

## Technical Bulletin

### The Importance of Viscosity in Conformal Coating Process Control

#### Why Control Viscosity?

There are numerous factors that directly affect the conformal coating process to greater or lesser degrees. Those which have major impacts irrespective of the substrate / PCB and assemblies include choice of coating material and method of application.

Whether conformal coating boards by dip, robot, batch spray or brush methods the viscosity of the coating is a critical factor in the overall process control.

#### What part of the process does the viscosity of the conformal coating affect?

A change in viscosity can affect the process in many ways including final coating thickness, production stoppages, change the flow of the coating across the surface of the board during application, create defects (scavenging, de-wetting etc) on the surface of the PCB and ruin the aesthetic finish of the final coating

Viscosity therefore is a critical factor that should be controlled at all times.

#### How do you measure viscosity?

An alternative is to use a flow cup process. This is typically an "egg cup" on a rod with a hole in the bottom. The principle is very simple in that you put the cup into the tank you are measuring, pull it out and measure the time for the coating to empty from the cup with a stopwatch. This is repeated a few times and an average time taken.

Since the flow cup is calibrated accurately to a known size, the time taken to empty is directly linked to the viscosity of the conformal coating. Therefore, it is possible to reasonably accurately measure the viscosity of the coating in a few minutes.

The alternative is to use a viscometer.

This is a machine that is like a mixing system that accurately measures the viscosity of the coating by the force the coating offers whilst it rotates in the coating.



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