



## The Pursuit of Thickness

**Q** Hi Joe,  
Thank you for giving solutions in the past that have helped us improve our powder coating products. We will try to learn to develop our products more. However, if you don't mind, please advise us on another issue. We are struggling to compete with competitors in the market at the same application system conditions, the same type of powder coatings gun, the same voltage level, the same flow, and the same line speed. The resin ratio in the formula is 60-70% and we use a special anti-stat additive, but our powder coating only gives the product a thickness of 30-40 micrometers, while the powder of the rival company can produce products with a thickness of 60-70 micrometers.

What's the problem with our product? We are trying to find the best solution and look forward to your comments.

Best regards,

Tu N.  
Vietnam

**A** Hi Tu,  
Thanks for your message. I think I understand your problem. Here are some things I would investigate:

1. Particle size: This is the single most important property when it comes to transfer efficiency. Questions: What is your median (D50) particle size? More importantly, what is the percent below 10 microns and above 100 microns? How do you measure particle size distribution? How do you control it?

2. What is the specific gravity of your powder? Is it

similar to the competitive product? Is it higher? Higher SG can reduce transfer efficiency by losing particles due to gravity (falling to the booth floor).

3. How well does your customer maintain their application system? Do they have good grounding (earth) on the hangers and hooks? Are the spray guns well-maintained? How often do they provide maintenance for their equipment? You may be experiencing poor application performance due to poor maintenance on the spray guns, reclaim, and booth.

BTW, I'm not a big fan of adding electrostatic additives to powders. I think that it's a band aid approach and should be tried after all else fails.

Please let me know if you have further questions?

Kind regards,

- Joe Powder

## Silent Fluidity

**Q** Dear Joe,  
Greetings from Johannesburg. I have a question. How can I increase the fluidity of my powder coatings?

Thank you,

Johann K.  
South Africa

**A** Hi Johann,  
Increasing the fluidity of a powder coating and really any powder can be tricky business. For our readers unfamiliar with fluidity, we're talking about the behavior in which a powder can allow air to evenly space the powder particles from each other in air. This is a critical property in the application of a powder coating.

In a powder application system, the bulk powder is introduced into a fluidized hopper. The fluidized hopper is either a cylindrical- or box-shaped container that has a porous Teflon plate at its bottom. Compressed air is passed through this porous plate to fluidize or prepare the powder to be transported through a powder pump, then hoses, and finally through a spray gun. And fluidity is crucial in getting the powder to feed evenly through the system.

Now to your question, Johann. A few factors are important in optimizing fluidity. First, particle size distribution is critical. Note that I said "distribution"

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and not just particle size. This means that you have to manage the entire size distribution of particles. Most important is to minimize “fines.” Fines can be defined as particles below 10 microns in diameter. Less is better and you should strive to have less than 6-7% fines. Too many fines will cause clumping, agglomeration, and poor fluidity. Ditto for large particles. By large, I’m talking about 100 microns and above. These are more difficult to physically move with compressed air and therefore should be minimized. I would target less than 1% over 100 microns for the best fluidization behavior.

After you nail your particle size distribution, it’s time to incorporate a fluid flow or dry-blend additive. These are fumed silicas or fumed alumina and act as ball bearings between the powder particles. Keep in mind that a little goes a long way. The addition should be made during the powder coating manufacturing process after the extrusion process. Typically, people add the fumed material with the extrudate chips (flakes) just prior to the pulverization process. This ensures that the agglomerated fumed silica or alumina are evenly dispersed. Otherwise, they can cause seeds and bits in the finished powder film.

One problem is that the fumed material can get pulled out of the grinding system and into the waste stream that deposits into the baghouse. Some manufacturers have devised ways to introduce the silica after the grinding process with a deagglomeration technique.

I mentioned a little goes a long way—I would shoot for a

concentration well under 1%, say closer to 0.2%.

Hope this helps and that you and your loved ones are all doing well in SA.

Warm regards,

*- Joe Powder*

Joe Powder™ is trademarked and owned by Kevin Biller, technical editor for Powder Coated Tough. Please send your questions and comments to Joe Powder™ at askjoepowder@yahoo.com or visit askjoepowder.com to listen to their “powdcast.”

**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!



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