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TECHNICAL BULLETIN #265

MI-GLOW 820

MI-GLOW 820 is a black liquid concentrate used for magnetic particle inspection. It contains non-fluorescent particles and special water chemistry, which consists of corrosion inhibitors, anti-foaming agents, wetting agents, and pH buffering agents. MI-GLOW 820 is designed for revealing very fine defects on both machined and unfinished ferro-magnetic materials.

Particle Color: Non-fluorescent black

Specific Gravity: 1.5 g/ml -- for the concentrate

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

Particle Sensitivity: MI-GLOW 820 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 all relevant specifications, including but not limited to MIL-STD-1949, AMS 3042, MIL-STD-271, NAVSEA 250-1500-1, NTR-1E, ASTM E 1444. Certification is available with each shipment.

Temperature Limit: 120°F Maximum

Preparation:

The change-over from a solvent system to a MI-GLOW 820 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 820 should be used at a dilution of 1 part concentrate with 39 parts of water. This will give a particle concentration of 9.5 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.

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

System Maintenance:

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.

Concentration Test: The suspension as delivered on the part should be tested for magnetic substance content by the following method at 8-hour intervals or shorter intervals as required by the user. The method of test should be as follows:

1. Run the circulating pump on the test equipment for at least 30 minutes.
2. Fill a 100 ml graduated centrifuge tube as specified in ASTM D96 or equivalent, to the 100 ml mark with suspension directly from the hose or device used for applying it to the part in an inspection, or from an immersion tank. Demagnetize the suspension if considered necessary and let it stand undisturbed for 60 minutes.
3. Read the volume of the precipitate in the graduate. Adjust the reading to account for any dirt, scale, or other foreign matter which may be present. The typical volume should be 1.0 to 2.4 ml. NOTE: Very fine particles may go into colloidal suspension.

In addition to the above test, the user should also use a suitable standard test piece which is periodically run through the system. This should be performed in accordance with ASTM E 1444 Section 7.

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 820. 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. WATER CONDITIONER 771 may then be added as necessary.

Shelf Life: 1 year, when sealed bottles are not subjected to extreme heat or cold.

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