

Painting over Galvanized Steel

Painting over galvanized steel provides excellent protection when done properly. A six-step method is described here to help you with the process.

- **Know the age of the galvanized steel to be painted**
- **Inspect the galvanized coating for imperfections**
- **Clean the galvanized surface**
- **Profile the surface if it is newly galvanized or partially weathered**
- **Use the correct primer**
- **Apply surface coating according to manufacturer's directions**

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The galvanizing on Powerbrace products provides a long-lasting protective coating. (Refer to *Technical Bulletin #5, Hot-Dip Galvanizing.*)

However, some customers may want to paint galvanized steel for a variety of purposes, including:

- to create decorative colors
- to add to service life with more corrosion protection, and
- to create a specific chemical resistance.

With the following steps, you can prepare galvanized steel of any age to receive a top coat of paint.

Six Steps to Painting over Galvanized Steel

1. Know the age of the galvanized coating

Different surface preparations are needed, depending on how old the galvanized steel is. Galvanized coatings can be grouped into three categories: newly galvanized, partially weathered and fully weathered. Each requires a different kind of treatment so paint will adhere.

Newly galvanized steel has been hot-dip galvanized within 48 hours. It has very little zinc oxide on its surface and has a bright, shiny spangle pattern.

Partially weathered galvanized steel can be between 48 hours and two years old, depending on environmental conditions. Generally, this coating has some zinc oxide, hydroxide and carbonate film, but not a full zinc patina.

Fully weathered galvanized steel is older than two years and has a fully formed zinc patina—a thin, hard,

tenacious film that is corrosion-resistant and helps to prolong the life of the part. The coating has a matte gray finish, dull and mottled.

2. Inspect the Galvanized Coating

Determine if the galvanized steel was dipped in a chromate bath after galvanizing. Powerbrace does not chromate dip, so only check for chromate coating when painting a non-Powerbrace product.

The chromates can greatly interfere with paint adhesion and must be removed prior to painting. It is difficult to detect chromates visually. To be sure, chemically test the surface for chromates. If found, the galvanized steel should be allowed to weather for two years before painting, or the chromates must be cleaned off.

Regardless of the steel's age, it should not have any bumpy spots, sharp icicles, high spots or extremely rough edges. Smooth out rough surfaces by hand filing or power sanding the area. Be careful not to remove any more of the zinc coating than necessary.

If any bare areas reveal the underlying steel (such as drill holes, weld lines, large scratches, or gouges), these should be touched up prior to painting with a zinc-rich paint or cold galvanizing compound.

3. Clean the Galvanized Surface

Clean the surface of any grease, dirt or oils before painting. Use a cleaning solution to clean the zinc surface, not remove it. The more zinc that is left in place, the greater the corrosion protection. The paint

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manufacturer should provide cleaning instructions.

Cleaning requirements change depending on the age of the steel:

- Newly galvanized steel – No major cleaning if dirt or grease is not present.
- Partially weathered – Remove surface oxide and hydroxide film, as well as dirt and grime.
- Fully weathered – Minimal cleaning, such as warm water power wash to remove contaminants.

Other cleaning tips include:

Use of alkaline solutions in the pH range of 11 to 12, but not greater than 13: These can include dilute sodium hydroxide, trisodium phosphate or similar solutions. Use a nylon bristle brush, not copper or steel. After cleaning, rinse with hot water and allow to dry completely.

Solvent cleaning: Use mineral spirits, turpentine, high-flash naphtha or similar solvents with lint-free rags or soft nylon brushes. After cleaning, rinse with hot water and let dry completely.

Ammonia cleaning: Only use ammonia in a one-two-percent solution if ash residue from the galvanizing is present. Apply with a soft nylon brush, rinse with hot water and let dry completely.

4. Surface Profiling

Newly galvanized and partially weathered galvanized steel can benefit from etching the profile of the galvanized surface to promote paint adhesion. (Not needed for fully weathered galvanized steel.)

Use one of the following methods, checking with the paint manufacturer about any chemical process. Remove as little of the zinc as possible.

Sweep blasting: Particle size for a sweep blast should be between 200 and 500 microns, or 8 to 20 mils. Aluminum/magnesium silicate can be used, or natural media such as corn cobs, walnut shells, corundum, limestone and mineral sands.

Zinc phosphate treatment: Applied by immersion, spray or soft nylon brush. Leave it on between three and six minutes. Follow with a clear water rinse and let dry. Do not use phosphate treatments when using zinc-rich paints.

Penetrating sealers, wash primers and acrylic passivation products may be used. Follow the manufacturer's instructions.

5. Using Primers

After cleaning and profiling the galvanized surface, you may use a primer coat such as zinc-rich paints to help paint adhesion.

Priming should be done as soon as possible after cleaning and profiling. Apply primers according to manufacturer's directions.

6. Painting the Galvanized Steel

The primer can be followed by a top coat, such as acrylic and latex-acrylic paints. Apply the paint to the manufacturer's recommended thickness, or the system will fail. If the paint is too thin, it will wear away quickly. If the paint is too thick, it may not cure correctly and the paint will flake or chip away.

Consult the paint manufacturer prior to painting galvanized steel, to ensure good adherence and long life. Different physical and chemical characteristics of paints cause varied reactions.

Pre-treatments, primers and finish coats are available, depending on the manufacturer's recommendations, depending on the type of steel and the demands of subsequent exposure and use.

What Is Most Important in Painting over Galvanized Steel?

Correctly clean and prepare the surface to be painted, and follow the manufacturer's instructions to determine the proper primer and paint combination.



For Further Information:

If you have any questions about painting over galvanized steel please call our Customer Service Department at **262.697.5328**.



Check Our Web Site

Additional information is available at **www.powerbrace.com**.

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