

TIRED OF REPLACING YOUR SHINGLE ROOF? A Homeowner's Guide to Re-Roofing



www.mcelroymetal.com

INTRODUCTION

Did you know that **12% of homeowners** who replaced their shingle roof in 2019 chose metal panels for their new roof instead of shingles? **According to Dodge** in 2020, that number jumped to more than 15%.

Why? With increasing frequency, homeowners realize that conventional shingles offer little real value. Sure they are often the cheapest alternative, but they also fill up our landfills, are petroleum-based, and usually require replacement after only 12 to 15 years. Conversely, metal roofing is the perfect approach for homeowners who are tired of constantly replacing their shingle roofs and instead are looking for an environmentally friendly option that offers:

• 50 to 60-year service life

- Low-maintenance
- Lower utility bills due to energy efficiency
- Environmentally friendly with high recycled content
- High resistance to Mother Nature's elements
- Increased curb appeal

We developed this e-book to help you understand why metal roofing might make more sense for you than conventional shingles and provide you with the knowledge needed to make an informed decision. Our goal is to make your next new roof your last roof!

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RECOVER SNAPSHOT

Historically, homeowners faced with a worn-out shingle roof went on autopilot and reached out to roofing contractors to get quotes for another shingle roof. However, gone are the days of assuming shingles are the only option for residential roofs. Instead, homeowners tired of constant shingle replacement and hungry for long-term options now research metal products with increasing frequency.

One of the typical early questions is cost. While it is generally accurate to state that metal roofing will cost more than shingles initially, as soon as shingles are replaced once (usually at 12 to 15 years), metal roofing actually becomes the more economical roof system. It's all about the difference between first cost and life cycle costs. If you're interested in learning more about the cost comparison between metal roofing and shingles, **check out this blog post.**

The benefits of metal roofing reach far beyond cost savings, though. We will take a more detailed look at the many features and benefits of metal roofing throughout this eBook. Below is a quick-reference table highlighting the many performance differences between conventional shingles and metal roofing.

	SHINGLE ROOF	METAL ROOF
AESTHETICALLY PLEASING	NO	YES
LONG SERVICE LIFE	NO	YES
LOWER UTILITY EXPENSE	LIMITED	YES
HIGH RECYCLED CONTENT	NO	YES
RECYCLED AFTER SERVICE LIFE	LIMITED	YES
FIRE-RESISTANT	LIMITED	YES
HAIL-RESISTANT	LIMITED	YES
HIGH WIND-RESISTANCE	NO	YES

Outside of cost, shingles offer few, if any, advantages for homeowners. Conversely, metal roofing provides a wide variety of benefits. Let's explore a few of those in-depth:

- Long Service Life
- Reduced Utility Expenses
- High Recycled Content
- Fire, Hail & Wind-Resistant

LONG SERVICE LIFE

When it comes to longevity and service life, it's hard to beat metal roofing. A <u>recent white paper</u> published by the Metal Construction Association indicates metal roofs made from Galvalume[®] substrates could last 60 years or more. For context, it's important to remember that's two to three times what you can expect from most shingles.

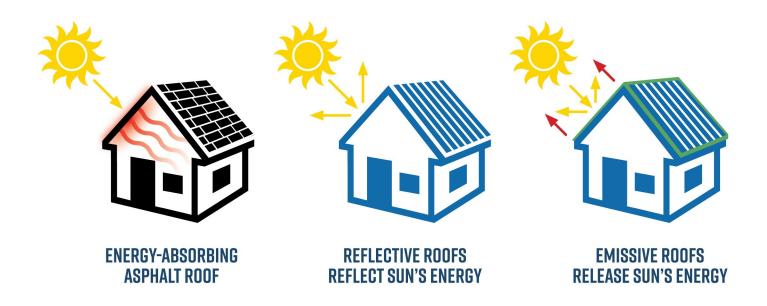
Utilizing a high-performing paint system is also key to maintaining a great-looking roof year after year. Universally recognized as the industry's superior coating for long-term performance, fluoropolymer/PVDF (Kynar 500[®]) coatings offer the best protection. If you're not familiar with PVDF coatings and their outstanding performance over other types of paint systems, you can **learn more here.**

REDUCED UTILITY EXPENSES

Energy savings represent another significant benefit for homeowners. Cool roof pigments and Above Sheathing Ventilation (ASV) are two ways owners can reduce their utility expenses.

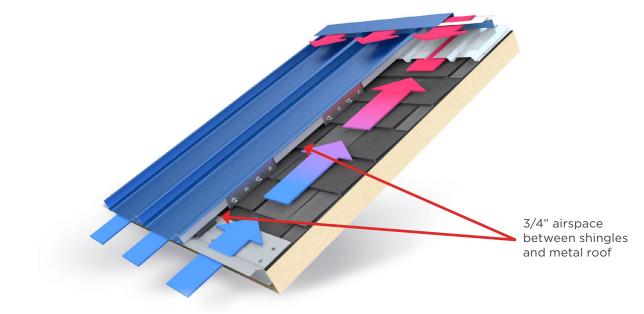
COOL ROOF PIGMENTS: Due to advances in paint technology, manufacturers can now add reflective pigments to their metal coating systems. These pigments change the way the panels perform concerning both reflectivity and emissivity. Reflectivity measures the amount of energy reflected away from the roof's surface. Thermal Emittance is the measure of a panel's ability to release heat that it has absorbed. These panels, commonly referred to as Cool Metal Roofing, lower utility loads by keeping much of the sun's energy outside the roof system and attic area below. Conversely, conventional shingles absorb much more of the sun's energy into the attic area and home, resulting in higher air conditioning loads.

Studies have shown that a cool metal roof can save owners as much as 20% in their cooling energy costs. Think about that statistic for a moment, and consider your annual utility bills. What could you do with the money that a 20% savings in that bill represents?



Even utility companies have become interested in cool metal roofing because it helps to reduce the peak demand for electricity during the afternoon hours in the summer months. Reduction of demand during those hours can prevent power disruptions. From an environmental point of view, cool metal roofing can also help mitigate a phenomenon known as the "heat island effect," where urban areas experience higher air temperatures due to the abundance of non-reflective roofing materials like shingles.

ABOVE SHEATHING VENTILATION: Above Sheathing Ventilation (ASV) means adding a ventilated airspace between the metal roofing and the substrate below. While not discussed frequently, ASV is perhaps even more impactful than cool metal roof pigments. This airspace enables energy to move and vent into the atmosphere instead of absorbing into the building structure. Conversely, when the warm air remains in the structure, utility expenses are increased.



To better understand the benefits of ASV, **check out this video** comparing attic temperatures of four different mockup systems exposed to Houston, Texas, summer heat. The mock-up with ventilated airspace had an attic temperature of only 5 degrees higher than ambient air compared to the standard shingle roof, which was nearly 40 degrees higher. It's important to remember that higher attic temperatures force your air conditioning system to work harder.

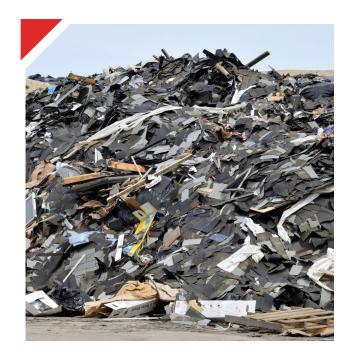
	MOCK-UP I	MOCK-UP 2	MOCK-UP 3	MOCK-UP 4	
ROOF TYPE	Sandstone	Sandstone	Dark Bronze	Asphalt	
	Metal Roof	Metal Roof	Metal Roof	Shingle	
ASV	Yes	Yes	Yes	No	
SOLAR VENT	Yes	Νο	Νο	Νο	
	TEMPERATURE INSIDE SIMULATED ATTIC SPACE				
100° AMBIENT	102.3°	104.5°	113°	137.8°	

The results from this experiment are impressive, and those energy savings add up. According to the Department of Energy, heating, cooling, and ventilation costs represent 35% of building energy costs. Given that statistic, it becomes clear that adding above sheathing ventilation to the new roof on your home might be a wise investment.

HIGH RECYCLED CONTENT

Metal roofing also contains a high percentage of recycled materials, so today's metal roof could have been a refrigerator or old automobile in its past life. When the service life of a metal roof ends (decades after installation!), the material is once again recycled.

Shingles represent a much more significant recycling challenge than metal and consequently usually end up in landfills. Many local landfills have more shingles than they care to accept and charge exorbitant fees to discard shingles. Every year, 11 million tons of shingles are removed from existing projects. To offer some perspective, that means every year 785,714 dump trucks make their way to landfills using fuel and increasing our carbon footprint, all to simply dispose of worn-out shingles.





FIRE, HAIL & WIND-RESISTANT

Metal roofing also does a great job of standing toe-to-toe against Mother Nature. There are plenty of examples of metal roofing's performance in adverse conditions.

- An ABC Nightly News story about a metal roof surviving a forest fire.
- A New York Times article about a home surviving Hurricane Florence.
- After the devastation Hurricane Irma caused in the Florida Keys, there are calls to make **metal roofing mandatory** in Monroe County.
- Many insurance companies recognize the benefits of metal and offer discounts for structures with metal roofs.

In addition to longer life expectancy, reduced utility bills and higher recycled content, metal roofing also offers more design and color options than shingles. Consequently, it's hard to dispute that metal roofing enhances curb appeal. As you drive around, just look at homes you find attractive. There is an excellent chance they feature metal roofs.

Today's metal roofs are available in various styles and colors to fit almost any design palette and building style. Panel styles run from exposed fastener to concealed fastener and vertical rib to tile shapes. Many manufacturers even offer a metal panel that looks like asphalt shingles. Consequently, as you start to explore the world of metal panels, it's important to understand the options available.



EXPOSED FASTENER VS. CONCEALED FASTENER

The first significant differentiation for metal panels is their attachment method. Panels typically fall into two categories: exposed fastener or concealed fastener. As the name implies, screws pierce through the metal panel and into the substructure below for exposed fastener systems. Conversely, concealed fastener panels, attached with either clips under the panel or slotted fastening flanges and are attached with hidden fasteners. Exposed fastener systems install quicker and are consequently more economical. However, they do offer some limitations. To read more about the differences between the two styles, **check out this blog post**.

With an understanding of exposed and concealed fastener panels, you can begin to explore the options each offers. It can be almost overwhelming when you first start researching. However, once you realize that five main criteria distinguish the panels within each category, it's pretty simple to understand. Consequently, let's look first at those differentiators.

- Rib Height: Rib height is the height of the major ribs. The height of the rib affects how the panel looks but also how it performs.
- Rib on Center: Rib on center refers to the distance between major ribs. This feature affects both aesthetics and performance.
- Slope Requirements: Indicates the minimum roof slope for the panel system.
- Panel Width: Indicates how much area one panel will cover. While not absolute, exposed fastener panels often cover 36", and concealed fastener panels vary from 12"-18".
- Gauge: Metal panels are most commonly produced in 24 Ga. to 29 Ga. with the lower number representing the thicker panel. Some panels are offered primarily in lighter gauges, while others trend toward heavier gauges. The panel gauge impacts how far the panels can span between structural supports, local building codes and loads the panels can support.

With that background established, let's now explore a few of our most popular exposed fastener panel styles for residential applications.

EXPOSED FASTENER PANEL STYLES



MAX-RIB: With a 3/4" tall rounded rib and 9" on-center rib spacing, the Max-Rib panel offers a softer look for roof pitches 3:12 or greater. 29 or 26 Ga. are the most common thickness for this panel.



MULTI-RIB: With a 1 1/4" rib height and 12" on-center rib spacing, Multi-Rib works well on slopes as low as 1:12. 26 or 24 Ga. are the most common thickness for this panel.



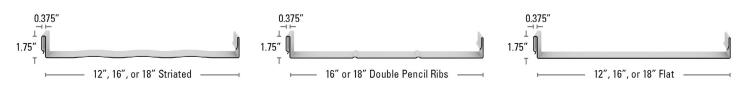
5V: The 5V panel is an interesting combination in that it aesthetically resembles a standing seam panel, yet is installed with exposed fasteners through the vertical rib. It offers a 1/2" rib height and 12" on-center rib spacing and requires a minimum 3:12 pitch. 26 gauge is the most common thickness for this panel type.



MET-TILE: With a major rib just over 2" tall and on-center spacing a little more than 7", our Met-Tile panel offers the look of Spanish concrete tile at a fraction of the weight. Additionally, these metal panels are much more durable than their concrete counterparts. This 26 gauge system performs well on projects as low as 1 1/2:12 with tape sealant at the panel laps and 3:12 without sealant tape.

CONCEALED FASTENER PANEL STYLES

Concealed fastener panels are a bit different in the five distinguishing criteria. Most times, the on-center width of the major ribs is the same as the panel cover width. Concealed fastener panels also typically offer different pan conditions in between the two major ribs. Standard options range from flat to pencil ribs and striations. While the pan condition rarely affects the cost, some options like striations can greatly minimize **oil canning**, which is an important consideration.

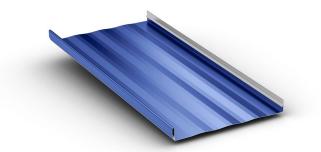


Concealed fastener panels are also either symmetrical or asymmetrical in their design. Symmetrical panels are the same on both the left and right sides, whereas asymmetrical panels are different. It's nearly impossible to tell the difference between the panel styles after installation unless you need to replace them. Symmetrical panels can easily be removed and replaced after installation. Conversely, asymmetrical panels can be difficult (if not impossible) to replace without tearing off panels back to the affected section. While repairs with metal roofing are rare, they can happen. Suppose a major storm hits your area, and a big tree limb falls onto your metal roof. If you chose a symmetrical panel system, it's relatively simple to replace only the damaged panel. However, an asymmetrical system may require you to remove all the panels back to the impacted area.

With a deeper understanding of concealed fastener panels and some of the inherent differences, let's look at some of our most popular concealed fastener panels for residential applications.

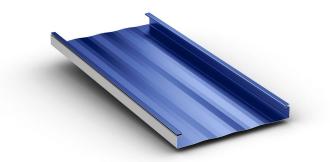


MERIDIAN: With a major rib just under 1" tall, the Meridian offers a great aesthetic look for smaller stature buildings with a 3:12 pitch or greater. This asymmetrical panel (left to right install) provides a 12" or 16" pan width and snaps together for easy installation. Since the panel is clipless and uses a pre-punched flange for attachment to the substructure, it represents the most economical option for a concealed fastener panel in residential and light commercial applications.



MEDALLION LOK: With a 1 3/4" rib height and panel widths of 12", 16" or 18", Medallion Lok is an attractive panel most commonly produced in 24 Ga. This asymmetrical system (think right to left installation) requires a 3:12 minimum slope and involves attaching a clip to the substructure before snapping the panels into place.

CONCEALED FASTENER PANEL STYLES (CONTINUED)



I38T/238T: 138T/238T systems offer a 1 3/8" or 2 3/8" rib height and panel widths of 12", 16" or 18". Both 1398T and 238T systems also require a clip attached to the substructure; however, they do not require a left-to-right installation. Unlike our **Meridian** and **Medallion-Lok**, it is a symmetrical panel. This symmetrical design decreases both install time and scrap. Perhaps most importantly, as mentioned earlier, this design allows for single panel replacement after the initial roofing project is complete. The 138T system requires a 2:12 minimum slope. The 238T requires a 1/2:12 pitch, so it's ideal for low-sloped applications. Both systems do require the use of a seaming machine.

TILCOR: Tilcor[™] CF Shingle is a concealed fastener stone-coated shingle designed to look like traditional asphalt shingles while lasting 2-3 times longer. Produced in 26 gauge, Tilcor[™] works well on slopes 3:12 and greater.





MILAN: Owners who want the look of shingles but performance of metal find the best of both worlds with our popular Milan panel. The system uses a four-way interlocking system secured to the roof using aluminum fastening clips. Produced in 29 gauge 12" long sections, the panels work well on slopes 3:12 or greater.

COLOR OPTIONS

Color palettes run from statement-making bold colors like reds and blues to muted colors that blend in more with the environment. There are lots of choices, and one of our **standard colors** almost always works. If not, **contact us** for custom colors for projects that are 5,000 square feet or more. Rest assured that your metal roof will keep its like-new appearance for decades to come with Kynar® PVDF paint systems. If you're not familiar with Kynar paint systems, spend a few minutes and **educate yourself here.**



Both PVDF (Kynar 500) and Silicone-Modified Polyester (SMP) panels were installed on this home in Louisiana. On day one, the colors were an identical shade of green. The above photo, taken only eight years after installation, tells a powerful story of the differences between the paint systems as it highlights both chalk and fade of the SMP paint system. Note that there is no visible fade or chalking on the darker (Kynar 500) panels.

RECOVER APPROACHES

Once you've decided to stop the constant churn of shingle replacement and use metal panels instead, it's time to determine how you want to approach your project. There are two basic ways to replace your shingle roof with metal panels: remove and replace, or recover.

REMOVE & REPLACE: While certainly not a new strategy, tearing off the existing shingles is always an option. This approach is often referred to as a remove and replace method, and in some circumstances, it's the best option. However, shingle tear-off involves noise, mess and shingle disposal costs that may be unnecessary. **Give this a read** for some insight to determine if it makes the most sense for you.

RECOVER: There are several different methods when installing a metal roof over shingles. A more cost-effective approach usually involves installing metal panels over the top of the existing shingles, referred to as a recover approach.

METAL PANEL ATTACHMENT INTO FURRING OR LATHING STRIPS: In this scenario, wood purlins or subgirts are used as furring strips on top of the old roof and attached to the structure below. This framing system can be installed directly over existing shingles or can also be applied over existing decking or underlayment. The new metal roof panels are then attached to the framing system.



The image above is simply one example of a furring strip application and should not be assumed to be the only approach. The copper elements in pressure treated wood may aggressively attack metal panels. Consequently, if using pressure treated wood for furring applications, a barrier of #30 felt or synthetic underlayment should be used between the wood framing and metal panels.

This method typically involves less mess than a complete tear-off. However, with the added cost of the furring material and installation, the final price can be similar to tear-off. Although, it is undoubtedly more environmentally friendly since the shingles remain in place.

This approach does add some weight to the roofing system, so it's essential to determine if the structure can support the additional weight. For more on this technique, **check out this white paper** by the Metal Construction Association.

RECOVER APPROACHES

METAL PANEL ATTACHMENT DIRECTLY INTO SHINGLES: One of the most cost-effective installation methods involves attaching metal panels directly through the shingles and into the wood deck below. While this method saves the cost and labor of furring strips, it's important to remember that steel often acts like a mirror and can telegraph deck and shingle inconsistencies through the metal panels. While this condition is purely aesthetic and doesn't affect panel performance, homeowners with a high emphasis on aesthetics may be better suited with a remove and replace approach or a system like our 138T, which will be addressed later in this eBook.

There are a couple of important considerations with the direct attachment approach. First, it's difficult to achieve Above Sheathing Ventilation (ASV) with this installation method. As mentioned earlier, ASV is critical to reducing energy consumption. While this approach often represents the most economical installation, it also offers reduced energy savings. Second, it's important to note that you must use a barrier between the original shingles and the new metal roof in direct attachment projects. This layer of protection is critical to prevent the shingles from wearing through the metal panels as they expand and contract over the roof's life. Common barrier products include #30 felt, synthetic underlayment products or even thin foil-faced insulation.



Image courtesy of **Cool Roofs** Check out their **Photo Gallery** for more ideas.

RECOVER APPROACHES

SHINGLE RECOVER SYSTEMS: A third recover approach involves using our patented 138T Shingle Recover System. As shown in the photo below, the system's patented clip automatically creates the Above Sheathing Ventilation airspace, making it easy for homeowners to maximize their energy savings.



Additionally, the panels in this system are symmetrical instead of asymmetrical, which easily accommodates single panel replacement if necessary. **Click here** for an animation highlighting the components of the Shingle Recover System.

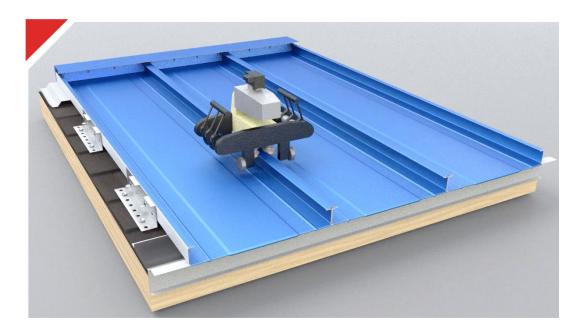


PHOTO GALLERY-IDEA CENTER

Depending on your personality, doing something different can be exhilarating or terrifying. Truthfully, in our 57+ years in the business, we've worked with owners on both sides of the fence with metal roofing on their homes. To some, the look of metal roofing is unique and something they're excited about. Still, others are completely onboard with the outstanding benefits of metal but have trouble visualizing it on their home. For our readers unsure about the look of metal roofing, (or those just looking for ideas!) we've got you covered in three different ways:

- I. Visit our **photo gallery** of completed projects to view residential roofs by color and even panel style.
- **2.** Use our **visualizer tool** to upload a photo of your actual home and experiment with different options to find the right look for you!
- 3. If you're short on time, simply check out the photos below to see how metal looks great on all different sorts of projects from traditional homes to log cabins and even on custom-built homes. We think you'll agree that from the simple to the extravagant, metal is a visually attractive option!



DO IT YOURSELF VS. CONTRACTOR INSTALLATION

Once you've decided on your preferred product and approach (remove and replace vs. recover), it's time to consider who will perform the installation. While not necessarily "difficult," metal roofing is much more involved than many other home improvement projects that you might tackle. Consequently, many homeowners skip the DIY (do it yourself) approach and instead search out an experienced contractor. To decide which method is best for your situation, consider the following factors.



CONSIDERATIONS

I. SAFETY: First and foremost, you should be comfortable with heights and have approved safety harnesses equipment at your disposal if you're planning to tackle a metal roof installation on your home as a DIY project. Sure, sometimes you will be on the solid roofing surface. However, there will undoubtedly be other times when you need to work from ladders or lifts. It's also important to realize that metal panels are slicker than shingles. While this helps them naturally shed environmental elements like dirt, the panels can also be challenging to walk on during and after installation.

2. ABILITY TO READ DRAWINGS: Most reputable manufacturers offer fairly robust installation manuals that show trim, fastener and tape sealant locations. However, not everyone can look at a flat piece of paper and understand how something goes together in 3D. If you can visualize how the parts and pieces go together from reviewing the drawings, you may be up to the challenge. If you're at a loss when reviewing the drawings, chances are you'll be better suited to use a contractor for the installation. To evaluate your skills in this area, feel free to review a few pages of our Meridian installation manual under the "Related Files" section **on this page.**

DO IT YOURSELF VS. CONTRACTOR INSTALLATION

CONSIDERATIONS (CONTINUED)

3. ATTENTION TO DETAIL: Since your roof keeps your family (and possessions!) in the dry, you'll want to be very detail-oriented if you're tackling a metal roof install as a DIY project. The steps aren't necessarily hard, but there is little margin for error. For example, one of the common steps involves putting a roll of tape sealant between the panel and eave trim, and then installing screws through the tape sealant. Position the tape sealant too high or low or miss hitting the tape sealant with the screw, and you could end up with leaks. Consequently, if you tend to be more of a big picture, "that's good enough" person, you'll likely save money by hiring a professional contractor who understands the importance of various install steps and the ramifications of not following the steps exactly.

4. HELPING HANDS: In residential applications, panels are often 15'-30' long, so it's critical to have adequate help on hand. While the panels only weigh a pound or two per foot, the long lengths can make them awkward to handle, especially considering the panels (most often set on the ground during delivery) typically arrive packaged in wood crates that can easily weigh 1,000 lbs or more. Consequently, the panels need to be lifted by either crane or manual labor to the roofing deck. Due to cost and crane accessibility in residential neighborhoods, the individual panels are most often lifted manually and require at least two people: one handing up panels from the ground and another positioned up on the roof to pull the panels up. It's even more helpful to have a third person on the roofing surface to help walk the panel to its proper location. Consequently, installing a metal roof may not be a great DIY fit for you if you're a crew of one.

5. TOOL REQUIREMENTS & EXPERTISE: You'll need access to basic tools like tape measures, utility knives, squares, pop rivet guns, drills, extension cords and marking pens. Perhaps more challenging is the specialty tools required for metal roof installation. You will need to purchase (and know how to effectively use!) specialty tools like metal hand snips and devices to cut the panels for dormer, hip and valley applications.

Experienced contractors frequently use two or three different metal hand snips to create precise and weathertight details. However, many inexperienced DIYers find it challenging to create a nicelooking and weathertight finished project with hand snips. Part of the difficulty lies in the fact that the strength of the metal makes it challenging to cut physically. However, gaining the proper position is also a significant challenge. As an example, consider cutting a circle out of a piece of paper with scissors. As you move around the circle, the chances are that you rotate the paper to gain the best vantage point. Conversely, when you're working with a 3' wide or 20' long panel, gaining proper position to accomplish a clean cut can be easier said than done.

FINDING THE RIGHT PARTNER

Once you've decided who will handle the install, it's time to search out the right partner for your project.

DO YOUR RESEARCH: It's crucial to vet both your material supplier and contractor thoroughly. Review websites, read reviews, ask questions, and talk to friends/family. In general, the goal is to educate yourself. While you're researching, it's also important to consider how long companies have been in business and identify differences in quality. For example, at McElroy Metal, we're proud to offer the Kynar 500[®] paint systems we addressed earlier. In contrast, many manufacturers only provide lower-quality Silicone Modified Polyester paint systems instead of the higher-performing Kynar 500 systems. To learn more about the two different paint systems, **give this a read**.

RESIDENTIAL FOCUS: As you research both material suppliers and contractors, chances are you'll find quite a few options. You'll typically find the experience more seamless when selecting contractors and manufacturers with a residential focus. It's not that those with a strictly commercial focus do a poor job, but instead, they simply may not offer robust tools as someone focused on residential products. Take McElroy, for example. We're proud to provide tools like those below specifically for the residential market:

- Find a Contractor platform designed to help connect owners with experienced contractors.
- Residential Metal Roofing Guide
- Robust residentially focused content on our website like this
- Blogs with a metal roofing focus targeted to homeowners that address frequent questions and tips such as How to Choose a Residential Metal Roofing Contractor
- Residential **FAQ**

SUMMARY

Admittedly, no one likes the hassle and expense of replacing their worn-out roof. Reasons like those below are just a few reasons why **15% of homeowners in 2020** selected metal roofing instead of shingles for their roof replacement:

- 50 to 60-year service life (3X longer than shingles!)
- Low-maintenance
- Lower utility bills due to energy-efficiency
- Environmentally friendly with high recycled content
- High resistance to Mother Nature's elements
- Outstanding curb appeal

Are you ready to join the discussion and growing trend? If so, **contact us.** We'd love to help!

ABOUT MCELROY METAL

Incorporated in 1963, McElroy Metal is a third-generation, family-owned and operated business. McElroy Metal's holdings include 13 manufacturing locations and 25 Service Centers located throughout the United States.

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