

## Roofing product comparison

A roof system makes a strong visible statement about a building. If your roof has reached the end of its useful life, you should replace your roof to increase your building's resilience and protection against destructive forces caused by wind and hail. Reroofing an existing roof is usually the most expensive maintenance project for organizations. Along with cost and lifespan considerations, color and texture are often key factors when selecting a roof covering. Consider impact-resistant roofing material when choosing your next roof.

Major categories of roofing products for sloped roofs include asphalt shingles, slate, tile, wood shingles and shakes and fabricated products of metal or plastic.

### Asphalt shingles

Asphalt shingles are the most common type of shingle used on residential and commercial buildings, as they come in a variety of styles, shapes and colors. An asphalt shingle is reinforced with organic material, wood fibers or fiber glass and surfaced with mineral granules. The two common types in the market are three-tab and architectural shingles. Asphalt shingles can last from 15 to 20 years.

### Tile roofing

Tiles are made from clay, concrete and rubber. Tile roofing can last up to 50 years. The weight of the tiles requires a significant support system. Average costs are typically two to three times higher than asphalt shingles.

### Wood shakes

Most wood shakes are made from treated wood, such as cedar, with dimensions generally random from one to another. Wood shakes typically last up to 30 years. Installation for wood shakes and wood shingles is about three times more expensive than asphalt shingles.

### Slate shingles

Slate shingles are dense, fine grained, metamorphic rock cut into shingles. Slate shingles come in many sizes, thicknesses and finishes. Slate shingles are heavier and harder to install. Synthetic slate shingles are becoming a popular replacement for traditional slate shingles. Synthetic slate shingles weigh less than traditional slate shingles. A slate roof can last from 50 to 75 years, and some will last more than 100 years if installed correctly. Slate shingles can cost as much as four times more than asphalt shingles. The cost is often recouped by its quality, aesthetic value and lifespan.

### Metal roofing

Standing seam, steel, aluminum and copper are the most common metal roofing materials used on commercial buildings. A metal roof can last between 30 and 50 years, and copper could last up to 100 years. A metal roof can withstand extreme weather, but hailstorms frequently cause cosmetic denting. Average costs are typically two to three times higher than asphalt shingles.

## Warranty

Warranties vary greatly between manufacturers and contractors. A manufacturer warranty might provide coverage against manufacturing defects in the materials and the contractor warranty might provide coverage against workmanship errors.

Major categories of flat or low-sloped roofs include built-up, single-ply membranes, modified bitumen and foam roof products.

### Built-up roof (BUR)

A built-up roof is the traditional hot tar and gravel roof. The components of hot tar and membrane are assembled in layers at the job site to form the built-up roof. The roof is normally ballasted by a layer of smooth river stone. A built-up roof can last up to 25 years and is the least expensive of the four flat roof products mentioned here.

### Single-ply membrane

Single-ply membranes are the most popular flat roofing material used in commercial construction. These roofs can often be installed in one complete layer of material. The most common types of single-ply membranes are EPDM, the true rubber roof, and PVC and TPO, a form of plastic. Most membrane roofs are glued down, but other attachment options include mechanically anchored fasteners or ballasted with river stone.

The light-colored versions are recommended in warm climates. Even the black version costs more than BUR or modified bitumen. Single-ply membranes are also more vulnerable to punctures than other choices. A typical roof can last 20 to 50 years.

### Modified bitumen

Sometimes referred to as polymer-modified bitumen, this type of roofing is a single-ply rolled roof with a mineral-based surface. Torch-down systems involve heating the adhesive as the material is unrolled. Newer peel-and-stick systems are safer and easier to install. A typical roof can last 20 to 30 years. Torch-down applications add to the cost.

### Sprayed polyurethane foam (SPF)

Sprayed polyurethane foam is sprayed on as a liquid. One of its biggest advantages is that it can be sprayed directly over an existing roof, eliminating the need to remove the old roof covering. The foam is then covered with a protective coating and granules for added performance. It can last 30 years, although the protective coating may need to be reapplied every 10 to 15 years. The cost of foam is relatively low. Cost increases come from the type of protective coating used and from the higher density foams.

## Life expectancy

Severe wind and hail storms can do serious damage and impact the life of a roof and its ability to protect a building from additional damage. Building factors, such as roof steepness and roof complexity, along with proper roof ventilation and sun exposure, affect the life of a roof. The life of the roof is also affected by location, building height and measures taken to maintain the roof.

## Hail impact-resistant roofing classifications

Underwriter's Laboratories (UL) classifies the degree of impact resistance based on the size of a steel ball tested to withstand direct impact. A point to note when purchasing materials is that the higher hail impact classes typically also provide greater wind resistance. The classes range from 1 to 4. Church Mutual recommends selecting roofing materials with a Class 3 or Class 4 rating.

- Class 3 – Roofing material can withstand 1 ¾" steel ball impact
- Class 4 – Roofing material can withstand 2" steel ball impact

## Construction difficulty

Construction difficulty refers to the project complexity with respect to labor, equipment and materials. Proper installation is critical for ensuring optimal performance.

- Low – Easy to install, limited training or equipment needed to install.
- Medium – Requires additional training or equipment to install.
- High – Highly specialized installation that requires expert skills and tools.



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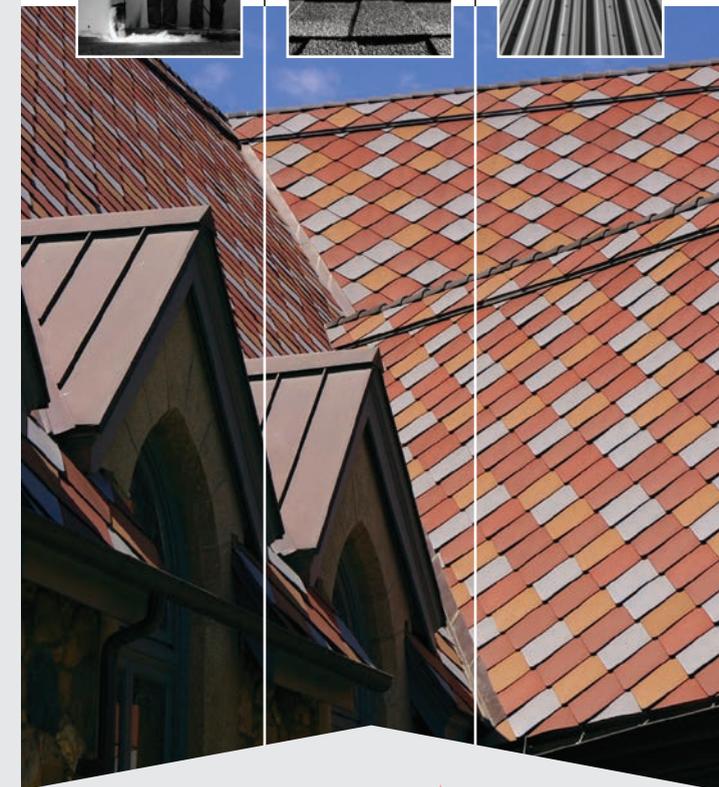
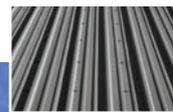
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## Roofing Product Comparisons

An overview of the most commonly used roofing products.



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	Asphalt shingles (three-tab shingles)	Asphalt shingles (architectural shingles)	Tile roofing (concrete or clay tile)	Wood shakes/Wood shingles	Slate	Slate - Synthetic	Metal - standing seam (26 gauge)	Metal - Agricultural panels/corrugated metal	Built-up roof (BUR)	Single-ply membranes (EPDM, PVC & TPO)	Modified bitumen	SPF - Sprayed polyurethane foam
Weight	2 - 4 lbs./sq.ft.	2 - 4 lbs./sq.ft.	6 - 15 lbs./sq.ft.	3 - 4 lbs./sq.ft.	7 - 20 lbs./sq.ft.	1 - 1.5 lbs./sq.ft	0.7 - 1.5 lbs./sq.ft.	0.5 - 3 lbs./sq.ft.	10 - 25 lbs./sq.ft.	The material is relatively light. Heavier if ballasted with river stone.	Less than 2 lbs./sq.ft.	Very light
Warranty	10-year limited warranty. Warranties available up to 110 mph	25-year limited warranty. Warranties available up to 130 mph	25- to 50-year limited warranty. Most wind warranties at least 110 mph	25- to 40-year limited warranty. Most wind warranties at least 110 mph	25- to 50-year limited warranty. Warranties available up to 130 mph	50-year limited warranty. Most wind warranties at least 110 mph	Typical warranty is 50 years. Can be installed for high wind requirements. Paint or finish is covered for a much shorter period.	50-year limited warranty. 120 mph wind warranty is typical	20-year limited warranty	30-year limited warranty	20-year limited warranty	10-year leak free warranty typical
Hail impact resistance ratings	Most are class 3 can be a class 4	Class 3 or 4	Class 3 or 4	Class 3 or 4	Considered virtually indestructible	Class 3 or 4	Class 4	Class 4 - Impact resistant, warranted against hail penetration	Class 4 for ballast/gravel surfaces	Class 4 for ballast/gravel surfaces	Low hail performance	Higher density foams can receive a Class 4 rating
Required maintenance	Low	Low	Moderate to High (replacing broken tiles)	High	Moderate to High (replacing broken tiles)	Low to Medium (checking for loose or broken tiles)	Moderate to High (if repainting is required)	Low to Medium (checking for loose fasteners)	Low	High (reseal seams every 5 years)	Low	High (inspections needed annually and recoating needed every 10-15 years)
Average costs	\$	\$	\$\$	\$\$\$	\$\$\$\$	\$\$\$	\$\$	\$\$	\$ Cheapest of the flat roof options	\$\$ Light-colored coatings (recommended in warm climates) can add 30% to the cost.	\$\$\$ Torch-down installation adds to the cost.	\$\$ Higher density foams add to the average cost
Lifespan	15 years	20 years	25 - 50 years	20 - 30 years	50 - 75 years	50 - 75 years	50 - 75 years	50 - 75 years	10 - 25 years	20 - 50 years	20 - 30 years	30 years
Average times to replace in 50 years	3 - 4 times	2 - 3 times	1 - 2 times	1 - 2 times	Once	Once	Once	Once	2 - 4 times	1 - 3 times	2 - 3 times	2 times
Construction difficulty	Low	Low	Medium	Medium to High	High	Medium	Medium (must accommodate roof penetrations)	Low	Low (but labor intensive)	Low	Medium	Low
Points to consider	Lowest cost, but also has the shortest lifespan.	The most preferred shingle type.	Might require reinforced roof framing. Highly fire resistive.	Local codes might limit use because of fire concerns.	Requires reinforced framing.	Lightweight yet strong and flexible.	Aluminum coverings won't rust, but lower grades dent easy.	Fasteners must be checked regularly for openings caused by expansion and contraction.	Smelly and messy to install.	Good for a large roof where expansion and contraction are a concern.	Torch-down installation is a fire hazard.	Can add insulation value to the structure.