

SEALING THE CEILING

RELIABLY AIR-SEALING VENTED ATTICS IS A CHALLENGE. PAY ATTENTION TO THESE DETAILS FOR THERMAL COMFORT

BY RICHARD BAKER

Continuity of the air barrier is critical to achieving optimal occupant comfort, indoor air quality, and energy efficiency, but attics present a significant challenge in a home's ability to effectively isolate unwanted air and moisture from living spaces. The reason: Voids in the attic space can be difficult to detect, often lurking unnoticed. And those voids can be found anywhere: above showers and closets, around chimneys or openings for electrical wiring, plumbing vents, recessed fixtures, and vent fans, among many others.

Also, more stringent codes for reducing air changes in homes make it even more difficult to achieve compliant blower-door test results, especially in smaller homes and townhomes with fire-rated partition walls that can be difficult to air seal.

EXPLAINING THE SCIENCE

During heating season in much of the country, inadequate air sealing at the ceiling plane lets warmth from heated living areas seep upward into the attic while simultaneously enabling cold attic air to descend through interior walls. Cool air descending from the attic into the living spaces is a condition suffered in older homes but easily avoided in new builds.

THE RIGHT STUFF

While there are many options for attic insulation, most production home builders use blown-in fiberglass or cellulose on the ceiling plane (the attic "floor"), with passive ventilation along the eaves and ridge. This method enables even distribution of insulation across the attic floor to provide uniform coverage, and blown-in



Providing a continuous, generous, and reliable air seal around every penetration in the attic floor is becoming increasingly critical for code compliance and indoor health.

insulation products are typically treated to resist settling, as well.

However, while this approach has proven effective, without proper attention to detail there are distinct paths for air—and moisture—to move between the unconditioned attic and conditioned space.

FIND THE PATHWAYS

Most builders are well-versed in air-sealing obvious penetrations through the ceiling plane, such as chase lids, fireplace flues, and soffits. But every penetration through the top plate—every can light, LED puck light, or ceiling fan—creates pathways that must be addressed.

Meanwhile, top-plate penetrations from electrical wires and imperfect plate-to-drywall connections create numerous small paths for airflow. Those are the areas where attention to detail can pay

dividends, and where diligence inspecting the work of trades really pays off. For example, don't allow your quality assurance team to assume that just because spray foam is protruding from an electrical penetration in the top plate that the hole is completely sealed. Close inspection will likely reveal an open path for air to move from the attic to the home's conditioned spaces.

In some high-performance builds we assess, builders are sealing all of the top plates and penetrations from the attic prior to insulation—a very effective approach to ensure gaps are completely sealed.

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Richard Baker drives quality and performance in home building as the building performance manager at IBACOS.