COMPANY PROFILE

TARAZ coated steel industries was established with designing, manufacturing, and commissioning priority of processing lines. This company was able to construct the first continues Hot Dip Galvanized and Galvalume Coated Steel With production capacity of 270,000 t/y.
PRODUCTS
- Galvanized Coated Steel
- Galvalume Coated Steel

Standards

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<tbody>
<tr>
<td>DX51D</td>
<td>CQ</td>
<td>SGCC</td>
<td>CQ</td>
<td>Comercial</td>
<td>Galvanizd</td>
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<tr>
<td>DX52D</td>
<td>DQ</td>
<td>SGCC</td>
<td>DQ</td>
<td>Drawing</td>
<td>Galvalume</td>
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<td>Drawing</td>
<td>Galvalume</td>
</tr>
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* The standards applied in TARAZ STEEL Co. are listed in the Table.

Technical Specifications

<table>
<thead>
<tr>
<th>Speed</th>
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<tbody>
<tr>
<td>Entry section Max.</td>
</tr>
<tr>
<td>Process section Max.</td>
</tr>
<tr>
<td>Exit section Max.</td>
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</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
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<tbody>
<tr>
<td>Thickness</td>
</tr>
<tr>
<td>Width</td>
</tr>
<tr>
<td>Inside Coil Diameter</td>
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<tr>
<td>Coil Diameter</td>
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<td>Coil Weight</td>
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<table>
<thead>
<tr>
<th>Coating weight</th>
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</thead>
<tbody>
<tr>
<td>Galvanized steel</td>
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<tr>
<td>Galvalume steel</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Surface Treatment</th>
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</thead>
<tbody>
<tr>
<td>Passivation Treatment</td>
</tr>
<tr>
<td>Anti-finger Print</td>
</tr>
<tr>
<td>Oiling layer</td>
</tr>
<tr>
<td>Max 2 g/m²</td>
</tr>
</tbody>
</table>

Application Consideration
- Commercial Steel
- Drawing Steel
Introduction to Production Process

- Electrolytic Degreasing
  The main function of this section is to eliminate the residual oil, residual iron and other pollutants to meet the demand of medium to high standard of the surface cleanliness to have perfect adhesion of zinc.

- Annealing Furnace
  The steel strip is recrystallized in Radiant Tube Furnace at temperature of 760°C. After the strip has been fully annealed, it is cooled down in several steps to around 460°C for galvanized coating and 600°C for galvalume coating. The same temperature as the zinc bath.

- Coating Pot
  Two bath pots, one for galvanized coating containing more than 99% zinc, and the other one for galvalume coating containing 55% aluminum and balance zinc, are available in TARAZ Company.

- Air Knife System
  The air knife system controls the evenness of coating thickness on strip. Nozzles arranged on both sides of strip for blowing the zinc off evenly. The nozzles could be adjusted on desirable angle.

- X-Ray Coating Measurement Device
  For accurate measuring of zinc layer thickness X-Ray device is used in a close distance from air knife system.

- Skin-Pass Mill and Tension Leveler
  The four-roll skin-pass mill gives the strip required surface structure and improves mechanical properties of the strip. Besides that tension leveler also eliminates unevenness such as waviness, bows, ....

A Glance at Production Line

- Roll Coater
  Coating layers are applied to the strip by means of pick up rolls and applicator rolls. The strip can be passivated by chromium solution or anti-finger print coating.

- Oilier Machine
  The oilier machine provides high quality strip surfaces with a protection layer of oil.
Hot Dip Galvanized Steel
Material Composition

Galvanized bath contains more than 99% zinc for galvanic protection, aluminum typically between 0.20 and 0.30% to control the growth rate of the alloy layer, and a small amount of lead and/or antimony for spangle development.

Product Features
- Corrosion resistance
- Excellent surface appearance
- Formability
- Paintability
- Weldability

Surface Appearance

- Large Spangles <= 15mm
- Medium Spangles up to 10 mm
- Minimized Spangles up to 0.5mm
- Zero Spangle Spangles >= 0.5mm

Galvanize and Galvalume Applications
- Structure grade
- Roofing and cladding
- Ducting
- Commercial forming and drawing grade
- Boxes color
- Furniture
- Heat plate
- Solar heating panel
- Electrical and light fitting
- Agricultural equipment
- Sandwich panel
- Automotive

Hot Dip Galvalume Steel
Material Composition

An aluminum-zinc alloy coating contains approximately, 43.5% zinc, 1.5% silicon, 55% aluminums. The purpose of the silicon is to control the growth of a brittle intermetallic layer that would otherwise form during manufacture of the product. This combination offers excellent barrier-coating protection combined with some galvanic protection.

Product Features
- Excellent durability and corrosion resistant
- Beautiful silvery white appearance with a finely spangled pattern
- Excellent thermal resistant and high heat reflectivity due to aluminum in the coating
- Available with chromate-free film
- High formability
- No change in color due to high temperature
Why Galvalume?

**Corrosion Resistance Galvalume**
- Zinc/Aluminum substrate
- Short term: May show edge rust earlier
- Long term: has superior corrosion protection (up to 9 times)
- No paint peeling
- 20 years rust through warranty

**Corrosion Resistance Galvanized**
- Zinc substrate
- Short term: May take longer to show edge rust
- Long term: has inferior corrosion protection
- Paint peeling
- No rust through warranty

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**Thermal Resistance**

Galvalume steel has high Al content, 55% of mass, and shows better thermal resistance than ordinary Hot-Dip galvanized steel sheet. Even when exposed to high air temperatures, it shows neither significant increase of mass due to oxidation nor any surface discoloration due to progressive alloying.

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**Heat Reflectivity**

The surfaces of galvalume steel sheet exhibit excellent heat reflectivity, showing no substantial deterioration after long term exposure to high temperature which makes this material to be suitable for roofing applications.
Introduction to Galvalume

The Zinc coating is a common metallic coating for corrosion protection of steel, which provides a very good combination of galvanic and barrier protection. However, in order to get a longer product life, alloy has been developed commercially known as Galvalume alloy (AlZnSi alloy) which is used in coating of steel just like Zinc. It has been successfully received the market place, especially for metal building roofing. Since 1972, over 140 million tons of licensed product has been produced globally. Galvalume continues to gain approval by specifiers, architects, building owners and many others due to its versatility, ease of use, aesthetics and long-term performance.

Features

The Galvalume alloy comprised of approximately 55% Al, 43% Zn, and 1.5% Si. TARAZ produces the AlZnSi alloy (Galvalume) to meet the requirement of exact chemical composition and homogeneity, uniform coating and less cross generation during remelting alloy in coating process.

Although the corrosion performance is mostly related to Al – Zn alloy, the inclusion is approximately 1.5% Si is vital. The primary purpose for addition silicon is to minimize the growth of the brittle intermetallic layer that forms when steel is zinc coated using the Hot-Dip process. Without Silicon the Galvalume coated steel could not be made using Hot-Dip process.

High Temperature Resistance

Due to the high aluminum content of the 55% Al-Zn coating the sheet can withstand surface temperatures of up to 750°F [400°C] without discoloration, and up to 1200°F [650°C] without heavy oxidation and scaling.

Colored chromium free passivation/Anti-finger print on galvalume coated steel

A clear, organic resin coating is applied to both sides of the substrate, using sophisticated reverse roll coaters. Once applied, the coating is then thermally cured. The use of online or offline roll coaters provide precise application of the organic film, assuring uniform film thickness. Because the resin coating is transparent, the standard surface appearance of the Galvalume substrate is unchanged. The application of an organic coating eliminates the need for conventional chemical treatment and vanishing oil. In addition, this clear resin coating can mix with different color themes, and produce a nice-shiny colored surface.

Corrosion Resistance

Table 1 contains corrosion performance data comparing the performance of 55% Al-Zn with galvanized coatings. The data indicate that the performance is superior versus galvanize coatings in all three types of environments – marine, industrial and rural. Ratio gives the relative improvement of the 55% Al-Zn coating versus galvanize for coatings of approximately the same thickness.

The unique dendritic structure of the alloy coating is now widely recognized as the primary reason for the improved corrosion resistance of the 55% Al-Zn coating. When it is exposed to the environment, the zinc rich areas corrode first. Since these areas are located in a labyrinth of inter-dendritic regions in the coating, the products of corrosion tend to fill the inter-dendritic interstices and the corrosion rate decreases. Performance of coated-steel sheet products in accelerated corrosion environment have been tested. The results of salt spray or salt fog teston product which exhibit a specified number of “hours to failure” characterize corrosion resistance. Galvalume shows almost 2 times better results than Galvanized steel in term of hours to failure in salt spray test.

Main Applications

Building construction and civil engineering structures: Roofing material, wall material, partition, and other structural metal fittings.

Electric appliance: Refrigerator, washing machine, air conditioner, automatic vending machine, showcase, stove, microwave oven.
<table>
<thead>
<tr>
<th>Packaging Code</th>
<th>Packaging Type</th>
<th>Detailed Information</th>
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<tbody>
<tr>
<td>N</td>
<td>Standard/Normal</td>
<td>One circumferential and three radial Steel straps</td>
</tr>
<tr>
<td>S</td>
<td>Spacial</td>
<td>Two circumferential, three radial steel straps, and protective metallic collar for both inside and outside diameters</td>
</tr>
<tr>
<td>Ex1</td>
<td>Export</td>
<td>Three circumferential, four radial steel straps, waterproof paper, sleeve and protective metallic collar for both inside and outside diameters</td>
</tr>
<tr>
<td>Ex2</td>
<td>Export</td>
<td>Three circumferential, four radial steel straps, waterproof paper, sleeve, protective metallic collar for both inside and outside diameters, galvanize cover and wooden pallett</td>
</tr>
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</table>