

# Selecting a Roof / 4 THE PROS AND CONS

The primary purpose of a roof is to protect your home from the weather. A roof also can offer fire resistance, be attractive and enhance resale value. While roofs are extremely durable, few can be expected to last the life of the house. Asphalt, wood and tile — the most commonly used roofing materials — all suffer from constant exposure to wind, sun and water. When roofs are allowed to deteriorate, moisture can enter the house and cause dry rot in the sheathing and rafters, resulting in difficult and costly structural problems.

Maintaining the roof will protect your investment in your home. When selecting a new roofing material, consider: the style or design of the roof; materials (includes roofing materials, flashing, gutters and downspouts); and cost, warranties and life expectancy.

## Roof Style or Design

The six basic roof styles commonly used for residential construction are: the gable, gambrel, hip, flat, shed and mansard.

There are a number of variations which combine two or more of the basic styles, such as a gable with a shed roof or a gambrel and a shed. At other times a basic style such as a hip roof may be modified to make room for dormer windows.

Roofs are constructed much like the floor or walls of a house. There is a framework of rafters which support the roof deck, sheathing and underlayment.

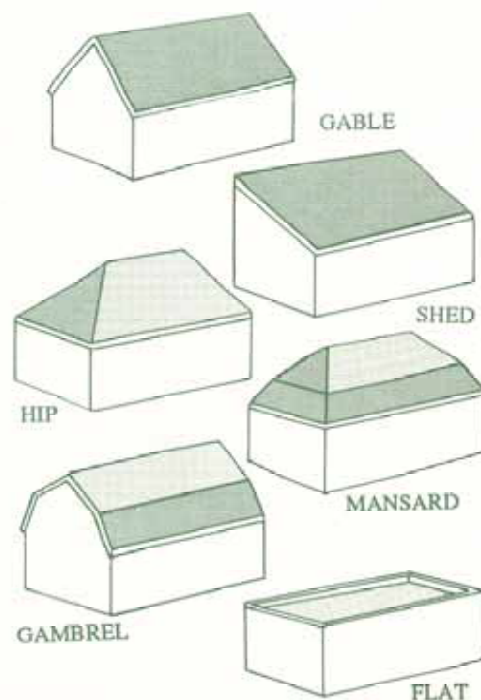
**Sheathing** provides a nailing base for the roof surface. Sloping roofs with asphalt shingles usually have solid wood or plywood sheathing, while homes with open-beam construction may use fiberboard sheathing. Roofs of thin wood shingles, thick wood shakes, tile or slate may be laid over "open" sheathing (1"x4" furring strips spaced evenly

over the rafters for air circulation).

**Underlayment** is sandwiched between the sheathing and the roof surface, and is usually a thick, fibrous, black paper material often called roofer's paper or tar paper. This felt-like material, while thick enough to resist water penetration from the outside, is also thin enough to allow moisture from within the house to escape.

The **roof deck or surface material** may be asphalt, wood, tile, slate or even metal. The principal function of the surface material is to shed water, snow and sleet.

Some roofs are easier to repair or reroof. Those with simple straight edges and no or few "valleys," such as the shed or gable, are easier and less costly to repair. The more complex the roof style and the steeper the slope or pitch, the more difficult and costly the job becomes.



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### Roofing Materials\*

Material	Durability Warranty	Design	Cost/Square (1 sq. covers 100 sq. feet)	Weight/ Square	UL Fire Rating	Ease of Installation
<b>Asphalt:</b> Standard weight, felt- based	15-20 yrs.	wide color & texture choice	low to moderate	240-300+	Class C	experienced DIYer or professional
<b>Fiberglass base</b>	20-30 yrs.	wide color & texture choice	moderate	220-330	Class A	experienced DIYer or professional
<b>Roll Roofing</b>	10-15 yrs.	color only	low	55-180	Class C	DIYer
<b>Wood</b>	15-30 yrs.	varies by width, length & thickness	moderate to high	140-350	none unless treated: <i>C when fire retardant added. A with retardant and foil under- layment</i>	professional
<b>Tile:</b> <b>Clay</b>	life of building	curved or flat	moderate to High	800-1,500	Class A	professional
<b>Concrete</b>	life of building	curved or flat	moderate to high	700-1,000	Class A	professional
<b>Slate</b>	50+ yrs.	color & texture choice	high	900-1,000	Class A	professional
<b>Metal</b>	20-50 yrs.	color	high	45-125	Class A	professional

\*Characteristics of materials vary with manufacturer, grade and availability. Consult your local building suppliers for products in your area.

### Fire and Wind Resistance Designations for Roofing

The Underwriters Laboratory, Inc., an independent testing service, has tested and rated asphalt and fiberglass roofing materials for three characteristics: *resistance to ignition, resistance to supporting the spread of fire, and whether the material will emit burning particles that might ignite new areas.* Class A rated materials have the most fire-retardant qualities.

- Class A** — Effective against *severe* fire exposure
- Class B** — Effective against *moderate* fire exposure
- Class C** — Effective against *light* fire exposure

Wind resistance is also designated by Underwriters Laboratory, Inc. Shingles with either factory-applied adhesive on the tabs (adhesive melts when exposed to heat of the sun) or an interlocking system can be certified by UL. Look for the UL symbol on packages or bundles rather than on the shingles.



# Roofing Materials

Commonly used types of roofing materials include: **asphalt rolls or shingles, fiberglass-base asphalt shingles, wood shakes or shingles, and tile**, which may be clay or concrete. A smaller number of houses are covered with slate, aluminum or galvanized steel, or even plastic. Flat or very low-sloping roofs may have surfaces of either tar and gravel or polyurethane foam that provides both insulation and weatherproofing. The **Roofing Materials** chart on page 2, compares the various types of materials by cost, fire ratings and other important factors.

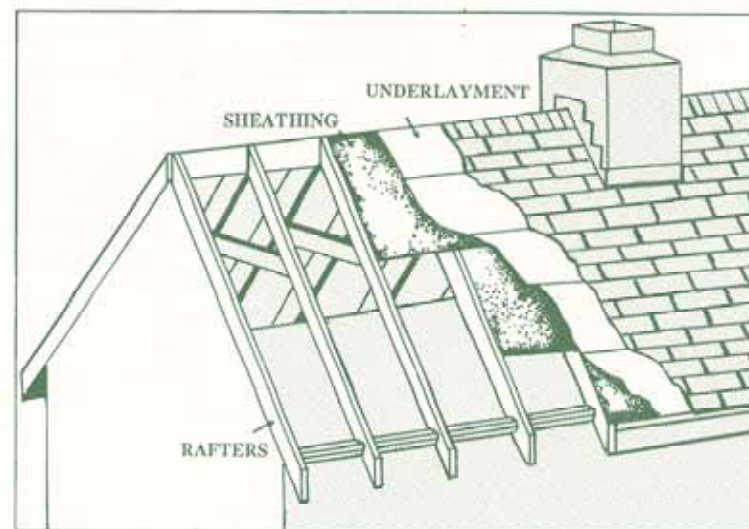
## Asphalt rolls or shingles

Asphalt (rolls or shingles) probably covers two-thirds or more of the homes in the United States, due in part to its moderate to low cost, durability, wind resistance, attractiveness (color/texture), ease of installation and low maintenance.

1. **Asphalt roll roofing** is most often used on porches, garages, sheds or other outbuildings or where the slope (pitch) of the roof is slight. Made of felt paper saturated with asphalt and covered with granules, roll roofing can also be used as underlayment for asphalt shingles. While lower in cost, life expectancy of the rolls is also lower than for shingles.
2. **Regular asphalt shingles** have a felt mat backing that is saturated and coated with asphalt. The shingles are then topped with fine ceramic granules. These provide color and protect the asphalt from the sun, which can cause the shingles to deteriorate.

Asphalt shingles with felt mats have a Class C fire rating required by most communities. A roof with Class C shingles is very resistant to fires, although it's not as good as one with a Class A rating. If you live in a very dry area like the northern mountains of North Carolina, consider using a shingle or roof with a Class A rating.

Asphalt shingles come in a wide range of colors and textures. Colors vary from rich earth tones to white, red, green and



black. In the hot, humid areas of this state, the light to white colors reflect more of the sun's rays. However light colors are more susceptible to staining and discoloration from fungi and algae. Choose shingles that have been pretreated to resist mildew and molds. In the colder parts of North Carolina, black or darker colored shingles help absorb the sun's rays and can reduce heating needs. Standard-weight asphalt shingles weigh about 240 pounds per 100 square feet. (Roofers refer to the amount of shingles it takes to cover 100 square feet as a square.) They aren't as durable as the heavy-weight ones, which weigh over 300 pounds per square. The extra weight comes from additional asphalt, and this can add 5 to 10 years of life to your roof.

3. **Layers of asphalt felt** can be used to cover low-sloping roofs. The layers are coated and sealed together with hot asphalt or pitch. Crushed stone or gravel is then placed on top of the asphalt to prevent the sun from baking the oils out of the asphalt or pitch. If the roof is flat, use pitch rather than asphalt.

4. **Fiberglass-base asphalt shingles**, also called "fiberglass," are similar to all asphalt shingles in appearance, but are different in weight and life expectancy. Fiberglass shingles are thinner and lighter (220 - 300 pounds per square) since the backing or mat is made of

glass fibers instead of the asphalt-saturated mat. Shingles made this way contain about 50 percent more asphalt for the same overall weight and thus have a longer life. Some heavy fiberglass shingles have a 30 year life guarantee. Fiberglass-base shingles are as good at weather resistance as the heavier, thicker all-asphalt shingles, and are also less affected by the sunlight. A real plus for fiberglass is the Class A fire rating which provides additional protection.

## Wood Shakes or Shingles

Wood (shakes or shingles) are often chosen because of their natural beauty and resistance to wind and weather. Wood shakes are split, while wood shingles are sawed. Shingles have a fairly smooth surface and shakes are more textured.

Red cedar is most common, but redwood, cypress and white cedar also may be used. Popular in the drier mountain areas of North Carolina, these roofs can last 40 years or more. Wood is used less frequently in the hot, humid areas along the coast. Wood shingles can last 15 to 30 years and shakes may last more than 50 years. While both cost more than asphalt, the cost is offset by a longer life expectancy, especially for shakes.

Always check your local fire code when considering wood for roofing. Some codes prohibit wood roofs unless the



wood has been treated with a fire-retardant chemical. This treatment, which increases the cost of the shake or shingle, gives wood shingles or shakes a Class C fire rating equal to the felt-based asphalt shingle. If a steel foil backing is used, treated wood roofing materials can be upgraded to a Class A fire rating. Just remember, *this additional protection will cost more.*

## Tile

Tile, which may be made of clay or concrete, lasts the lifetime of the house and is fireproof. Due to the additional weight of tile, the house must be designed or reinforced to support this type of roofing material.

Classic red clay tiles have been used for years on Spanish and Mediterranean style homes. With the introduction of new concrete tiles that are cheaper to produce and can be molded into many shapes, the use of roofing tiles has expanded. While concrete tiles are often red or brown to simulate the natural color of clay tile, other colors can be produced by adding pigment to the top layer or by baking a glazing material onto the hardened tiles. In addition to the weight problem, you may want to consider the additional costs of shipping tiles from the manufacturer.

## Slate

Slate, a cousin to tile, is very expensive but also very durable and fire-resistant. Cost, weight, and need for professional installation place it out of the range of most North Carolina budgets. Slate comes in rectangular shapes and a wide range of colors.

## Metal

Metal, aluminum or galvanized steel roofs can offer long life expectancy and a Class A fire rating. Color can also be added, or the roof can be painted. The cost of a metal roof is moderate to high, and it should be installed by a professional.

## Plastic

Plastic panels may be used for certain parts of a roof, such as over a sun porch, but these aren't as durable as other

roofing materials. Cost will vary based on the size of the area and the type of material chosen.

## Flashings and Gutters

Flashings, gutters and downspouts are other important parts of the roof system. Flashing seals joints around a chimney or a dormer, where vent pipes extend up through the roof, and in the "valleys" where two roof planes meet at an angle. Metal (galvanized tin, painted tin, aluminum or copper) or plastic flashing may be used.

The importance of careful and thorough flashing can not be overemphasized. If it is to last, a roof must be made watertight.

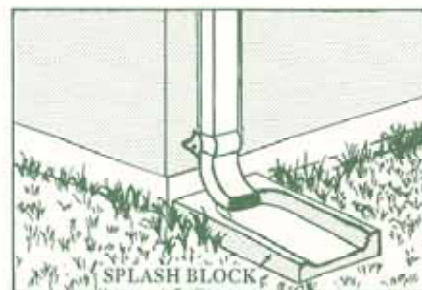
How efficiently the gutter-downspout system works depends on both the quality of the installation and frequent maintenance. Most gutters and downspouts are made of **galvanized steel, aluminum or vinyl.** Copper or wood gutters may be used but are very expensive. Galvanized steel gutters are strong, heavy and the least expensive. Aluminum gutters are available either unfinished or painted, but the factory-applied baked enamel finish is more durable. Aluminum gutters are lightweight, easy to handle, moderate in cost and more weather-resistant than steel. Vinyl gutters and downspouts are more expensive but wear well with little maintenance. They won't rust, rot or blister, and they never need painting.

Improperly sloped gutters won't let water move toward the downspouts as it should. Gutters clogged with leaves, branches, nuts or pine needles must be cleaned out several times a year. To prevent litter from accumulating in the gutters or downspouts, lay mesh screens over the gutter troughs or heads of the downspouts.



Repairs will need to be made to leaky gutters or, if not repairable, the section which leaks should be replaced. Downspouts should direct the water away from the foundation to prevent eroding the soil along side the house and to keep moisture from the crawl space or basement.

Concrete splashblocks, placed below the downspouts and tilted slightly away from the house, carry water to dry areas away from the house. Plastic or fabric sleeves that attach directly to the downspout and slope away from the house are also alternatives.



Gutters and downspouts need to be checked regularly for clogs or leaks.

Look for:

- debris which is stopping the drain of water down and away from the house
- flaking or peeling paint
- cracks in connecting seams
- rust spots and holes in metal
- gutters that have sagged due to loose fastenings
- loosened straps along downspouts
- soft spots in fascia boards that indicate dry rot

Use a level to check the slope of gutters. They should tilt away from valleys and toward downspouts 1 inch every 20 feet.

## Warranties and Life Expectancies

Warranties vary from 15 to 30 years depending on the type and brand of materials purchased. Most roofing manufacturers guarantee their products against manufacturing defects during the expected life of the roof *on the condition that the roof was installed correctly.* Always read the warranty carefully and be sure to follow the printed installation instructions.



Usually, the longer the warranty, the higher the cost. Check to see how the warranty prorates the settlement on replacement cost of both the roofing material and the labor.

For example, if you install a roof which carries a 30-year warranty on \$1,500 in materials and labor, your warranty is worth the full \$1,500 if the roof fails in the first year. However after 10 years, the warranty may be worth only \$1,000 or two-thirds of your money.

The average asphalt shingle roofing material should last 15 to 25 years, while a clay tile or slate roof may last 100 years or the life of the house. Life expectancy is important but not the only consideration when selecting a new roofing material. The **Roofing Materials** chart on page 2 will help you evaluate the expected life of various types of roofing materials. When making your decision, consider such things as: cost versus durability, warranties, ease of application, availability of materials and appearance. In areas subject to high winds, it is recommended that "wind resistant" shingles be used. Such shingles are provided with factory-applied adhesive as a part of the locking tabs and the bundles or packages should carry Underwriters Laboratories, Inc.'s "Wind Resistant" label. This means that the roofing is designed to withstand winds of at least 60 miles an hour for a two hour period. If "free tab" shingles are used, they should be cemented down to offer effective wind resistance.

## Reroofing

At some point in time, your asphalt or wood roof will need to be replaced. If the existing roof deck is in fairly good shape, you can save time, labor and dollars by adding another roof over the present one.

Most houses should have no more than two layers of roofing, but some can take three layers. While reroofing over an existing roof will save money on labor costs (a total tear-off, replacement and clean-up can add up to 50 percent more to the final cost), you must check on the condition of the present roof material as well as the sheathing before deciding on

putting another roof over the present one. If they have been damaged by water, it will be necessary to remove all or parts of both. Be sure the shingles lie flat, not curled. If you are missing a few shingles, these can be replaced before re-roofing, but if there are large bare areas, stripping to the sheathing may be necessary. When roofing with wood over asphalt, you will need to install furring strips for ventilation between the two roof surfaces.

A wood shingle roof will usually serve as a nailing base for a new roof of wood, asphalt or possibly tile. However, if using tile, always be sure the structure will support the additional weight.

Whether you can roof over the old surface or will need to strip off the worn material down to the sheathing depends on the:

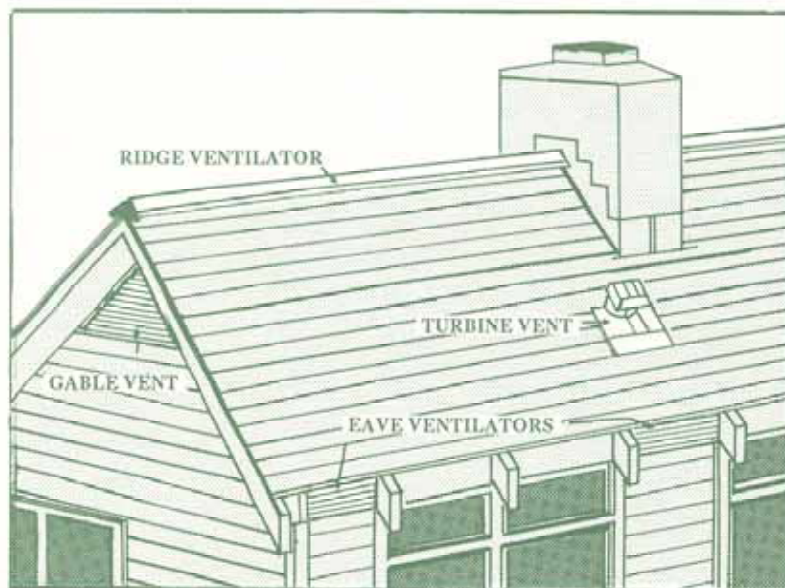
- **Condition of the present roof material** — Check for badly worn spots. Large areas are hard to repair and may result in uneven nailing surfaces.
- **Condition of the sheathing** — Rotted sheathing must be replaced. Water is very damaging to the sheathing and signs of dry rot mean stripping the present roof off and repairing the sheathing before installing new materials.
- **Compatibility of the old and new roofing material** — The roofing and sheathing materials must be compatible.

If you decide to change the type of roofing material on the house, you may have to strip both the present roofing and sheathing off to provide the correct match of materials.

- **Pitch or slope of the roof** — Higher peaked roofs can usually support more weight, up to three layers of roofing.
- **Number of roofs the framework already supports** — Remember, three layers is the usual limit. Check local code requirements.
- **Manufacturer's recommendations for the roofing material chosen** — The thick texture of wood shakes are too irregular for most reroofing. While it is highly unlikely you will ever need to reroof over tile or slate, if you do, you must remove the old tiles completely.
- **Local building codes and requirements** — Be especially concerned about fire- and wind-resistance recommendations.

## Ventilation

When you are considering reroofing, you would be wise to see how well your attic is ventilated and to make any needed changes. The amount of ventilation needed depends on such things as: the amount of sun and shade, wind direction, and the roof lines that may interrupt or encourage air flow. As a general rule, provide 1 square foot of net-free vent





opening for each 150 square feet of attic floor area. For more information on this subject you may want to read *Moisture Control in North Carolina Residences*, HE-293, which is available free of charge at your county extension center.

The most common types of roof vents are: gable, soffit, ridge, plane turbines and fans.

Triangular shaped **gable vents** are installed at the top of the gable and eliminate heat that collects near the house ridge. **Soffit vents** are rectangular and are placed at the soffit or eave area of the roof to provide an in-flow of cool air. Convection then draws this air up to and through gable or ridge vents. Soffit vents help dry out roof decks that have leaked.

**Ridge vents** consist of long, inverted metal troughs placed along the ridge line. Since the hottest air collects at the ridge, this is a very good area for placing a vent. They allow free air flow out of the house without admitting rain. **Turbine vents** placed on the roof generate an air flow from the turbine action when the wind blows. **Powered attic exhaust fans** are placed in the attic over ceiling vents and pull warm air out of the house.

## How to Select a Roofer

Before selecting a roofer, weigh these factors:

- Does he have good recommendations?
- How long has he been in business?
- Does he have a reputation for getting the work done on time and for delivering what he promises?
- Does he back up his work with service?
- Is he insured for on-the-job accidents?
- Is he willing to furnish references?

If in doubt about a roofer, check him out with a local roofer's association or with the Better Business Bureau.

It's generally a good idea to obtain estimates for comparison, but don't limit your comparison to price alone. Check to see that contractors are bidding on the

same materials and same quality of workmanship.

Before signing a contract, be sure the agreement spells out in detail the work to be done, materials to be used, completion date and any penalties, warranties, removal of waste materials, final price and method of payment. *Do not make the final payment until all the work is done and you are satisfied with the job.*

Be especially careful with door-to-door roofers. Be sure to select a roofer who is well known in your community and whose work you can see.

## Doing It Yourself

Reroofing can be a do-it-yourself (DIY) job. This can save you money, but not necessarily time. To take on a job of reroofing means you need to be: handy with tools, have the patience to follow the manufacturer's instructions exactly, familiar with the necessary safety procedures, able to give the time, and able to handle hard, physical labor. If you are at all bothered by heights, forget it. Leave this home improvement job to the professional.

## Summary

Most people take the roof of their house for granted until something goes wrong. We depend on it to keep the house dry and expect it to last a lifetime. However, there will come a time when a roof will need to be repaired or replaced.

When selecting a new roof, consider:

- style or design of the roof
- type of materials available
- costs of doing-it-yourself or hiring the work done
- warranties and life expectancies
- weight of the roofing materials and construction of the house
- pitch or slope of the roof
- fire- and wind-resistance needed
- color and texture desired
- ventilation needed

The roof is one of the most noticeable

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exterior design elements of the house. When selecting the color and texture of a new roof, keep in mind the total appearance of the house and try to blend all the exterior elements (siding color and texture, trim, windows and doors) together to create a unified appearance. *If you are planning to update the exterior of your home, you may want to look at the other publications in this series which cover planning for exterior changes, windows, doors and siding.*

## Maintenance

*After you have chosen your new roof and had it installed properly, you should have only minimal maintenance.*

- Keep gutters, downspouts and roof surfaces clear of fallen leaves, twigs, and other litter so that water will drain freely and not back up.
- Never allow water from a downspout to pour directly onto a roof below. Keep the downspout connected to the gutter which drains the lower roof.
- Keep trees trimmed to prevent scuffing of the roof by branches or damage by falling limbs. Keep climbing roses and vines trimmed back.
- Always avoid walking on a roof. It's dangerous and can damage shingles or tiles. When it is necessary for workmen to go onto the roof, they should use walk boards, ladders, scaffolding or other protection.

*A good quality roof, installed and cared for properly, lasts an average of 20 years. Protect your investment!*