

	<h1>Buntrock Industries, Inc.</h1> <p>Investment Casting Supplies</p>	Document#: 7.1
		Rev#: 0
	Title: Slurry Viscosity – Flow Cup Method	Page#: 1 of 2

Rev	Description of Change	Author	Date
0	Initial Release	Joe Norvell	2/4/14

1.0 Scope:

- 1.1 This procedure describes a method of indirectly measuring the viscosity of slurries by means of a metal flow cup in which the time in seconds is determined for a constant amount of slurry to flow through the orifice in the bottom of the cup. Various cups are in use in the industry and each cup gives a different reading. This test is applicable to both water-based and alcohol-based slurries.

2.0 Purpose:

- 2.1 The flow cup method for measuring slurry viscosity is one of the most widely used control tests. Controlling viscosity by adding water to counteract evaporation losses allows the foundryman to produce consistently even prime and backup coats.

3.0 Hazard and Safety:

- 3.1 Consult the Material Safety Data Sheet (MSDS) for required handling procedures and Personal Protective Equipment (PPE) required.

4.0 Equipment:

- 4.1 Thermometer per section 7.6 Slurry Temperature.
- 4.2 Stopwatch.
- 4.3 Viscosity cup such as Zahn Signature, Zahn EZ, Mini ISO and Boekel cup.

Note: Cup selection also involves selecting the cup number that reflects the diameter of the cup's orifice. In general, viscosity cups are selected so that slurries drain from cup within 10 to 50 seconds. As a result, cups with large orifices will be used on thicker slurries (i.e. prime dip slurries) and cups with smaller orifices will be used on thinner slurries (i.e. backup dip slurries).

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5.0 Procedure:

- 5.1 Make sure the cup is clean.
- 5.2 Make sure that sample is homogeneous. Screen a sample to make sure no clumps of material are present.
- 5.3 Measure and record slurry temperature per section 7.6 Slurry Temperature.
- 5.4 Hold the cup in a vertical position by means of the small ring at the top of the handle and dip it into the slurry to be tested.
- 5.5 Simultaneously lift the cup quickly out of the slurry and perform the following operations:
 - 5.5.1 Start the stopwatch when the top edge of the cup breaks the surface.
 - 5.5.2 Raise the cup well above the surface in one smooth, continuous motion.
 - 5.5.3 Stop the stopwatch when the steady flow of slurry from the orifice suddenly stops or a break in the stream is detected. When using smooth flowing liquids, the break point is usually measured at 4 inches from the bottom of the cup. For many slurries, this point is difficult to read and a point at 1 inch or less is used. At some foundries, the technician will look into the cup and stop the watch when an outline of the hole is seen in the bottom of the cup. In any case, be consistent.