

test used a "test fence"—not the walls of a house. The test has since been upgraded to simulate the moisture and temperature profiles of a house. Next year we may know a lot more.

As for where the water comes from, some speculate that moisture forms on the sheathing in the morning like dew, some blame wind-driven rain, and some believe moisture comes from the interior. Once the moisture's in there, the theory goes, it gets trapped between the foam and wood and causes cupping.

A contributing factor is that the foam provides no support for nails, so if there is any movement in the wood it is more prone to come loose and drop out of alignment. The compressibility of the foam also creates nailing problems—particularly for hardboard sidings. It is easy to overnail, creating dimples and waviness.

All parties agree that most of the problems are due, in large part, to poor installation. Improper nailing is cited more than any other factor. In many problem cases, contractors were using familiar 7d or 8d siding nails that barely made it through the foam. Some nailed only into the foam.

Another area of agreement between factions is that poor stock is more subject to failure. Craig Westover of Mid-America Cedar points out that high moisture content, too much large, flat, or irregular grain, or too much sapwood can all increase twisting or cupping. Letting the siding get wet prior to installation can lead to problems. All these problems are increased with thinner ( $\frac{1}{2}$ -inch) and wider (beyond 8-inch) materials. But as Peter Johnson, a veteran wood technologist at CRA, points out, "We've used  $\frac{1}{2}$ -inch redwood sidings successfully over wood sheathing for many years, even unfinished."

## The cure

Though the cause remains murky, the cure is pretty straightforward—do everything right, only better. The joint committee report is a good place to start. The tough part is deciding how far to go to be safe.

**Nailing** It's agreed that proper nailing is essential. Proper nailing means  $1\frac{1}{2}$ -inch penetration into solid wood. Sixteen inches on center is preferable with wood siding and mandatory with hardboard sidings. However, finding a  $3\frac{1}{2}$ -inch siding nail is difficult. Two sources of true hot-dipped (not merely "hot-galvanized") extra-long and thin, high-carbon siding nails are: Maze Nail Co., 100 Church St., Peru, Ill. 61354, and Independent Nail Inc., 106 Hale St., Bridgewater, Mass. 02324. Good stainless steel nails (316 Series) are a more expensive but reliable alternative. With hardboard sidings a 12d galvanized box nail provides the best results over 1-inch insulating sheathing.

Over foam, bevel siding should lap at least one inch (some say  $1\frac{1}{4}$  inches) with each nail located at least  $\frac{1}{8}$  inch above the top of the board below to allow room for

expansion. In rabbetted patterns the  $\frac{1}{8}$ -inch space should be left in the rabbet. Pre-drill at butt joints and make sure they fall on studs. Ring-shank or spiral nails are recommended.

Double-nailing of bevel sidings—that is, nailing through the thin top of the board below—has traditionally been spurned by the redwood and cedar companies for fear that it would cause splitting when the siding shrinks and expands. Some members of the joint committee, though, prefer double-nailing over foam sheathings and are testing it in this year's study.

**Finishing** Siding should be finished before or shortly after installation with a water-repellent preservative. Most feel that light-colored stains and paints are preferable, since they keep the siding cooler. Some advocate pre-finishing on all sides to limit moisture movement into and out of the siding. If you go this route, look into commercial dipping. It can save you a lot of headaches. With wide sidings, pre-finishing has the advantage of eliminating lines due to shrinkage.

**Quality** The report recommends that siding be well-seasoned, and that it be kept dry prior to installation. Westover emphasizes that the quality of the product is essential over foam sheathings but that quality cannot be judged by grade alone. He suggests that anyone using wood over foam sheathing get his lumberyard, and indirectly the wholesaler, to stand behind the product. Only the wholesaler, he says, can know which mills turn out stock that will work over foam.

## Strapping

One surefire solution is to leave a cold-side air space by installing strapping on the outside of the sheathing. This, I'm told, is how they do it in Canada's Maritime Provinces, where wood rot is as plentiful as codfish. While some technical people in the industry see strapping as a practical alternative, businessmen fear that most contractors would resist the added expense, so it is rarely recommended in company literature.

## How far to go

**Q.** Over foam sheathing, must I use all clear-heart, vertical-grain stock, pre-finish it on all sides with a light-colored preservative stain, and nail it up with 16d galvanized, double-hot-dip, ring-shank shingle nails?

**A.** If you can get paid for it, why not? At a minimum, get the right nails, and use good stock. Vertical-grain siding commands only a modest premium. Don't leave the siding unfinished, unless ultra-rustic is expected.

For a free copy of the Joint Industry Committee's recommendation, send a business-sized SASE to "Wood Siding," *Solar Age*, Church Hill, Harrisville, N.H. 03450.