Troubleshooting Wood Siding

by David Utterback

Solid wood has been used successfully for hundreds of years as a siding material. Its properties make it adaptable to various climates and architectural styles. But getting optimum performance from wood siding requires choosing the right product for the job and installing it correctly.

As a field representative for the Western Wood Products Association, I travel throughout the Midwest talking with builders about wood siding and helping them troubleshoot installations that went wrong. Most of the problems that I see cropping up over and over are easily preventable. This article covers the most common of those problems and how to avoid them.

Selecting the Right Material

One whole set of problems stems from selecting the wrong material for the job. Picking the wrong grade, size, or pattern can lead to a finished product that either doesn't look good, doesn't last long, or both.

Select a proper grade. Many siding problems occur because the grade is not adequate for the job. The chart on the following page, "Standard Siding Grades," can guide you in specing a suitable grade. If your lumberyard uses other terms for their siding grades, find out if they are equivalent to the standard grades established by industry trade associations shown in the chart.

Many mills or yards, for instance, use their own proprietary grades. And many use a hodgepodge of grades to compose their "knotty" grade of siding, also known as "STK" or *select tight knotty*. Make sure any STK or knotty grade is composed of siding grades identified in the chart as acceptable for quality siding jobs. Otherwise you won't know what you're buying until it shows up on the job site. And if it turns out to be a pile of green wood with loose knots and a host of other defects, you'll have little recourse. You can't argue that it doesn't meet grade or request a reinspection if there are no written rules to be met.

Buying actual industry grades, such as "Select Knotty" or "Quality Knotty," is a lot safer. Another option is to use common board grades such as No. 2 or No. 3 Common, which give you the same knotty appearance and perform as well as siding.

Customers who want the highest quality appearance — and are willing to pay for it — will prefer the premium grades or some of the special cedar siding grades.

Don't forget moisture content. Nearly all wood siding shrinks somewhat after installation. If its moisture content is too high when installed, the shrinkage will be excessive and can lead to splitting, warping, or cupping, as well as paint checking. You can minimize these types of problems by specifying "S-Dry" material. S-Dry contains no more than 19% moisture. You should still stack the siding in a sheltered place on site for a week to ten days so it can acclimate to its surroundings. This will minimize the shrinkage after installation.

Premium grades are dried to MC 15, meaning that the wood has 15% moisture content or less (and that 85% of the pieces are dried to 12% or less). This wood should arrive at the site with close to its final installed moisture content.

"Alternate" grades follow standard grading rules but are unseasoned, with unknown moisture content. The same is true for ungraded sidings.

The importance of pattern. Many failures result from choosing the wrong pattern for the job. The least forgiving pattern is tongue and groove (T&G), because the pieces can come apart with relatively little shrinkage. Therefore T&G siding should be close to its final moisture content when installed and should be prefinished (see Figure 1, page 21).

As a rule of thumb, narrow patterns perform best because there is less movement from wet to dry periods, and from season to season. Thicker patterns are safer since they have less tendency to cup or split than thinner patterns. And the surface texture will affect how well the finish performs. Rough textures will typically hold a finish longer than a smooth finish.

The chart "Wood Siding Patterns" (page 22) suggests which products to use for various types of jobs and provides installation tips.

Pattern width. Finally, many of the problems we see are caused by siding that is too wide. Because wide pieces of siding move more, they are

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For an attractive, durable job, select the right pattern, nail it correctly, and finish it well

more prone to warp, cup, or cause checking in the finish. In general, patterns over 8 inches in width will probably cause you some problems.

In an effort to save time and money, many builders like wider patterns because they cover an area faster, thus reducing labor costs. But these savings are more often than not wiped out by callback problems later on. If you have experienced this problem, try using the same patterns, but in widths of 8 inches or less.

Putting It Up Right

Even if you start out with the right pattern, grade, and width, it will not perform well if you put it up wrong. The basics of siding installation are not complex, but following them is crucial.

Nailing. The most common problem is improper nailing. The chart, "Wood Siding Patterns," on the next page, gives nailing guidelines. One rule holds for any pattern and size: *Never double-nail solid wood siding.* That is, never nail through more than one layer of siding at a time. New siding is going to shrink as it acclimates to its new surroundings. If the siding is nailed at both the top and bottom edges (or left and right edge for vertical applications), the nails will restrict the movement of the siding and cause it to split (see Figure 2). With bevel siding, be sure that each nail is slightly above the top of the underlying piece.

Another common problem with bevel siding is overdriving. Drive the nails just flush. Overdriving can cause cupping or splitting.

Finally, make sure the siding nails hit solid wood, not just sheathing or air. On vertical siding, this means using horizontal blocking where two pieces meet (see Figure 3).

Proper overlap. A related problem stems from the amount of overlap. Some builders will use too wide a pattern for the amount of reveal they desire — say, a 6-inch-wide board when they want a 4-inch reveal. This leaves too much board under the overlapping board, forcing you either to double-nail (causing splitting) or to nail through the thin part of the board, causing cupping and possibly splitting (see Figure 4, page 23). You should buy bevel siding 3/4 to 1 inch wider than the reveal you want. If you want a 5-inch exposure, buy 6-inch siding, not 8-inch.

Metal studs. Another fastening problem arises when attaching wood siding to metal studs. In this case, builders often nail the siding into the plywood or OSB structural sheathing. While plywood is good for lateral wall bracing, it's a poor nail base for siding. For good performance, siding must be nailed into 1 1/2 inches of solid wood. This is supported by all the model building codes.

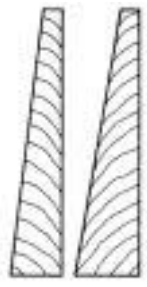
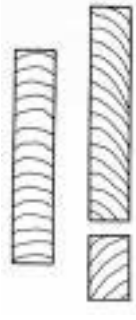
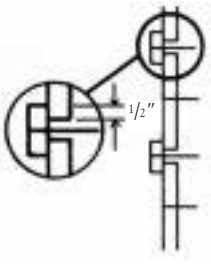
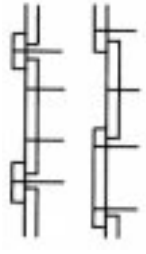
The best way to achieve this is to attach 2x nailers at each metal stud. An alternative is to fasten directly to

Figure 1. *T&G is not a forgiving pattern. When installed green (left), it is bound to fail from excessive shrinkage. Even installed at 19% moisture content, the 1x10 siding (below) opened at numerous joints. A better choice would have been 1x6s, acclimatized for at least a week before installation.*

Figure 2. *Nails at both edges and the middle of this wide piece of channel rustic (left) caused cracking. Two nails per board, 3 to 4 inches apart — with no nails through the overlap — is best. Bevel siding that is double-nailed is prone to cracking, particularly at the ends (below).*

Figure 3. *Use horizontal blocking at the joints in vertical siding. Otherwise, the end joints will pull loose and flap in the breeze — even with T&G, as shown here.*

Wood Siding Patterns

Siding Patterns	Nominal Sizes (thickness and width)	Nailing (Do not nail where siding pieces overlay)	
		6 in. and narrower	8 in. and wider
Bevel or Bungalow Bungalow (Colonial) is slightly thicker than Bevel. Either can be used with the smooth or rough-faced surface exposed. Patterns provide a traditional-style appearance. Horizontal applications only. 	1/2x4 1/2x5 1/2x6 5/8x8 5/8x10 3/4x6 3/4x8 3/4x10	Plain  Recommend 1″ overlap. One siding nail or box nail per bearing, just above the 1″ overlap.	Plain  Recommend 1″ overlap. One siding nail or box nail per bearing, just above the 1″ overlap.
Tongue & Groove T&G siding is available in a variety of patterns. Vertical or horizontal applications. 	1x4 1x6 1x8 1x10 Available with 1/4″, 3/8″, or 7/16″ tongues. For wider widths, specify the longer tongue.	Plain  Use one casing nail per bearing to blind nail.	Plain  Use two siding nails or box nails 3 to 4″ apart to face nail.
Channel Rustic Channel Rustic has 1/2″ overlap and a 1″ to 1 1/4″ channel when installed. The profile allows for maximum dimensional change without harming appearance. Available smooth, rough or saw textured. Horizontal or vertical applications. 	3/4x6 3/4x8 3/4x10	 Use one siding nail or box nail to face nail once per bearing, 1″ up from bottom edge.	 Use two siding nails or box nails 3 to 4″ apart per bearing.
Board-and-Batten Boards are surfaced smooth, rough or saw-textured. Rustic ranch-style appearance. Requires horizontal nailers. Vertical applications only. 	(4/4) 1x2 1x4 1x6 1x8 1x10 1x12 (5/4) 1 1/4x6 1 1/4x8 1 1/4x10 1 1/4x12	Board and Batten  Recommend 1/2″ overlap. One siding or box nail per bearing.	Board and Batten Board on Board  Increase overlap proportionately. Use two siding nails or box nails, 3 to 4″ apart.

the metal studs with stainless-steel or galvanized screws. But I doubt there's much cost difference between this approach and using 2x blocking and regular siding nails.

Rusty nails. Another problem that rears its ugly head time after time is rusting fasteners or rusty streaks draining from nail holes (see Figure 5). This is a great way to ruin a nice siding job. To avoid it, always use corrosion-resistant fasteners — typically hot-dipped, galvanized nails. More costly alternatives include stainless-steel and high-tensile-strength aluminum nails. Do not use the nails galvanized through an electrolytic process, as the zinc coating can crack during installation and the nails will rust.

Keeping the weather out. Siding is a weather barrier, but it is not waterproof. Water can and will find its way in behind the siding at times, and if nothing else is there to stop it, it may eventually work its way through the wall to the inside of the building (see Figure 6). Some sheathings claim to be waterproof and say you can put siding directly over them. However, the industry recommendation is to use a building paper or a house wrap over all types of sheathing before applying the siding. This is the real waterproofing of your wall. We've also found that the siding itself performs better when installed this way.

The use of building paper or a house wrap is particularly important behind any vertical or horizontal patterns, since those installations don't shed water as well as overlapping horizontal installations. It's a good idea on vertical installations to scarf any butt joints to prevent water penetration at these points. Make sure, however, that the scarfed joints are angled so they drain toward the exterior of the building.

The biggest problem with diagonal siding is that it channels water directly into door jambs, window moldings, or other joinery details on a structure. This means flashing and caulking details are critical. The best approach is to flash each side of the window with a cap molding (like the one used over the head casing).

Finishing Problems

Finally, many problems stem from choosing the wrong finish or applying it incorrectly.

First things first: Backprime. On most jobs, siding is finished after it is installed, so only the exposed face gets sealed. The back does not. This allows the back of the siding to absorb more moisture than the front, leading to cupping, warping, or even paint failure as the moisture looks for a way to escape. Backpriming equalizes the flow of moisture into and out of the front and back of the siding, minimizing these problems. For this reason I highly recommend backpriming or prefinishing siding before installing it. This one step would

Standard Siding Grades

Standard Clear Grades — Western Red Cedar			
Product	**Grade**	**Description**	**Moisture Content**
Bevel Siding	Clear VG (vertical grain)	Free of knots and imperfections; for use where the highest quality appearance is desired.	MC-15 (15% or less — most pieces 12% or less)
	A Grade	Includes some mixed grain and minor growth characteristics.	
	B Grade	Includes mixed grain, limited characteristics and occasional cutouts in longer pieces.	
	Rustic	Similar to A Grade, but graded from sawn face.	
	C Grade	Admits larger and more numerous characteristics than A or B Grades.	
Boards (Finish, Trim)	Clear	Finest appearance with clear face, few minor characteristics.	MC-15 (15% or less — most pieces 12% or less)
	A Grade	Recommended for fine appearance. May include minor imperfections or growth characteristics.	
	B Grade	Permits larger and more characteristics, but may have short lengths of fine appearance.	
Standard Knotty Grades — Western Red Cedar			
Product	**Grade**	**Description**	**Moisture Content**
Bevel Siding, Boards, Channel, T&G, etc.	Select Knotty	For fine knotty appearance.	19% or less
	Quality Knotty	Permits more pronounced characteristics and has occasional cutouts in longer pieces.	
Boards, Channel, T&G, etc.	Select Merchantable	Has fine appearance and includes knots and minor markings.	Unseasoned
	Construction	Limited characteristics allowed to assure high degree of serviceability.	
	Standard	Allows more characteristics than construction.	
Standard Softwood Grades (All species except redwood)			
Product	**Grade**	**Description**	**Moisture Content**
All patterns	C Select	Mixed grain, a few small knots allowed. For uses where a fine finished appearance is desired.	MC-15 (15% or less — most pieces 12% or less)
	D Select	Mixed grain, slightly larger knots than allowed in C Select.	
All patterns	#2 Common	Has fine appearance and includes knots and minor markings.	19% or less
	#3 Common	Limited characteristics allowed to assure high degree of serviceability.	
	#4 Common	Allows more characteristics than #3. Used chiefly for serviceability rather than appearance.	

Note: *These grades apply to all lumber graded under the rules of Western Wood Products Assoc. (WWPA), West Coast Lumber Inspection Bureau (WCLIB), or National Lumber Grades Authority (NLGA) of Canada. The term "characteristics" refers to knots, wane, pitch pockets, irregular grain, etc.*

Figure 4. *The carpenter nailed this bevel siding too high up, where the boards are thin and unsupported. This can cup and split the siding. The maximum overlap should be one inch.*

Figure 5. *Rusting nails leave ugly streaks down the side of a building. The right nails are stainless steel or hot-dipped galvanized — not electrogalvanized.*

Figure 6. *Siding is not waterproof. Here, water got into the wall cavity of a new home and rotted the studs and plates. Building paper would have prevented the problem.*

Figure 7. *The silver-gray, weathered look that some clients desire happens naturally only where there's plenty of sunlight and salty air to discourage mildew growth. Left untreated, cedar siding is more likely to end up dark and blotchy.*

Figure 8. *Solid-body stain applied directly to smooth siding has led to many failures. The solution: Use a primer first or put the rough side out. In either case, backbrush the finish if applied by spraying.*

prevent a large percentage of siding callbacks.

Let it weather? Some people choose to let the siding weather naturally, expecting it to turn that light gray color they've seen in pictures of houses on Cape Cod. The problem is, most places don't have Cape Cod's salty air to discourage mildew growth, so the unfinished siding ends up uneven in color. It tends to blacken in areas exposed to high moisture, while protected areas, such as under eaves, remain the original color (see Figure 7). Some blackened areas eventually lighten up, but areas exposed to water splash stay dark for a long time.

To achieve that gray, weathered appearance quickly while adding some protection, use a bleaching oil. This preparation typically contains bleach as well as some light pigment to help keep the coloring consistent.

Solid stains. Recently I have seen a number of problems with opaque stains when they were applied to smooth surfaces. These are sometimes called solid-color or heavy-body stains. Since they have more pigment than semitransparent stains, you might think of them as thin paints.

Since opaque stains form a thin film on the wood surface, they can flake and peel if the bond is poor (see Figure 8). Consequently these stains are not recommended directly over smooth surfaces. If you choose to use this type of finish on smooth siding, the wood should be primed first.

Brush it in. Speed is often the top priority when it comes to painting or staining siding. For this reason, many finishes are sprayed on. But spraying leaves the paint or stain sitting on the surface without penetrating into the wood. Eventually, it will start to flake off, even on a rough-textured surface. For that reason, spray-applied finishes should be backrolled or backbrushed to work them into the wood fibers.

The natural look. Many customers want their wood siding to look brand new and "natural" forever. Unfortunately, the natural process is for the wood surface to oxidize and break down. A number of clear finishes containing fungicides and mildewcides can delay the weathering process and keep the wood looking young for several years. But these generally require reapplication every year.

A better approach, I feel, is to apply a semitransparent oil-based stain with pigments that match the color of the natural wood. This allows the grain to show through, but keeps the color true. As the wood is periodically refinished, the color can be restored indefinitely. ■

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