

## Powdercoat Finishing

### Description

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### Why not do both Paint and Powder Coat?

Despite being applied in different states (liquid versus solid), the industrial application methods for powder coating and liquid paint are surprisingly similar.

Pretreatment is identical in both processes. Before any coating can be applied, the surface needs a thorough cleaning. Any oil, dirt, moisture, or other contamination will interfere with surface adhesion.

After cleaning, the processes diverge slightly.

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## Powder Coating

The application of powder coating relies on negatively charged dry powder being attracted to grounded metal parts

For the powder coating process, dry powder is shot through an electrostatic gun on to the metal exterior. The gun gives the powder a negative charge, and the negatively charged powder is attracted to the grounded part. The attraction results in fast, even application.

Once the coating reaches the desired thickness, the coated piece is placed in a curing oven, where the heated powder gels. Curing creates thermal bonds between powder particles, resulting in a smooth, hard finish.

Liquid paint is dispensed in a fine spray. It is also electrostatically charged, but to much less effect. While powder coating forms even coats with almost effortless ease, liquid paint needs to be applied by highly trained experts to avoid drips or sags.

Some liquid paints are air dried, while others are placed in a curing oven.

It is normal for both powder coating and liquid paint to include a primer and a color coat, however, liquid paint may also include multiple color coats and a clear top coat.

In some applications, the appearance of the finished paint job is nearly as important as performance.

Some textures can be attained equally well by powder coating or wet paint, but others are easier to achieve with a particular medium.

Textured finishes are much easier to attain with powder coats. Thinner powder coats are naturally more textured, while thicker layers are smoother.

It is technically possible to attain a high-gloss finish with powder coating, but it is much easier with liquid paint.

## COLOR MATCHING

Powder coating has many strengths, but liquid paint is the unequivocal winner when it comes to color matching.

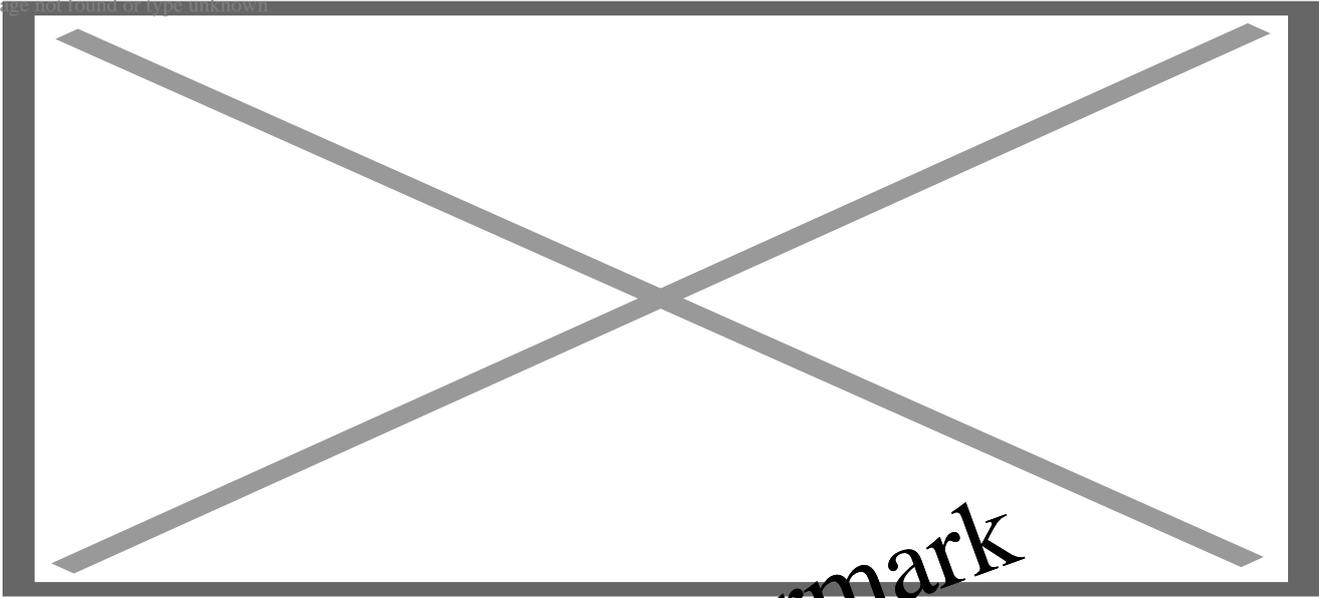
Custom colors of liquid paint can be mixed on-site, and with a high degree of precision, by almost any paint supplier. A blue and red pigment can be mixed to produce purple paint.

In contrast, custom powder coat colors require a special production run. The color of powder coatings is determined by the plastics ground down to form it. There is no solvent in powder coating, so an attempt to blend blue and red powder will just create a blue and red speckle pattern.

Because it is hard to color match, powder coating is usually produced in large batches of standard colors. Custom orders are possible, but more time consuming and expensive than color matching with wet paint.

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## PERFORMANCE

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A finish is meant to protect metal surfaces from corrosion and other environmental damage. If the finish is damaged by scratching or chipping, it ceases to function as an effective barrier.

Powder coating provides better performance than wet paint—it is more resistant to chipping, scratching, and other wear because of the thermal bonding it undergoes during curing, and because it can be applied in much thicker layers. This performance is especially important for outdoor products, like [bollards](#) and [bike racks](#).

In addition to its physical toughness, powder coating provides superior color retention. Long term exposure to moisture, sunlight, and heat breaks down the resins found in both paint and powder coating. This process, known as chalking, causes resin and pigment particles to lose adhesion. Affected particles form a chalk-like layer on the coating surface.

The early stages of chalking merely give the coating a faded appearance, but severe chalking will eventually erode the coating enough to compromise surface protection. The rate of chalking depends on the resiliency of the resin. Polyester based powder coatings are frequently used as top coats due to their exceptional chalk resistance.

## HEALTH & SAFETY

Although not extensive as liquid paint, powder coating presents a wide selection of colors to choose from

Powder coating isn't just more durable than liquid paint—it is also safer to store and apply.

Liquid paint is hazardous for several reasons. First of all, it's flammable. Careless storage can easily

lead to a dangerous chemical fire. Wet paint is also a health hazard to the operators that work with it.

Wet paint emits volatile organic compounds (VOCs). Long term exposure to VOCs, especially in enclosed spaces, causes respiratory irritation and compounding health problems. VOCs are also a major source of industrial pollution.

Because powder coatings don't contain any fluids to evaporate, they don't emit any VOCs, and are completely free of the associate health and safety risks.

## **COST**

First, powder coatings have a much better utilization rate. Unlike liquid paint, powder can be collected and reused. Approximately 70% of paint is lost to overspray during application, while material loss of powder coating can be kept under 5%.

Because it is more hazardous, wet paint requires more investment in mitigation measures and insurance premiums. Powder coating facilities can keep these costs to a minimum.

Finally, powder coating has much lower disposal costs. Less of it needs to be disposed due to the high utilization rate, and any amount that does need to be thrown away isn't subject to the same environmental controls as paint.

## **OTHER EVOLUTION AND INNOVATION IN FINISHING**

Materials science keeps evolving, searching for innovative coverings that are more resilient and environmentally aware.

## **POWDER COATING VS PAINT**

- Powder coating and paint are similar, each containing resin, color pigments, and other additives. Paint additionally has solvent.
- Paint is more widely available. It is less expensive, and it is easier to creating match colors for existing paints. High-gloss finishes are easier to achieve.
- Powder provides better coverage, lower maintenance, and more wear resistant. It is slightly more expensive.
- Both paint and powder are vulnerable to chalking when outside for a long time, resulting in a faded appearance.

New technological advancements and decreasing costs are driving up the popularity of powder coating, especially in industrial applications.

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## **Date Created**

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