



Brought to you by
Gema

Ask Joe Powder

Oil Causes “Unseamly” Finish

Q Hi Joe!

I am having an issue that I haven’t seen before. We manufacture fairly standard welded metal cabinets and carts. The issue I am having is with a particular cart that would resemble a single drawer file cabinet with a pencil drawer that most people have in a cubicle. The bottom of the cart fits over sides creating a slight “lip” or edge, if you will. My vendor claims that there is “oil” trapped in the seam and when the part runs through the cure oven the oil seeps causing issues with the finish.

We hang these upside down using the caster holds for hanging points. So, the seam is upside down.

We are using a six-stage iron-phosphate, dip, prewash system. The dry-off oven runs at a fairly consistent 392°F (200°C) as does the cure oven.

The vendor wants to blast the seam with something resembling a WWII flamethrower! This solves the oil issue, but contorts the part in some cases. Do you have any recommendations as to how we can resolve the issue without “breaking the rules of the Geneva Convention”?

Thank you and kind regards,
John A.

A Hey John,

The unseemly woes you describe are rather common. Fabrication lubricants and machine oils can get trapped in seams and cause headaches further down in the finishing process. There are a few approaches you can consider to alleviate this issue, although flame-throwing—while it has to be an exciting operation—seems a bit extreme and hazardous solution.

The first consideration is to eliminate the problem at its source. This entails cleaning the metal thoroughly before the seams are made. Seems simple (simple seams?), but this would guarantee no oil seepage when the powder is curing in your vendor’s oven.

If this is not possible, you may want to consider stronger impingement of cleaning solution at the seams. It seems like the use of a power washer could dislodge any residual oil and reduce the problem. This would be a manual process that would slow productivity and incur additional cost. It may require modest capital expenditure as well.

It seems to me that the best option to reduce this unseemly issue is to attack it at the source. Keeping the metal clean before the seams are established should alleviate the problem without compromising the Geneva Convention or any subsequent international treaties.

— Joe Powder

Look for a Long-Term Solution

Q Good day, Joe,

We regularly read your column in *Powder Coated Tough* magazine. We are a manufacturer of industrial hardware that is used in industrial environments and usually outside. Currently we plate our steel parts (stampings and castings) with yellow zinc dichromate and then send them for powder coating. We have had some adhesion and rust problems and are wondering if we are doing the right thing here. The plating process seems to clean the products better than the powder coater can and also provides a secondary barrier to seal the part from the elements. Do

Gema

The Global Leader in
Powder Coating Technology

www.gemapowdercoating.com

you think we are doing the right thing to best protect our steel hardware items?

Thank you,
Everett F.

A Hello Everett,
Powder coatings generally have sporadic problems adhering to zinc dichromate. I'm not sure if it's related to varying thickness of the zinc dichromate, but it is a recurring problem. The zinc plating process cleans the metal really well but may not be the best surface for adhesion of a powder coating. In addition, part handling after plating and prior to powder coating may introduce soils and oil on the surface.

The ideal means to achieve excellent powder coating adhesion to steel is to skip the zinc chromate and find a powder coater with a high quality pretreatment system that is used just prior to powder coating. A multi-stage iron phosphate system is good, whereas a multi-stage zinc phosphate is so good that the automotive and appliance industries use it. Another piece to the puzzle is keeping the parts from corroding between the time they are fabricated and when

they see the pretreatment system. This is a matter of logistics, environment and possibly temporary protection.

This probably makes you start to think about investing in the installation of your own pretreatment and powder coating system. I would give it some serious thought in your long-term strategic planning.

I hope this helps.

— Joe Powder

Give It a Shot

Q Greetings Joe,
I would like to have my 357 magnum IMI Desert Eagle hand gun powder coated. It is made of stainless steel and has a six inch barrel. I do not plan to coat any mechanisms like the trigger, hammer, decocking lever nor the grip. Can a hand gun like this be powder coated? I can disassemble the gun and provide it as individual parts.

Lynn

A Howdy Lynn,
Powder coating the parts of this gun should not be a problem. The most critical issues will

be 1.) Coating choice (good adhesion and durability), 2.) Preparation of the metal, 3.) Masking of critical surfaces, and 4.) Achieving proper cure. Let me address each of these.

I recommend an epoxy-based powder coating for its excellent adhesion to stainless steel and its toughness/scratch resistance. It also looks good in a matte finish. Preparing the metal should start with thorough wipe down with acetone to remove any oil and dirt. Follow this with blasting with a fine grade of glass beads or aluminum oxide. A 120 mesh grade should suffice. Wipe the parts down again with acetone after blasting the surfaces.

Masking is important as you want to ensure that you do not coat any surfaces that have critical tolerances. I would use a polyimide grade masking tape and silicone plugs for cavities. With these high-temperature masks they can remain on the parts until the powder coating has cured and is removed from the oven.

Achieving proper cure is critical to the performance of the powder coated surface. It is essential that the coating sees the proper amount of time at or above the cure temperature recommended

by the powder coating supplier. You will find this information on the Technical Data Sheet supplied by the powder manufacturer. This does not mean time in the oven, it refers to time after the part/coating has eclipsed the specified cure temperature. It may take 5 to 10 minutes for the parts to reach this temperature depending on oven design and settings.

If you pay close heed to all these issues you'll end up with a beautiful finish that will last for years.

— Joe Powder

Joe Powder is our technical editor, Kevin Biller. Please send your questions and comments to Joe Powder at askjoepowder@yahoo.com.

Editor's Note: Letters to and responses from Joe Powder have been edited for space and style.

Not Your Average Joe...

Each issue, we take the padlock off the PCI® Test-Lab door for a few minutes so our favorite technical editor and “powder guru” Joe Powder can run in the yard. When he's not gnawing on a rawhide bone, he loves to answer readers' questions. Go ahead and send him one at askjoepowder@yahoo.com... he doesn't bite. Maybe it'll end up in the next issue!