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## **Technical Bulletin 183**

### **Mi-Glow® 106**

Mi-Glow® 106 is black particles for use with CircleSol M™, a refined petroleum distillate, or Wetting Agent 771, in a water system. It is designed to be used with visible light for finding discontinuities in finished products. Higher particle concentration provides heavier indication buildup for easy detection.

#### **Properties**

Particle Color: Black

Specific Gravity: 0.4 g/ml

Particle Size: Not less than 98% passage through US Standard No. 325 (45 µm) as defined in AMS 3042. The typical range of particle sizes is from 0.5 to 4.0 µm, with an average particle size of 1.5 µm.

Sensitivity: Mi-Glow® 106 shows a minimum of 6 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 3042, MIL-STD-271, NAVSEA 250-1500-1, NTR-1E, ASTM E-3024. Certification is included with each shipment.

Temperature Limits: 32-120°F (0-49°C)

Shelf Life: Four (4) years, when closed containers are stored in a clean dry environment, away from excessive heat or cold. A Certificate of Shelf Life is available upon request.

#### **Directions for Use**

Preparation for Use in Oil: Mi-Glow® 106 should be used at a concentration of 10-15 oz. av. per ten gallons (9.5 grams/liter) of CircleSol M™. For best results, add a small amount of CircleSol M™ to the powder and form a slurry prior to adding to the bath.

Preparation for Use in Water: The change-over from a solvent system to a water 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® 106 should be used at a concentration of 380 grams (or 1-1/2 level scoops using the 1-cup scoop included with Mi-Glow® 106) per quart of Wetting Agent 771. The recommended proportion may vary depending on specific applications.

1. Thoroughly shake each bottle of Wetting Agent 771 for approximately one minute, to ensure all components are thoroughly incorporated.
2. Completely empty the Wetting Agent 771 into a mixing container and mix for 10 minutes.
3. Slowly add the Mi-Glow® 106 at 380 grams/quart of Wetting Agent 771 and mix into the wetting agent until completely incorporated.
4. Continue mixing for 10 to 15 minutes.
5. If the concentrate will not be immediately placed into a bath, return the prepared concentrate to the Wetting Agent 771 quart bottles, being careful to minimize any spillage. Periodic mixing **MUST** occur during the bottle filling to ensure even particle distribution in the concentrate bottles.
6. Prior to use, each bottle of prepared concentrate should be thoroughly mixed. Once a bottle is emptied, it should be rinsed with water and the contents added to the system.
7. The prepared concentrate should be used at a dilution of 1 part concentrate with 39 parts of water.

**Lighting:** A minimum of 100 foot candles (1000 lux) of visible light at the part surface per ASTM E 709 and ASTM E 1444 is recommended.

**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 1.2 and 2.4 ml.
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 water systems):** 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 (for water systems): 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 the prepared concentrate. 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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