

# The finish line

A Forest Products Laboratory finishing factsheet



## Wood Shakes and Shingles for Roof Applications Tips for Longer Life

Many wood shakes and shingles have been replaced by composition or asphalt-based shingles. Nevertheless, wood shakes and shingles are still widely used on commercial structures and residential houses.

**Shingles** are sawn from wood blocks; they are tapered and generally have a relatively smooth surface. **Shakes** are split from wood blocks; they are less uniform in thickness than shingles, are sometimes grooved, and frequently have little taper. Shakes may be split and then sawn (from top-edge corner to opposite bottom-edge corner) to provide taper as well as a relatively flat side, which is turned away from the weather during installation. Shakes have a rustic appearance. Shingles and shakes can be used on sidewalls as well as roofs, but only roofs are addressed here.

In this circular, the term shingles includes shingles and shakes. The following tips will help ensure a long life for your roof shingles.

### • Select Durable and/or Treated Wood

The most important wood property to consider when buying shingles is **durability**, its resistance to decay (rot). Some woods, such as western redcedar, have natural durability. The heartwood of old-growth western redcedar is rated as extremely durable because of its extractives. However, the generally small amount of sapwood associated

with this species is not durable. There is general consensus that some second-growth timber, even from a decay-resistant species, is not as durable as the old-growth timber. Nevertheless, the durability of any wood decreases as rain or other sources of moisture leach extractives from the wood. For these reasons, the use of a “durable and treated” wood for shingles is increasing.

The most commonly used wood for shingles is western redcedar. Treated southern yellow pine taper-sawn shingles are also available. If the shingles are properly treated, other species can also be used. Using preservative-treated or naturally durable wood for shingles should result in a roof free of decay for 25 to 30 years.

**Weathering** is erosion from sun, wind, debris, and precipitation. Even wood that does not decay is still subject to weathering. The weathering process removes about 1/4 inch (6 mm) of unprotected wood per century for softwoods (e.g., cedar) on vertical exposures, but more wood is removed from roofs. Shingles are often left to weather naturally and, depending on exposure and climatic conditions, the wood will turn silver, dark gray, or dark brown. Weathering can be reduced by applying finishes, especially those with pigment. Some treatments retard both decay (preservatives) and weathering (finishes).

Proper selection of materials will appreciably influence the service life of wood shingles. Use only the top grade of shingles manufactured with edge-grained heartwood (or treated sapwood). A lower grade of shingles can be used on sidewalls or areas that require an undercourse. Roofs, unlike walls, have the most direct and extreme exposure to rain and sunlight.

Shingles rapidly absorb moisture because their lower edges are end grain, where wood is similar to a bundle of straws. The swelling and shrinking of the wood results in cracks, which can increase the entry of moisture. Decay occurs when nondurable, untreated wood remains wet for sufficiently long periods.

Under high moisture conditions, naturally durable and treated shingles last longer than untreated shingles. In warm, humid climates and on heavily shaded roofs, mildew, moss, algae, and lichens can grow; because these organisms retain moisture, the wood will decay with time. In some cases, particularly where warm, humid conditions persist for substantial parts of the year, it is desirable to extend the life of wood shingles with special preservative treatments. For maximum effectiveness and long life, purchase shingles pressure treated in the factory. Chromated copper arsenate (CCA, Type C), copper–8–quinolinolate, and copper naphthenate are effective



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wood preservatives when applied at the recommended levels. A CCA treatment on shingles will also decrease weathering. Note: Pigments may be required if the green stain from the copper is objectionable.

Wood roofs are more flammable than composition roofs. Wood roofs may be unsuitable in arid regions, in high density neighborhoods, or where appreciable amounts of flammable vegetation grow close to the structure. Application of fire retardants may be required by local ordinances.

#### • Apply Appropriate Finish

Weathering rapidly deteriorates any finishing system. Various finishes and preservatives can be applied to shingles to reduce weathering and potential decay, and to obtain a particular color. Prefinishing shingles is not difficult and may be well worth the effort. **Caution: Some finishes may increase flammability of roofs.**

**Film-forming finishes**, such as paint, solid-color stains, or varnish, should *never* be used on roofs. Such finishes do not tolerate shrinking and swelling and will crack, providing a site for water to enter; the areas of intact film will later restrict moisture release. A transparent finish, such as varnish, will deteriorate within a few months, and a pigmented finish, such as paint, will usually last only a few years. The result will be an unsightly appearance and the wood will be difficult to refinish. Increased wood decay is also likely because the film-forming finish helps to retain moisture in the shingle.

**Semitransparent penetrating oil-based stains** are the most effective finishes for roofs. These stains provide color without entirely concealing the grain and texture of the wood, and they can last for several years on roofs. Semitransparent stains last longer

on rough-textured edge-grained surfaces than on smooth surfaces. The stain should contain a wood preservative and a water repellent. Some stains are specially formulated for use on shingles. Stains with the highest concentration of pigment will probably give the longest service life and provide the most protection from surface erosion.

**Water-repellent preservatives** can also be used on roofs, although their life expectancy is less than that of semitransparent stains. These finishes contain a wax or other water repellent, a preservative, and a solvent or carrier.

**The first coat of finish is best applied** before shingles are installed so that the back, butt-end, and face of each shingle are thoroughly coated. The finish may be applied by dipping the shingles to at least two-thirds their length and then standing them vertically until the finish has dried. In addition to dipping, the finish may be applied by brushing, rolling, or spraying. Dipping is the most effective method and brushing is the next best. If a light-colored finish has been applied, the butt-end and edge of the shingle will eventually discolor as a result of leaching of water-soluble extractives from the wood.

#### • Use Proper Installation Methods

How shingles are installed influences the moisture condition of the roof. With the inherent water exposure of roofs, moisture buildup greatly affects service life.

Before and during the 19th century, wood shingles were commonly used for roofs. The shingles were fastened to widely spaced nailing strips without the use of tarred or asphalted felts as a secondary barrier. Today, asphalted felt is used as a secondary barrier over sheathing, so wood shingles typically dry

less quickly. Providing an air-space between the shingles and the felt-covered sheathing vastly improves drying. The airspace can be created by attaching furring strips to the felted roof deck parallel to the trusses or rafters and then attaching widely spaced nailers perpendicular to the furring strips. Water that gets past the shingles can drain away, and the airspace allows drying. Alternatively, a commercial thick plastic mesh called "Cedar Breather" that can be applied over roofing felt creates some airspace between the shingles and the felt-covered sheathing.

The single most important way to prevent moss from developing on roofs is to use **zinc, galvanized, or copper flashings**. Copper flashings that change color (turn green) in time are better in this regard than copper flashings that presumably do not change color. The normal corrosion from these metals provides some control of moss (plus mold and mildew) for 15 ft (5 m) or more down slope from the metal. The metal can be used as a ridge cap, or strips can be placed under the top course with at least 1 inch (25 mm) exposed. Additional strips may be necessary farther down the roof.

Details on shingle and shake grades and application procedures are available from the Red Cedar Shingle and Handsplit Shake Bureau (515 116 Ave. NE, Suite 275, Bellevue, WA 98004). Similar information on CCA-treated Southern Pine shakes is available from the Southern Forest Products Association (P.O. Box 52468, New Orleans, LA 70152).

#### • Perform Routine Maintenance

Leaves and other debris that accumulate on roofs, particularly in the valleys and gutters, trap moisture in shingles, increasing the likelihood of decay. Therefore, clean loose debris from roofs and

gutters routinely. Overhanging limbs and vines that provide excessive shade keep the shingles wet for longer periods, encourage moss growth, and may encourage decay.

Periodically check the roof for moss or lichen growth and apply a chemical treatment if necessary. A solution of 1 quart (1 liter) household bleach, 1 ounce (30 g) detergent, and 3 quarts (3 liters) warm water can be used to clean the roof.

Surface treatment of the roof with selected chemicals can also provide some protection. A solution of copper naphthenate with 3% to 4% metal content, copper octoate with 1% to 2% metal content, and copper-8-quinolinate with about 1% active ingredient content can be used to control moss, lichens, and surface decay. You can also purchase commercial treating solutions. All solutions are best applied by brushing or dipping. Even if the roof is surface treated, serious decay problems can still occur within the shingled or unexposed parts of the roof that are

not treated. Nevertheless, surface treatment helps to lengthen the life of a wood roof by preventing the growth of moss and lichens.

### **Summary**

Protecting wood from decay is of primary importance. Failure from decay can occur in less than 10 years, and failure from weathering, though slower, is an accumulative process. Refinishing with semitransparent stains will reduce weathering. Stains containing preservatives can also be used to protect wood from decay.

*Caution: Manufacturers' application and safety recommendations should always be followed because wood preservatives, if used improperly, can be toxic to humans and plants. Humans, animals, and vegetation should be protected from drippings and runoff from the roof or gutters.*

### **Additional Information**

*Care and Maintenance of Wood Shingle and Shake Roofs* can be purchased from the Oregon State University Extension Service, Corvallis, Oregon (503) 737-2513; cost \$0.75.

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