

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!

A Question for the PCI Coneheads

We manufacture many different products that are powder coated. We have a couple of powder suppliers that provide us with TGIC polyester, white, smooth, and high gloss. However, our operators have said that the powders from the two vendors are not the same and required changes to the powder gun settings. They also noted one powder produces a lot more waste. I have been told that the height of cone (HOC) is different. I know nothing about HOC or why it would matter. Hence, my question is can PCI explain what this means?

This is a potentially tricky area. First, let's broach an explanation of HOC or height of cone. This refers to the angle of repose of the dry flow of the powder. One typical test used to measure this is ISO 4324:1977 *Surface active agents—Powders and granules—Measurement of the angle of repose*. HOC comes from measuring the height of the cone of powder by taking a fixed quantity of powder and pouring it onto a flat surface to form a cone. The angle formed by the side of the cone measured provides an indication of the flow of the powder. Normally, this is used to test from one batch of powder to the next, or a different powder entirely. The problem is that this measurement in itself does not directly test the ability of a powder to fluidize well.

There is a fluidity test, ISO 8130:1992 *Coating powders*, where the flow properties of powder/air mixture are tested. Particle size distribution (PSD) and performance would be based on the customer's application. For a particular

application there needs to be a balance between HOC and PSD. Since the specific gravity of your two powders are close, the distribution, mix and any other additives seem to be having a greater effect on the materials. It may be that the operators are going by the appearance of the cloud versus the actual powder output which could lead to this perception difference. In other words, to make one spray pattern look the same it may require a higher output setting although it may not be warranted. The best way to compare this is to take the current setting used by one, put a pre-weighted vacuum cleaner bag over the end of the gun, turn off the kilovolts (Kv) and spray with a stopwatch for 30 seconds. Post-weigh the bag and multiply by two to determine the grams per minute accumulated. Then repeat the process with the other material at the same setting or at the setting the operators feel is required due to the visual cloud appearance. You will likely find a significant difference. Testing the application may require a leap of faith at a lower perceived setting. However, if coverage is achieved then you should be able to see the performance difference.

Good As New



I sent you a picture of my mailbox that was powder coated but over the years, does not look as good as it did when it was new. I am wondering if this is typical or if the coating failed? I'd like to spruce it up so I'm also wondering if it is possible for me to recoat the mailbox without sanding it back to bare metal?

Many times, one picture doesn't tell the entire story. First, in the picture it appears that the coating on the mailbox hasn't weathered well; however, there are areas that look better than others. While the coating looks as though it has chalked, it also appears that the chalky residue can be wiped away to some degree. It is difficult to be sure of the reason for the poor appearance without knowing the type of powder used along with other details of the powder coating process. Be that as it may, the good news is yes, the mailbox can be recoated. After removing all of the decorations on the front of the mailbox, clean the mailbox with soap and water—rinsing well. Since

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there is no way of knowing what coating was applied initially, lightly scuff sand the exterior to help improve the adhesion to the current coating. Then, recoat with a weatherable polyester coating (either TGIC or primed) if you wish to powder coat it. Otherwise, an outdoor liquid coating can be used.

Waste Not, Want Not

We have been in operation for several years and have been disposing our waste powder as hazardous waste. As the company has grown, we have more and more waste to dispose of and it is getting very expensive. I have reviewed the safety data sheet of our powder and do not find any hazardous materials listed. What is the proper method to dispose of my waste powder?

First, congratulations for taking the time to read your safety data sheets. That is the very first step in determining what method is needed for disposal. Some ingredients are considered toxic, such as arsenic, barium, cadmium, and mercury to name a few. You should consult with your landfill or local authority having jurisdiction for a list of hazardous materials or toxic materials.

If your waste powder does not contain any hazardous elements, the best method of disposal is to collect the waste powder, place it in an aluminum tray, and put it in your cure oven to melt and fuse the powder into a solid block. This solid block can then be disposed of with your normal waste. Alternatively, a special disposal plastic bag designed for waste powder may be used to collect the waste powder and dispose of it. Be sure to not just dump loose powder into a garbage bin as it can become airborne while transporting or at the landfill as it is dumped.

If your powder contains any toxic components, then you must follow local, state, and federal guidelines and regulations for disposal of the hazardous materials.

Spark or No Spark

I am in the process of meeting with our local fire marshal to get our equipment approved and permitted. My question is, if we are using a handheld gun to apply powder coating, is a flame detection device required in the booth? The NFPA (National Fire Protection Association) 33 code does not specifically spell this out for a handheld gun, but it does state that requirements in Chapters 12 and 15 still need to be adhered to. That's confusing. I would like to better understand so I can discuss the requirements with the fire marshal.

Technical standards and requirements can certainly be difficult to decipher. You've come to the right place! Here's a quick and easy explanation of the standard in question. If you are only using manual guns, a flame detection device is not required. Manual guns follow the requirements specifically noted in Chapter 12 of the NFPA 33 standard

“Handheld Electrostatic Spray Equipment.” When automatic guns are being used, the requirements outlined in Chapter 15, Section 15.5.11 “Protection for Automated Powder Application Equipment” must be followed. This section notes that a detection device is only required for an automated system. The rationale behind the different requirements for a manual gun vs. automated is that should an operator see a spark or flame, he would immediately stop spraying powder in the booth and the fuel source would be stopped. When an automatic gun or guns are in use, there may not be an operator in the area to see a spark or flame. Thus, a detection device is needed to automatically turn off the powder delivery in the event a spark or flame is detected.

Staying Healthy

We are in the process of opening a new powder coating shop. What would be the recommended PPE (personal protection equipment) that I should provide for my employees?

Congratulations on your new shop and thank you for thinking of your employees as there are several health and safety protocols related to handling and applying powder coatings. First, everyone should review the safety data sheet (SDS) and product safety data sheet (PSDS) provided by the manufacturers of the powder coatings as well as pretreatment chemicals and other products you use in your operation. It is generally recommended that any person handling powder coatings utilize NIOSH-approved safety glasses with side shields, gloves, long sleeve shirts, and long pants. Anyone spraying powder must wear a respirator, and applicators should take measures to prevent powder contact with their skin.

If you reference the May/June 2018 issue of *Powder Coated Tough* (<https://digital.powdercoatedtough.com/2018/12-03-May-Jun/>) we provide a number of safety tips, including an article dedicated to PPE. For more health and safety guidelines and other helpful tips for your powder coating operation, please use PCI as your resource!

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