



Pretreatment and Film Build

Q Joe, I have a question concerning the relationship between pretreatment chemicals (currently using a zirconium-based pretreatment in a six-stage system with an alkaline cleaner in stage one) and powder coat thickness. Can the condition of the bath play a role in how thick the dry film thickness is on a part? I don't think so, but others in my organization feel like there is some cause/effect on bath and thickness.

Terry T.
La Vergne, TN

A Hi Terry, You pose an interesting question and your instincts are correct. To avoid confusion, there is more than one way to consider this question. First, does pretreatment affect the measurement of powder coating thickness? The answer is, yes. The pretreatment obviously is a physical layer on the surface of the substrate and therefore, must be considered when measuring film thickness. This issue is easily managed by standardizing your film thickness gauge to read zero on the pretreated substrate, otherwise you'll be measuring the coating thickness and the pretreatment layer. In reality, the pretreatment is a rather thin film typically a couple tenths of a mil, so it doesn't significantly skew the thickness measurement, but precision is precision.

The question you are asking, however, deals with the effect pretreatment has on film build. Does pretreatment influence film build during application? Does the quality of the pretreatment cause the film build to be higher or lower? My experience says no, it does not. To affect film build it would have to affect the continuity of the part to ground or insulate the substrate surface to lower the conductivity. I don't think the layer of pretreatment is thick enough or insulative enough to cause either of these phenomena.

I hope this helps to settle your dispute. If you really want to nail down this conclusion you could run an experiment by coating an unpretreated part vs. a pretreated one using the same application conditions and see if you observe a difference.

Best regards,

- Joe Powder

Camera Coatings

Q Dear Joe, I was in the Ohio State engineering capstone class of 2015 and was briefly in contact with your company during our thesis. I remembered your name and have come across a paint finish conundrum. I'm wondering if you would be the expert I need in order to figure it out.



I have this finish in mind and I am trying to find the industrial process to make it or its specific name. I've been searching for months with no luck. It is common on DSLR cameras. I have attached an example to the email. Is this powder coating?

Thanks so much for your help,

Sam S.
Columbus, OH

A Hi Sam, Thanks for contacting me and remembering us. The finish on that spiffy Nikon DSLR looks like

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a liquid coating. Let me break it down. The top and bottom caps of the camera body look to be a two coat system. First a smooth dead matte black (obviously), let it set and dry, then a splatter coat to give the semi-regular “bumpy” pattern. Liquid paint technologists sometimes alter the base coat (first coat) by thickening it then use it to create the splatter.

The body proper probably is coated with the same smooth dead matte liquid paint. The texture, as you probably can tell, is from the embossing of the metal.

So - there's a high probability that the coatings are not powders. That said, the powder coating industry has developed a really awesome “zero gloss” black powder for industrial photo imaging machines. Similar powder coating technology has been developed for a watch company out of Detroit.

If you need a special coating, just let me know. I can connect you to the right people.

- Joe Powder

Sam's response:

Joe,

You're the man! Thank you so much for the information. Way more than expected and so helpful. It is exactly the info I was looking for. I have a customer looking for a sturdy rigid surface like this one. Your insight has helped me a ton.

By the way, I wear one of those cool watches made in Detroit!

Thanks again,

Sam

Unnecessary Scraping

Q Hi Joe,

It has been a while since I have required your expertise. I am no longer at a lighting company but at an actual coating company. Here is my question. What ASTM Adhesion standard is best suited for a cast iron 46LB valve that has a red oxide epoxy powder coating? Mils required are between 4 and 8. This part is shot blasted. The TDS (technical data sheet) for the paint quotes ASTM D3359. I have read this adhesion standard and for a porous material I think that it is adequate, but I am not sure.

The other part that I am struggling with is that the customer is cross hatching with a box knife ASTM D-3359 method B and scraping back and forth over the crosshatch. When this is done

it does tend to gouge out paint. When I, on the other hand, perform the ASTM D3359, I follow the test method B with a wider space between squares. I scratch, adhere the appropriate test tape, rub the top of the tape and pull. I am getting good adhesion using this method. However, when the customer does their adhesion test, crosshatching and then scraping the hatched area with a knife, they get coating that comes up.

But per the supplier's TDS, in the ASTM test method there is no mention of scraping. By any chance is there an ASTM where this process exists? I am thinking that if the customer is requiring a more stringent ASTM for the valve castings, then I need to look at the paint performance of the powder vendor. My main concern is that we are passing the ASTM test done per standard but failing from the customer perspective because of their added scraping. Any advice would be outstanding.

Best regards,

Bonnie H.
Racine, WI

A

Hi Bonnie,

Thanks for the question and congrats on your new position. It's great to hear from you. I'm sure that your new company is very fortunate to have someone with your skill level on the team. As for your adhesion conundrum: I recommend that both you and your customer ascribe to ASTM D3359-B. This is the crosshatch with tape adhesion test methodology. It is the most common and provides the best results and precision. I'm a bit surprised that the customer would use a destructive test such as you describe. Scraping the crosshatch with a knife is too extreme.

I hope that this helps and feel free to contact me with any of your future powder coating questions.

Kind regards,

- Joe Powder

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