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23-ERDD-01 Retrofitting with Innovative Building Envelope Solutions Concept

Attic Penetration Air Sealing and Thermal Bridging Elimination

Additional submitted attachment is included below.

Attic penetration air sealing and thermal bridging elimination

The fundamental physics that hot air rises and cold air sinks makes attics the most impactful area of a building's envelope; and attic penetrations, particularly can-lights and bathroom exhaust fans, the weakest link and thus most important component requiring effective treatment.

That said, effective penetration treatment remains the most misunderstood and underappreciated Holy Grail of efficiency upgrade opportunities and upgrade programs still don't have a category to properly embrace and include it.

Years ago CanCoverIt penetration treatment was the prominent lobby display at California's Center for Sustainable Energy and professional specialists at the time understood the critical importance of including it as the keystone component of attic upgrades.

Unfortunately there was no great appreciation for the necessity of treatment and no category for inclusion in the programs of the time.

Without a category professionals tried work arounds like adding a few cents to insulation costs only to see those costs rejected and the most consciences professional's forced to dip into their own profits to include the essential treatment.

Programs often address individual components and overlook the interconnected importance of components within a system.

Ratings like the R Value of insulation are useful tools for developing an envelope system, but there is tendency to focus on individual components and forget that the components function within a system and that the real world component value is reliant on other features of the system and ultimately only effective as the weakest link within the system.

Insulation, regardless of R Value, is permeable, so metal fixture attic penetrations when left untreated create air leakage, moisture and thermal pathways between the attic unconditioned air and the living space conditioned air space.

In moderate weather this problem is less apparent, but as the outside temperatures become more extreme this air leakage and conductive heat path can form a feedback loop with the conductive metal fixture acting as the engine to drive the process. In other words the actual effectiveness of the insulation is so severely compromised that actual R Value is considerably lower. (Imagine wearing an unlined fleece jacket on a windy day, its R Value disappears and you find yourself shivering.)

Effective attic penetration treatment is the most critical first step for building envelope upgrades. In fact, CanCoverIt penetration treatment on even a few fans and/or can-lights can transform an air leaky energy wasting attic from 4,000 CFM at 50 Pa to a tight efficient under

1,500 CFM, easily in minutes, but it's not just air leakage that matters, isolation from thermal bridging is also critical.

UCSD Engineering School used physical testing and computer modeling show air sealing and eliminating thermal bridging with CanCoverIt penetration treatment results in up to 63% efficiency improvement relative to weather extremes. In other words as the weather gets more extreme the treatment becomes more impactful.

“...CanCoverIt's have reduced not only heating and cooling costs but also solved moisture problems in my customers attics. We can install one in 5 minutes or less with scissors and can foam or caulking. We can get a 20-30% reduction on our blower door test in as little as one hour. In the past I would need sometimes a full day of Air Sealing to get the same reduction. “
Rob Calnan – Calnan's Energy Systems Inc.

I'm always available and would welcome discussing this in greater depth.

Thanks and respectfully,

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