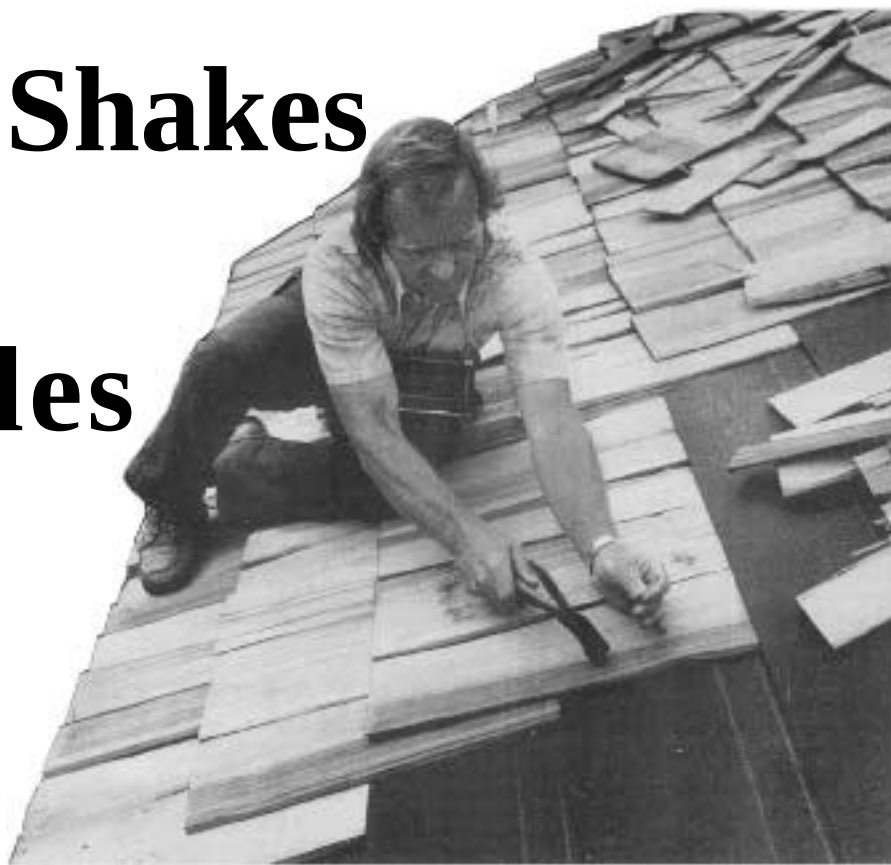


Wood Shakes & Shingles

*How to install,
treat, and
maintain
wood roofs*

by Henri de Marne



Shakes are installed with strips of 30-pound felt laid between each course to keep windswept snow and rain from penetrating between them.

There is something romantic and earthy about a wood-shake or -shingle roof. The materials evoke images of New England's colonial days when they were used extensively as both roofing and siding. They've also become a symbol of California's western architecture and outdoorsy style of living.

Early Easterners used a variety of wood species: white pine, white cedar, and so on, to make handsplit shingles, called shakes. As pioneers reached the Pacific Northwest, they found the ideal wood: western red cedar.

The properties of red cedar—durability, light weight, and ease of splitting—were well known to the Indians of the West Coast from Oregon to Alaska, who used it to make dugout canoes and side their houses.

Pros and Cons

In addition to good looks, wood shakes and shingles offer other benefits. They weigh less than most other roof coverings, making them easy to handle and suitable for reroofing over existing shingles. Wood roofs also offer some insulating benefit in summertime, although this is less important these days, with improved ventilation and insulation practices.

Moreover, shakes and shingles can withstand high winds and hailstorms better than most other roof coverings. Their strength also adds some racking strength to a roof structure.

They are not, however, without problems. They are extremely flammable. A spark from a woodstove, chimney, or forest fire can quickly set a

wood-roofed home ablaze. In the West, where forest fires are common during the hot, dry summers, many houses have been lost because of their wood roofs, while those with noncombustible roofs survived.

Wood roofs are also affected by fungus, moss, lichen, and moisture. Despite the claims of long life made for these roofs—20 to 35 years for a temperate northern climate—many of them must be replaced in as few as 10 or 15 years if used in the wrong environment (wet and shaded), badly installed, used on too shallow a roof, or not properly maintained.

Sheathing and Felting

Shingles and shakes can be laid over either solid or spaced sheathing. Spaced

sheathing—1x6s spaced on centers equal to the weather exposure of the shingles—will extend the life of shingles and shakes by several years (about 10 percent, estimates one wood-roofing consultant) because it allows them to “breathe” from underneath and, therefore, dry readily from both sides.

In areas where windblown snow is expected, use solid sheathing under shakes, since fine snow can penetrate the coarse shakes. Conversely, in hot and humid areas, use spaced sheathing under shingles. Shingles need the extra drying, because they are not self-ventilating like shakes. In other cases, the choice is yours.

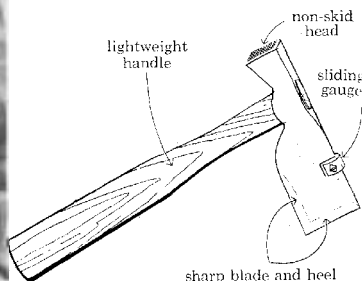
For spaced sheathing, four 1x6s are nailed at the eaves to start with, then single 1x6s are fastened on centers equal to the weather exposure of the shingles or shakes—but never more than 10 inches. Shingles applied over spaced sheathing should not have felt underlayment or interlay, as these will inhibit drying.

Where shingles are applied over solid sheathing, felt underlayment is not recommended either. But if you want extra protection against leaks, use a highly permeable underlayment.

With shakes, 18-inch-wide strips of #30 felt should be interlaid between rows regardless of the type of sheathing used. The interlaid felts keep wind-driven snow and rain from penetrating through the irregularities of the shakes.

Where shakes are installed on spaced sheathing, the shinglers will nail a 36-inch-wide strip of #30 felt at the eaves, then nail 18-inch strips to each 1x6 as far as they expect to go during the day.

Make sure the strips of felt are laid straight; they will be used as a guide to lay the shakes. One worker fastens the felt at the top of the roll, then unrolls it, sending it to a worker at the other end of the roof. Here it is straightened out,



Tools of the trade: A nail stripper (left) can greatly speed up shingling. (Made by McGuire-Nicholas Mfg. Co., 6223 Santa Monica Blvd., Los Angeles, CA 90038.) The shingle hatchet (above) has a blade for trimming, and a shingle gauge for checking courses.

measured, and nailed with roofing nails.

While the second person cuts the roll and moves up to the next 1x6, the first checks measurements in the middle of the roof and nails the top of the sheet. Other nails are placed every 10 feet or so. The process is repeated all the way up the roof.

Installation

As the shakes are laid up, they are tucked under the strips of felt so that, for a 10-inch exposure, 4 inches at the top of each shake is covered by felt and 20 inches is exposed. Check the exposure often to ensure an even row, until the third course. At that point you can look between the shakes and line up the

Galvanized staples used on wood roofs have been known to rust away and let the shingles blow away with the next breeze,

butt of the shakes with the felt interlay one course below.

You may not be able to buy 18-inch-wide felt, so you'll have to cut your own. Have fun! I buy a bunch of cheap, disposable circular-saw blades and cut through the rolls while someone else holds them firmly in place and rotates them as needed. It's risky business and no fun. A roofing contractor I know uses a radial-arm saw with a 12-inch blade to precut the rolls with greater ease and safety.

The eave course should be doubled or tripled, and all joints staggered. YOU can use 15-inch starter-finish shakes to save cost. If no gutters are to be used, the shakes should overhang by two inches to provide a proper drip edge.

Shakes and shingles should be laid so that joints between courses are staggered by at least 1 1/2 inches and do not line up for at least two courses up.

As you go along, you will also want to set aside all wide shakes or shingles to use at the valleys and hips. Or you can pull them out ahead of time and precut all valleys. Don't throw away the cutoff pieces—you can generally use them on the opposite side of a hip.

Use premanufactured hip and ridge units, if available, and make sure you alternate the joints as you go up the hip or along the ridge. The best procedure to install the cap pieces at the ridge is to start at each end of the roof with a double piece, and meet in the middle or at a chimney.

Nailing

Use hot-dipped, zinc-coated box nails—3d for 16- and 18-inch shingles, 4d for 24-inch shingles, and 6d for shakes. Just make sure there is at least 1/2-inch penetration into the sheathing (7d nails might be safer with shakes). Use 8d for shake hips and ridges. When reroofing over an existing roof, use longer nails.

You'll need about two pounds of nails per square. Use only two nails per shingle or shake, and drive them so that the head touches the wood without breaking the fibers or distorting the shingle.

For shingles, place nails about 3/4 inch from the edge of the shingle, no more than one inch above the exposure line. For shakes, nail about one inch in, and one to two inches up.

Since 1979, the Red Cedar Shingle and Handsplit Shake Bureau has endorsed the use of pneumatic nailers, but only with aluminum or types 304 or 316 stainless-steel fasteners. Galvanized staples used on wood roofs have been known to rust away and let the shingles blow away with the next breeze. Also, it's important that the nailer be adjusted so the staples do not damage the wood fibers—and therefore lose their holding power.

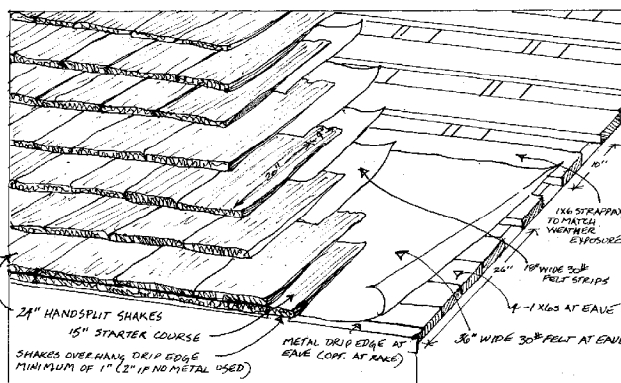
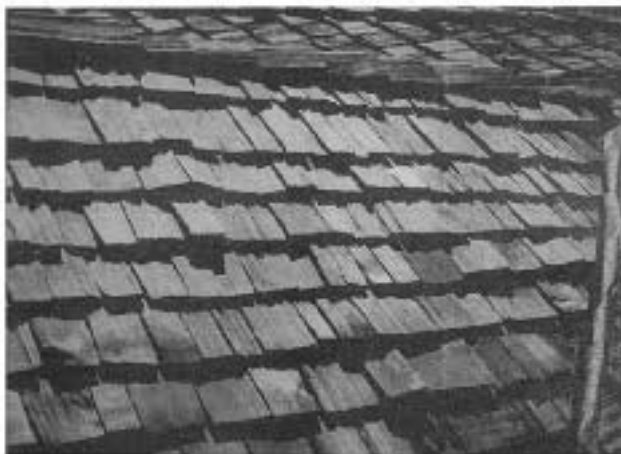
Fire Safety, Durability and Maintenance

Because they are wood, even though of a durable species, shakes and shingles are subject to fire and rot if they are not treated.

Although few fires originate on roofs, fire will spread quickly once it reaches a wood roof. As pointed out

Photos above right show a roof before and after cleaning and treating. Periodic maintenance can dramatically extend a wood roofs life span—particularly on low-slope roofs in wooded areas. Clean with a stiff broom or high-pressure jet of water. Effective treatment can be done with a simple garden sprayer and a low-toxicity preservative such as copper-8 (10-percent solution).

Interlaid felt strips should always be used with shakes, but not with shingles as they will inhibit drying. Use skip sheathing (shown above) in hot, humid climates, and solid sheathing in snowy regions.



earlier, in dry, windy areas such as southern California, houses with wood roofs have been lost to brushfires because flying embers ignited the roofs. A number of communities have banned or restricted wooden roofs, partly due to bad publicity from several major apartment-complex fires in Texas—even though the fires were traced to careless home owners.

In areas where wood is a major source of winter heat, there is also a danger of fire spreading to the roof from chimney fires or flying embers—unless the roof is covered with snow.

Where fire-resistant roofs are required or desirable, you can use pressure-treated shingles or shakes and achieve a Class C, B, or A roof covering. The cost will be double—or more—the price of untreated wood.

Existing wood roofs in good condition can be made fire-resistant to Class

wood roofs—particularly on low-pitch roofs in humid, wooded areas. Portions of the roof under overhanging trees are particularly vulnerable because of both the shade and the organic debris that lands on the roof. Moss and lichen take hold, encouraged by pine needles and other vegetable matter that accumulates on shallow roofs and retains moisture. Subsequent rainfall is, in turn, held by these growths and even pumped inside the wood cell. Sunlight and rain interact to rob wood shingles and shakes of their natural preservatives within a few short years. The shingles begin to curl, cup, split, and absorb water; the decaying process has started.

Chemical treatments that can control these problems are available both for new shakes or shingles—using pressure or dip treatment—or for existing roofs.

Again, the Texas Forest Service has tested many chemical treatments and come up with a practical and inexpensive recommendation. A 10 percent solution of copper-8 (copper-8 quinolinate) in water can be sprayed on the roof with a garden sprayer. The solution is not toxic to vegetation, so there is no need to cover plants, but overspraying should be avoided. Eye and skin protection must be worn during the application.

Copper-8 becomes highly insoluble once it dries in the wood cells; nevertheless, treatment should be renewed every two or three years. Faithful treatment should double the life of the roof.

Penta is also a good preservative, but has environmental problems. Light-pigmented stains have little value, are expensive, and must be applied on a yearly basis. Neither copper nor zinc naphthanate are recommended because of their high cost, low durability, and unsightly color.

Few home owners realize that maintenance is essential to a long-lasting roof. Sweeping the roof with a stiff broom or brush is not enough; all material that has accumulated on or between the shakes or shingles must be removed periodically. This is a large and tedious undertaking, best performed by a high-pressure water jet.

If moss and lichen have taken hold, they should be scraped off as much as possible and the roof sprayed with a weed killer, following the manufactur-

er's directions.

Finally, if you have to replace damaged shingles or patch into an existing roof while remodeling, don't leave behind a patchwork of new and weathered shingles. You can blend the two by speeding up the weathering process. Simply spray or brush coat the new shingles with a solution of one pound baking soda dissolved in a half gallon of water. A few hours of sunlight will do the trick and the chemical reaction is permanent.

On my own houses, I have had to replace one wood-shingle roof only 12 years old (in the Washington, D.C., area) and a shake roof that was 13 years old (in Vermont). In all fairness, both roofs had 4-in-12 pitches, were laid over solid sheathing, were in deeply wooded areas, and were untreated. Also, I was less than thorough in keeping the roofs clean of organic matter.

Yes, cedar makes a beautiful roof. But shade, moisture, organic debris, and lack of maintenance can make that beauty short-lived. ■

Henri de Marne was a remodeling contractor and custom builder for 25 years in Washington, D.C., and Vermont. He now consults, does home inspections, and writes a nationally syndicated column.

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C specifications by spraying, but this treatment needs to be repeated frequently as the chemicals leach out.

An inexpensive treatment developed by the Texas Forest Service uses dissolved diammonium phosphate—a chemical used as a fertilizer, and readily available—at a concentration of one pound per gallon of water. The solution is sprayed liberally onto the shingles or shakes. Because it is easily leached out of the roof, however, it should be applied every six months under normal conditions and every month in brush-fire regions.

The other major enemy of wood shingles is organic growth. Moss, lichen, fungus, and rot are at-home on

GRADES & COVERAGE

Shingles are sawn on both sides to produce smooth surfaces. They come in four grades:

- #1 or Blue Label, are clear heartwood, edge grained;
- #2, or Red Label, are flat grained and have limited sapwood;
- #3, or Black Label, are economical utility shingles; and
- #4 shingles are used for shims and under-coursing.

Numbers 1 and 2, rebuttet-rejointed shingles, are trimmed with straight edges and square corners for close tolerance applications on exterior walls. They also come sanded smooth.

Shakes come in four different types, but all are #1 grade. *Hand-split*, *resawn* shakes are tapered; one side is heavily textured while the other is sawn smooth. They are heavier and thicker at the butt than other shakes. *Tapersawn* are sawn

on both sides on a taper to attain a thick butt. *Tapersplit* shakes are of medium thickness and texture, and are produced by reversing the cedar block and handsplitting to obtain a natural taper. *Straight-split* shakes, also called "barn shakes," are handsplit without reversing the block; this results in a more uniform untapered thickness.

Lengths

Shingles come in three lengths: 16-inch (fivex), 18-inch (perfections), and 24-inch (royals). Generally, it takes four bundles to cover a square.

Shakes come in 18- and 24-inch lengths, as well as a 15-inch starter-finish shake. Shakes come in two weights—*mediums*, with 1/2-inch butts, and *heavies*, which average 3/4 inch at the butt. It takes five bundles of shakes to cover a square of

roofing with a 10-inch weather exposure.

Weather Exposure

Weather exposure depends on roof pitch. With #1 Blue Label shingles, the Red Cedar Shingle and Handsplit Shake Bureau recommends the following exposures:

For 4-in-12 or steeper roofs, allow a 5-inch maximum exposure for 16-inch shingles, 5 1/2-inch for 18-inch shingles, and 7 1/2 inches for 24-inch shingles. This ensures a three-ply roof covering, which is the minimum recommended.

For roof pitches of 3 to 4 in 12, the exposure should be reduced to 3 3/4 inches for 16-inch shingles, 4 1/4 inches for 18-inch shingles, and 5 3/4 inches for 24-inch shingles, giving a four-ply roof. Below 3 in 12, don't use wood roofing.

If you use #2 or #3 shingles, you

must reduce the exposure. The Bureau will provide details upon request.

Shakes should not be used on roof pitches below 4 in 12. A maximum 10-inch exposure is recommended for 24-inch shakes, and 7 1/2 inches for 18-inch shakes. These exposures will give you two-ply coverage, which is usually adequate. But if a three-ply roof is desired, reduce these exposures to 7 1/2 and 5 1/2 inches respectively.

Leave a 1/2-inch space between the shakes, and 1/4 inch between shingles to allow for expansion during wet weather. If the shingles are butted too tightly, they can buckle. If the shingles or shakes are very wet when applied, however, many roofers butt them tighter—down to 1/8 inch for shingles—to ensure weathertightness when they dry and shrink. ■

—H. de M.