



**METAL ROOFING**  
**S Y S T E M S**  
BEAUTY FOR LIFE!

## **Homeowners Guide to Metal Roofing**

### **A Homeowner's Guide to Roofing**

This guide is incredibly boring! There is more roofing information in this article than you may ever want but we tried to be complete and fair. If at any time you feel overwhelmed by this voluminous text you can stop reading and call us at Metal Roofing Systems. We'll send help. Our roofing expert will make practical sense of what is available in today's marketplace so that you can make a wise decision for your home.

Shopping for a roof can be confusing. There are dozens of types and styles of products, all with varying characteristics. How do you determine which will work best - both functionally and aesthetically - for your home? Are there products designed specifically for residential use? How are they different from commercial or agricultural products?

Our goal, as roofing experts, is to assist you in gathering all the information you need to make an informed decision. This guide will help you select the perfect roof for your home by arming you with information pertaining to the materials, product types, product profiles, installation issues, and overall features and benefits of today's roofing systems.

Of course, if you have additional questions or would like to discuss your options in greater detail, please email or contact us. We'll do whatever we can to make sure that your roofing needs are met with the right product for your home!

### **How to Choose a Roofer**

When replacing your roof the decision goes well beyond selecting the right material or finding the best price. It means choosing a company that you can trust, not only to install your new roof, but also to give you peace of mind in the process. Relax. It's easier than you think. Asking the right questions and

following some simple guidelines will lead you to a reliable contractor whose workmanship is top notch.

**Step 1:** Do your research.

The research you are doing right now will save you time. Deciding on a permanent roof over a temporary roof, for instance, will eliminate the time you might waste interviewing contractors that do not or simply cannot provide what you are looking for. You can vet out product type, quality, approximate cost, and warranty information long before you undertake the arduous task of choosing a contractor.

**Step 2:** Solicit price quotes from reputable contractors.

Once you have decided what you want your roof to be, find a reputable contractor you trust, will provide the level of service you are willing to accept. There are many levels of “quality” service. **Defining the quality you expect during your search is much easier than training the contractor you have chosen to behave while they work on your home.**

**Step 3:** Call the references, see work

Call recent customers of the contractors on your list before you invite them into your home. **As consumers we often do this backwards. We get prices first then we check competence, having wasted time and energy simply getting numbers on paper.** Call ahead and get a number of references from which to choose. Call at least three from this list. Quality companies will have readily available a list of homes for you to see even before you entertain a first in-person meeting.

**Step 4:** Make sure the company is stable.

Verify the prospective contractor's business address and telephone number. Ask to see their federal tax identification number, business license, and proof of adequate liability coverage and worker's compensation insurance. Credentials can usually be verified with a few phone calls.

**Step 5:** Inquire about materials and workmanship warranties.

Professional roofers should be well-versed in the latest products and materials and their warranties. Verify the roofers' information about a particular product's durability, appearance and guarantees. **Guarantees can be (are) tricky! Don't rely upon pretty brochures for warranty information. You really need to drill down into the legal jargon to get**

**the whole truth. The rule of thumb: Roof longevity will coincide conveniently with the exclusion or proration of covered labor costs.**

**Step 6:** Verify lead safe certification if your home was built before 1978.

All home improvement contractors are required by federal law to employ certified lead safe worker supervision on the jobsite. There are also state and possibly local licensing and certification requirements that you will want to verify prior to signing a contract.

**Step 7:** Seal the deal.

Once you have chosen a roofer, a contract must be negotiated and signed by both parties. It should include exact costs, timeframe for completion and a clear understanding of the scope of work to be completed. Products should be listed by specific brand name and quantity if applicable. The contract should also cover items such as permits, and lien rights, and the ramifications of rescinding the contract.

## **Questions You Should Ask Your Contractor**

### **1. Ask for current references.**

Contractors assume you will not call references - and most of you won't! Here are some helpful questions to ask the references:

- Were commitments made by the contractor fulfilled?
- Was communication satisfactory?
- How was the general rapport?
- How would you rate the quality of workmanship?
- Would you hire the contractor again?

### **2. Ask for a list of projects in your area.**

The company should be able to provide you with a list of addresses to view. What does some of their recent work look like?

### **3. Did the contractor do a thorough assessment of your attic including moisture reading, insulation level and proper ventilation analysis?**

These should all be standard for today's roofing professional.

**4. Inquire about the financial stability of the contractor.**

Check bank and supplier references to verify this.

**5. Does the contractor use sub-contractors?**

Verify the reliability of the sub-contractors. Be sure to get certifications from the contractor and their sub-contractors.

**6. Ask if there could be any additional charges you currently are not aware of.**

Has a written quotation been provided? Have you checked that all required work is covered in the quote?

**7. What roofing material/shingle do they recommend and why?**

**8. Does the manufacturer offer a guarantee?**

What does this guarantee cover? How long is the guarantee? Read the fine print!

Note: Manufacturer warranties will give you a pretty accurate account of when you can expect the roof to fail. This is usually indicated by the point at which they no longer cover labor in their warranty!

**9. How will the contractor accommodate your needs and minimize inconvenience to you?**

This includes start and finish of their workday, delivery of products, and communication.

**10. Will they clean up when they have finished and remove all debris from site?**

**11. How do they dispose of excess material?**

Do they recycle any waste material or simply landfill the problem?

Other things to keep in mind:

- Have you had face-to-face contact with someone from the company?
- Did they carry out a thorough inspection of your roof?
- Have they explained the entire roof system and installation process to you?
- What has their level of service, professionalism, manner and friendliness been like to date?
- Do you like the products they offer?
- Do you like the way it looks?
- What are the chances you will need to re-roof in the future?

- Did you contact the Division of Consumer Protection at the Wisconsin Department of Agriculture for possible complaints concerning the contractor?

## **Temporary Roofing**

### **Asphalt**

Asphalt costs significantly less than higher-priced rivals (including tile, wood, cedar, slate, and metal). Nearly four of every five homeowners in the United States have decided to roof their home with asphalt shingles. Asphalt singles come in two varieties, the compositions shingle that has an organic base, and the fiberglass shingle.

Organic-based asphalt shingles are manufactured with a base made of recycled waste paper and wood fibers. This organic base is then saturated with a specially formulated asphalt coating and surfaced with a ceramic granule coating.

Fiberglass-based asphalt shingles are manufactured with a mat composed entirely of glass fibers of varying lengths and orientations. This fiberglass base is then coated with an asphalt surface, followed by a ceramic granule coating.

Due to the material and production of shingles, they start to deteriorate immediately after installation. Roofing problems become evident when the roof begins to lose its original color and luster. Granules begin to wash away immediately following the installation. Many roofs will develop dark streaks (especially on the north face). This discoloration is *Glocapsa Magma* (mold) that feeds on the limestone in the shingles' base. Exposure to the sun and cold climate will wear on the shingle and will cause cracking and curling over time. In areas that are continually wet, algae can grow on shingles. Although the algae have no proven effect on shingle life, it does stain and discolor the shingle.

The negatives associated with asphalt shingle roofing are mainly durability issues. They are a good choice if you are seeking a temporary solution to your roofing needs. However, the cost of asphalt roofing is much higher over time than a permanent alternative would be, as they need to be replaced on a fairly regular basis. Expected service life of an average to higher-end asphalt based roofing product is 12-15 years.

## **Profiles**

In low-slope roofing, you can now choose from a range of peel-and-stick self-adhesive products, as well as new low-fuming asphalt formulations. Even the old standbys - modified bitumen and built-up roofing - have seen a huge number of additions to the product line, giving you the flexibility to match the right system to your individual needs.

In steep-slope roofing, you can now choose among a huge range of strip shingles, laminate shingles, interlocking shingles, and large individual shingles, across a dramatic spectrum of contemporary styles and shadow lines. Perhaps most exciting of all is the enormous variety of rich, gorgeous colors now available, not to mention a profusion of textures, evoking the charm of natural materials such as tile, slate, and cedar.

## **Warranties**

The common misperception, promoted by roof manufacturers and roofing contractors, is that modern (fiberglass) and asphalt roofing (organic) are the best roof for your home. And because these shingles come with 50 year warranties, they must last a long time. In fact, the opposite is true!

From the early 1900's through the 1970's roofing shingles were manufactured by saturating waste paper and wood fiber with asphalt and then covering the shingle with a stone coating. These shingles came with a 15 or 20 year warranty but often lasted over 30 years.

With the 1974 oil embargo increasing oil costs, manufacturers of asphalt shingles converted to fiberglass layered with asphalt and stone. At that time asphalt content was reduced by adding filler materials, such as limestone.

To enhance sales, asphalt manufactures started to offer limited "manufacturing defect" warranties of 30, 40, and 50 year periods. Manufacturers insist warranties do not provide any assurance as to d, only that the shingles met internal production specifications.

Roofing manufactures admitted that product warranties are simply "marketing tools" and openly joked in a major trade magazine of providing 150 year warranties if it would sell the product. This is why you see shingles rated in terms of decades as in 30, 40, and 50 year products while their full warranties rarely exceed 10 years. Most 30 and 40 year products only fully cover the product for a period of five (5) years.

Cost: \$ 250- \$400 per 100 square feet

## **Cedar**

The warmth and beauty of a natural cedar shake or shingle roofs reflect a high degree of pride in ownership. Trees are a renewable resource so the use of wood building products is an environmentally sound choice. The aesthetic appearance and the natural durability of cedar add value to your home. Cedar shakes and shingles also prove to be highly wind resistant roof coverings. These are just a few of the reasons cedar is so often used as a roof covering.

### **The benefits of using cedar:**

Wood shakes can last up to 30 years, however, throughout that time, they may shrink, warp or splinter which is inherent in any wood. There is also the fire concern in our area. Wood is vulnerable to fire exposure. Cedar shakes are more resistant to hail than most other roof coverings used today. Cedar shakes have earned a high impact-UL-2218 rating. UL-2218 is the Underwriters Laboratories test standard for Impact Resistance of Prepared Roof Covering Materials. If you live in a hailstorm prone area there are some insurance underwriting companies that will offer a discount on your premium if you use a roofing material that is impact resistance rated.

### **Cleaning, and/or Treating Cedar Shake Roofs**

Over a period of years, the effects of weather can change the appearance and reduce the natural decay resistance of wood. Through the interaction of sunlight and rainfall, cedar shakes and shingles can lose much of their natural preservatives.

Moss, fungus, and mildew are the leading cause of premature deterioration of cedar shakes and shingles. These growths cause the wood to become soft and spongy. This usually occurs first at the butt of the shake or shingle, eventually covering the entire roof. Cedar roofs, shaded by trees, are more likely to develop moss, mildew and decay, than un-shaded roofs.

There are a number of ways to clean a cedar roof but the most effective and efficient way is by power washing. Once cleaned, the wood can be treated to guard against mildew, molds and fungus for up to four (4) years. At that time treatment will need to be repeated. After being treated, your roof will return to the silver gray color of a healthy cedar roof.

## **Routine maintenance for your cedar roof**

A cedar roof is a natural product and as such does require periodic maintenance. Make sure to observe the following:

1. Keep the valleys clean of leaves and debris. This applies to any roofing system but is especially important in cedar roofs. When debris accumulates in the valley it retains the moisture and eventually will allow the cedar to decay and rot.
2. Keep the gutters and downspouts clean and free of debris to prevent back ups and prevent ice damming.
3. Trim back the branches of near by trees to prevent them from scrapping and brushing against the roof.
4. In heavily shaded areas insure that the moss and fungus is not allowed to accumulate on the cedar. This moss build up allows the cedar to retain moisture and leads to decay.
5. Working on any roof can be hazardous and requires special tooling, skills and experience. Many homeowners are injured and even killed while on their roof for any number of reasons. This is one area that is best left for professionals!

## **Profiles**

Typically shakes are made of either cedar, spruce or treated pine. The hand-split shakes have a rough, textured look on the front and are usually smooth on the back. Wood shingles are sawn by machine, and are smooth on both sides.

Cedar is the best performing wood for making shakes. But, treated pine shakes also do well. When first installed, shakes are a brown or reddish color, but will weather and fade to a gray color during the first year.

## **Warranties**

Warranties generally range from 10- 50 years and non-transferrable and limited. Shakes are warranted against damage by termites or fungal decay that would make the material structurally unfit for roofing. Warranties do not include damage to shakes caused by warp, twist, splitting, shrinkage, swelling or other



properties of wood. Cost of delivery, installation, or removal of shakes are usually not covered.

**Cost:** \$650-\$1,100 per 100 square feet

### **Plastic / Composite Shingles**

Plastic roof tiles are made from modern materials such as PVC or TPO (define). The biggest problem with plastic slates has been the uniformity or lack of thickness, so if shopping for plastic be sure to take the thickness into consideration. Plastic roof tiles are highly durable when manufactured at a high thickness. Plastic shingles are low-maintenance and commonly come with a Class A Fire rating, a Class 4 Impact resistance rating and high wind resistance. Plastic tile roofing is also lightweight, making for easy installation. The only thing buyers should be wary of is that this light weight (2.4 pounds per square foot) feature makes maintaining and repairing plastic roofing tiles very complicated, and even dangerous. For this reason, we highly recommend you hire a plastic roof tile professional to take care of these services. Life span of a plastic roof usually ranges from 30-35 years for residential buildings.

### **Profile**

Plastic roof tiles can be produced in a variety of colors, shape, sizes and styles. You can get some that resemble slate, cedar or tile. Colors run the gambit from subtle and traditional brown and gray to contemporary magenta and pink.

### **Warranties**

Most plastic roofs come with a 50 year warranty. The warranty will normally cover the roof from damage resulting from winds less than 90 miles per hour. No protection is offered for fading of the material. After 10 years from the date of application, the amount covered by warranty will be pro-rated and does not include tear off, flashings, accessories or installation.

**Cost:** \$1,000 – \$1,600 per 100 square feet

## Permanent Roofing

### **Tile**

Tiles provide the longest track record of performance compared to other roofing materials such as asphalt shingles. Clay and concrete tile roofs are one of the most cost-effective choices due to their long lifespan - 50 to 100 years or more. Modern engineering design provides a natural water shedding and ventilation feature allowing tiles to be the primary choice of roof covering in both warm and cold climates (even reducing ice damming in cold areas!). The higher weight and strength of this tile allows it to meet the anticipated loads of today's design requirements for all of the climatic regions. With proper installation, tile roofing is one of a few select roofing systems that are proven to withstand sustained winds of 150 miles per hour.

The colors in tile come from natural sources such as the color and mixture of the clay used in clay tiles or from iron oxide pigments in concrete tiles, both of which are extremely durable. Tiles may experience varying degrees of color softening after extended exposure to the elements. However, this occurs to a lesser degree with roof tile than with most other roofing materials.

### **Profiles**

Roof tiles come in many colors, shapes, and sizes. In fact, with modern innovations, concrete and clay roof tile manufacturers can produce tiles to suit any architectural style, from authentic Spanish and Mediterranean to New England Colonial, historic, or contemporary. Roof tiles can be flat or round, simulate wood shakes, or seek to replicate centuries-old roofing materials. The possibilities are virtually limitless.

### **Warranties**

A 50 year limited warranty is offered with slate products, heavily pro-rated after 10 years. This covers manufacturing defects only. Installation issues will not be warranted by the manufacturer. A 90 mile per hour wind warranty is in place for the first ten (10) years. A two (2) year transferable warranty is available.

**Cost:** \$900-1300 per 100 square feet

## **Metal Roofing**

### **The Benefits**

First, let's take a look at the benefits of metal roofing. Choosing the right metal roof is critical but, even before that, you must know why you're choosing metal in the first place. As we discussed, it is often (though not always) a higher investment than more common roofing materials. Why are tens of thousands of homeowners choosing metal each year?

### **Weather Resistance and Other Benefits**

The roofing industry is driven by extreme weather. Whether it is strong winds and storms, hail, snow, ice, or brutal sun, the weather is what makes roofing materials break down. Chances are you have experienced this and that is what has driven you to investigate metal as an option. Let's look at how metal stands up to weather extremes.

### **Heat and Sun**

While particularly damaging in southern exposures and at high altitudes, heat and sun play huge roles in the degradation of most roofing systems. Ultimately, most roofing systems fail because they dry out, become brittle and crack with age. Metal roofing systems are completely impervious to this type of damage. They will not curl, crack or become brittle when exposed to sun and heat. Additionally, today's coating technology offers a variety of finishes which maintain their integrity and color very well when exposed to heat and sun.

### **Wind Resistance**

Recent devastating hurricanes in our country have brought a lot of media attention to this subject. We have all seen the video footage of damaged roofs. Does metal really perform better than other products? Let's take a look at the issues involved.

It's important to understand that, in a hurricane or other windstorm, there are many things that happen which affect the roof. Of course, you have actual physical wind speed blowing into the roof from a certain angle. This wind puts strain on the metal panels as it hits them but, sometimes even to a greater degree; it puts uplift pressure on the backside of the roof. Next, you can often have structural movement occurring which will impact roof performance – some homes are built better than

others to withstand this. Structural movement can cause roof panels to disengage, particularly if they were not designed to allow for it. Additionally, improper attic venting can cause attics to literally explode. No roof covering will be able to handle that. And, of course, windblown debris striking the roof can compromise its performance as well.

In order to verify their wind resistance, metal roofing products are subjected to uplift tests which simulate actual wind occurrences. This is done through what is called the “bag test”. With some variations, a section of roofing is installed in a laboratory with plastic bagging between the metal and the roof decking. This plastic bagging is then filled with air pressure to determine at what point the metal roof panels disengage. The point of disengagement can be used to approximate a failure point in terms of wind speed.

Some metal products have actual mechanical interlocks between the panels. These products, if properly designed and installed, will often perform better in uplift test than will overlapping panels or panels with a “slip lock” rather than a true interlock. Some products with overlapping panels, though, will have fasteners driven right through the overlap which can make them perform very well as well.

One important factor to remember when considering the wind performance of any roofing material is aging. Many roofing materials soften or become brittle with age. As that happens, their ability to withstand extreme winds lessens. Metal products, on the other hand, retain their strength and wind resistance very well as they age. A 30-year-old metal roof will likely withstand wind the same as a brand new metal roof.

For all of these reasons, property owners in wind-prone areas are increasingly turning to metal as their roof system of choice.

## **Snow and Ice**

Many people may not think about it but snow and ice are among the worst conditions that Mother Nature can throw at a roof. They cause degradation of materials, failure of sealants and ice damming can cause severe home damages.

Metal roofing is known for its ability quickly shed snow loads. Typically this happens when the sun comes out and radiant heat passes through the snow load, warming the metal. In some cases, it may be advisable to have snow guards on the roof which are small protrusions designed to hold the snow a bit and break it up into smaller chunks when it does slide. This can be a good idea particularly over doorways and shrubbery.

Homeowners are cautioned that, while metal roofing tends to shed snow quickly, it still doesn't make up for a lack of attic insulation and ventilation which can result in ice damming on the roof. Generally speaking, snow and ice on a metal

roof will not cause damage but if ice damming occurs over the eaves and water starts to pool and freeze higher up on the roof it can be a challenge for any roof system. When replacing your roof, it is a good idea to ask your contractor whether you need any additional or improved attic ventilation to guard against winter damages.

## **Lightning**

It is common for homeowners to wonder whether a metal roof might attract lightning. It is true that metal conducts electricity but it does not draw it. There is no evidence that metal roofing puts a home at greater risk of a lightning strike. Typically, lightning will hit the highest object around and rarely is that the top of the house. Just the same, metal roofs can be grounded by a lightning protection specialist if desired.

## **Hail**

Metal roofing is widely respected for its hail resistance. While there can certainly be storms from which no roofing material will escape unscathed, metal roofing offers good protection from leaks even if aesthetic damages do occur. The most widely-accepted test of hail-resistance is Underwriters Lab (U.L.) 2218, a steel-ball drop test that simulates the effect of hail impact on roofing products. Metal roofs pass U.L. 2218 at Class IV, the highest rating. As a result, homeowners in many hail-prone states can obtain discounted insurance premiums. Additionally, unlike other roofing materials, metal roofing resists hail damage even as it ages. This is another big advantage for metal.

## **Fire Safety**

Most metal roofs are approved for Class A, B, and C fire ratings. In some cases, a special underlayment may be required to meet certain code and fire classification requirements. However, metal roofing is widely recognized for its resistance to airborne sparks and burning debris. Particularly if you currently have a wood shingle or shake roof, you may enjoy a lower insurance premium with a metal roof. Additionally, in the event of a fire inside your house, the low weight of metal roofing minimizes the possibility of roof cave-in as the structure weakens. This can help save your home and belongings, providing firefighters with greater opportunity to put out the fire.

## **Earthquake Resistance**

With weights from 45 pounds for aluminum roofing up to a maximum of about 125 pounds (per 100 square feet), metal can be as little as 1/20<sup>th</sup> the weight of other roofing materials. It is generally the lowest weight roofing available. This can help protect the structure in the event of seismic activity when oftentimes homes are destroyed under the weight of heavy roofs. Additionally, metal's low weight can be a positive for older structures as well.

### ***The Bottom Line***

The industry is seeing a rapid increase in the use of metal roofing in areas prone to severe weather. The “proof is in the pudding.” People are seeing metal systems out-perform other roofing systems on a regular basis during weather occurrence of all types. Products that perform well in severe weather will also, naturally, do very well in more moderate weather, too.

## **Metals**

Many people automatically assume, when they hear “metal roofing” that the “metal” is steel. Yes, a majority of metal roofing products are manufactured from various types of steel, but there are several other quality metals used more frequently today than ever. Additionally, there are different types and grades of steel of which the educated consumer needs to be aware. What follows is a summary of these various metals and their relative applicability in relation to one another.

### **Galvanized Steel**

Because the traditional carbon/iron steel alloy is rust prone when exposed to the elements, steels used for the metal roofing industry are coated with a specific thickness of another metal or alloy on both sides of the base carbon/iron steel strip. The process used to accomplish this is called the hot-dip process, and involves running the steel through a molten bath of the metal to be applied. The hot-dipped process is basically a less expensive, more efficient alternative to a similar process with which you might be pretty familiar: electroplating.

Steels are classified and named according to the metal that is applied. Galvanized steel is base carbon/iron steel with a metallic coating of zinc. The

coating metal offers two kinds of protection: galvanic or barrier. Galvanic protection is a self-sacrificial process by which the metal coating gives itself up rather than allow the base metal to corrode. Barrier protection is simply that the coating metal keeps the elements from reaching the base metal.

In the metal roofing industry, galvanized steel is used more often than any other metal and is available in most metal roofing profiles. It is lower cost than most other metals, strong and has a great affinity to hold paint. Because zinc provides galvanic protection, scratches on galvanized steel are somewhat self-protected or “band-aided,” preserving the steel from rust. Therefore, the life-span of galvanized steel depends largely on the thickness of its metallic coating since the more zinc that is present the longer the steel is able to remain protected and rust-free. G-90, the most common zinc thickness used in the metal roofing industry, means that 0.90 ounces of zinc are coated per square foot of steel surface. Lower grade-galvanized steels are G-30 and G-60 and should usually be avoided for residential applications. Always check the manufacturer’s specifications to determine the thickness of the steel’s metallic coating.

It is important to note that G-90 *only* refers to the thickness of the zinc coating, not the thickness of the steel itself. That thickness is measured in gauge number (26 Gauge, 24 Gauge, etc.) and depends on the profile of the steel metal roofing product to be used. In regard to the overall metal thickness, the higher the gauge number, the thinner the metal is. With a few exceptions, such as mill-finished shingles or other metal roof styles, all galvanized steel systems are coated with a base paint coat of some sort. In addition, many of the higher quality galvanized steel metal roofing products, especially shake, shingle and tile systems that are used largely on residential applications, come with an added “post-forming” coat to help protect against corrosion in areas where the metal had been refashioned during the manufacturing process. This is discussed in further detail in the Coatings section.

Galvanized steel is not a good option for homeowners in coastal areas or areas with an above average amount of corrosive elements in the air. Salt spray and these other elements can speed up corrosion and shorten the life of galvanized steel. Overall, though, with consideration just for the metal itself, galvanized steel is very appropriate for residential applications. Classic Metal Roofing Systems’ TimberCreek Shake is manufactured from high quality G-90 galvanized steel and is an example of a galvanized steel product designed specifically for residential roofs. It includes a unique “post-forming” coat consisting of electrostatically-applied Kynar powder paint.

## Galvanized Steel Summary

### Advantages:

- strong
- lower cost
- available in a variety of looks

### Disadvantages:

- shorter life span than other metal roofs
- can rust prematurely if not used or installed properly
- can be more difficult to work with (must be cut with a shearing action rather than saw-cut)

### Thicknesses:

26-28 gauge (.018" - .014") is most common for shake, shingle, tile and slate profiles. 24 gauge (.024") is most common for standing seam systems, with a good amount of 26 gauge as well.

Weight: Between 100 and 150 lbs. per square (100 sq. ft.).

Recycled Content: Usually around 35%

## Galvalume® Steel

Base carbon/iron steel coated with an alloy of aluminum *and* zinc is known as Galvalume steel. When aluminum is added with zinc, both of the positive and negative attributes of aluminum are magnified. Because aluminum itself is a very corrosion-resistant metal, Galvalume steel is also very corrosion resistant, i.e. the aluminum/zinc alloy provides barrier protection, as opposed to galvanic. The negative aspect of aluminum in the alloy, though, is that Galvalume doesn't self-protect scratches or cut edges as well as galvanized steel does.

Galvalume steel is also more susceptible to a process known as "tension-bend staining." When steel is formed into the various metal roofing profiles, the Galvalume zinc/aluminum and the galvanized zinc coatings are spread very thinly over areas in the metal where there are deep folds or tight bends—so thin, in fact, that the coating has a tendency to form microscopic cracks. Because of galvanic action of zinc, galvanized steel is able to protect these scratches with little harm. With Galvalume steel, however, the aluminum in the alloy somewhat neutralizes zinc's galvanic properties and therefore the Galvalume steel isn't able to self-



protect the cracks, or other scratches in general. Tension-bend staining occurs when moisture or other corrosive elements permeate these cracks and facilitate rusting. The result is “stains” of rust in areas with folds and bends in the metal. Over time, this corrosion will spider its way under the metallic coating causing further deterioration.

For this reason, Galvalume steel is used most commonly in rather simple profiles, such as standing seam, because there isn't quite as much bending in the metal. Because Galvalume steel is more corrosion-resistant than galvanized, it is sometimes installed unpainted or with a low cost acrylic clear coat. While this is most often done in commercial applications, homeowners who like the bright, shiny metallic look have selected unpainted Galvalume as well. However, most Galvalume is painted for added durability and beauty.

### Galvalume Steel Summary

#### Advantages:

- very corrosion resistant
- strong
- relatively inexpensive

#### Disadvantages:

- susceptible to tension-bend staining
- limited profile availability (mostly standing seam or simple shingle styles)
- must be cut with a shearing action rather than saw-cut

Thicknesses: 24 gauge (.024”) is most common for standing seam systems

Weight: Between 100 and 150 lbs. per square (100 sq. ft.).

Recycled Content: Usually around 35%

### Aluminum

Lightweight, durable and corrosion resistant aluminum is a good option for almost any residential metal roofing system, including standing seam, shake, shingle, tile and slate profiles. Aluminum will never rust so it is an ideal metal for coastal applications and other areas where steel might be in danger. Aluminum's propensity to resist rust gives it an extremely long life span. One of the first architectural aluminum applications was the cap on the Washington Monument way back in 1885. It was around this time that processes to separate aluminum

from bauxite were developed. Manufacturing building grade aluminum alloys became efficient enough to make aluminum a viable option for the building industry. Prior to that, aluminum had been considered a precious metal.

Nowadays, virtually all aluminum roofing is pre-painted, and aluminum can be found in just about any profile in which metal roofing is manufactured. In fact, more heavily formed products lend themselves very well to aluminum due to its high malleability and the fact that heavy forming adds additional structural strength. Aluminum roofing is usually manufactured from a large percentage of recycled material, the majority of which is post-consumer material such as used beverage cans. The recycled content of aluminum roofing will usually be 90 – 95%. One square of aluminum roofing (.019” thick) can use as many as 1,152 aluminum beverage cans—closing the recycling loop for the consumer. Classic Metal Roofing Systems produces several product lines aluminum. Many homeowners easily make the decision that aluminum is the best choice they can make in terms of overall value for their roof.

### Aluminum Summary

#### Advantages:

- lightweight
- rust free
- attractive
- energy efficient.

#### Disadvantages:

- more expensive than steel

Thicknesses: .019” for shake, shingle and tile; minimum .032” for standing seam; .032” for some heavier tile profiles.

Weight: As low as 45 pounds per 100 square feet

Recycled content: Usually around 95% (mostly post-consumer).

## Copper

Copper is generally recognized as one of the most attractive metal roofing options. Unfortunately, it carries a pretty hefty price tag. Copper is the most expensive of the three most popular roofing metals (steel, aluminum, copper in increasing order of expense). Rarely used over an entire residential roof, copper is mainly used for accents over bay windows, dormers, or other areas where a touch of elegance is desired. Copper is used often on historic buildings, church steeples, cupolas, and the like. Copper is installed in short standing seam panels or sheeting, but there are some copper shingles available as well. Classic's Chateau Slate and Oxford Shingle are both available in copper, both ideal choices for the applications mentioned above.

Sometimes copper is used as a flashing material in conjunction with other roofing materials. This technique is not recommended for use with aluminum or steel roofing for a couple of reasons. Because most residential metal roof systems come with their own preformed flashings copper accompaniments are not necessary. And when copper is left in direct contact with a dissimilar metal it will speed up the deterioration of the other metal.

As copper patinates, the water runoff has a tendency to stain other metals, brick, concrete, and almost anything else with which it comes in contact. Therefore, it's important to understand where the water runoff over a copper portion of a roof is being directed and how it is channeled off of the roof. As an alternative, and to solve this problem, lead-coated copper is sometimes used as a replacement for pure copper. This is being done less often, though, due to the public outcry against anything lead-related in building products.

Copper is best known for its attractive blue-green, or verdigris patina that forms when left exposed for 8-15 years. The actual length of time to complete patination depends on what is in the air. Salt spray in a coastal environment, for example, dramatically hastens the process. The patina is like a barrier against corrosive elements and is part of the reason for copper's extremely long life. While copper can be treated to speed up or slow down the patination process, or even be purchased pre-patinated, most homeowners elect to allow copper to weather naturally so as to ensure the rich, luxurious verdigris look.

Because copper is relatively soft and malleable, it is fairly easy to work with and usually solders well. Copper is extremely durable and has a very long life—sometimes more than 100 years. Copper has been used extensively for hundreds of years in the United States. One of the first applications was the Massachusetts State House. The copper for this project was one of the first orders for Paul Revere's newly founded copper rolling mill in 1801.

Recent coatings technology has brought homeowners the option of choosing steel or aluminum roofing that has been coated to resemble copper. Finishes are available from bright “new” copper to fully weathered copper, as well as coatings designed to look like copper in varying stages of the patination process. Classic offers several colors along this line on its aluminum roofing systems, giving homeowners an option of the permanence of copper at a lower cost.

### Copper Summary

#### Advantages:

- classic beauty
- extremely durable
- easy to work with
- easily soldered

#### Disadvantages:

- expensive
- runoff will streak or stain other materials
- natural patination takes time.

Thicknesses: 12 oz. (.016”) and 16 oz. (.022”) are common for pre-formed shingles, 16 oz. (.022”) and 20 oz. (.027”) are common for vertical seam.

Weight: Between 100 and 150 pounds per 100 square feet

Recycled Content: Varies but is often around 35%

### **Other Exotic Metals**

There are other metals available for roofing as well including rolled zinc, stainless steel, terne-coated steel, terne-coated stainless, and titanium. Generally, roofs made from these more exotic metals will be architect-specified and will be custom-formed by a fabricator for a particular application. If you have interest in one of these more specialized metals, contact us for availability and suitability for your end use.

### ***The Bottom Line***

One of the most unique things about metal roofing is the wide variety of product types. This affords consumers the opportunity to do their research and find

the product that works best for them. As they go through this process, many homeowners choose to look at the expected life cycle cost of each metal. From this examination emerges the realization that those choosing metal roofing have a choice between ferrous (rusting) metals and non-ferrous (non-rusting) metals. Many of the non-ferrous products come at considerable extra expense. For many homeowners, aluminum roofing is seen to offer the best value – an ideal combination of reasonable price and worry-free durability.

### **Through-Fastened vs. Clip-Fastened Systems**

Through-fastened panels refer to metal roof systems in which the screw or nail that secures the metal roofing to the deck, purlin, lathe, etc., actually penetrates through the panel itself. Conversely, clip fastened panels utilize a specialized clip system that attaches to the panel or shingle. The fasteners are then driven through the clips and therefore have no direct contact with the metal panels themselves. In most cases, clip fastened panels are designed so that the clip and fastener are concealed (concealed fastener system). The fastener can also be concealed on certain types of through-fastened panels. Some products with concealed fasteners may use a combination of through-fasteners and clips. Both through-fastened and clip-fastened systems may be architectural or structural.

Through-fastened panels that utilize exposed fasteners are most common. In many cases, the exposed fastener is simply driven through an overlap between panels as well as through other strategic locations as specified by the roofing manufacturer. Exposed fastener systems are usually lesser-quality systems and therefore are subject to less comprehensive warranties than concealed fastener systems. The reason for this is that exposed fasteners are subject to the elements and tend to break down and fail much sooner than concealed-fastener panels. Exposed fasteners are normally self-drilling screws with a hex-head drive. These screws will typically have an oversized “cap” head protecting a neoprene washer for water tightness. The screws will normally be painted to match the roof system. Although the screws are self-drilling, most installers will pre-drill holes in the roofing from the backside to ensure proper placement. Over time, as the metal panels expand and contract, a great deal of pressure is put on through-fasteners, often wallowing out the holes in the panels or fatiguing the fasteners and causing them to back out or even break.

Concealed-clip fastener systems are usually regarded as higher quality and more functionally sound for another reason, too. Because metal expands and contracts when it is subjected to temperature changes, sometimes panels have a tendency to wrinkle or “oilcan” as it is called in the industry. The most common cause of oil canning is fasteners that are driven too tight and are therefore not

allowed to move when they expand and contract. If the panels are secured with fasteners that are driven through a clip and not the panels themselves, the result is a system that floats over the deck and is much less susceptible to oil canning. This also creates far less concern for fastener fatigue. With concealed fasteners, the fasteners are often screws for longer roofing panels and nails for smaller modular sized shingles. Other causes for oil canning can include an uneven surface of the original roof deck, improper forming of the roofing and, quite often, unavoidable stresses and chemical composition differences inherent to the metal itself.

## **Profiles**

There are literally dozens of different looks and feels that can be achieved with metal roofing—from the traditional standing seam look, to the old-world tile look or the beauty of shakes, to the more agricultural corrugated look. The variety of attractive metal roofing profiles is one of the great advantages of the industry. No matter what the style or look of your home, there is almost certainly a metal roof system out there that will complement it perfectly! Unfortunately, the variety of profiles is sometimes one of the industry's detriments as well because it can lead to improper products being used for less than ideal applications. The following section should help you make an informed choice about the product that will work best, both aesthetically and functionally, for your home.

## **Sheet Roofing**

Sheet metal roofing is available in many different profiles, all going by different names. “5V” Crimp, “R” Panel, corrugated roofing, face-fastened panels, through-fastened panels or screw down panels are some of the synonyms for the style of metal roofing that is encompassed under the umbrella term “sheet.” Metal sheet roofing is manufactured primarily from Galvalume or galvanized steel in thicknesses that vary between 24 and 30 gauge. The defining characteristic of all sheet roofing is large panels (or sheets) of varying widths and lengths that overlap and have exposed fasteners. The fasteners are driven through the overlapping portions of the panels, as well as in other strategic locations and into the roof decking, purlin, or spaced sheathing below. A neoprene washer is located beneath the head of the fastener to ensure water tightness.

One common type of sheet roofing is the 5V Crimp pattern. It has five small V crimps per panel. Other corrugated patterns of sheet roofing give a more “wavy”

look. The look of any of these products is sometimes construed as an agricultural or rural look. Sheet can also give a historical look, particularly if used unpainted.

Sheet roofing can be installed painted or unpainted. Because sheet roofing is often chosen as a more economical type of metal roofing, the paints used on sheet metal roofing are often lower quality. This saves even more money on the overall system. Generally, sheet-roofing systems should be examined closely before being selected for residential projects looking for a lifetime roof. While most sheet roofing is still higher quality than many traditional roofing materials, it contrasts quite sharply with some of the more technologically-advanced metal roofing options available to homeowners who want to make lasting investments in their homes.

Sheet roofing is the most economical form of metal roofing. It is also one of the easier to install types of metal roofing. The disadvantages of sheet roofing are that it's not as long lasting, both functionally and aesthetically, as some other types of metal roof systems.

## **Standing Seam**

Standing seam is probably the most recognizable profile of metal roofing for both commercial and residential projects. The popularity of standing seam has grown so much in recent decades that many people automatically assume that standing seam is implied by the term “metal roofing.” Standing seam provides a very contemporary, distinctive look, and is chosen to complement homes of all styles. The key, though, to choosing the right standing seam depends on the actual dimensions of the roof. More often than not, residential roofs are smaller, more compact, and more complex than commercial roofs. For this reason, it's advisable to select a standing seam roof with a relatively small panel width – usually around 12”. Wider panels will present a more commercial look to the roof, obviously a condition to be avoided when selecting metal roof for a home.

As mentioned in the section on through fastener vs. clip fastened systems, standing seams can be either through- or clip-fastened. Through-fastened standing seam systems are less common and utilize a fastening “flange” that runs the length of the panels. The fasteners are driven through this flange and then concealed by the subsequent panel. So, although the fastener is concealed to the elements, fastening still occurs directly through the panels. These systems are more cost effective options, but since most quality standing seams used residentially are continuous panels—meaning the panels are custom formed to the length of the rafter—using these through-fastened panels is not recommended on longer rafter lengths. The reason is that the longer the panel, the more it will expand and

contract, and the more likely to fatigue fasteners, “wallow out” fastener holes and also to oilcan. These through-fastened panels are a good option, however, for shorter runs such as porch accents or bay windows.

For longer runs, the better option is a standing seam system that utilizes a clip system. The clip should be manufactured from a similar metal as the standing seam itself, or from a metal like stainless steel that is not conducive to galvanic action between dissimilar metals. The clip is fastened to the roof deck so that the panels are allowed to “float.” This helps to ensure that the system will maintain its water tightness much longer, and also its aesthetics, as oil canning will be less of a concern. For longer runs, or even for shorter runs downhill from longer roof runs, it is also recommended that a system with a higher rib is used. The rib is the portion of the standing seam that gives it its dimension, and is also the joint of the two adjacent panels. Higher ribs will give the panels more capability to carry water down the entire rafter length, and thus prevent water from spilling over the panels and possibly backing up under an overwhelmed rib or other flashing.

Standing seam roofs are most commonly manufactured from galvanized or Galvalume steel and range in gauge from 18 for the heavier structural products (rarely used residentially) to a lighter 26 or even 28 gauge for simpler projects. Gauge 24 and 26 are the most common for residential steel standing seams. Some high quality standing seams, like Classic’s ClickLock Premium Standing Seam are manufactured in heavy gauge aluminum ranging typically from .032” to .050” with .032” common for residential applications.

Many standing seam systems, like ClickLock, come with an entire array of preformed flashings. These flashings help reduce installer error and help ensure a watertight roof for many decades to come. Flashings for true standing seam systems usually need to be custom-made for each job in order to exactly meet the pitch and other geometry of each individual roof.

## **Shake, Shingle, Tile, and Slate**

The growth in demand for standing seam in the residential roofing market over the past few years may be exceeded only by the growth in popularity of the “new metal roofs” – the shake, shingle, tile, and slate profiles. These products allow homeowners the opportunity to have the benefits of metal roofing along with the looks of something very traditional and timeless. The four different types of these “modular” panels can vary greatly in terms of look and use. Following is a description of all four.



Metal shakes are designed to mimic the look of hand split cedar shakes. While many homeowners select these shake systems because of their resemblance to wood shakes and also because of the long-term performance metal provides many other homeowners enjoy these specialty metal shake systems for their own unique and distinctive look. These modular panels come in various sizes with common dimensions of 2' x 1' and 4' x 1' and are usually fastened to the roof deck with a concealed clip system or a nailing flange formed into the top of the shingle. Shake and shingle facsimile profiles are installed on the roof in a staggered pattern to avoid vertical line repetition. The shake systems are usually more "high-profile" than shingle systems, meaning that they are designed with a little more dimension and texture. Many times, this added dimension to the shingle allows it to be installed directly over previous roof layers, even some thin wood shingles. Metal shakes are usually manufactured from 26 or 28 gauge steel, or .019" or .024" thick aluminum. Steel metal shakes are commonly coated with a post-forming stone coat or Kynar® powder coat. This helps seal the edges in areas where the zinc or zinc/aluminum alloy coating has been spread thin over areas of tight bends. Some manufacturers, including Classic Metal Roofing Systems, also offer aluminum shakes with the special post-forming coats, but in the case of aluminum, these coats are selected more for aesthetic reasons than to ensure the functional soundness of the system.

Most metal shake systems come with a complete line of pre-formed flashings, which usually includes hip caps, ridge caps, gable trim, sidewall flashing, eave starter, and valley. These are typically universal flashings designed to work with any roof pitch. Higher-quality metal shake systems utilize an open valley system to help ensure that leaves, ice, pine straw, etc. do not block up the valley and cause water to back up under the panels or the valley itself. It is usually a good idea to inquire with your contractor about the type of valley flashing used with the metal roof system you are considering.

Metal shingles are similar to metal shakes except with a lower-profile design. Many homeowners who are fed up with the short lives of the traditional machine split wood shingle select metal shingles for their durability and beauty. Also since metal shingles look more like dimensional standard shingles, some homeowners choose them for their ability to blend in with a more modest neighborhood look. Like the shake profiles, the single metal roof systems are modularized panels fastened to the roof deck most commonly with a clip system, or sometimes with a nailing flange formed into the top of the shingle.

Metal tile profiles come in a wide variety of looks and feels, from the exotic Mediterranean barrel tile look to the stately S-Serpentine look. Most tile profiles are through-fastened usually with exposed fasteners, and some utilize a batten grid attached to the roof deck to which the panels are attached. Most metal tile systems

are made in large sheets that typically stretch from eave to ridge. Fewer seams and quicker installation are a plus, but waste can be dramatically increased with such systems.

Metal slate profiles are manufactured in steel, aluminum, and copper to replicate the look of natural slate. The advantage of metal facsimile slate profiles is that they are about 1/2 to 1/3 the cost of real slate, and are also much, much lighter than traditional slate – which can help prolong the life of older buildings.

Some other, more exotic profiles, such as diamond shapes, scalloped, and flat tiles are available in metal roofing.

### ***The Bottom Line***

Homeowners who are considering a metal roof have a wide variety of looks to choose from. This allows them to choose a roof system which matches the design of their home, as well as their own personality. Each different roof design has its own characteristics and attributes so it is also important for consumers to read this guide and understand those aspects of their purchase as well.

## **Other Things You Should Know**

### **Realities of Metal Roofing**

There are two realities homeowners must be aware of when considering a metal roof: rain removal and snow shedding. Benefits are numerous with metal roofs yet homeowners need to be informed that metal roofs may require additional attention to your gutter system and snow shedding concerns if you live in a snow laden climate.

Many people may not think about it but snow and ice are among the worst that Mother Nature can throw at a roof. They cause degradation of materials, failure of sealants, and ice damming which in turn can cause severe home damages. Metal roofs with proper ventilation can help eliminate these problems if installed correctly. Let's now take a look at these two realities.

### **Rain Removal Systems**

Due to metal being smooth and less resistant, rain water will travel down the roof much faster. In turn, this means larger gutters and downspouts are required to absorb the rain runoff and divert water away from the house. Commercial grade gutters of at least 6" and downspouts of 4x5" are recommended. Please be mindful that not all homes need a gutter system. If the landscaping around your home is

pitched enough on a downward slope away from your home, the pitch may be enough to divert water away from your home. It is best to consult with a professional gutter installer to assess your landscaping and determine if your landscaping is pitched enough to allow for rain removal.

It must also be noted that homeowners who have gutters attached with metal straps to the top of their roof will need to have these removed prior to installation of a metal roof. Metal roofs require that gutters be attached to the fascia boards. In some cases of older homes, this may mean adding wider fascia boards or adjusting the fascia boards with wedges to allow for attachment of gutters. Be sure the metal roofing installer you choose address these gutter realities before he begins work. Otherwise, homeowners may be miffed and upset when they learn about gutter realities after their metal roof is installed. Be sure to address your gutter realities prior to install to ensure their metal roofing system is compatible with your chosen gutter system.

## **Snow and Ice Shedding**

Metal roofing is known for its ability to quickly shed snow loads. Typically this happens when the sun comes out and radiant heat passes through the snow load, warming the metal a bit. Add to it that the metal is less resistant in nature and you now have ideal conditions for snow to shed very quickly all in large sections. The good thing is that homeowners will not have to use snow rakes or crawl on their roofs to shovel off snow. The flip side is that snow will shed in bigger sections and fall further out from the edge of your roofline. This may or may not mean falling on landscaping. Depending on your where your roofline ends, this may mean having more snow fall on your driveway or sidewalk.

In some cases, it may be advisable to have snow guards on the roof which are small protrusions designed to hold the snow a bit and break it up into smaller chunks when it does slide. This can be a good idea particularly over doorways, porches, delicate shrubbery, and garages. One would not want large sections or sheets of snow falling on your vehicle or favorite pet when they least expect it. It will usually require temperatures in the 30's before this type of quick shedding occurs. Homeowners will also hear a slight rumble of sorts as the snow lets go and slides off the metal roof.

## **Installing Over Existing Roofing Materials**

Due to their very low weight, many metal roofs can be installed over existing roofing materials. This is particularly the case when going over old composition shingles. Additionally, the formation of many of the heavily profiled

shake and tile profiles of metal roofing can even permit installation over wood shingles or wood shakes.

Before deciding to install over an existing roof, the manufacturer or an experienced contractor must be consulted, as weight is not the only issue. In many cases, building codes prohibit more than two layers of roofing, although building inspectors have been known to waive that restriction for metal roof layover installations. If there is an existing weight problem with the structure or if there is question as to the integrity of the structure or roof decking, those issues must be addressed before installing over the existing shingles.

In some cases, particularly with wood shingles and shakes, the old roofing must be removed from the edge perimeter of the roof and even the lumber can be removed and replaced with fresh lumber before proceeding with the roof installation.

Metal can also sometimes be installed over existing slate and asbestos slate roofs though, again, the manufacturer or an experienced contractor should be consulted. Existing tile roofs and, in most cases, existing metal roofs, need to be removed prior to installation of the new roof.

## **Coatings**

In most cases, the coatings on metal roofing are applied before the manufacturer or contractor even sees the metal. The finishes are applied at roll-coating facilities where the metal is cleaned, chemically etched, coated, and baked. In some cases, a “print coat” is involved as well, allowing for these finishes to have an attractive multi-hued appearance. After coating, the coiled metal is shipped off to the manufacturer who fashions it into the various profiles. The finishes used in the metal roofing industry consist of three main components: 1) the pigment (also referred to as “solids”), which gives the coating its color, 2) the solvent, which is the liquid medium that is baked off after the coating has been applied, and 3) the resin, which binds the pigment to the surface after the solvent is gone. The finishes used in the metal roofing industry are classified by the quality of their resins.

There are three main types of coil-applied baked-on metal finishes used in the North American metal roofing industry today. Water-based acrylic emulsions are one of the most common and most environmentally-friendly coatings. They are typically two-coat systems consisting of a primer coat followed by a topcoat. They do not carry a warranty for fade or chalk.

Another coating type is polyester coatings including a number of formulations such as siliconized modified polyester (SMP). Like acrylics, polyesters are lower cost finishes and also subject to fade and chalk over time.

SMP finishes are higher quality than more generic polyester paints, but still won't achieve the performance of the standard for today's metal roofing industry: polyvinylidene fluoride (PVDF).

PVDF coatings are usually sold and applied to metal as the trade names Kynar® and Hylar®. These are two-coat systems with a primer coat followed by a topcoat. If the formulation is made up of the standard 70% Kynar or Hylar resin, it can use the full Kynar 500 or Hylar 5000 trade names. These trade names are used so that consumers, contractors, and architects can tell for sure that the finish on the metal roof system they are selecting is of the highest quality possible. There is no substantive difference between Kynar PVDF resin and Hylar PVDF resin, except that they are manufactured by two different companies, and thus marketed under two separate trade names. Kynar 500 / Hylar 5000 finishes usually carry a 30 year fade warranty up to five Delta E units. A Delta E unit is the smallest recognizable color shade shift seen by the naked eye. PVDF represents the highest quality coatings available for use on metal roof systems. Most metal roofing manufacturers and contractors would never recommend selecting a residential product that uses something other than a PVDF – Kynar 500 / Hylar 5000 finish.

In addition to these base coating options, some steel shake, shingle and tile profiles include an extra layer of coating to add both beauty and functionality to the products. This type of coating is applied “post-forming,” which means after the profile is fashioned by the manufacturer. The advantage of these post-forming coats, in addition to creating a gorgeous look, is that they can help seal off any cracks or fissures in the zinc or zinc/aluminum coating over the steel that may have occurred during the fashioning of the profile. The two main options here are stone-coatings and Kynar powder coatings.

Stone coated steel products (also called “aggregate” or “granular” coated) are used very extensively for residential applications, primarily on the West Coast and in the Southwest. These coatings present a multi-hued, textured appearance and are primarily used on shake and tile profiles. The coatings consist of ceramic-coated sand or stones, which are bonded to the base steel and then covered with a clear acrylic coating.

The other post-forming coating option, the Kynar powder coat, is so far a Classic Metal Roofing exclusive. This coat is an electro-statically applied Kynar powder coat that is then baked into the base Kynar coat. The result is a beautiful, long-lasting, scratch-resistant, multi-hued coat that represents the pinnacle of modern coating technology. We call this coat the ThermoBond Textured Finish.

The newest development under the “coatings” headline is probably the most exciting due to its potential impact on the entire roofing industry: reflective pigment technology. These specially formulated pigments, which were first developed by the military in order to help camouflage tanks against infrared

detection, are able to reflect a much larger percentage of the sun's rays even in darker colors. This means that less heat is absorbed into the attic space, and therefore less energy is required to keep the home at a comfortable temperature during the hot summer months. The end result is a reduction in the home's energy bills! Classic was the first specialty residential roofing manufacturer to incorporate this technology into all its product lines. Classic calls this technology Hi-R, for highly reflective. Other manufacturers are marketing their versions under various names, and the stone coatings are developing this technology as well.

Please note that all galvanized steel, Galvalume, and aluminum roofs should have some sort of protective coating on the backside of the metal as well. It is acceptable for this to be a low cost coating. In many cases, it might be colorless.

### **Sound Transmission**

Most residential metal roofs are installed over solid decking and there is usually an attic space beneath that. These factors help to reduce noise transmission and avoid objectionable noise from rain hitting the roof. Additionally, the more heavily profiled metal roof styles are very good at breaking up any "sound board effect." Whereas rain may create a slightly different sound hitting metal roofing than other products, it will not create an increase in sound.

### **Ventilation**

In most cases, metal roofing does not increase the need for attic ventilation. However, it also doesn't decrease it. Through the use of better weatherization technique, our homes are becoming more airtight than ever before. This is resulting in moisture getting trapped inside the house. This moisture generally migrates to the attic and needs to be exhausted out year-round, as does the excessive attic heat which can build during the summer months. The most proven method of venting is a combination of soffit vents and a roof ridge vent. Most metal roof systems will offer some sort of ridge vent option (some performing better than others). If moisture is not vented from an attic, unhealthy and damaging conditions including mold and rot can occur.

In the rare instances when structural metal roofing (i.e., metal roofing that is installed over purlin or lathe rather than solid decking) is used on a residential-scale building, good ventilation is critical to prevent the collection of condensation on the exposed bottom side of the roofing panels.

**The need for proper ventilation must not be overlooked. Your roofing contractor should assess your current ventilation efficiency and recommend**

**whatever steps necessary correct deficient systems. The cost of making ventilation changes while the roof work is being completed is significantly less than making changes later on.**

### **Stress Skin “Sandwich” Panels**

Increasingly, homes are being built from stress skin panels, which consist of foam sandwiched between two layers of decking or outer decking and inner gypsum board. These panels can pose potential condensation issues because they often do not have any venting. This goes against the International Building Code, which requires a 1” vented airspace in the United States and 1½” in Canada. One answer is to have a complete vapor barrier on the bottom side of the panels. Before proceeding with the installation of any roofing over stress skin panels, consult with panel manufacturers, roofing suppliers, and building officials as necessary to ensure that steps are being taken to avoid condensation issues.

### **“Walkability”**

Most metal roofs can be safely walked without damage. Inquire with the roofing manufacturer as to the correct methods for foot traffic on the roof. Some of the shingle and shake style metal roofing products have optional foam backers for even greater rigidity and walkability.

### **Energy Efficiency and Environmental Impact**

Metal roofing is increasingly being recognized for its many “green” benefits. The durability of metal roofing makes it a very sustainable product. Additionally, should it ever need to be removed in the future, it is 100% recyclable. Most metals used in roofing have very high initial recycled content. This is as high as 95% with aluminum, and lower with other metals. The production of metal from recycled stock also has very low embodied energy in comparison to producing metal from original ores.

With the onset of various “cool roofing” initiatives in the country, metal is being recognized for its ability to keep buildings cooler in hot weather. This is done through a combination of reflectivity and emissivity, often enhanced by coatings on metal roofing. Additionally, shake, shingle, and tile profile metal roofing products have minimal contact with the home’s structure, blocking heat transfer by conduction as well.

Finally, the ability to install metal roofing over old roofing materials means that landfills are not being burdened with the old roofing.

## **Warranties**

Metal roofing has a long history. Many metal roofs in the United States today are more than 100 years old. Those roofs did not have the benefit of today's coating and manufacturing technology either. Metal roofing manufacturers provide warranties covering such things as manufacturer's defects, product integrity, and coating integrity. The coating warranties may include such things as fade and chalk. Homeowners are reminded though that, as is the case with all building materials, the actual installation workmanship is warranted by the installing contractor, not by the product manufacturer. Compare warranties both from the product manufacturers and the installing contractors before making a final choice.  
Cost 700 – 1200 Per 100 square feet



## Roofing Comparison Chart

<b>Property</b>	<b>Aluminum (Kynar)</b>	<b>Steel</b>	<b>Asphalt</b>	<b>Wood Shake</b>	<b>Plastic Shingle</b>	<b>Slate and Tile</b>
<b>Aesthetics</b>	Excellent	Good	Average	Good	Good	Excellent
<b>Aesthetic Durability</b>	Excellent	Excellent	Poor	Poor	Poor	Excellent
<b>Longevity</b>	100 + yrs	30-50yrs	12-20yrs	15-30 yrs	30 yrs	100 + yrs
<b>Storm/Fire Proof</b>	Excellent	Excellent	Poor	Poor	Poor	Good
<b>Hail</b>	Excellent	Excellent	Poor	Average	Average	Excellent
<b>Energy Savings</b>	Excellent	Good	Poor	Poor	Good	Poor
<b>Tax Credits</b>	TBD	Varies	None	None	None	None
<b>Environmental Friendliness</b>	Excellent	Good	Poor	Good	Poor	Good
<b>Weight</b>	Very Light	Light	Heavy	Medium	Medium	Heavy
<b>Noise</b>	Average	Average	Average	Average	Average	Quiet
<b>Color Fast</b>	Excellent	Average	Average	Poor	Poor	Average
<b>Color Choices</b>	Excellent	Excellent	Good	Poor	Excellent	Good
<b>Walkability</b>	Average	Average	Good	Average	Average	Poor
<b>Maintenance</b>	Low	Low	Medium	Required	Low	Low
<b>Initial Cost</b>	High	High	Low	High	High	High
<b>Long Term Cost</b>	Very Low	Low	High	High	High	Low