How to rework powder-coated rejects

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No matter how well your powder coating system operates, it will generate a reject, or defective part, occasionally. The decisions you make at this time can mean the difference between salvaging the part at minimal cost or producing more costly rejects that you may end up scrapping anyway. The following hints can help you set up the most beneficial and least costly rework procedure for your company.

Prevention
Of course, the first line of defense against having to rework parts is to prevent rejects in the first place. To accomplish this goal, set up and maintain your equipment and train your system operators properly. [Editor's note: See “How to set up your system for a new part,” August 1991 issue; “Housekeeping and finishing quality—there is a connection,” December 1991 issue; and “How important is training? February 1991 issue.]

The next line of defense is to establish appropriate quality standards for your product, your customer's expectations, and your application method. This will deter you from making mistakes when judging defects on parts.

Another way to prevent rejects is to catch defective parts before they enter the cure oven. This can be accomplished easily by inspecting parts after they exit the powder spray booth. Simply remove the rejected part from the conveyor, remove the uncured powder, and send it back through the spray booth for recoating.

Identification
If prevention has failed and a reject has been detected after it exits the cure oven, some other factors must be considered.

First, is the defective part a reject that can be reworked, or is it one that should be scrapped? If the rework cost isn’t justifiable or the defect isn’t correctable, the part should be tossed. Making the right decision at this stage can save you a lot of money in the long run.

Second, what type of reject do you have? Is there a defect in the metal, such as a dent, scratch, or bad weld?

If so, recoating the part will not correct it. Remember, powder coating is a finish, not a filler that can hide major metal defects. Rejects caused by dirt, contamination, inadequate coverage, and other surface defects, however, can be reworked with minimal difficulty. Identifying the type of reject you have is imperative to your rework process.

Rework procedures
After you have identified rejected parts for rework, you will need to have a good rework procedure in place to help recoup some of the expenses you have already incurred in finishing these parts. There are several ways to prepare defective parts for respraying. Following are the more common ones:

Spot sanding. Localized surface defects can be sanded from the part. The sanding should be carefully done with the appropriate grit paper and finished with a feathered, or smooth, edge.

Sand, glass-bead, or plastic-media blasting. Blasting with sand, glass beads, or plastic media is used most often to remove the
defective, cured powder coating from the entire part. This method is especially appropriate when spot sanding will not correct the defect. If you use this method to correct spot defects, you will still need to hand sand with grit paper to get a feathered edge.

**Chemical and oven burn-off stripping.** These methods have many advantages if you want to strip all the cured coating from the part. Using chemicals or placing parts in a burn-off oven is a fast way to strip large batches of parts. These methods also completely remove the coating from the part, which is a particularly effective technique when stripping oddly shaped parts or parts with deep recesses or corners.

**Liquid touch-up paint.** Liquid touch-up paint can be used to correct a small, uncoated spot or a lightly covered spot on a part. It should not be used on spots that are in high-appearance areas. When choosing a liquid touch-up paint, consult with your powder coatings supplier. Most liquid touch-up paints air dry. Spot sanding may be necessary for proper adhesion to the powder-coated surface.

If film thickness is more than 3 to 4 mils, recoating may be difficult because the ground to the part will be insufficient for good electrostatic attraction. Sometimes, preheating the part or lowering the spray-gun voltage helps. If neither one of these tactics works, however, complete striping of the part may be necessary before you can recoat with powder. You can also coat the recoated part with a darker color to provide better hiding at a lower film thickness.

**Post-rework procedures**

After you have removed the defective coating from the part, you will need to prepare the part for recoating. In all cases, the defective part should be rinsed in the clear-water stage of your surface preparation system to remove dirt and surface contaminants. This will help prevent the part from being rejected a second time after recoating.

Send the part through all stages of the surface preparation system again if the pretreatment coatings were removed during rework. Spotting from pretreatment chemicals on the recoated part is normally covered with new powder coating. You may want to shut off the sealer stage to reduce the spotting. Review your situation with your chemical supplier to determine which washer stages should be turned off when reworked parts are processed.

**Recoating procedures**

Recoating reworked parts with powder is surprisingly simple. The primary rule is to treat the reworked parts as raw stock. The surfaces that needed powder coating the first time through the spray booth will need to be recoated in the spray booth after the rework has been done.

A dry-spray appearance will be apparent on the part’s surface if the second coat of powder is not as complete as the first coat. Powder must be applied at a minimum film thickness to flow evenly and smoothly in the cure oven. This film thickness is dictated by the powder supplier and is based on the powder’s formulation.

**Conclusion**

If you’ve taken preventive measures and you’re still producing defective powder-coated parts on your powder coating line, you must decide how to handle rework. Sound judgment, proper defect identification, and efficient rework procedures will help reduce operating costs.

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