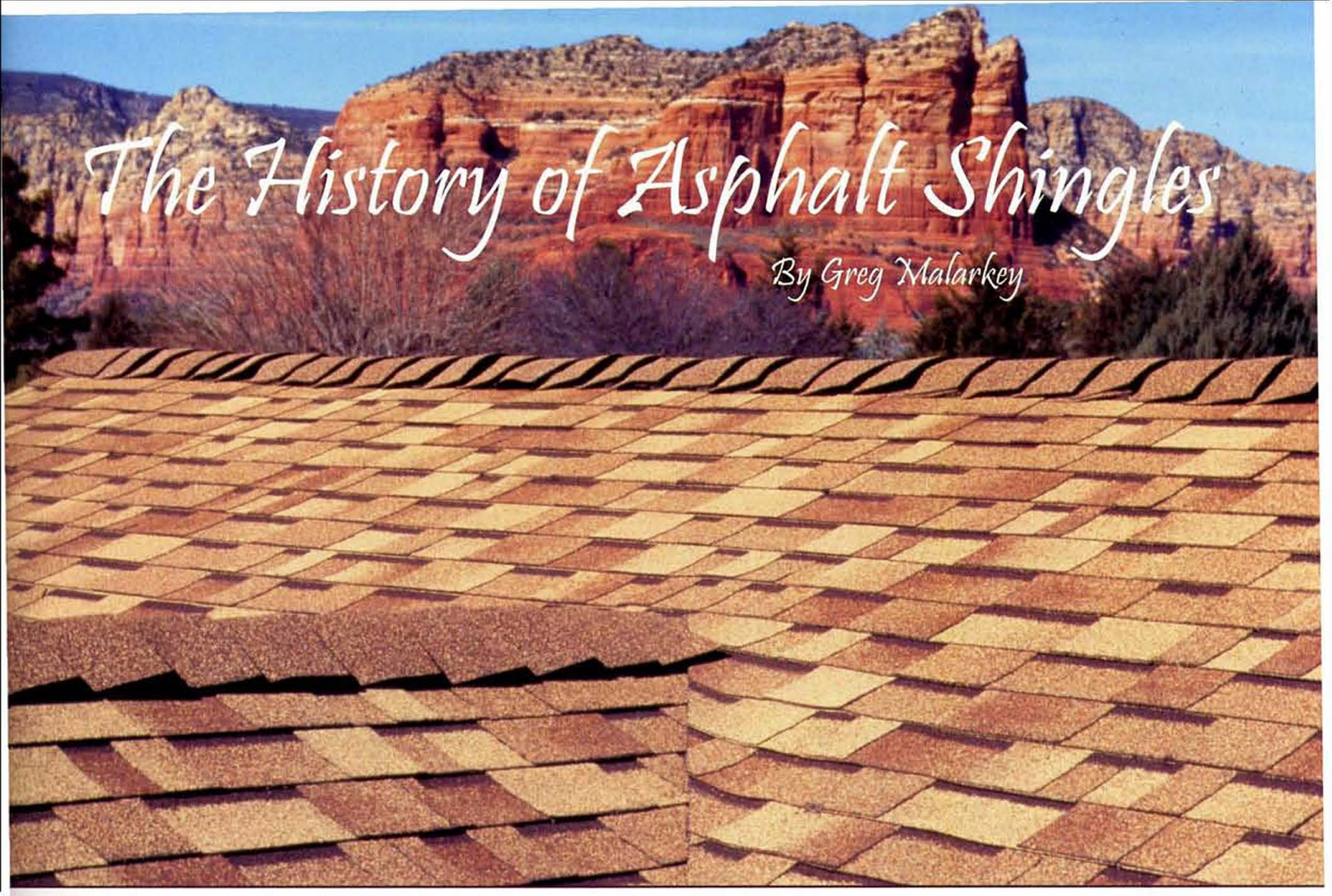

The History of Asphalt Shingles

By Greg Malarkey

Asphalt shingles today dominate the steep slope roofing arena, commanding over 70% of all the steep slope roofs. There are several reasons for this market share, including easy application, low costs, excellent performance, and, of course, attractiveness.

Asphalt shingles, like many other products, have changed a fair amount from the early days. For example, today we take self-sealing shingles for granted. This wasn't always the case. And even the "seal down" (the asphalt which secures the shingles) has gone through dramatic changes.

As we move into the 21st century, the roofing consumer finds more types and styles of asphalt shingles available than ever before. Although the range of products now offered is breathtaking, these varied products have the same basic building blocks. How these blocks are assembled ultimately determines how well any given shingle performs. So let us begin by looking into the basics of today's asphalt shingles.

All shingles start with some type of basic "mat" upon which the rest of the shingle is built. Many years ago, the "mat" was made of pulped up rags which were made into a "ribbon" of material referred to as "rag felt." These rags provided a sheet of very absorbent material to which asphalt could be applied.

During World War II, man-made fibers began to find their way into rags, and these fibers (such as polyester) did not absorb asphalt. This, coupled with declining supplies of rags, led the industry to turn to a wood pulp or paper product. This was a relatively thick "paper" referred to simply as "felt."

In the late 1970s and early 1980s, again we saw a change in the "mats" from the paper-based product to fibrous glass mats. Fibrous glass had several advantages over paper, including the fact that it did not rot. Additionally, fibrous glass improved the shingle's fire ratings and production speeds at the shingle manufacturers.

Today, fibrous glass mat is the product of choice for the vast majority of asphalt shingles produced in North America. It is estimated that in excess of 95% of all the asphalt shingles sold in the United States are fibrous glass based.

The next component we will examine is the asphalt. Manufacturers of shingles start with a product called flux (virgin asphalt, if you will). Flux normally has a softening point of around 120 degrees Fahrenheit (the softening point is the temperature in which the flux or asphalt begins to flow). Clearly, if a shingle were made using only flux, it would run off the roof on a nice day. So it is necessary to raise the softening point to a more useful level. This is done by blowing air through the flux, which takes some of the "goodies" out of the flux to make the product more "brittle" or aged. This process, however, raises the softening point up to about 220 degrees Fahrenheit and creates what is called asphalt.

Now that we have asphalt, we need to mix a stabilizer into it to help give us some "body." The stabilizer is referred to as "filler," and there are many types of fillers used in the roofing industry. The most common is limestone dust.

Fillers not only displace asphalt, but they also assist in

The colored granules make up the surfacing of the shingles and perform two basic functions: to make them attractive and to protect the asphalt from the attack of ultraviolet light.

improving the fire resistance of the shingles. Additionally, fibers help in keeping the colored granules on the shingles. Of course, when higher and higher levels of filler are used to displace the more expensive asphalt, the product can be weakened to the point where it simply will not work. In many cases of early shingle failure (such as cracking), the cause can be traced to having filler levels that are too high.

The surfacing of the shingles is the colored granules. Granules perform two basic functions. One is to make the shingles attractive. Shingle manufacturers spend substantial amounts of time and money on their color designs. The appearance of the shingle is many times foremost in the customers' minds. Good color blends are designed in order to satisfy this customer requirement. There is a second (and frankly more important) function of the colored granules, and that is to protect the asphalt from the attack of ultraviolet light.

UV light breaks down or ages the asphalt, so one of the keys to making sure that shingles last a long time is to protect the asphalt from degradation due to UV attack. Selection of the right type of granule and attention to the details of how the granules are applied to the surface of the shingle are very important to a successful roof.

The last component is the "seal down," which is generally asphalt with a softening point of around 160 degrees Fahrenheit. When the shingles are heated

Application of SBS shingles.

over time, this triggers the "seal down" and "glues" the shingles together.

As the shingles that are offered grow to fulfill varying needs of the roofing customers, more and more types of shingles are introduced. Today demands are being placed on asphalt shingles to not only be attractive, but to perform in more difficult environments.

Two of the more noticeable examples of increased demands on shingles are the requirements for shingles that have the ability to withstand high winds (commonly experienced in coastal environments) and to be impact-resistant for hail-prone areas.

After Hurricane Andrew in Florida, Dade County was one of the first areas to adopt much stricter standards for shingles, including wind testing to 110 mph. Needless to say, that prompted the roofing industry to address wind-related issues.

Today, the industry has answered this demand in two basic ways: the first is to modify the asphalt to create a tougher shingle, and the second is to modify the seal-down to create a more aggressive adhesive.

In the area of hail, the Department of Insurance in Texas has created a program that requires insurance companies to reduce a homeowner's insurance premium if they install shingles that have successfully tested for impact resistance.

This movement has spread outside of Texas, and today many insurance companies offer discounts in many states if the shingles that are installed on the homeowner's roof are rated as impact-resistant.

Again, the roofing manufacturers have answered this challenge, and several asphalt-based shingles are now available that are impact rated.

In this case, all of these shingles have what is known as "modified" asphalts. That is to say, asphalts that have been blended with polymers to enhance performance. The main asphalt polymers used in modified asphalt shingles are SBS (Styrene Butadiene Styrene). SBS-modified asphalts take on rubber-like properties, such as improved elongation with the ability to recover.

In the case of SBS-modified asphalt shingles, the manufacturers go all the way back to the flux stage. Then, instead of blowing air through the flux to raise the softening point, the matrix created by the SBS within the flux raises the softening point of the flux. This means that these shingles not only take on the attributes of the SBS but also keep more of the "goodies" of the flux when compared to standard asphalt shingles. These changes in the basic structure of the asphalt provide the roofing consumer with products that have enhanced performance to meet their varied needs.

The most widespread change to asphalt shingles, though, is not in their basic construction, but in the "design" of their "cut." In the last five years, we have seen a dramatic shift to what are known as "laminated" or "architectural" style shingles, away from the older three-tab shingle took. In fact, in the western portion of the U.S., laminated shingles are the most common type of shingle sold. Unlike the more traditional three-tab shingles, laminated shingles are made by "gluing" two strips of material together to provide a more enhanced visual appeal.

As we move into the next millennium, we expect to see continued changes, both to the design and to the manufacture of asphalt shingles to provide consumers ever-growing choices. ■

About the Author

Greg Malarkey

Greg Malarkey has work for Malarkey Roofing Company since 1987. He was initially hired as Sales Manager and has been promoted to Marketing Manager then Vice President and is currently Senior Vice President of Marketing. During his years at Malarkey Roofing, Gregory has been instrumental in the developing of several new product designs, including SBS modified shingles and the most recent being The Zone. Gregory is married and has three children; his interests include music, micro brews, and chess.