

## **CIRCLE SYSTEMS, INC.**

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### **Technical Bulletin #267** **Mi-Glow® 778**

Mi-Glow® 800 fluorescent yellow-green particles premixed with liquid Wetting Agent 771 for use in water media. This advanced formulation allows for superior corrosion protection, wetting and particle mobility. It is designed to be used with black light to detect very fine discontinuities in finished products. This material is used in the automotive and aerospace industries on finished component parts, where extra corrosion protection is required.

#### **Properties**

Particle Color: Fluorescent Yellow-Green

Specific Gravity: 1.3 g/ml - for the concentrate

Particle Size: Not less than 98% passage through US Standard No. 325 (45 µm) sieve as defined in AMS 3044. The typical range of particle sizes is from 1 to 12 µm, with an average particle size of 5 µm.

Sensitivity: Mi-Glow® 778 shows a minimum of 8 lines on an AISI 01 Ketos tool steel ring (as defined in SAE AS5282), set on a 1-inch diameter copper bar, magnetized with 2500 A of direct current.

Particle Certification: Particles meet or exceed all relevant industry specifications, including but not limited to MIL-STD-1949, AMS 3044, MIL-STD-271, NAVSEA 250-1500-1, NTR-1E, ASTM E 1444. Certification is included with each shipment.

Temperature Limits: 32-120°F (0-49°C)

Shelf Life: One (1) year, when sealed bottles are not subjected to extreme heat or cold. A Certificate of Shelf Life is available upon request.

#### **Directions for Use**

Preparation: The change-over from a solvent system to a Mi-Glow® 778 system requires a thorough cleaning of the tank and piping. This can be accomplished in most cases by flushing the system twice, using about 1/2 gallon of Cleaner 500 and 10-15 gallons of water. Flushing should be followed by a water rinse.

Mi-Glow® 778 should be used at a dilution of 1 part concentrate with 39 parts of water. This will give a fluorescent particle concentration of 1.0 grams per liter. The recommended proportion may vary depending on specific applications. Each bottle should be thoroughly mixed before using. If a bottle is emptied, it should be rinsed with water and the contents added to the system.

**Settling Test:** The settling test, to check particle concentration and contamination, shall be performed upon startup, at each shift thereafter and whenever the bath is changed or adjusted.

*Checking Bath Concentration* - The settling test is essential to check the bath concentration and is accomplished by gravity settling in a graduated pear-shaped centrifuge tube as specified in Guide E709.

1. Run the pump for 30-60 minutes, to agitate the suspension thoroughly and to assure particle distribution.
2. Fill 100 ml sample from the delivery hose into the centrifuge tube.
3. Demagnetize the sample and stand, together.
4. Allow particles to settle for a minimum of 30 minutes or until completely settled.
5. The recommended volume is between 0.15 and 0.25 ml and will vary from one specification to another. (Read the settled particles that are fluorescent using a black light.)
6. Adjust bath, either by adding particles or vehicle, if necessary.

*Checking Bath Contamination* - To determine bath contamination, use the same sample that was used for the concentration settling test, and examine the liquid above the settled particles with a black light. The liquid should be clear. If the bath is noticeably fluorescent, the bath must be changed. Next, examine the graduated portion of the tube where the particles have settled, with a black light and visible light for striations or bands of contamination that will be different in color and appearance than the settled particles. These striations or bands represent solid contamination, and if they exceed 30% of the settled particles, the bath should be changed.

**Corrosion Inhibition:** For best results, the system should be run in the pH range of 8.5 - 9.5, as verified by testing with a pH meter or pH paper. A special test for corrosion inhibition, Technical Bulletin 235, is available upon request and should be adapted to the specific part being inspected. This test should be run periodically to monitor the level of corrosion inhibitors present in the bath.

**Evaporation:** If the level of solution in the system has dropped, the following procedure should be used as a guideline. First, replenish the water to the proper bath level. Then check the particle concentration using the concentration test. Make any adjustments by adding Mi-Glow® 778. The final step will be to test the level of corrosion inhibition in the system using the procedure that is outlined in Technical Bulletin 235. Wetting Agent 771 should then be added as necessary.

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