Madison Chemical Industries Inc.

WASTE NOT, WANT NOT

A Guide for Minimizing Coatings Consumption

By Ross Mitchell

A frequently asked question revolves around the issue of "waste". What will be the difference between theoretical coating consumption and actual? It's a critical question to the applicator, the O.E.M user, the specifier and the end customer.

In this paper, we will try to provide some guidance. In the first section, we'll make some comments that apply equally to plural component and single component formats. Then we will deal with each of those two individually and raise a few points unique to each.

SOME GENERAL COMMENTS

We at Madison have found that we can be of the most help in this area by breaking "waste" into its component parts and providing some common sense tips in each area. The three parts are: true waste, overspray and overbuild.

Waste The most critical thing we've learned over the years is that the difference between theoretical and actual consumption probably has little to do with waste in the normal sense of the word. Waste is product left in the container or the hose, material consumed in the course of setting up or shutting down the spray equipment and similar losses of this type. With a bit of common sense, waste in the true sense can be held down to 5% or so. Examples include: -

- ✓ always store product according to manufacturer's instructions;
- ✓ always seal partly used containers;
- ✓ always drain near-empty drums as soon as you switch to new ones.

Overspray A much bigger factor in determining yield is overspray. In our experience, losses of 30% are not unusual. We'll deal with this further in the sections below, but some factors common to both plural and single component spray equipment include oversized or worn nozzles, an overly wide spray pattern and applicator inattention. The answer lies in training and awareness.

Most applicators have never given much thought to overspray; they get paid and praised for pushing coated product out of the other end of the spray building. Sometimes there are penalties imposed for being wasteful, but seldom do we see sprayers rewarded for coming up with innovative ways to reduce waste. Overspray reduction is one of the topics that we cover at initial set-ups and again during our refresher training programs.

Overbuild The third factor to consider is overbuild. If a specification calls for a minimum of, say, 15 mils (375 microns), the sprayer with no professional training will tend to put on an average of 20 mils to achieve that 15 mil minimum. *That's a whopping 33% difference between actual and theoretical!*

What to do?

We recommend training, practice, monitoring and automation.

Training Bright sprayers -- people who are well paid and thoroughly trained -- will pay their salary back in saved material simply by working on their technique. Your coater should be making at least as much as a journeyman welder.

Practice Plenty of experience and practice are required to achieve a smooth, even, calibrated spray technique. Allow and encourage your sprayer to experiment and come up with his own ideas.

Monitoring This makes a huge difference, A little later, I'll tell you a dramatic, but typical, example of that.

Automating In many cases, automation pays for itself almost overnight. With the internal lining and external coating of pipe, for example, the difference between theoretical and actual consumption can be as little as 10% -- an overwhelming competitive advantage.

Changing the specification -- You may want to get the specification changed, in our example above, to "average of 20 mils, minimum of 15". This provides a better end result and puts everybody on an even playing field. Another possibility is to build some downward leeway into the specification. We are not adverse to having a few "light areas" on the structure provided the coater compensates for that by carrying out holiday testing on the coating to make sure that every square inch is pinhole free.

A Caveat *Let common sense prevail however; the cost of the coating is tiny compared to the cost of what you are protecting. On a multi-million dollar*

pipeline, we sometimes see owners and applicators going into orbit over an extra 10 cents per square foot of extra coating protection. We also see, almost constantly, people fighting tooth and nail to get us as a coating manufacturer to approve a dangerously thin coating film on a critical application, while being oblivious to the fact that applicator training and awareness are more fruitful areas on which to focus.

Taking Secretarial Notes, can make the difference ...

I mentioned monitoring above. This is a very interesting phenomenon. Many years ago, I worked with a good customer on a serious waste problem. By looking at their coating consumption and their output of coated structures over a three month period, they had realized that the material consumption was about double the theoretical. I suggested that we simply ask the sprayer to keep a log; in a secretarial notebook, he was asked to mark on a page all the structures that he was able to coat per drum set of coating (a drum set is one 55 gallon drum of "A" and one 55 gallon drum of "B"). I must confess that I was a bit sneaky and told him that we simply wanted to establish a base line and that we would later try out some things to optimize consumption. Of course, what he didn't know was that we already had a base line.

Our real purpose was to find out the difference, if any, that would occur if the sprayer were simply thinking about it. To everyone's amazement, the consumption per square foot dropped by 18%**...** and that was before we made any actual changes or did any supplemental training! Eventually we were able to shave off more percentage points, but that *little secretarial notepad* made the biggest difference of anything we did.

PLURAL COMPONENT TECHNOLOGY

With plural component technology, there are some specific waste and overspray issues.

Waste A very common habit when changing drums is to switch before the drums are empty. In fact, it make a lot of sense to do so because running dry on one side of a plural component system is, to put it mildly, an occasion for stress. But this doesn't mean you have to put the old drum aside and later throw a bunch of old "A" drums together and a bunch of "B" drums with each other. Try to spray these old dregs and now we are talking about mega-stress, not to mention poor quality and costly shutdowns. Doesn't happen, you say? Well, my friend, it happens almost every week -- just because you guys up in the front office don't hear about it doesn't mean it isn't happening.

Overspray The type of gun plays a huge role here. Many people like to use a Gusmer gun because it is "self purging". Unfortunately, it is also incredibly wasteful.

The Binks 43P gun has fallen into disfavor in recent years because it is a solvent flush design, but the ability to attach ordinary spray tips on the gun means significant savings. In our experience, it could cut overspray losses in half. This is particularly true with smaller objects. To control overspray, there is another alternative to consider. Using a manifold arrangement and a slightly slower-setting product enables the coater to use an ordinary spray gun such as a Graco Silver model and this will reduce loss even further.

As a rule of thumb: --

- ✓ most wasteful -- air purge (self-cleaning) gun;
- ✓ least wasteful -- manifold arrangement with single component gun
- ✓ in between -- solvent flush plural component gun.

SINGLE COMPONENT TECHNOLOGY

Many coatings are applied with ordinary single component spray equipment. Madison has many such products in four formats: slow setting 1:1, slow setting 1:4, Single-Component-Plus-Catalyst precatalalyzed. Our precatalyzed products are true single component products -- open the can, stir and apply.

We recommend using a smaller tip with a narrower fan pattern. The time saved by using a big tip is overwhelmed by the extra material cost.

On small jobs involving only a few gallons of coating, hose diameter and length are factors. High solids coatings require lots of pressure at the gun tip, which usually means a big pump (Graco King or equivalent) and a 3/8" hose. But you could have two hoses, a 25' by 1/4 inch line for small jobs and a 50' to 75' foot 3/8" line for bigger jobs.

ABOVE ALL ELSE

Hire good conscientious sprayers. Train them well and pay them well. Instead of punishing them for wastage, work with them to find ways of reducing it. And give them a positive inducement for so doing***. You'll save money, have happier employees and turn out a better result.***

Madison Chemical Industries Inc.
490 McGeachie Drive, Milton, Ontario Canada L9T 3Y5
Tel: (905) 878-8863 Fax: (905) 878-1449
Warehouses and Sales Office throughout the U.S.A. and the Middle East