

Heritage Industries - Forging Ahead!
Pennsylvania's Premier Custom Ornamental Iron Company

Finishes

- [Powder Coating](#)
 - [What is Powder Coating](#)
 - [Advantages](#)
- [Galvanizing](#)
 - [What is Galvanizing](#)
 - [Advantages](#)
- [Combined Powder Coating & Galvanizing](#)
 - [Advantages](#)
 - [Disadvantages](#)
- [Heritage Specifications for Powder Coating over Galvanizing](#)

Powder Coating Color Chart



[Click to see more Options](#)

Heritage offers a variety of finishes including Powder Coating, Galvanizing, Basic and Primer Coats and Hand Treatments.

Heritage highly recommends powder coating and or galvanizing for all outdoor projects to avoid corrosion. Corrosion of steel is an electrochemical reaction brought on by environmental elements. Steel in its unprotected state will rust as it tries to return to its natural state. Once rust develops, it is both time consuming to maintain and can be expensive to repair!

Heritage includes the cost of the finish or finishes that best suit the customers' project goals and budget within the written estimate sheet. This number is separate from the material and fabrication cost as well as the installation cost. This allows our clients to make an educated decision regarding their project needs and budget.

POWDER COATING

What is Powder Coating?

Powder coating is a procedure in which to apply a professional finish to metal. Items to be powder coated are high pressure washed with an acidic phosphate solution. After cleaning, items are racked and rolled into the spray booth where an electrical charge is applied and ultra fine polyester powder is sprayed onto the parts. They are then baked at temperatures around 180oC for 15 minutes to allow the powder to melt onto the metal. After cooling, the powder has set to a hard, durable, uniform finish with excellent atmospheric weathering characteristics.

Advantages of Powder Coating

1. Durability

Powder coating is one of the most longest-lasting, quality finishes available.

Powder coated surfaces are more resistant to chipping, scratching, fading, and wearing making them virtually maintenance free.

2. **Color and Finish Options**

Color selection is unlimited with thousands to choose from. Metallic, tonal, stippled and clear finishes are also available.

Gloss intensity ranges from matte to very high shine.

Textures are optional to add dimension to the finish while hiding natural surface imperfections. Textures can vary from smooth tonal looks to more dramatic surfaces such as wrinkled and crackled.

3. **Financially Smart**

Powder coating costs can actually be less than liquid painting for the reasons stated below.

Liquid painting requires surface preparation including removal and disposal of rust and residual paint that add to labor costs. Additional supplies such as cleaners, primers and finishing paints are factored into the material costs while increasing labor time to apply each coat. Since liquid paint does not protect from the environmental elements like powder coating does, maintenance costs and labor will be incurred for the life of the product.

4. **Environmentally Friendly**

While liquid finishes contain solvents which have pollutants known as Volatile Organic Compounds (VOCs), powder coating contains no solvents and releases negligible amounts of VOCs into the atmosphere. In addition, most powder coating overspray that does not adhere to the metal can be retrieved and reused, virtually eliminating the waste commonly found in liquid finishing processes.

GALVANIZING

What is Galvanizing?

Galvanizing or Hot Dip Galvanizing (HDG) is the immersion of steel into an 850 degree bath of liquid, molten zinc. The zinc bath imparts a metallurgical bond between the zinc and the steel creating a coating that prevents corrosion. The galvanizing process, patented in the 1800's is both proven and predictable.

Advantages of Galvanizing

1. **Durability**

Galvanizing ensures a tough, durable and abrasion resistant coating that lasts up to 75 years.

If the zinc surface is scratched, surrounding layers of zinc will electrochemically protect the exposed metal. This is due to the anodic relationship between zinc and iron and is often described as self-sacrificing.

2. **Financially Smart**

As stated in the powder coating section, galvanizing costs can also be less than liquid painting for the reasons stated below.

Liquid painting requires surface preparation including removal and disposal of rust and residual paint that add to labor costs. Additional supplies such as cleaners,

primers and finishing paints are factored into the material costs while increasing labor time as well. Since liquid paint does not protect from the environmental elements like powder coating does, maintenance costs will be incurred for the life of the product

3. **Environmentally Friendly**

Zinc, used in galvanizing, is essential for all life and can be found in most minerals. Nearly 30% of the world's supply comes from recycled zinc.

COMBINING POWDER COATING & GALVANIZING

To achieve the most durable protective coating for steel, properly applied polyester powder coating over hot dip galvanizing will give optimal results.

Advantages

In combination, powder coating over hot dip galvanized steel ensures maximum durability providing 50 plus years rust free.

Disadvantages

There are three main problem areas associated with the powder coating over hot dip galvanized steel products:

- Pin holing
- Poor adhesion
- Incomplete curing of the polyester resin.

Understanding what these problems are and why and when they occur during the process allow us to alleviate the effect on the steel. Proper plant layout and procedures will ensure that a consistent, quality product is achieved. Details of the above noted issues are described in length below.

1. **Pinholing**

Pinholing is caused by the formation of small gas bubbles in the polyester powder coating during the "stoving" / curing cycle. These bubbles form small craters on the surface which may reduce its long term durability, particularly in aggressive (marine) environments.

The main reason for pin holing appears to be that the discrete polyester resin particles in contact with the galvanized steel do not fuse at the same time as those on the surface of the polyester powder film. This is due to the mass or thickness of the galvanized steel *1, and the time that it takes to reach fusion temperature. To resolve the issue of pin holing, the steel sections must be pre-heated in an oven allowing the sections to reach optimal temperatures prior to the powder coat application. Also, specially formulated polyester powders with 'degassing' agents have been developed to delay fusion of the powder. The pre-heating combined with the degassing grades of powder allow for a successful end result.

*1 Note: Hot dip galvanized items tend to be of heavier section thickness than other steel items, typically sheet steel, that are powder coated. Thus, these items take longer to reach oven temperature because of their greater mass.

2. **Incomplete curing**

As stated above, galvanized items, with their heavier section thickness, take

additional time to reach optimal fusion temperature. Because polyester powders are thermosetting resins that cross-link to their final organic form by being maintained for 10 minutes at 180oC, curing ovens are designed to provide this time / temperature combination. Pre-heating of the heavier work will assist in accelerating the curing process, thus meeting the curing specifications.

3. **Poor adhesion**

The final stage in the hot dip galvanizing process involves water quenching the product in a weak sodium dichromate solution. This process cools the metal so it can be handled and passivates the surface of the galvanized coating to prevent early oxidation.

When powder coating after galvanizing, the presence of a passivating film on the surface will interfere with the zinc or iron phosphate pre-treatments, and in many cases, render these treatments ineffective. It is essential that the product is not quenched *2 after galvanizing and prior to powder coating. This ensures that the zinc surface is in a highly reactive state to accept the pre-treatment applied in the powder coating process.

*2 Note: It is equally important that the unquenched hot dip galvanized surface is kept clean and dry prior to powder coating. If wet with rain or dew, it will rapidly oxidize and cause coating adhesion and quality problems.

Another disadvantage to powder coating over galvanizing, can for some clients be the final surface result. Galvanizing creates somewhat of a textured surface and therefore keeps its textured quality even after the powder coating is applied. If you are a client that seeks a very smooth end product, you may just want to have your items powder coated.

HERITAGE SPECIFICATIONS FOR POWDER COATING OVER GALVANIZING

1. Hot dip galvanize and do not water or chromate quench.
2. Remove all drainage spikes and surface defects (brush blasting).
3. Powder coat within 12 hours of galvanizing. Do not get surfaces wet. Do not leave outside.
4. Keep the surface clean. Do not transport uncovered loads. Diesel fumes will contaminate surface.
5. If surface contamination has occurred or is suspected, clean the product with proprietary solvent/detergent designed for pre-cleaning prior to powder coating.
6. Use zinc phosphate pretreatment if highest adhesion is required. Surface must be perfectly clean. Zinc phosphate has no detergent action and will not remove oil or soil.
7. Use iron phosphate if standard performance is required. Iron phosphate has a slight detergent action and will remove small amounts of surface contamination. Best used for pre-galvanized products.
8. Pre-heat work prior to powder application.
9. Use 'degassing' grade polyester powder only.

10. Check for correct curing by solvent testing. Adjust pre-heat and line speed to ensure full cure.