UNVENTING ATTICS IN COLD CLIMATES

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Build your cold-climate attic with no vents—the shingles may not last quite as long, but you'll get big payoffs in performance and energy savings.

As *Home Energy* readers know, venting attics in hot, humid climates brings a great deal of moisture into the structure (see "Conditioned Attics Save Energy in Hot Climates," *HE* May/June '97, p. 6). Not venting the attic avoids this problem.

What is less well understood is that venting causes many problems in cold (dry) climates, as well. For example, it allows a great deal of snow to blow in—especially the really fine snowflakes that weigh less than raindrops. Not venting also avoids this problem. Finally, as most builders know, venting roof assemblies can be extremely difficult for roof designs with complex geometries. Not venting avoids these difficulties, too.

Overcoming the Objections

I can hear the objections: What about moisture? What about sheathing temperature and shingle temperature in the summertime? What about the energy costs? What about the code?

First, take moisture: People usually vent attics in cold climates to prevent moisture accumulation in the roof sheathing and control ice dams. In cold climates, moisture in roof assemblies typically comes from inside, and the key to problems with moisture is the temperature of the roof sheathing.

Unvented attics have higher temperatures on the underside of the roof sheathing. If this area—typically the first condensing surface—is kept above the dew point temperature of the interior air-vapor mix, condensation and moisture accumulation will not occur (see Figures 1 and 2).

Ice damming can be controlled by reducing heat flow to the shingles through air sealing and insulating to more than R-40, rather than by flushing heat away from the roof shingles with venting. The net effect is the same—the roof shingles are cold—but by eliminating venting, we save a great deal of energy.

Warming Up to Unvented Roofs

The underside of the roof sheathing is where the real benefits of not venting roof assemblies are found. Our field measurements and computer modeling

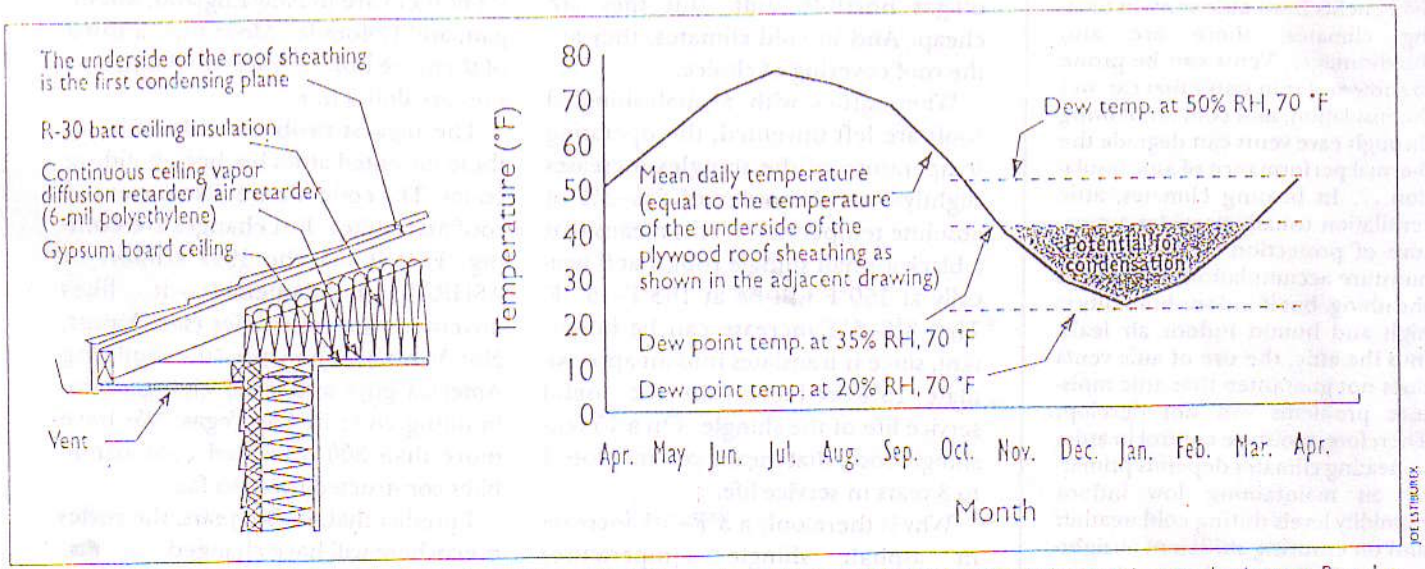

Figure 1. Potential for condensation in a roof assembly in Chicago, Illinois. The roof assembly has R-30 fiberglass batt insulation and a vented attic space. By reducing interior moisture levels, the potential condensation is reduced or eliminated.