

Western Instruments

Established 1965

26509 Township Road 543
Sturgeon County, Alberta
T8T 1M1

Phone: (780) 459-6720
Fax: (780) 459-7837
E-mail: info@westerninstruments.com

Web: www.westerninstruments.com

Centrifuge Tube

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Centrifuge Tubes are used to perform a Settling Test, to measure particle concentrations, of Wet Method Inspection Media (Visible or Fluorescent). The tubes are outlined in ASTM D 96, however the procedures and parameters of the Settling Test is set out in ASTM E 1444 and E709. The Centrifuge Tube must be *Pear Shaped*, with a graduated volume of 100ml. The straight lower stem or capillary tube must have a volume of 1.5ml, and must be graduated.



The graduations, for Fluorescent Particles, must be in 0.05ml increments for at least 1.0ml. Graduations for Visible Particles, must be in 0.1ml increments from 0 to 1.5ml. Acceptable concentrations, for a sample volume of 100ml, are between 0.1 to 0.4ml for Fluorescent Particles and between 1.2 to 2.4ml for Visible Particles. This is why the W-CT is equipped with 0.05ml graduations from 0 to 1.0ml, followed by 0.1ml graduations up to 1.5ml, and 0.5ml from 2.5 to 5ml. This permits one Centrifuge Tube to be used for Fluorescent or Visible Baths. Furthermore, the graduations permit full compliance even to the maximum acceptable concentration of a Visible Bath (2.4ml from a 100ml sample). Operators can not test bath concentration often enough!

Measurement of particle concentration is very important for a recirculation system, as there is a tremendous amount of particle 'Drag', even after a workpiece is demagnetized. This drag will cause the bath concentration to be regularly diminished, so a frequency should be established and maintained or the E 1444 specification should be closely followed, at once per shift. Even when a batch is mixed for portable use (typically 4 liters at a time), operators can make a measurement or mixing mistake before the bath is dispensed into a spray bottle. A bath with a low concentration will cause operators to miss critical defects.

It is important that a bath is fully agitated or mixed prior to dispensing the 100ml into a clean Centrifuge Tube. It is also recommended to demagnetize the bath after dispensing it into the Centrifuge Tube. Depending on the Carrier (water or oil), the tube should not be disturbed for up to 60 minutes.

When the contents of the Tube is settled, the particle concentration can be measured, and then examined for contamination. A UV Lamp should be used to inspect the settled particle to ensure they fluoresce brightly. Furthermore, the bath should be monitored to ensure it does not excessively fluoresce, as it could mask particle indications.

Considering the amount of use a Centrifuge Tube receives, it should be considered a consumable item as they are delicate. As a back up, or for field (portable) operations, a Type 2000 Stripe Card can be used, but a settling test in a W-CT is more reliable.

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