

Is the Right Metal Finish More Important Than You Know?



In metal finishing, a surface finish will make all the difference in the aesthetic of a final product -- you already know this. And, you're probably aware that a surface finish will contribute to performance requirements. But, if your reasons for choosing a specific metal surface finish end here, there's more to consider.

Here, we're going to explore everything you need to know about metal surface finishes to make the best choice with your next metal-plated product or part. Learn what can go wrong so that you can avoid it.

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What is Surface Finish in Product Design?

In product design, surface finish refers to the final look of the exterior of a product or part. Surface finishes can be metallic, molded, or painted, each with a very different look based

on color and texture. Surface finish variations are nearly limitless and can be accomplished through many finishing techniques.

For example, a metallic surface finish can be painted onto a product or part. However, this will accomplish a completely different look, feel, and performance standard than a product or part that is plated (electroplating, PVD, etc.).

Common Types of Metal Surface Finishes

There are various types of surface finishes involved in metal plating. While the names sometimes vary from supplier to supplier, they can be broken down into six basic categories.

- **Bright** - Mirror-like sheen with no roughness
- **Satin** - Soft sheen with very fine roughness
- **Matte** - Dull appearance with fine roughness
- **Spin Surface** - Visible roughness with circular lay
- **Brushed Surface** - Visible roughness with straight lay
- **Selective Plating** - Intermittent metal plating

These finishes can be applied to different metals to achieve various results.

You can break these categories further into a vast spectrum of finishes -- think chrome, black chrome, rose gold, stainless steel, and brushed bronze. Each look requires a certain type of metal, roughness, and lay.

Metal Electroplating vs Physical Vapor Deposition (PVD) Coating

There are several metal finishing methods. Let's focus on metal injection moulding and compare electroplating and PVD coating.

[Electroplating](#), also known as electrodeposition, is a process that applies a thin layer of metal onto a product's surface and binds it through the use of an electrical current. This process maintains a product's original form, but gives it certain properties of high-grade metal like durability and aesthetic appeal.

[PVD nanotechnology](#) is a more high-tech manufacturing technique that vaporizes solid metal inside a high-powered vacuum. The metal is then bonded with electrically conductive materials. This gives the final product additional physical properties, such as durability and conductivity.

You might wonder, *'is PVD better than electroplating?'* The answer is no. The processes are both widely used, often in conjunction with one another.

What Can Go Wrong When You Choose a Surface Finish for Your Product or Part?

Designers are typically interested in a surface finish with the most aesthetic appeal, essentially asking "What will it look like?" Engineers are more concerned with performance standards and have questions like, "Is it going to be hard?" and, "Will there be operational resistance?"

While these points are *crucial* for a successful project, there are a few important factors that may not be on their radar. So that you can avoid them, here are some of the problems that might arise when you choose a surface finish.

When You Don't Consider Consumer Trends

In general, consumers want their kitchens to look like the interior of their cars, and they want their cars to look like the interior of their kitchen. Designers aren't sure which came first -- the car or the kitchen. So, if you're designing auto accessories, you might want to look at the latest home interior trends and vice versa. You need to be relevant and can't use design and color trends from ten years ago if you want people to purchase your product.

Yes, you might read that oil-rubbed bronze items sold at an astounding rate within the last decade, but that doesn't mean that it will continue to. Make sure your inspiration is up-to-date. Right now, relevance might equate to black chrome and rose gold.

Furthermore, just a few years ago, it was blasphemy to combine finishes. Now, in a bathroom, for instance, you might see a chrome lavatory faucet, stainless steel in the shower, and black iron fixtures throughout the rest of the room. *Consumer trends constantly change.*

At the same time, you need to consider if your product should have lasting appeal. If you retail products at a high price point, your consumer will expect the product to be relevant for years to come -- think aesthetics, performance, and functionality.

Higher-end brands may want to consider timeless looks like chrome or stainless steel. Otherwise, your end-users could end up moving on to a competitor with a more classic style when it's time to replace their products.

When You Don't Involve a Vendor in the Design

While most OEMs involve their vendors during the technical review process, the right time to [select and involve a vendor](#) is during the design phase. By the time you're working on a technical review, it can be too late to make substantial changes that will affect your costs and performance.

A designer's job is to decide on the look of a product. It is then up to an engineer to figure out how to achieve that look. But, there is a knowledge gap between these two and another between the engineers and vendors. Setting your sights on a design that hasn't been reviewed by designers, engineers, and vendors can create problems for the entire product development team down the line.

When this happens, people might specify product or part details that either don't exist or are simply too expensive to be worthwhile.

For example, imagine a top-load washing machine. A brand wants their washer to compete well against another model on the floor right next to it in the retail space. The competitor has a metal agitator in their machine. So the brand's designer comes up with a plan for a new look for the current model. Then, the engineer determines that the look can be achieved by electroplating the plastic agitator and putting a PVD coating on it to ensure that it'll survive the engineering tests.

So, the vendor takes a part that costs around two dollars and electroplates it. Now, the part costs about ten dollars. A certain warm chrome look is applied with PVD coating. By the

time all elements are applied, the agitator is now a 30 dollar part. Suddenly the price for a single part has increased by 1500%. Multiply this by the number of parts that you might want to change, and you can see how disconnected processes might break the bank.

A metal additive vendor could have told the designer or engineer that a less expensive option would have been to instead plate the agitator cap for much less time, money, and resources and achieved a similar look and performance standard. When a vendor can be involved to collaborate and educate about surface finish options during the design phase, it can save OEMs pain, confusion, and money.

Conclusion

In a nutshell, choosing the wrong surface finish has the potential to wreak havoc on your project, essentially by way of draining your budget. Luckily, there's a very simple solution: ask an expert to help you answer any surface finish questions you might have -- [schedule a call today](#).