

Carport built using Galvalume

The benefits of a steel roof using Galvalume.

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Why is Galvalume® sheet called by other names? Are all of these products the same?

The product is a 55% aluminum-45% zinc alloy coated sheet steel developed by Bethlehem Steel and sold commercially under the trademark Galvalume®, starting in June 1972. Bethlehem Steel later licensed other major steel companies to produce and sell the product using its patents and technology. In North America, the Galvalume® trademark is used by Bethlehem Steel, Dofasco Inc. (Canada), National Steel Corp., U.S. Steel and Wheeling-Nisshin, Inc. In Central and South America, Industrias Monterrey (Mexico) markets the product under the trademark Zintro-Alum, while Galvak S.A. de C.V. uses the trademark Galval. Steelscape, Inc. uses the trademark ZINCALUME®. All of these products are the same generic 55% Al-Zn coated sheet steel made by the same process using the same technology.

How is it made?

Both Galvalume® and galvanized sheet steels are made by a "continuous hot dip" process. Coils of cold rolled steel are welded end-to-end and processed continuously on the coating line at speeds up to 600 feet per minute. The uncoiled sheet is first cleaned to remove rolling oils and mill dirt, and to reduce surface oxides so that the surface will accept the coating. These continuous sheets are first fed into a molten coating bath contained in an open top, brick-lined heated pot. The sheet then passes around a roller submerged in the coating bath and exits the bath vertically, pulling out with it an envelope of the coating material. As it exits, the sheet proceeds through a pair of opposing air knives, which are positioned above the bath and equidistant from the surface of the sheet. Most modern production lines have a coating thickness gauge feed-back control, which automatically adjusts knife air pressure and position to ensure that a uniform coating is applied. Various finishing steps are carried out to complete the process, after which the sheet is wrapped around a reel into a coated steel coil.

Why is it a good material for roofing?

Galvalume® sheet is an ideal material for roofing because of its extraordinary outdoor corrosion resistance and resulting long life. It can be readily rollformed into a variety of panels, as well as formed and stamped into tile and shingle facsimiles. It can also be factory painted to impart color and extend durability. Most important, it can be used in modern day steel roof designs which are strong, yet light weight. And unlike conventional nonmetallic roof systems, Galvalume® sheet roofs won't crack and peel when subjected to the sun and weather.

Galvalume® sheet is sold with AZ50 and AZ55 designations. What do they mean?

Galvalume® sheet is made to meet ASTM Specification A792. This specification covers a number of requirements, including coating weight. AZ50 and AZ55 are the English unit coating weight designations indicating that, respectively, 0.50 ounces per square foot and 0.55 ounces per square foot of the aluminum-zinc alloy coating have been applied to both sides of the Galvalume® sheet. Converting these coating weights to coating thickness, AZ50 is equivalent to

about 0.8 mil (0.0008") on each side of the sheet, and AZ55 to about 1.0 mil (0.001") on each side. In metric units, AZ150 is equivalent to about 20 microns and AZ155 to about 25 microns on each side.

What is the reflectivity of Galvalume® sheet?

Galvalume® sheet has good heat and sunlight reflectivity. Its bright, white reflective surface makes it an ideal material for roofing. During the summer it makes buildings cooler by efficiently reflecting away sunlight and reducing the amount of heat transmitted into the building. Likewise, it makes buildings warmer in the winter by reflecting inside heat from the underside of the roof back into the building. This good thermal reflectivity translates into energy savings by reducing cooling costs in the summer and heating costs in the winter. Tests have shown that only half as much heat from solar radiation is transmitted into a building fitted with a Galvalume® roof compared to a galvanized roof, and almost one-third less heat compared to a terra-cotta roof.

What are the advantages of a Galvalume® standing seam roof (SSR) compared to a built-up roof?

Leaking conventional, flat nonmetallic roofs are the biggest problem on nonresidential buildings for architects and building owners. Conventional roofs made with organic materials deteriorate even under normal environmental conditions. They embrittle from the heat and ultraviolet radiation from the sun. Then, as result of temperature fluctuations, they develop cracks, splits and tears. Finally, because they are flat, ponding water inevitably penetrates these brittle, cracked systems and leaks into the building, causing damage to goods and disrupting activities inside the structure. Leaks can be patched early in the life of the roof, but as time passes, leaks become more frequent and an expensive replacement of the roof is required. Such replacements often require tearoff, extra labor and even a temporary building shut-down. Galvalume® standing seam roofs (SSR) offer a weathertight, maintenance-free roof system that will last for decades on commercial, office and factory buildings. Galvalume® SSRs are economical to install, leak proof, maintenance-free, energy efficient, noncombustible and long-lived.

Can a Galvalume® SSR be installed over an old flat built-up roof?

A Galvalume® SSR is an ideal system for retrofit roofing. Its light weight makes it suitable for retrofit applications over any old, leaking, conventional, nonmetallic roof system. Retrofitting is accomplished by installing to the existing roof structure a light weight sub-framing system, generally made with light structural steel sections, that provides a minimum ¼:12 slope for the new Galvalume® SSR. By installing the roof directly over the existing nonmetallic roof, costly and time-consuming tear-offs are eliminated, and activities inside the building can continue without interruption.

Are Galvalume® roofs offered with a warranty?

Regarding warranties, a purchaser needs to consider the two types of Galvalume® roofs that are used -- structural and architectural systems. Structural systems are those, such as SSR, that are installed directly on the roof structural system (i.e., purlins), without decking. These are low slope systems, up to about 1:12 pitch, using bare, heavier gauge Galvalume® steel sheet. Use in this application is guaranteed for 20 years. (Some roofing manufacturers also warrant their roof systems for weather tightness.)

Architectural Galvalume® roofs are those used in applications in which the roof is being used not only for protection against the weather, but also for its appearance. Because architectural roofs are visible from the ground, they are used as a design feature of the building. Such systems are used at high slopes, usually up to 4:12, for both residential and nonresidential buildings. In most cases the Galvalume® panels are prepainted in a wide range of colors using today's high performance paint systems.

Warranties cover both the Galvalume® sheet and the paint system. Most Galvalume® producers give the same warranty for the Galvalume® steel substrate for prepainted roofing as that for bare roofing. Most producers also give a 5 year warranty against chalk, fade and peel of the paint system. Paint companies and coil coaters typically extend the paint warranty as much as five years beyond the 20 year Galvalume® sheet producer warranty, depending upon the paint system and environmental conditions. Galvalume® sheet producers and roof manufacturers should be contacted for specific requirements for their warranties.

How does the corrosion resistance of Galvalume® sheet compare with that of galvanized sheet, and how long can a Galvalume® sheet roof be expected to last?

Galvalume® sheet has been successfully used in roofing applications for more than 25 years; it has been evaluated in outdoor R&D tests for well over 30 years. Based on these tests, in which corrosion weight losses were measured and compared with galvanized, Galvalume® sheet is projected to outlast galvanized sheet (with an equivalent coating thickness) in various atmospheres by up to nine times. Likewise, recent inspections of 82 low slope Galvalume® roofs up to 22 years old in the eastern U.S. confirms the R&D results. These roofs are in excellent condition and are projected to last 30 to 40 years before requiring major maintenance.

Should architectural Galvalume® sheet roofs be installed on decking or over shingles on residential applications?

Wood or steel decking is normally used for prepainted Galvalume® architectural roof systems on both residential and nonresidential applications, but it is not recommended to install the panels in direct contact with the decking. Instead, 30 pound felt, or an equivalent, should first be installed on the decking and the roof panels then installed over the felt. For residential applications, the roof panels would be installed over roofing felt on wood decking for new construction applications, or in applications in which the old shingles would be removed from the deck.

Roofing manufacturers should be contacted for design and installation details both in warmer regions where condensation can occur under roof panels, and also in cold regions where snow, ice and water can collect at eaves and valleys and leak into the building.

What types of insulation are recommended for Galvalume® roofs? Are there any to be avoided?

By far, fiberglass roll insulation is the most commonly used insulation for Galvalume® steel roofs on nonresidential buildings. It can be used in any of the available thicknesses to give the required insulation value. One of the main benefits of retrofitted Galvalume® roofs installed over leaking nonmetallic flat roofs is the ability to add insulation under the new Galvalume® roof and realize significant energy savings from reduced heating and cooling requirements. In

such instances, fiberglass roll insulation can either be placed on top of the old nonmetallic roof or under the new retrofit roof.

Wet insulation, which may be rain soaked at the site or wet from condensation or a leak in the roof, should not be in contact with Galvalume® roof panels. Insulation should be dry when installed and kept dry after installation. Fiberglass insulation retains water and can cause rapid inside-out corrosion on Galvalume® sheet panels. Also, spray-on insulation is sometimes used inside buildings under roofs and on siding. This insulation may contain fire retardant chemicals that can be corrosive to Galvalume® sheet. Manufacturers should be consulted about such fire retardant additives if spray-on insulation is used.

What types of flashing are recommended for bare and/or painted roofs?

Because Galvalume® sheet can be expected to provide long life, flashing should be used that will provide a life commensurate with that of Galvalume® sheet. For bare Galvalume® sheet roofs, Galvalume® sheet flashing is preferred, although aluminum flashing is also acceptable. Galvanized flashing is not recommended because it will not provide comparable corrosion resistance. Copper and lead are not recommended for flashing in direct contact with Galvalume® roof panels because they will cause galvanic corrosion of the Al-Zn coating. For prepainted Galvalume® sheet roofs, flashing as well as trim parts should preferably be made from prepainted Galvalume® sheet from the same color and coil line batch for both initial color matching and long term color change during weathering.

What is the difference between Galvalume® roof systems that use concealed and exposed fasteners.

There are a number of variations of concealed fastener systems. For low slope structural systems, panels are overlapped and lockformed or snapped together at the seams and held down with clips, one end of which is overlapped in the seam and the other end fastened to the structural member of the roof. The clips have a sliding feature that permits the roof panels to "float" during expansion and contraction from ambient temperature changes.

Exposed fastener systems use fasteners that are driven through the top side of the roof panel into a deck. These systems are designed for high slope applications for both bare and prepainted Galvalume® roofs. Panel lengths are typically short on these systems because they do not provide for expansion and contraction from temperature changes. These systems also require many overlapping joints which must be properly sealed to avoid crevice corrosion.

Galvalume® sheet can be attacked by concrete and mortar. How are such attacked areas on Galvalume® roofing and siding best repaired?

The aluminum-zinc coating on Galvalume® sheet suffers fairly rapid corrosion in highly alkaline environments, such as concrete. The coating is attacked during the setting period when buried in concrete, and can also be attacked from mortar splashes and droppings during masonry installation. The best repair for attack from mortar splashing is to cover the affected area with a protective coating. On bare Galvalume® roof panels, successful results have been obtained with Uniflex 500, an asphalt-based, fiber aluminum system available from Kool Seal, Inc. Repair of prepainted Galvalume® should be done using the same type finish coats that are applied on the coil.

coating line. In all cases, the surface should be clean and dry and manufacturers' instructions should be followed.

Can I place bare or prepainted Galvalume® sheet in contact with the concrete foundation footer?

Direct contact with the concrete footer is not recommended for either bare or prepainted Galvalume® sheet. Water can accumulate at the crevice between the Galvalume® panel and the footer, causing corrosion at the cut edge. Ideally, sill plates should be used on concrete foundations to avoid direct contact with the foundation and to drain water away from the edge of the panel. Also, the siding panel should not be in contact with the sill plate. Sill plates should be tilted slightly away from the building to avoid trapping water and providing for drainage away from the edge of the panel.

The footer also is an area where fiberglass blanket insulation should be installed properly. Insulation needs to be installed above the sill so that it won't get wet and act as a wick to cause inside-out corrosion. To avoid wet insulation at the footing, several inches of fiberglass insulation should be removed from the waterproof vapor barrier at the end of the blanket. The vapor barrier should then be folded up and around the insulation and placed between the panel and the sill plate, thereby eliminating contact of the fiberglass insulation with any water that may accumulate in this area.

What is the life of a prepainted Galvalume® roof or wall?

From a practical standpoint, the life of a prepainted Galvalume® panel is dictated by the performance of the paint film, i.e., appearance as affected by conditions of fade, chalk and peel, and the life of the paint film is determined by the type of paint system and the weathering conditions to which it is exposed. Almost all building owners will repaint a prepainted roof or sidewall when the appearance of the paint film is determined to be aesthetically unattractive from weathering.

Paint systems applied on modern coil coating lines can be expected to provide good to excellent performance in nearly every environment. The most commonly used topcoats are acrylics, polyesters, siliconized polyesters, fluoropolymers and plastisols. When combined with chemical pretreatments and high-performance primers, these topcoats enhance adhesion of the paint film to the metal coating and increase overall corrosion resistance, particularly at cut edges, scratches and bends.

Can pressure-treated wood be used in contact with bare and prepainted Galvalume® sheet?

Contact with pressure-treated wood or, for that matter, any wet lumber is not recommended for either bare or prepainted Galvalume® sheet. Treated lumber contains chemicals that protect the wood when buried in soils. Direct contact between wet treated lumber and Galvalume® sheet creates a corrosion cell and the corrosive chemicals leaching out of from the wood accelerates this process. All rooftop ancillaries, such as air conditioners, should be mounted with factory-made mounting accessories compatible with Galvalume® sheet (roof curbs, for example). Some HVAC contractors commonly mount rooftop air conditioners on pressure treated landscape ties.

Direct contact of these ties with the Galvalume® roof causes corrosion of the aluminum-zinc coating. Even drainage from pressure treated lumber onto Galvalume® sheet should be avoided.

Where can I buy a Galvalume® roof and how can I get a list of Galvalume® roof suppliers for my area?

The best way to buy a Galvalume® steel roof is through the roof panel manufacturers. The major manufacturers have regional sales offices and manufacturing plants throughout North America. They also have qualified and affiliated contractors who are trained and approved to install their roof systems. It's important that only experienced and approved contractors be used to install Galvalume® roof systems. The Galvalume® Sheet Producers of North America, located in Vancouver, WA, can be contacted at 360-750-5791 to obtain this list of licensed manufacturers. Also, an online directory of Galvalume® roof manufacturers, grouped by region, can be found by selecting the "Where to Buy" button located on the tool bar. Using a simple search engine, visitors can view and then print a list of manufacturers in their region who can, in turn, refer the visitor to an affiliated contractor.

How do the costs of both new and retrofit low slope Galvalume® standing seam roofs compare with traditional flat nonmetallic roofs?

The many benefits offered by new and retrofit Galvalume® standing seam roofs (SSR) over traditional nonmetallic roofs translate into both direct and indirect cost savings. A retrofit Galvalume® SSR installed on a light weight structural system over an old, leaking nonmetallic roof is a lower cost long term alternative and, in many cases, a lower initial cost alternative if tear-off of the old nonmetallic roof is required. Benefits that translate into related cost savings result from the installation of additional insulation under the Galvalume® SSR, avoiding tear-off so that activities inside the building are not disrupted and disposal of nonmetallic material is not necessary, and the ability to schedule retrofit installations on a year-round basis in almost all climates.

The initial cost of a new, low slope Galvalume® standing seam roof will generally be more expensive than a traditional flat nonmetallic roof, such as a built-up roof. However, if long term life cycle cost is considered, say, up to 25 or 30 years, the Galvalume® SSR will cost less than a nonmetallic roof. That's because initial repairs for leaks on nonmetallic roofs are not unusual after only 8 or 10 years, and replacement by tear-off may be required after about 15 to 20 years. So, over the long term, a new Galvalume® SSR will cost less than a traditional nonmetallic roof. This lowered life cycle cost, resulting from the minimal maintenance required by a Galvalume® roof, is what makes steel roofing an appealing, affordable and long-lasting alternative to traditional asphalt, wood, tile and slate roof coverings