What You Need to Know About Wet-Spray Cellulose

Interest in wet-spray cellulose insulation systems among builders, utility personnel and others has been growing in recent years. Manufacturers' claims for these products would lead you to believe that they perform better than other insulating systems. However, these claims are based on a variety of questionable assumptions and misinterpreted test results. Perhaps even more troubling, there is little information on the long-term performance of wet-spray cellulose.

Promoters of wet-spray cellulose would rather not discuss the following points — but we believe you'd be wise to consider them before you decide which insulating system to use.

Moisture Content

Wet-spray insulation is manufactured with a dry adhesive that is activated by moisture at the time of application. Water represents about 50 percent of the weight of wet-spray cellulose. A number of studies have been done to determine the drying time of this product, and the results raise a number of interesting questions.

For example, a field study conducted in the humid climate of Newfoundland, Canada, indicated that wet cellulose simply did not dry out and that the moisture content of wood framing members remained extremely high: 60 percent after two years (the normal moisture content of wood is about 12 percent). Another field study found that, even in the relatively dry climate of Alberta, it took sheathing and framing about five months to dry to near-normal moisture levels.

A study conducted in the U.S. included comparisons of test frames both with and without vapor retarders; when vapor retarders were used, they were installed within two days of the wet-spray cellulose application, a procedure consistent with standard construction practices in many areas. Significant differences in drying times were recorded between those test frames that had the vapor retarders and those that did not. Even in a dry environment with no vapor retarders, it took about one month for the frame to dry completely. With a vapor retarder on one side, it took about three months for the frame to complete much of the drying, and ten months to dry out completely.

From these results, it seems clear that wet-sprayed walls will not be dry by the time a home is drywalled.

Can you think of a good reason to install a product that contains that much moisture?

Vapor Retarders

Some manufacturers of wet-spray cellulose insulation systems claim that vapor retarders are unnecessary when using their products. There's just one problem: Most local building codes ***require*** *vapor retarders. In addition, homes without vapor retarders can experience condensation problems, especially in colder areas.*

Why would cellulose manufacturers recommend an installation procedure that is directly at odds with the collective wisdom of building code officials around the U.S.? The answer: Their product must dry out to achieve optimum performance. And vapor retarders significantly slow the drying process.

Why compromise widely accepted building practices if doing so will lead to problems?

Construction Delays

Common sense dictates that you should allow a high-moisture content insulation system like wet-spray cellulose to dry out before drywall or other sheathing is installed. The tests described above show how long it takes for cellulose, and the wood framing members that surround it, to dry out after installation.

The problem is that builders can't wait 30 days — much less 90 days, or 150 days — for cellulose insulation to dry. Common practice is to install drywall a day or two after the insulation has been applied. Manufacturers of wet-spray cellulose have not published any data on what problems can occur when their product is enclosed inside the wall while it's still very moist.

Why put yourself in the position of deciding between a long construction delay and the possibility of such problems?

Air Infiltration

The manufacturers of wet-spray cellulose insulation claim that their product is superior in terms of reducing air infiltration. The primary basis for this claim is a seriously flawed study done in 1984 at the University of Colorado (see CertainTeed publication 30-21-1226).

First of all, it's important to remember that sheathing and drywall are substantially more important as air barriers than any wall cavity insulation. A 1996 Penn State University study found it impossible to determine whether wet-spray cellulose or fiber glass batts provided a more airtight structure, and concluded that any difference between the two types of insulation was insignificant compared to overall leakage through other components of the house.

Another study, conducted in 1996 by the St. Louis-based utility Union Electric, concluded that a properly installed sealant package can significantly reduce air infiltration and save energy in a home regardless of the type of insulation used.

In 1997, a study by the NAHB Research Center again concluded that wet-spray cellulose performed no differently than other sidewall insulation in respect to air infiltration. The important factor was proper sealing and caulking of the home.

It's also worth noting that most cellulose manufacturers' claims of superiority in this area are based on tests conducted while the material was still wet. The moisture in the insulation causes wood framing members to swell, closing seams in the framing interfaces and between the bottom plate and the subfloor, common sources of air infiltration.

Why choose wet-spray cellulose on the basis of its alleged superiority as an air barrier when sidewall insulation has so little effect on air infiltration in the first place?

Voids

Manufacturers of wet-spray cellulose claim that installations using fiber glass batts have voids that affect thermal performance. However, the example they cite – a 4 percent void, based on a test referenced in the ASHRAE Handbook of Fundamentals – is totally unrealistic. No builder would tolerate an installation of such poor quality.*

Another question to consider is what happens to wet-spray cellulose as it dries out. Common sense suggests that the product may shrink, leaving voids, but we know of no studies that have been done by wet-spray cellulose manufacturers to test this assumption.

Doesn't it make more sense to specify an insulation product that, when properly installed, leaves no void areas, than to use an insulation product whose long-term performance in this area is unknown?

**A 4 percent void equals an uninsulated gap of nearly 4" by cavity width in every stud cavity.*

Corrosion Problems

It stands to reason that wet-spray cellulose insulation systems, with their high moisture content, present problems when they come in contact with fasteners, electrical boxes, pipes and other metal building components. In tests conducted by the Oak Ridge National Laboratory on fiber glass, rock wool and cellulose insulation in the presence of moisture from condensation, "all of the cellulosic insulation materials tested produced corrosion of steel and copper," while the other forms of insulation showed no corrosion at all.

Why take this kind of chance when excellent insulation alternatives like fiber glass are available that present no risk of corrosion?

Indoor Air Quality

Think about it: Wet-spray cellulose is a moist mixture made up primarily of newspaper, installed in an enclosed area that slows the drying-out process. Sounds like a prescription for mold, mildew and subsequent indoor air quality problems, doesn't it?

Again, why take chances that this kind of problem will crop up after your home is complete when effective insulation alternatives like fiber glass, which do not retain moisture or present a breeding ground for mold and mildew, are readily available and offer proven performance?

Conclusion

This brochure raises a lot of questions. And they all boil down to one basic point: Wet-spray cellulose insulation systems present potential problems in a number of performance-related areas. With so many unanswered questions — and the common sense assumption that it's not a good idea to put damp material inside enclosed sidewalls — we suggest you consider your choices carefully before selecting an insulation material.

For more information about fiber glass insulation, or about the issues raised in this brochure concerning problems with wet-spray cellulose, contact:

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