



Pretreatment & Organic Finishing

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Too Much of a Good Thing Can Be Costly

We typically believe that we can eat food that looks good, smells good, and tastes good—especially if we know who did the cooking. When grandmother fixed the meal, everyone rushed to the table to enjoy those delicious combinations of meat, potatoes, vegetables, and desserts. Most people tend to order the same foods when dining out, expecting the meal to be prepared the same as in the past.

It is very similar when a paint line starts up each day. Every person is expected to use previous training and experience to perform the same quality job as the last.

Sometimes, however, we find that too much dessert is unhealthy. It also can be unhealthy for a paint line to use more than necessary, or not enough, solvent for thinning. If the wrong amount of solvent is used, it can result in poorly finished parts.

Solvents Serve a Purpose

Thinners (solvents, VOCs) are added to obtain the proper viscosity for spraying paints, and to obtain a desired result in the finish. Paint can be thinned with different solvents, or combinations of solvents, to provide a better flow in the spray, or obtain a better result in the cure (bake). Solvents are also used to speed the drying process, or to increase the electrical properties for a better wrap-around during electrostatic application. This can help to provide better coverage of edges and hard-to-reach places on parts, and overcome what is called the “Faraday cage” effect (a term used to describe the tendency of paint to go to the closest point of ground—the edges or outside a box instead of the back or inside corners).

Paint can be thinned to a predetermined spraying viscosity with internal heaters and circulation. A

“paint kitchen” uses heaters to thin paint before spraying. Paint is circulated continuously through stainless steel tubing, from the drum to the paint spray booth and back, until the trigger of the spray gun is opened to apply at a viscosity determined by the temperature.

Most paints should be sprayed at 65 °F or above, or in surroundings where the temperature is above 65 °F. It should not be sprayed above a range of 130–150 °F, unless it has been formulated to do so. Excess heat will cause the paint to cure in the lines, creating trash from dried paint resins that will contaminate fresh paint as it flows through the tubes.

Paint becomes thicker as the temperature drops. If the paint gets too cool, it becomes more difficult to atomize, which can cause squirting and uneven application problems. Too much heat or solvent will cause the paint to become thin, and can result in runs and coatings that are too thin.

Controlling Pollution

There is a trend toward using ready-to-spray high solids, which produce low amounts of volatile organic compounds (VOCs), to replace conventional solvent paints. The use of high solid paints helps to control the amount of solvent escaping into the atmosphere. In the past, conventional paints have typically contained four to five lb/gal of solvent, and weighed an average of nine to 10 lb/gal. They required thinning with another two to three lb of solvent. The use of such paints now would require a capture and treatment system to comply with regulations.

High solids contain in the range of 2.8 to 3.2 lb/gal of solvent, and weigh an average of 11 to 13 lb/gal, allowing the use of dry filters, or

water-wash paint spray booths, to capture overspray.

There is also a trend toward using powder coatings. They create little or no VOCs during spraying or curing.

Maintenance

Good maintenance and housekeeping procedures are a “must” for a paint application line. Clean all systems immediately after each shutdown, color change, and shift change to avoid problems.

Improper maintenance and cleaning can cause color contamination. Contamination with black will cause white to darken, and contamination with white can cause black to become light or speckled.

Improper cleaning can allow hard chunks to set up in lines and spray guns, causing flow problems with the next application. To correct this, painters sometimes increase air pressure to provide a higher volume of paint. This, in turn, can cause residual paint to atomize, resulting in unacceptable gloss, thickness and coverage in the finish (called surface hiding). Excessive overspray is unfriendly to the environment, is not economical, and can expose operators to higher amounts of VOCs.

Improper thinning and poor maintenance practices can lead to a number of problems in a paint line. Most of the problems can be avoided by using good judgment. It’s like the situation I find myself in sometimes following a holiday feast. If I eat too much, I have trouble getting into my pants and shirts, and I don’t feel good. If I use good judgment, however, my clothes fit properly, and I feel much better.

So, pay attention to what you are doing, and use good judgment. It can help you to be successful in business and in life. ○