive types of insulation (like cellulose) is to convince builders that they can get away with less insulation than code books require.

### **Air sealing requirements in the code**

There's no way to fathom Icynene's tangled logic without first taking a look at existing code requirements for sealing air leaks.

In the 2006 International Residential Code (IRC), air-sealing requirements can be found in section N1102.4. The code requires that "The building thermal envelope shall be durably sealed to limit infiltration. ...The following shall be caulked, gasketed, weatherstripped, or otherwise sealed with an air barrier material, suitable film, or solid material:

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.



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**Just use less?** At least one spray-foam manufacturer is informing customers that it's perfectly acceptable to install less insulation than required by code.

5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceilings separating the garage from conditioned spaces.
8. Behind tubs and showers on exterior walls.
9. Common walls between dwelling units.
10. Other sources of infiltration."

The real zinger in this list is #10: "Other sources of infiltration." That just about covers it, doesn't it?

The IRC requires *all* sources of infiltration to be "caulked, gasketed, weatherstripped, or otherwise sealed with an air barrier material, suitable film, or solid material." The code does not include any exceptions. In other words, there is no such thing as a legal crack or air leak.

### **Building inspectors rarely check airtightness**

Unfortunately, the requirements of Section N1102.4 are rarely enforced, and as a result, many new American homes — especially fiberglass-insulated homes — perform poorly.

Icynene has seized on this fact — the fact that lax code enforcement has encouraged the proliferation of leaky homes — to put forth the surprising proposition that Icynene-insulated homes can perform poorly, too.

To match the poor performance of leaky fiberglass-insulated homes, all an Icynene contractor has to do is skimp on insulation thickness.

### **The code says R-38, but what the heck — R-20 should work**

As an example of Icynene's tactics, consider the experience of Sophie Piesse, an architect in Carrboro, North Carolina. Piesse was advised by a spray-foam contractor to insulate a cathedral ceiling with only 5 1/2 in. of open-cell spray foam (equivalent to about R-20). Since the local prescriptive code (the North Carolina State Building Code) requires ceilings to be insulated to a minimum of R-38, the contractor's recommendation was surprising.

When Piesse questioned the contractor further, she was presented with a letter from Icynene that justifies installing only 52% of the minimum insulation thickness required by code. Presumably, the letter is intended to convince a local code official that Icynene is so good that there's nothing wrong with skimping on R-value.

Signed by Viktor Ginic, a building science engineer at Icynene, the letter reads, "The air-seal advantage of Icynene provides improved energy performance over much higher R-value insulations that are air-permeable. The blower-door testing of airtightness of the houses insulated with Icynene indicates an average air infiltration rate 5.5 times lower than a house insulated with mineral fiber insulation. Based on measured air infiltration and the number of energy analyses performed, we have found that Icynene, installed in accordance with the manufacturer's installation instructions to a nominal thickness of 3" in the walls and floors and 6" in roof/ceiling applications will perform better thermally than R-19 and R-38 air-permeable mineral fiber insulation." [Author's note: since this blog was written, two sources have confirmed that Viktor Ginic's letter specifically applies to builders complying with performance paths of code compliance, not prescriptive paths.]

## Unscrambling Icynene's logic

The prescriptive path of the IRC clearly requires a home to comply with two separate requirements: It must meet minimum insulation requirements, and It must be sealed against air leakage.

By arguing in favor of cutting corners on insulation thickness, here's what Icynene appears to be saying: "We've noticed that most building inspectors aren't enforcing air-sealing requirements. That gives us an idea! If some houses are violating one part of the building code, why not let us violate a different part of the code? Many fiberglass-insulated houses don't meet air-sealing requirements — so we think it's only fair that Icynene-insulated houses be allowed to cut corners when it comes to minimum insulation requirements."

That's right — the company is arguing, "An Icynene-insulated house with an R-20 ceiling is at least as good as that illegal house down the street." Talk about bragging rights!

When I called Icynene to inquire about the company's startling advice, I was connected with Ed Reeves, Icynene's engineering manager. "We're operating based on the way the world is operating right now," Reeves told me. "On a day like today when the fiberglass guys do not have to seal up their house, all I'm doing is following the practice in the marketplace. We have to follow suit."

## It's time to stand up for R-38

The intent of the code is clear: every new home must be sealed against air leakage *and* must meet minimum insulation requirements. These are separate requirements; there is no reason to believe that a builder who complies with only one of these requirements is exempt from the other.

In Climate Zone 4 — an area that includes architect Sophie Piesse's home town of Carrboro, North Carolina — the minimum prescriptive requirement for ceiling insulation is R-38. If a contractor wants to install Icynene insulation in a Carrboro ceiling, the minimum required depth is 8 1/4 in., not 5 1/2 in.

Many energy-efficiency experts are frustrated that the code is unevenly enforced. The solution to this problem is better code enforcement, however — not lowering the bar so that violators of one code provision can perform just as poorly as violators of a totally different code provision.

## Dereliction of duty

It's time for building officials to enforce the code as written. That means that new homes, whether insulated with fiberglass batts or Icynene, must meet both air-sealing requirements *and* minimum insulation requirements. Since R-20 is clearly not as good as R-38, building officials must uphold an important principle: code requirements for insulation represent the bare minimum allowed by law. Every time that Icynene convinces a local code official into approving the installation of R-20 ceiling insulation, the company succeeds in making a sale that might otherwise have slipped away. Icynene profits from the sale — at the expense of the gullible homeowners, of course, who end up living in a house with an underperforming ceiling.

In this sad tale, there's plenty of blame to go around. It's finger-pointing time:

Icynene is being short-sighted — that's a charitable way to express what I'm thinking — by urging builders to install less insulation than required by the code.

Any building department that, based on Icynene's arguments, allows builders following the

prescriptive code to install less than the minimum required thickness of insulation is failing in its duty to enforce the code. Building departments are also derelict if they fail to enforce existing code requirements for air sealing.

*Last week's blog: "Blower Door Basics."*

TAGS: **BUILDING CODE, FIBERGLASS BATTS, FIBERGLASS INSULATION, ICYNENE, INSULATION, IRC, OPEN-CELL, OPEN-CELL FOAM, SPF, SPRAY FOAM, SPRAY POLYURETHANE FOAM**