Technical Bulletin 284
Mi-Glow® 418

Mi-Glow® 418 is a dual response particle that easily detects discontinuities in UV-A or a combination of UV-A and visible light. Mi-Glow® 418 particles are premixed with Wetting Agent 34 for use in water based systems. Mi-Glow® 418 is capable of being used to inspect on surfaces up to 300˚F without additives using specific directions detailed below.

Properties

Particle Color: Fluorescent yellow-green

Specific Gravity: 1.1 g/ml

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 2 to 18 µm, with an average particle size of 7.5 µm.

Sensitivity: Mi-Glow® 418 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. When lighting conditions meet those identified in a darkened inspection area as outlined below.

Particle Certification: Certifications are dependent on the lighting conditions used in the inspection area. For the specific inspection conditions described (see below for detailed description of different inspection conditions), the particles meet or exceed relevant industry specifications including but not limited to: ASTM E709, ASTM E-1444, ASTM E-3024, AMS 3044, MIL-STD-271, NAVSEA 250-1500-1, NTR-1E

> *Dual Response Inspection* – ASTM E709 (p. 8.5.3 – UV-A or a combination UV-A and visible light), NAVSEA 250-1500-1

Temperature Limits: Dry Powder Storage: 32 - 120°F; Application: 32 - 300°F

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.

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 (aka settling bulb) 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. Refer to the application specific settling bulb volumes listed below. Volumes 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.

Application Specific Directions for Use – UV-A Inspection

Lighting: The inspection area should be darkened such that no more than 3 foot candles (30 lux) of white light is present. A UV-A light source capable of 1000 microwatts/cm^2 at the part surface is recommended.

Preparation: Mi-Glow® 418 should be used at a concentration of 8 oz. av. (6.0 grams/liter) per ten gallons of water or one scoop per one gallon of water (using the included 26cc blue scoop). For best results, add a small amount of water to the powder to form a slurry prior to addition to the bath.

Settling bulb volume: 0.15 – 0.25 ml

Application Specific Directions for Use – Dual Response Inspection (UV-A & visible light)

Lighting	Preparation – per 10 gallons	Settling Bulb Volume
1000µW/cm^2 + 0 – 100 lux	8 oz. av. (6.0 g/liter)	0.15 – 0.25 ml
1000µW/cm^2 + 101-250 lux	13 oz. av. (10 g/liter)	0.25 – 0.35 ml
1000µW/cm^2 + 251 - 400 lux	18.7 oz. av. (14 g/liter)	0.35 – 0.45 ml
5000µW/cm^2 + 0 – 100 lux	8 oz. av. (6.0 g/liter)	0.15 – 0.25 ml
5000µW/cm^2 + 101 - 250 lux	13 oz. av. (10 g/liter)	0.25 – 0.35 ml
5000µW/cm^2 + 251 - 400 lux	13 oz. av. (10 g/liter)	0.25 – 0.35 ml
5000µW/cm^2 + 401 - 500 lux	18.7 oz. av. (14 g/liter)	0.35 – 0.45 ml

Additional Directions for Use in Applications above 120°F

Note: These directions apply to both UV-A inspection areas and UV-A and visible inspection areas (dual response) as described above.

Particle Application - Mi-Glow® 418, suspended in water, shall be applied by the wet continuous method – the medium is applied prior to magnetizing the part. Proper timing of part magnetization and application of particle suspension over the area to be examined are required to obtain the proper formation and retention of indications.

Materials Performance Verification - The overall performance of this special high temperature application shall be verified, recorded and maintained daily. A reliable method for material performance verification is the MTU test block (See Technical Bulletin 316). If the correct magnetic particle indications are produced and identified on this test block, then the material and bath is verified for further use. The bath must be replaced if indications are not produced.