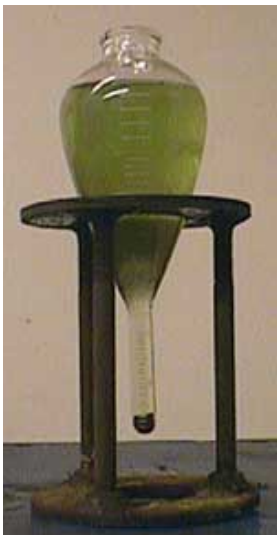
Particle Concentration and Condition

Particle Concentration



The concentration of particles in the suspension is a very important parameter in the inspection process and must be closely controlled. The particle concentration is checked after the suspension is prepared and regularly monitored as part of the quality system checks. ASTM E-1444-01 requires concentration checks to be performed every eight hours or at ever shift change.

The standard process used to perform the check requires agitating the carrier for a minimum of thirty minutes to ensure even particle distribution. A sample is then taken in a pear-shaped 100 ml centrifuge tube having a stem graduated to 1.0 ml in 0.05 ml increments for fluorescent particles, and graduated to 1.5 ml. in 0.1 ml increments for visible particles. The sample is then demagnetized so that the particles do not clump together while settling. The sample must then remain undisturbed for a minimum of 60 minutes for a petroleum-based carrier or 30 minutes for a water-based carrier, unless shorter times have been documented to produce results similar to the longer settling times. The volume of settled particles is then read. Acceptable ranges are 0.1 to 0.4 ml for fluorescent particles and 1.2 to 2.4 ml for visible particles. If the particle concentration is out of the acceptable range, particles or the carrier must be added to bring the solution back in compliance with the requirement.

Particle loss is often attributed to "dragout." Dragout occurs because the solvent easily runs off components and is recaptured in the holding tank. Particles, on the other hand, tend to adhere to components, or be trapped in geometric features of the component. These particles will be "drug out" or lost to the system and will eventually need to be replaced.

Particle Condition

After the particles have settled, they should be examined for brightness and agglomeration. Fluorescent particles

should be evaluated under ultraviolet light and visible particles under white light. The brightness of the particles should be evaluated weekly by comparing the particles in the test solution to those in an unused reference solution that was saved when the solution was first prepared. The brightness of the two solutions should be relatively the same. Additionally, the particles should appear loose and not lumped together. If the brightness or the agglomeration of the particles is noticeably different from the reference solution, the bath should be replaced.

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