



# What You Need to Know Before You Replace Your Roof

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## Roof System Components

All steep-slope roof systems (i.e., roofs with slopes of 25 percent or more) have five basic components:

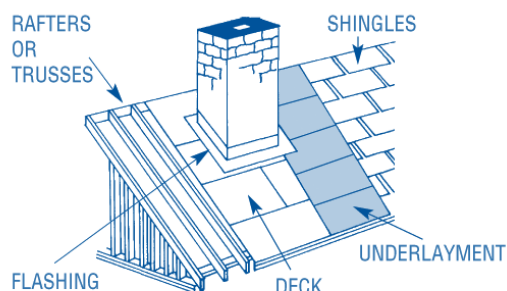
**Roof covering:** shingles, tile, slate or metal and underlayment that protect the sheathing from weather.

**Sheathing:** boards or sheet material that are fastened to roof rafters to cover a house or building.

**Roof structure:** rafters and trusses constructed to support the sheathing.

**Flashing:** sheet metal or other material installed into a roof system's various joints and valleys to prevent water seepage.

**Drainage:** a roof system's design features, such as shape, slope and layout that affect its ability to shed water.



## Choosing a Roofing System

There are a number of things to consider when selecting a new roof system. Of course, cost and durability head the list, but aesthetics and architectural style are important, too. The right roof system for your home or building is one that balances these five considerations. The following roofing products commonly are used for steep-slope structures.

**Asphalt shingles** possess an overwhelming share of the U.S. steep-slope roofing market and can be reinforced with organic or fiberglass materials. Although asphalt shingles reinforced with organic felts have been around much longer, fiberglass-reinforced products now dominate the market.

- Organic shingles consist of a cellulose-fiber (i.e., wood) base that is saturated with asphalt and coated with colored mineral granules.
- Fiberglass shingles consist of a fiberglass mat, top-and-bottom layers of asphalt, and mineral granules.

Asphalt shingles' fire resistances, like most other roofing materials, are categorized by Class A, B or C. Class A signifies the most fire-resistant; Classes B and C denote less fire resistance. Generally, most fiberglass shingles have Class A fire ratings, and most organic shingles have Class C ratings.





A shingle's reinforcement has little effect on its appearance. Organic and fiberglass products are available in laminated (architectural) grades that offer a textured appearance. Zinc or copper-coated ceramic granules also can be applied to organic or fiberglass products to protect against algae attack, a common problem in warm, humid parts of the United States. Both types of shingles also are available in a variety of colors.

Regardless of their reinforcing type and appearance, asphalt shingles' physical characteristics vary significantly. When installing asphalt shingles, NRCA recommends use of shingles that comply with American Society for Testing and Materials (ASTM) standards-ASTM D 225 for organic shingles and ASTM D 3462 for fiberglass shingles. These standards govern the composition and physical properties of asphalt shingles; not all asphalt shingles on the market comply with these standards. If a shingle product complies with one of these standards, it is typically noted in the manufacturer's product literature and on the package wrapper.



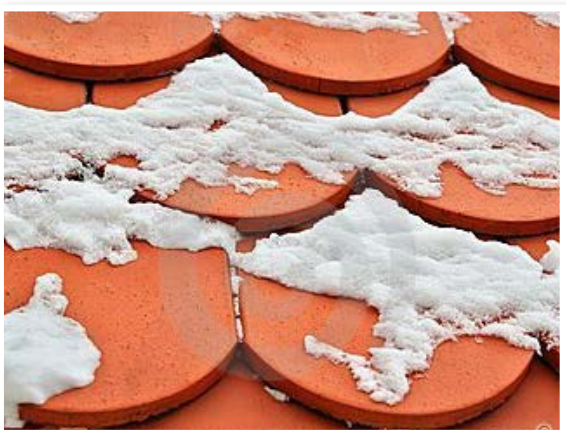
**Wood shingles and shakes** are made from cedar, redwood, southern pine and other woods; their natural look is popular in California, the Northwest and parts of the Midwest. Wood shingles are machinesawn; shakes are handmade and rougher looking. A point to consider: Some local building codes limit the use of wood shingles and shakes because of concerns about fire resistance. Many wood shingles and shakes only have Class C fire ratings or no ratings at all. However, Class A fire ratings are available for certain wood shingle products that incorporate a factory-applied, fire-resistant treatment.



**Tile**—clay or concrete—is a durable roofing material. Mission and Spanish-style round-topped tiles are used widely in the Southwest and Florida, and flat styles also are available to create French and English looks. Tile is available in a variety of colors and finishes. Tile is heavy. If you are replacing another type of roof system with tile, you will need to verify that the structure can support the load.



**Slate** is quarried in the United States in Vermont, New York, Pennsylvania and Virginia. It is available in different colors and grades, depending on its origin. Considered virtually indestructible, it is, however, more expensive than other roofing



In addition, its application requires special skill and experience. Many old homes, especially in the Northeast, still are protected by this long-lasting roofing material.

**Metal**, primarily thought of as a low-slope roofing material, has been found to be a roofing alternative for home and building owners with steep-slope roofs. There are two types of metal roofing products: panels and shingles. Numerous metal panel shapes and configurations exist. Metal shingles typically are intended to simulate traditional roof coverings, such as wood shakes, shingles and tile. Apart from metal roofing's longevity, metal shingles are relatively lightweight, have a greater resistance to adverse weather and can be aesthetically pleasing. Some have Class A fire ratings.

**Synthetic roofing products** simulate various traditional roof coverings, such as slate and wood shingles and shakes. However, they do not necessarily have the same properties.

## Even Roofs Have Enemies

A roof system's performance is affected by numerous factors.

Knowing about the following will help you make informed roof system buying decisions:

**Sun:** Heat and ultraviolet rays cause roofing materials to deteriorate over time. Deterioration can occur faster on the sides facing west or south.

**Rain:** When water gets underneath shingles, shakes or other roofing materials, it can work its way to the roof deck and cause the roof structure to rot. Extra moisture encourages mildew and rot elsewhere in a house, including walls, ceilings, insulation and electrical systems.

**Wind:** High winds can lift shingles' edges (or other roofing materials) and force water and debris underneath them. Extremely high winds can cause extensive damage.

**Snow and ice:** Melting snow often refreezes at a roof's overhang where the surface is cooler, forming an ice dam. This blocks proper drainage into the gutter. Water backs up under the shingles (or other roofing materials) and seeps into the interior. During the early melt stages, gutters and downspouts can be the first to fill with ice and be damaged beyond repair or even torn off a house or building.





**Condensation:** Condensation can result from the buildup of relatively warm, moisture-laden air. Moisture in a poorly ventilated attic promotes decay of wood sheathing and rafters, possibly destroying a roof structure. Sufficient attic ventilation can be achieved by installing larger or additional vents and will help alleviate problems because the attic air temperature will be closer to the outside air temperature.



**Moss and algae:** Moss can grow on moist wood shingles and shakes. Once it grows, moss holds even more moisture to a roof system's surface, causing rot. In addition, moss roots also can work their way into a wood deck and structure. Algae also grows in damp, shaded areas on wood or asphalt shingle roof systems. Besides creating a black-green stain, algae can retain moisture, causing rot and deterioration. Trees and bushes should be trimmed away from homes and buildings to eliminate damp, shaded areas, and gutters should be kept clean to ensure good drainage.



**Trees and leaves:** Tree branches touching a roof will scratch and gouge roofing materials when the branches are blown by the wind. Falling branches from overhanging trees can damage, or even puncture, shingles and other roofing materials. Leaves on a roof system's surface retain moisture and cause rot, and leaves in the gutters block drainage.

**Missing or torn shingles:** The key to a roof system's effectiveness is complete protection. When shingles are missing or torn off, a roof structure and home or building interior are vulnerable to water damage and rot. The problem is likely to spread-nearby shingles also are ripped easily or blown away. Missing or torn shingles should be replaced as soon as possible.



**Shingle deterioration:** When shingles are old and worn out, they curl, split and lose their waterproofing effectiveness. Weakened shingles easily are blown off, torn or lifted by wind gusts. The end result is structural rot and interior damage. A deteriorated roof system only gets worse with time-it should be replaced as soon as possible.

**Flashing deterioration:** Many apparent roof leaks really are flashing leaks. Without good, tight flashings around chimneys, vents, skylights and wall/roof junctions, water can enter a home or building and cause damage to walls, ceilings, insulation and electrical systems. Flashings should be checked as part of a biannual roof inspection and gutter cleaning.

# Frequently Asked Questions

## How can a homeowner recognize when a roof system has problems?

All too often, roof system problems are discovered after leaking or other serious damage occurs. Periodic (twice-a-year) inspections often can uncover cracked, warped or missing shingles; loose seams and deteriorated flashings; excessive surface granules accumulating in the gutters or downspouts; and other visible signs of roof system problems. Indoors, look for cracked paint, discolored plasterboard and peeling wallpaper as signs of damaged roof areas.

## What are my options if I decide to reroof?

You have two basic options: You can choose a complete replacement of the roof system, involving a tear-off of your existing roof system, or re-cover the existing roof system, involving only the installation of a new roof system. If you've already had one re-cover installed on your original roof system, check with a professional roofing contractor. In many instances, building code requirements allow no more than one roof system re-cover before a complete replacement is necessary.

## My roof leaks. Do I need to have it replaced completely?

Not necessarily. Leaks can result from flashings that have come loose or a section of the roof system being damaged. A complete roof system failure, however, generally is irreversible and a result of improper installation or choice of materials or the roof system installation is inappropriate for the home or building.

## Can I do the work myself?

Most work should not be done yourself. Professional roofing contractors are trained to safely and efficiently repair or replace roof systems. You can damage your roof system by using improper roofing techniques and severely injure yourself by falling off or through the roof.

Maintenance performed by home and building owners should be confined to inspecting roof systems during the fall and spring to check for cracked or curling shingles and cleaning gutters filled with dead leaves and other debris. If you must inspect your roof system yourself, use a firmly braced or tied-off ladder equipped with rubber safety feet. Wear rubber-soled shoes and stay on the ladder (and off the roof system), if possible.

## How long can I expect my roof system to last?

Most new roof systems are designed to provide useful service for about 20 years. Some roof system types, such as slate, clay tile and certain metal (e.g., copper) systems, can last longer.

Actual roof system life span is determined by a number of factors, including local climatic and environmental conditions, proper building and roof system design, material quality and suitability, proper application and adequate roof maintenance.

## What will a new roof system cost?

The price of a new roof system varies widely, depending on such things as the materials selected, contractor doing the work, home or building, location of the home or building, local labor rates and time of year. To get a good idea of price for your roof system, get three or four proposals from reputable contractors in your area. Keep in mind that price is only one factor, and it must be balanced with the quality of the materials and workmanship.

For each roofing material, there are different grades and corresponding prices. There also are a variety of styles and shapes. You need to look at the full product range and make a choice based on your budget and needs.

Within the roofing profession, there are different levels of expertise and craftsmanship. Insist on a contractor who is committed to quality work.



## Terms You Should Know

**Deck/sheathing:** The surface, usually plywood or oriented strand board (OSB), to which roofing materials are applied.

**Dormer:** A small structure projecting from a sloped roof, usually with a window.

**Drip edge:** An L-shaped strip (usually metal) installed along roof edges to allow water run off to drip clear of the deck, eaves and siding.

**Eave:** The horizontal lower edge of a sloped roof.

**Fascia:** A flat board, band or face located at a cornice's outer edge.

**Felt/underlayment:** A sheet of asphalt-saturated material (often called tar paper) used as a secondary layer of protection for the roof deck.

**Fire rating:** System for classifying the fire resistances of various materials. Roofing materials are rated Class A, B or C, with Class A materials having the highest resistance to fire originating outside the structure.

**Flashing:** Pieces of metal used to prevent the seepage of water around any intersection or projection in a roof system, such as vent pipes, chimneys, valleys and joints at vertical walls.

**Louvers:** Slatted devices installed in a gable or soffit (the underside of eaves) to ventilate the space below a roof deck and equalize air temperature and moisture.

**Oriented strand board (OSB):** Roof deck panels (4 by 8 feet) made of narrow bits of wood, installed lengthwise and crosswise in layers, and held together with a resin glue. OSB often is used as a substitute for plywood sheets.

**Penetrations:** Vents, pipes, stacks, chimneys—anything that penetrates a roof deck.

**Rafters:** The supporting framing to which a roof deck is attached.

**Rake:** The inclined edge of a roof over a wall.

**Ridge:** The top edge of two intersecting sloping roof surfaces.

**Sheathing:** The boards or sheet materials that are fastened to rafters to cover a house or building.

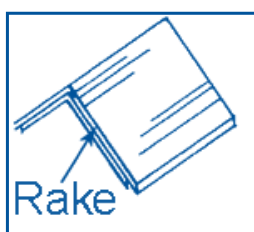
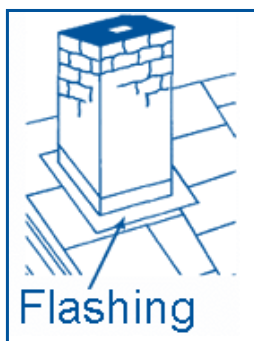
**Slope:** Measured by rise in inches for each 12 inches of horizontal run: A roof with a 4-in-12 slope rises 4 inches for every foot of horizontal distance.

**Square:** The common measurement for roof area. One square is 100 square feet (10 by 10 feet).

**Truss:** Engineered components that supplement rafters in many newer homes and buildings. Trusses are designed for specific applications and cannot be cut or altered.

**Valley:** The angle formed at the intersection of two sloping roof surfaces.

**Vapor retarder:** A material designed to restrict the passage of water vapor through a roof system or wall.



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10255 W. Higgins Road, Suite 600

Rosemont, IL 60018-5607

Telephone: (847) 299-9070

[www.NRCA.net](http://www.NRCA.net)