



Data Sheet

PRODUCT NAME

Prepainted Galvalume® Sheet

MANUFACTURER

Bethlehem Steel Corporation
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PRODUCT DESCRIPTION

Product and Application: Galvalume, the registered trade name for a patented sheet steel having a hot-dip coating of corrosion-resistant, aluminum zinc alloy, is available prepainted from the manufacturer. The use of prepainted Galvalume sheet offers the consumer many positive features in addition to the proven superior corrosion resistance of the substrate. Compared with post-painting, these features include:

- More uniform paint coating.
- Reduction of in-plant rejections resulting from defective material treatments and coatings.
- Longer tool life because of prepainted Galvalume sheet's lubricity and non-abrasiveness.
- Shorter production schedules by eliminating handling, cleaning and post-painting.
- Elimination of capital equipment by the fabricator; thus, saving money and maintenance time.
- Reduction of fire hazard and pollution problems by eliminating storage of volatile solvents.
- No special tooling requirement because prepainted Galvalume sheet is generally formed on press brakes and roll forming equipment with the same dies and rolls used for bare steel.

Prepainted Galvalume sheet is an ideal product for many painted applications where superior atmospheric corrosion resistance is needed, such as in pre-engineered buildings, architectural panels, siding, roofing (conventional and standing seam) and other building components. It is also suitable for appliances and other end uses. A wide variety of colors and finishes are available to satisfy most applications.

TECHNICAL DATA

Typical Mechanical Properties (Commercial Steel):

Yield Strength:	40-55 ksi
Tensile Strength:	55-70 ksi
Total Elongation:	20-36%
Hardness:	50-65 HRB

(Structural steels, including 50 ksi and 80 ksi minimum yield strengths, are also available.)

Substrate: The Galvalume sheet coating consists of an alloy of nominally 55% aluminum, 1.6% silicon, and the balance zinc by weight, as listed in ASTM designation A 792. On a volume basis, the coating is approximately 80% aluminum. The high aluminum content of the coating results in Galvalume sheet having a lower density and less weight per unit area than G90 galvanized sheet of equivalent thickness.

This means that a ton of Galvalume sheet will yield more square feet of useable product than a ton of G90 galvanized of equivalent thickness. A Bethlehem sales representative can provide specific details for a particular application.

The metallic coating is applied by a continuous hot-dip process whereby properly cleaned low carbon, cold-rolled steel is dipped into a molten aluminum-zinc bath. The patented alloy coating of

Galvalume sheet provides an optimum balance between (a) the long-term general corrosion resistance of aluminum, and (b) the galvanic protection of zinc at scratches and cut edges.

Process Specification: Bethlehem has instituted a process control program to insure that prepainted Galvalume sheet is produced to prescribed standards. The program specifies the methods and materials to be used in each phase of the painting process, as well as stringent product performance requirements. The Bethlehem Process Specification for prepainted Galvalume sheet is based on extensive laboratory evaluation and outdoor exposure tests in cooperation with pretreatment and paint suppliers.

Processing: Galvalume sheet is cleaned and pretreated in preparation for painting. Surface contaminants are removed using a suitable alkaline cleaner. The sheet is then pretreated with a chromate pretreatment. The pretreatment is a uniform, continuous deposit applied in a manner to provide excellent paint adhesion and corrosion resistance.

A minimum of two coats of paint are applied to both the face side and back side of the sheet: a corrosion inhibitive primer and a top coat. The primers are selected from a list of Bethlehem-approved paint systems. The primer is a uniform continuous film, compatible with the subsequently applied top coat. It is applied to each surface at a thickness specified by the paint manufacturer (typically 0.2-0.25 mil.). Top coat thickness varies depending on paint type and end use. The face side top coat has excellent long-term outdoor weathering characteristics. Both face side and back side top coats must meet various quality

assurance tests, such as adhesion, flexibility and hardness.

Paint Adhesion: Paint adhesion on Galvalume sheet is consistently better and less variable than on G90 galvanized sheet. Adhesion is determined by pick-off on a tape pull on a cross-hatch, wedge bend and nine joule (80 inch-pound) reverse impact dimple.

Flexibility: Based on laboratory reverse impact testing, the coating flexibility of Galvalume sheet is superior to that of G90 galvanized sheet. When subjected to the nine joule reverse impact dimple test, prepainted Galvalume sheet shows less evidence of paint crazing than does prepainted G90 galvanized. Less paint crazing occurs with prepainted Galvalume sheet because the aluminum-zinc coating is less susceptible to micro-fracturing during forming than is the zinc coating on G90 galvanized. Less paint crazing results in improved corrosion resistance.

Corrosion Resistance: Based on 30-year atmospheric test results, bare Galvalume sheet is at least two to four times more resistant to atmospheric corrosion than G90 galvanized. Prepainted Galvalume sheet has also exhibited excellent corrosion resistance in a variety of accelerated tests and atmospheric exposures. It has demonstrated equal or better performance than prepainted G90 galvanized in corrosion protection at flat areas, paint damaged areas, and formed areas where paint crazing has occurred. Prepainted Galvalume sheet exhibits less than 3mm of edge creep along sheared edges and no scribe creep after 750 hours salt-spray exposure (Specification ASTM B 117). Additionally, no blistering or loss of paint adhesion occurs after 1,000 hours waterfog exposure (100% relative humidity at 100°F).

Edge Creep: Edge creep is paint undercutting along sheared edges

on prepainted metal sheets. Outdoor exposures of Bethlehem-approved paint systems applied to Galvalume sheet demonstrate the product's excellent resistance to edge creep.

In tests of siliconized polyester paint systems, widely used in the industry, prepainted Galvalume sheet exhibits consistently low edge creep that tends to level off to about 1 mm after three years of exposure at Bethlehem's most corrosive test site at Kure Beach, NC. This low level of edge creep is maintained up through at least 10 years of exposure, the longest exposure time for which data are available.

INSTALLATION

Certain precautions should be taken when installing prepainted Galvalume sheet, including:

- Prepainted Galvalume sheet should not come in direct contact with wet concrete. Concrete's high alkalinity attacks the aluminum, causing the coating to peel.
- Prepainted Galvalume sheet should not be placed in contact with copper, lead, or the water run-off from either. Electrochemical reaction between these elements and the aluminum-zinc alloy coating will lead to premature corrosion of the coating.
- Fasteners should have corrosion resistance at least equivalent to the expected life of the base material.

Otherwise, prepainted Galvalume sheet can be stored, handled, and installed using the same procedures as with prepainted galvanized steels. Good installation practice includes removal of metal fines due to drilling, cutting, etc. from the sheet surface and avoiding exposure of insulation to the weather.

AVAILABILITY AND COST

Availability: Prepainted Galvalume sheet is manufactured at Bethlehem's plants at Sparrows Point, MD and Jackson, MS, and painted at approved coil coaters throughout the country. Prepainted Galvalume sheet can be obtained in thicknesses from 0.014" to 0.055" and in widths up to 48". Inquire for heavier thicknesses.

Cost: Prepainted Galvalume sheet is priced competitively with prepainted G90 galvanized on a per square foot (or per part) basis. Specific price quotations will be furnished upon request.

WARRANTY

Prepainted Galvalume sheet is conditionally warranted against rupture, structural failure or perforation due to corrosion for a period of 20 years and six months when used for building panel applications.

Paint finishes are warranted depending upon application, paint system and color. More specific information regarding warranties will be furnished upon request.

MAINTENANCE

Prepainted Galvalume sheet requires no special maintenance under normal use. Recommended touch-up paint systems are available from the paint manufacturers for repairing areas damaged during erection.

TECHNICAL SERVICES

For more information call Bethlehem Steel at (800) 521-4789 or write: Bethlehem Steel Corp., Coated Sheet Marketing, 5111 North Point Boulevard, Sparrows Point, MD 21219; or visit our website at www.bethsteel.com.