

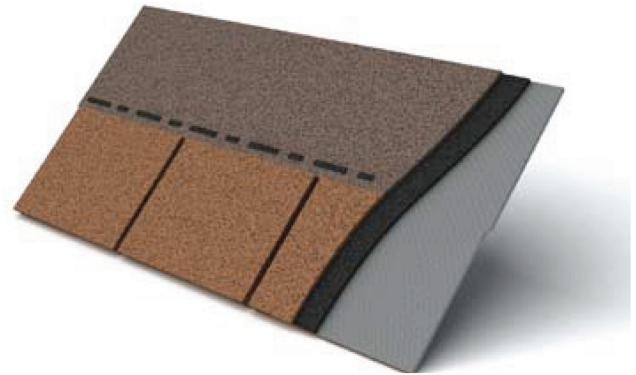
# Asphalt Shingles

Asphalt shingles are the most common type of sloped roof covering in North America. They are easy to install, reliable and arguably the best bang for the buck.

## Shingle Construction

While there are many types of asphalt shingles, the general construction is similar. There are three distinct layers:

- A base material that gives the shingle strength and shape.
- An asphalt layer that forms a waterproof barrier.
- A granular surface that reflects the ultraviolet radiation and gives the shingle durability, color and texture.



*Three layers of an asphalt shingle*

## Warranty

What's a 20-year shingle? 20 years is the manufacturer's limited warranty against defects. The number loosely represents the number of years the shingle could last in an ideal installation and under ideal conditions. In practice, the reliable life is less than stated. Common shingle warranties are 15 to 50 years. The higher the warranty, the thicker the layer of asphalt and the thicker and heavier the shingle.

## Fiberglass or Organic Based Asphalt Shingles

The two common base layer materials are paper saturated in asphalt, and fiberglass. While they are both asphalt shingles, they are often referred to as organic and fiberglass respectively.

Fiberglass base shingles were developed to use less of the expensive asphalt but still maintain the same shingle life. The main difference is that the fiberglass based shingle is thinner and lighter than the equivalent organic shingle, making it more desirable for installers.

Organic shingles are thicker and heavier and are considered to have better durability and tear resistance. Fiberglass based shingles are more flexible in hot weather and may perform better in wind storms. Both types are used successfully in most climates. There have been problems reported with fiberglass based shingles involving cracking of the shingles due to thermal stress (large temperature fluctuations). These problems are less prevalent now as new standards for manufacturing these shingles have been adopted by most manufacturers.

## Architectural / Laminated Shingles

The most common asphalt shingle is the three tab shingle shown in the illustrations. Alternatively, instead of three tabs, the architectural shingle has pieces of shingle material stuck on to create a

more interesting pattern. Because there are pieces stuck on, it's often called a laminated shingle. As a premium product, it will have a 25 to 30 year warranty as a minimum. Many styles are available.

## On The Roof

The illustration below shows a roof deck with the first few rows of shingles. The shingles are arranged so water sheds from one shingle to the next. The key point is that the system is not waterproof. It relies on gravity and the slope of the roof to shed water. Asphalt shingles are designed for a roof with a slope of 4 in 12 or greater. They can be used on low slope roofs as well but a special application technique is required.

**Flashing:** Asphalt shingles will shed water reliably. At roof penetrations or intersections, special treatment is required. For example, you can't reliably seal shingles to the edge of a skylight or chimney. Flashings are pieces of metal that are strategically placed to shed water over roof penetrations and onto the field of shingles without relying on sealants. Done properly, flashings will do the job for the life of the roof as they rely on nothing but gravity and slope. Flashings are often not done properly and are considered to be the weak point of any roof surface. Roofs rarely leak in the middle of a field of shingles, they leak at roof penetrations and intersections where flashing has been poorly installed or has become damaged.

## Life Cycle & Reliability

Asphalt shingles wear out. Imagine an asphalt shingle roof surface as a sacrificial wear surface. The life cycle of the surface is always less than the advertised warranty period of the shingle.

**Wear:** Asphalt shingles deteriorate from exposure to ultraviolet radiation. For this reason, south and west facing shingles wear out much more quickly than north and east facing. Other wear factors include heat, inadequate venting of the roof space underneath, roof slope, leaves and debris, snow and ice.

**Reliability:** When the surface is near the end of its service life, it becomes unreliable. We are often asked if an old roof could last another year or two. The answer is usually, "yes but." Either live with a reduced reliability (increased risk of leakage) or improve the reliability by giving the roof a "once over," focusing on repairing flashings. Depending on the roof, it may not make economic sense to spend money repairing flashings that will only be torn off when the roof is ultimately resurfaced. Furthermore, the surface is hard to work with because it becomes very brittle when it's old.

**Multiple layers:** When it's time to resurface the roof, it is possible to install new asphalt shingles directly over the old. This is less expensive than stripping the existing surface. The trade-off is that the roof may not last as long and may not be as reliable. This is because old flashings are often used and are often not done properly and because the shingles are laid upon an uneven base. Some areas allow up to three layers while other areas allow only two.

