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# Ask Joe Powder

## Powder Pioneer Ponders Pink Potty

**Q** Hello Joe!

It's Allison from Boise. So we have been doing some experimenting since the last PCI meeting. Rob has powder coated his leather boots and wood handles on our wheelbarrow. That all being said, I had a customer inquiring on powder coating a porcelain toilet PINK. Is that possible? Pre heat and shoot hot? Or just stay away from the test altogether? Thanks for your insight!

Allison

**A** Hey Allison,

How are things in Idaho? Tell me how the boots and handles turned out. As for the porcelain throne—yes, it can be powder coated. I would spend extra time with prepping the surface. I recommend cleaning with a decent detergent and follow with a good clean rinse. I would also consider a light blast with something like aluminum carbide or fine glass beads to roughen the surface. Then preheat and powder coat with a laundry appliance grade powder, which will have the water and cleaner resistance to withstand the rigors of the crappiere. If you need a specialty product we can come up with one for you. Like they always say, “it’s a crappy job but someone has to do it.”

— Joe Powder

## I Don't Zinc It's Necessary

**Q** Joe,

Do you have any articles that talk about

the pros or cons of powder coating with zinc primer vs. galvanizing and then powder coating over top? Thanks for sharing your wealth of knowledge. :)

Sincerely,  
Allison L.

**A** Hi Allison,

I like the idea of bare steel (non-galvanized) being properly cleaned and pretreated followed by a good epoxy primer (doesn't have to be zinc rich), then a high quality polyester topcoat. The most critical step is cleaning/pretreating the steel. If it's hot-rolled pickled and oiled (HRPO), then the cleaning/pretreating step is a bear. The challenge here is to completely remove the “oiled” layer. This can sometimes require a strong acid etch stage in your pretreating scheme.

If it's cold rolled steel, then the pretreatment process is much easier. A good alkaline cleaner followed by a rinse and then a chemical conversion like iron phosphate or a zirconate followed by a rinse and perhaps a sealer.

It's a very good idea to gel, but not cure, the epoxy primer prior to applying the topcoat. This enhances intercoat adhesion by allowing the unreacted chemical groups in the epoxy to react with carboxyl groups in the polyester.

I don't like HDG (hot dipped galvanized) because it's variable, it needs degassing and pretreatment can be tricky. A really good electrogalvanized surface is a different story, but a job coater like yourself probably doesn't see electrogalvanizing too often.

As for an article about this, I dunno. (*Editor's note: Please visit [www.powdercoatedtough.com](http://www.powdercoatedtough.com) and use the search browser to find articles that may have been written on this subject.*) I've written about HDG and the challenges it brings, but I don't think I've compared it to epoxy. Perhaps my next column?

— Joe Powder

## Quit Touching Me!

**Q** Good day, Mr. Powder,

Currently we are having issues with leaving touch marks on the parts from where they contact our cart. It leaves a black line on the part, but we have been able to remove it with rubbing alcohol.

Our current oven setup is turning parts out of the oven at roughly 100 to 350°F (38 to 177°C) with only 3-4 minutes of cooling before they are

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placed onto our carts. I believe that our parts have not had the proper amount of time to cool down and harden before they are placed on the carts. Most of our carts are lined with rubber edging, nylon or plastic tubing to keep from scratching the metal cart structure.

My first question is: what is the general amount of time a part should rest before being handled or worked with? Additionally, is there a material or handling method that you might recommend for handling them with our current setup?

Thank you,  
Alan Y.

**A** ...and Good Day to you, Mr. Y.,

Your observations are good. The powder coating surface may be a little too soft to be contacted with the cart liners. Powder coatings, being thermosetting materials, harden or crosslink, when exposed to the proper curing conditions (heat and time). This thermosetting phenomenon causes the polymer and curing agent to chemically react thereby creating a harder, more durable film. The hardness of this film will vary depending upon its temperature. Most thermosetting powder coatings reach a glass transition temperature (a.k.a. Tg) of somewhere between 185 and 248°F (85 and 120°C). Tg is the

temperature in which the coating goes from a hard, glassy state to a softer rubbery condition.

Therefore it is important to avoid handling a powder coated part if it is above the coating's Tg. Most polyester and hybrid type powders have post-cure Tgs in the 185 to 203°F (85 to 95°C) range. I suggest that you allow a part to cool to room temperature and see if you still observe marking. If that is the case, then you may need to change the composition of your cart liners. Alternately you can switch to a powder coating that has a higher Tg. One other thing to check is whether or not the powder is completely cured. Solvent rub testing is a simple means to ascertain degree of cure.

Another option is to request a lower curing powder coating from your supplier. With a lower curing product you can lower the temperature of your oven and hence the parts will exit at a lower temperature and take less time to cool. It is critical to accurately measure the temperature of the powder coating surface (you probably have already thought of this). A non-contact IR thermometer is a good way to do this.

— Mr. Powder

*Joe Powder is our technical editor, Kevin Biller. Please send your questions and comments to Joe Powder at [askjoe powder@yahoo.com](mailto:askjoe powder@yahoo.com).*

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