



**BOB'S
BRIN**

Metal finishing and what you need to know about rust prevention.

By Larry Ensley, Hubbard-Hall

The most common type of corrosion - called atmospheric corrosion - occurs when a metal surface is exposed to oxygen and moisture which then causes a chemical reaction producing iron oxide or rust. For a metal finisher rust is a problem with real consequences. Here we share ideas on addressing it.

What are some ways to reduce corrosion from occurring?

The most common method to prevent corrosion is to apply rust preventatives. There are other types of prevention you can do -- such as painting or plating -- but corrosion preventatives or rust preventatives are the most economical and easy methods to prevent corrosion on the surface of a metal part.

Are there different types of rust preventatives?

We typically identify those as classes of rust preventatives. The first class is a water-displacing product that works by displacing the water from the surface of a part and leaving a thin protective film behind. Another type is a soluble oil -- or emulsifiable oil -- that mixes water and oil to form an emulsion. These are typically used where high flash applications are needed, they are more economical and cheaper

to buy upfront, but they typically give less corrosion protection than water displacing products. Another class would be temporary rust inhibitors; where the other products last months or years, you could get hours to days of rust protection from a temporary rust inhibitor. These are very good because, in a production atmosphere, you want to protect a newly produced part prior to painting or plating, but you don't want to contaminate your paint or plating lines with oil. So these products are easily removed and used in applications prior to painting and plating. The next type is dry film type products such as waxes and lacquers; the waxes are typically used where you need torque reduction or some minor rust inhibition, and lacquers are used for aesthetics where you don't want the product to come off not only on the packaging but also on the customer's hands.

What are different ways that corrosion prevention treatments can be applied?

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Typically, the most efficient method is immersion. However, rust preventatives can be applied via spray, brush, or a sponge. I've seen them applied in many different ways, but the most efficient method to apply a rust preventative is immersion; it ensures 100% coverage on the surface of the part.

What is flash rust?

Rust is typically thought of as something that happens very slowly over a period of months or years. Flash rust is just like it sounds: it happens very quickly, hours to days or even minutes. It is caused because the surface of the metal is so active in the presence of water or moisture and oxygen.

What advice would you give a finisher about solving issues that they are having with corrosion, and where would they start?

If I were talking to a finisher who was new to this, the first thing I would tell this person is, according to the National Association of Certified Engineers. The U.S. typically spends around \$17.5 billion dollars a year on corrosion. So, the first thing I'll tell them is to

look at their process and ensure that they're getting corrosion protection throughout the entire process, and that includes the processes prior to subsequent operations such as painting or plating, and all the way to the end user's need. We need to have rust protection across the entire board so that you do not have to go back and re-manufacture, reprocess, rework or even scrap parts.

What recent developments has Hubbard-Hall made to combat some of these corrosion and rust issues?

There are three products that really come to mind. Our product line is called Metal Guard®, and the number one thing that every customer asks is: what is your best rust preventative? What gives you the most rust protection? We recently developed a product called Metal Guard® 560, and it gives you two times the rust protection of your typical long-term rust prevention. This is measured in salt spray hours; most customers are very familiar with the ASTM B117 corrosion exposure, and 100 hours is an industry-standard. We are getting double that, over 200





hours of corrosion protection with the Metal Guard® 560, and seeing good success with it in the industry. We want to do more with less; we want to use less product -- if possible -- and get as good or better protection. We're doing this with a soluble oil called Metal Guard® 320, and instead of using it at 10% by volume, we're able to cut the concentration in half and still get better corrosion protection than most people are getting with a 10% solution. This allows customers to use less product and get better protection. Another more sustainable product line is called Metal Guard® 700; it's a long-term water-based product that is designed to be used as received. It gives the same protection as many solvent-based products, and it's eco-friendly. It's based on environmentally-friendly raw materials, so it's a more sustainable product.

What is Metal Guard®?

Metal Guard® is a corrosion rust preventative line of products from Hubbard-Hall, and it is designed to prevent corrosion on metal surfaces. We have several different classes: water displacing, water-soluble, temporary rust inhibitors, or lacquers and waxes.

How does Metal Guard® work?

Metal Guard® works by applying a protective film barrier on the surface of a metal part. Typically, the rust preventative is dissolved in a carrier such as mineral spirits or water. The part is immersed in Metal Guard®, and when the part is pulled out, the carrier evaporates -- water or mineral spirits -- and it leaves this thin film barrier on the surface of the part and provides protection and keeps it from being exposed to oxygen and water.

Are there different types of Metal Guard®?

Yes, there are water displacing products that are designed to displace water from the surface of the part and leave the rust preventative behind; these are typically solvent-based products. There are water-soluble products that are emulsified oils; these are typically your more economical versions and give higher flash points but less rust protection than your solvent-based products. And then, we have the water-

based or temporary Metal Guard® products, which are designed to be used in-process and are easily removed prior to painting or plating so that you don't contaminate cleaning lines. We also have our waxes and lacquers, which are our dry film products that are designed to either improve torque reduction and reduce the coefficient of friction if we're talking about waxes, and the lacquers are designed to give dry-film rust protection on parts for aesthetic looks.

How is Metal Guard® applied?

Metal Guard® can be applied either spray, brush, or immersion. The most typical -- and most efficient method -- is immersion so that you ensure that the entire product is coated with a rust preventative. Once it's removed from the rust preventative, the carrier evaporates, and it leaves that thin-film rust protection that can protect it from exposure to moisture and oxygen.

