

Ask the Experts

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Your questions answered by  member experts.

You have questions, we have answers. In each issue of PCT, our extensive network of powder coating experts provides information to help you with your powder coating challenges. Let us know what's keeping you awake at night, and we'll do our best to help you get a good night's sleep!

Sweet Carolina

I am currently working on a design of a prototype deck repair in a commercial (condo) setting for a property located on the beachfront in South Carolina. The client requested a cable rail system to go back in place of the original rail system. We have selected a design and a vendor for the cable rail system and specified stainless steel to be used for rail posts. The vendor uses 316 stainless steel and will powder coat the posts to the client's preferred color.

We are familiar with AAMA 2603-5 for aluminum coatings, but I just wanted to clarify if there is an equivalent standard for powder coating of stainless steel to ensure we are getting a product that is going to stand up to the elements. Our vendor has a sandblasting operation and a five-stage iron phosphate washer with a non-chrome sealer. Any advice would be greatly appreciated.

To the best of our knowledge, there is not a corresponding specification system in place for stainless steel. Painting 316 stainless can be tricky; by its very nature, it is both chemical and corrosion resistant. The system you mentioned should work fine. Typically, any conversion coating is needing the presence of iron (for iron phosphate) or fluoride in the pretreatment chemical (for etching aluminum) to get these substrates to produce maximum effectiveness. 316 stainless does not contain iron and fluoride and will not provide a chemical etch.

If you sandblast the parts, this will create a mechanical bond between the surface and the paint. By processing the

sandblasted parts through both alkaline cleaner (removes organics like oils and grease) as well as an iron phosphate (which also contains detergents to remove any acid loving soils like metal fines), rinsing in between, and applying a silane based final seal (adhesion promoter), the paint should not have a problem bonding to the surface.

The paint, not the pretreatment, will be doing all the work. The pretreatment will provide clean-only capabilities. To get the best finishing results, a zinc rich powder primer can also be considered as the first coat.

What's the Rub

I am hoping you can help with information on the MEK rub test standards such as the procedures and if there is an ASTM standard for this? I have heard about it and need to perform the test for one of my customers but am not sure how to go about it.

A solvent cure test has been devised which will differentiate between cured, partially cured, and uncured thermoset powder coated products. Problems with the cure of powder coatings can cause failures of physical properties such as impact resistance, flexibility, and adhesion. Incomplete cure of powder coatings can also contribute to problems with chemical and corrosion resistance in a hostile environment. Therefore, a quick, reliable method for determining cure of thermoset powder coating is needed.

The full test procedures can be found in either *Powder Coating: The Complete Finisher's Handbook* which is sold in the PCI store or in the ASTM-D4752 standard.

Up to Standard

I am trying to find out more about industry standards that are out there for powder coating. For example, many items will have to meet an ASTM standard. I was wondering if there was something similar for powder coating requirements. Thank you for your help with my research.

There is not any one specific powder coating industry standard. The determination of what type of pretreatment and powder coating are required is based upon the substrate to be coated and performance requirements of the coatings. For the automotive industry, this typically includes using galvanized material, zinc or zirconium pretreatment coatings, E-Coat (electrodeposition), and a final powder coat to achieve a durable, high gloss, long lasting finish. Throughout the finishing process, many ASTM specification procedures are

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SYNCHRONIZE IT CHANGE IT INTEGRATE IT AUTOMATE IT COMPLETE IT.

used. These all end up being specified by the producer of the product (you).

To help you determine your performance requirements we suggest talking to powder coating and pretreatment suppliers who can help you determine your specifications. You can get a list of suppliers at www.powdercoating.org/directory. You can also purchase PCI's *Powder Coating: The Complete Finisher's Handbook* from the PCI store: www.powdercoating.org/handbook. This is the "bible" of powder coating with information on powders, pretreatment, equipment, quality, and testing.

Foodie

Hi there, I am a project engineer working with the food industry. I had a query about polyester powder coatings. We must coat the inner surface of some storage bins with a powder coating. Flour and food material must pass through these bins. I want to have a clarification about whether polyester powder coatings are food-safe, or do I need to consider another alternative?

Yes, there are FDA approved polyester powder coatings. Products are available for use in food contact applications as all raw materials conform to meet 21 CFR 175.300 (resinous and polymeric coatings) as well as 21 CFR 178.3297 (colorants for polymers).

Most powder producers will be willing to work with you to provide a coating to fit your needs.

Proof of Performance

I'm wondering whether you have any case studies on the benefits/performance of powder coating vs. liquid spray painting? We are in the process of performing a feasibility study on replacing our current liquid spray painting system with powder coating; however, we cannot find any specifics on performance levels. I appreciate that there are many benefits (durability, automation, safety, environmental, etc.), but I'm hoping to view some quantifiable evidence around it. Do such information/case studies exist?

It seems there is no direct performance study comparing powder coating to liquid coating. However, both liquid and powder coatings are tested by the coatings manufacturers for many areas such as salt spray, UV resistance, chemical resistance, color and gloss retention, and durability to name a few. Powder coatings consistently perform the same or better than liquid coatings with the advantage that they are a green product with little or no volatile organic compounds (VOCs) or hazardous air pollutants (HAPs). In addition, powder coatings are safer for use in the painting facilities with fewer restrictions on safety requirements and waste handling.

If you would like to read a general article about a liquid paint line converted to powder, we recommend "A Successful Conversion from Liquid to Powder" from our September/

October 2020 issue. If you are looking for a specific performance type, it is recommended that you talk with a coating supplier that provides powder coating. They would be able to steer you in the right direction to meet your needs.

Lighting the Way



I have some street light metal poles that were galvanized and powder coated. The customer stated that they have coating irregularities of various lengths throughout each pole at various spots. The manufacturer of the poles is telling us that the irregularities on the pole are due to the pole being galvanized. I need clarification and a second opinion if it is a reasonable assumption that the irregularities on the pole as seen in the picture are from the pole being galvanized?

Based on the straight line of the defect, it could be the result of one of two root causes. Either it's the weld seam line of the tube and it has issues, or this was hung horizontally and there's some chemistry (pretreatment) that accumulated on the bottom edge and didn't get rinsed immediately. If the surface has any type of irregularity it will show up even after it has been powder coated as the powder will be the same thickness across the entire part. Take a look at the raw part prior to the coating operation and see how the weld appears. Next check to see if there is any accumulation of pretreatment on the part before powder coating.

Impactful

We will be purchasing an impact tester to test our powder coat finishes in accordance with AAMA 2605. The PCI Architectural Comparison document on your website states that AAMA 2605 uses ASTM 5420 for impact testing. My understanding is that ASTM D2794 is to be used as noted in the table on page 26 of the ASTM D5420; for testing the impact resistance of flat, rigid plastic. Whereas, D2794 is for testing the resistance of organic coatings to deformation. Can you please clarify which is the appropriate test?

AAMA 2605 does in section 8.5–Impact Resistance state to follow "ASTM D5420 which describes a method to compare relative ability of a material to resist deformation caused by physical impact on a small area. In finishes standards, this test is useful in determining the ability of a coating or laminate to maintain adhesion to the substrate after impact." The procedure of using a 5/8-inch diameter round-nosed impact tester is similar to the ASTM D2794 test.

Have a question for our powder coating experts? Send it to asktheexperts@powdercoating.org.