

Measuring Viscosity

When you use spray equipment, the material you are spraying must not be too viscous (sticky) for the spray gun or spray system you're using. This quality of the coating is called viscosity. Check with your spray gun/system manual or the manufacturer to find out the proper viscosity for the spray gun you're using.

If it's too thick, the finish won't atomize well or may not even come out of the spray gun. Poorly atomized coatings (clear finishes, pigmented finishes, paint, etc.) create a rough surface and look bad; not to mention you probably have to move very slowly to get anything close to even coverage. When the material is properly atomized, it looks like a fine mist and leaves tiny droplets on the surface being sprayed. These tiny droplets flow together and make a smooth, level film.



A viscosity cup (shown above) is used to measure the viscosity of the coating (finish, paint, etc.) being sprayed, by measuring the length of time the paint takes to drain through a small hole at the bottom of the cup. The shorter the draining time, the thinner the paint is.

The first step when getting ready to spray is to check the viscosity of the material and thin it if needed (check with the coating manufacturer for thinning limits). Spray gun manufacturers have a recommended viscosity for each of the spray guns they make, and your spray gun will work best if the viscosity is right. If you always spray the material at the same viscosity, you will always get the same atomization and consistent results.

You can thin just the quantity you plan to spray today, or you can thin the whole container. But the temperature of the material affects the viscosity, so keep it at the same temperature all the time if possible. If the finish is 18°C when you thin it and 29°C when you spray it, it will be thinner when it's warmer and will get runs and sags if you don't spray lighter coats. Finishes and paints are thicker when cool, and thinner when warm.

The advantage of the viscosity cup measurement is that the operator can bring the paint to the correct spraying viscosity at almost any temperature – within recommended limits; optimally between a low of 15°C and a high of 30°C.



Filling the Cup

Using the viscosity cup is easy. Dip the cup into the coating just below the surface to fill it to the rim (picture above). Using the second hand on a clock or watch, mark the exact time and lift the cup out and let the material flow out the hole in the bottom (picture below). Watch the fluid stream closely and mark the exact time it stops. The number of seconds it takes for the fluid to run out of the cup is how the viscosity is measured.



Fluid Pouring Out

As an example, the manufacturer of your spray gun may list the recommended viscosity as "20-22 seconds, Zahn #2" or something similar. 20-22 seconds is the time range for the cup to empty. Zahn is a brand of viscosity cup, and #2 is one of the cups they make with a specific size opening.

If you have a Ford #4 viscosity cup, you need to convert the time range for the Zahn to the time range for the Ford. To do this, just look at the viscosity conversion chart attached and look up 20 seconds under Zahn #2. Then go over to the Ford #4 column and you'll see it's 14 seconds. The higher number, 22 seconds on Zahn #2, is the same as 18 seconds on the Ford #4.

So on your Ford #4 cup, the range you want is 14-18 seconds (same as 20-22 on the Zahn #2 recommended by the spray gun manufacturer in this example). Use the chart to convert the actual numbers the manufacturer supplies to the viscosity cup you have. Try to thin the material the same amount every time within this range for the most consistent results.