

MG-450A

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Fluorescent Magnetic Particle Premix

MG-450A is a borax-free ultra-high fluorescence magnetic particle premix for locating small, medium, and gross discontinuities in high-volume applications using fluorescent wet method magnetic particle testing under ultra-violet light or a combination of ultra-violet and visible light (mixed light).

Designed to mix with water, MG-450A improves indication visibility with less background fluorescence because of the high-strength, high-fluorescent MG-410 particles. These high-performance particles combine with patent-pending water conditioner and corrosion inhibitor package to create a water bath that requires less maintenance, keeps performing longer and protects parts and equipment from rust.

MG-450A is a great option for high-speed, high volume applications on raw products/materials, after secondary processing, on textured/rough surface finishes or on unmachined parts where indication visibility and through-put are important.

MG-450A is used in conjunction with suitable magnetizing equipment for fluorescent wet method magnetic particle testing under ultra-violet light or a combination of ultra-violet and visible light (mixed light).

In conditions with a combination of ultra-violet and visible light (mixed light) the user should read the Recommended Concentrations, Inspection Parameters, and Disclaimers sections of this Product Data Sheet before using MG-450A. MG-450A is not recommended by the manufacturer for inspections under visible light only.

FEATURES

- Clear, ultra-bright indications under UV light
- Patent-pending water conditioner and corrosion inhibitor package
- Ultra-high fluorescence particles
- Very low background for easy indication detection
- Good surface wetting
- High indication contrast
- Strong corrosion protection
- Low foam
- Safer, borax-free formula

SPECIFICATION COMPLIANCE

- AMS 3044
- ASTM E709
- ASTM E1444
- ASME
- MIL-STD-2132
- NAVSEA 250-1500-1
- NAVSEA T9074-AS-GIB-010/271

APPLICATIONS

Defect location: surface and slightly subsurface

Ideal for:

- Detecting small, medium, and gross discontinuities
- High volume inspection
- Raw products/materials
- After secondary processing
- Textured/rough surface finishes
- Unmachined parts
- Semi-dark environments

Defect examples:

- Inclusions
- Seams
- Shrink cracks
- Tears
- Laps
- Flakes
- Welding defects
- Grinding cracks
- Quenching cracks
- Fatigue cracks

PROPERTIES

Appearance	Dry powder
Color in Visible Light	Forest green
Color in UV Light	Fluorescent yellow-green
Odor	Odorless
Mean Particle Size*	19 microns
SAE Sensitivity**	7

* As determined by industry-typical method for measuring particle size

** Representative of the number of indications on a tool steel ring as defined in ASTM E1444.

USE RECOMMENDATIONS

NDT Method	Magnetic Particle Testing, Fluorescent or Mixed Light, Wet Method
Suspension Vehicle	Water
Required Equipment	Magnetizing device, UV light source
Temperature Range[†]	32 to 120°F / 0 to 49°C
Settling Volume	0.03 – 0.1 mL

[†] Particle integrity and mobility may decline beyond these temperature limits.

PREPARATION INSTRUCTIONS

Mix MG-450A with water for use. Fill tank or container with water. Measure or weigh out MG-450A and add to the water. Add directly over the pump for more rapid dispersion. Mix for a minimum of 15 minutes, until the particles are completely and evenly dispersed in the suspension. Check concentration before use. Using warm water (100°F / 38°C) to prepare the suspension will help the MG-450A mix faster.

NOTE: Make sure to add MG-450A to water instead of adding water to MG-450A. If water is added directly to MG-450A an exothermic (heat generating) reaction may occur, although this reaction is mild and not expected to pose a hazard, adding water directly to MG-450A is not recommended.

Do not mix MG-450A with oil.

1. Ultra-Violet Light Inspection

Settlement volume = 0.03 – 0.1 mL

Water	MG-450A
1 gallon	1.4 ounces
1 liter	10.75 grams

2. Combination Ultra-Violet and Visible Light (Mixed Light) Inspection***

Settlement volume = 0.05 – 0.15 mL

Water	MG-450A
1 gallon	1.4 – 4.2 grams
1 liter	11 – 33 grams

3. Visible Light Inspection

Not recommended with MG-450A

INSTRUCTIONS FOR USE

Use MG-450A with appropriate magnetization procedure and equipment. For best results, all components, parts, or areas to be tested should be clean and dry prior to testing to provide an optimal test surface and reduce particle suspension contamination. Particle suspension must be properly mixed and continuously agitated when in use to ensure uniformity and concentration. Particles will settle out of suspension very quickly on standing.

The suspension can be applied by gently spraying or flooding the area to be tested using the continuous or residual application method. Inspect under ultra-violet black light. Check particle concentration before use.

Inspection Parameters

Use the following recommended parameters when using MG-450A:

1. Ultra-Violet Light Inspection

Ultra-violet intensity	$\geq 1000 \text{ uW/cm}^2$
Visible light intensity	$\leq 2 \text{ foot-candles / 21.5 Lux}$

2. Combination Ultra-Violet and Visible Light (Mixed Light) Inspection***

Before using MG-450A for a mixed light inspection, it is recommended that a preliminary test be performed to verify the conditions in the local environment. As a general principle, visible light should be at a minimum and ultra-violet light should be as high as reasonably possible.

When carrying out an inspection in mixed light conditions, the angle of visible light, relative to the surface and the inspector, is critical to Probability of Detection (POD) levels. If the visible light source or angle creates a significant amount of glare/reflection on a test surface, indications can be completely obscured. It is recommended that the visible light source be positioned behind the operator to minimize the level of glare/reflection.

Note: An inspection in mixed light conditions will not give the same level of sensitivity as an inspection in ultra-violet light only conditions. Therefore, extra care is required when inspecting in mixed light conditions to ensure compliance with the all applicable inspection procedures and specifications.

Ultra-violet intensity	$\geq 2000 \text{ uW/cm}^2$
Visible light intensity	$\leq 55.7 \text{ foot-candles / 600 Lux}^{\dagger}$

[†] Inspections with more than 55.7 foot candles / 600 Lux of visible light must be approved by a qualified Level III

3. Visible Light Inspection

Not recommended with MG-450A

Maintenance Recommendations

Magnetic particle suspensions need to be properly maintained to provide consistent results. Suspension concentration and contamination should be monitored at least once a day, or according to applicable specifications. Contaminated suspensions, or those in use for an extended length of time, should be replaced. Properly cleaning all components, parts, or inspection areas before testing helps to significantly reduce particle suspension contamination.

Particle concentration should be determined after initial bath preparation and at least once a day, or according to applicable specifications, to maintain the proper level of particles in the suspension. The most widely used method of control is by settling volume measurement in a graduated

ASTM pear-shaped centrifuge tube. For testing MG-450A, Magnaflux centrifuge tube 507923 is recommended: 100 ml capacity, stem graduated from 0 to 0.2 mL in 0.01 mL increments.

REMOVAL

All components, parts, or inspection areas must be properly demagnetized before cleaning to ensure easy particle removal. Cleaned parts may be treated with a temporary film protective coating if longer corrosion protection is required.

STORAGE

Store in a well-ventilated area away from magnetizing equipment and heat sources. Product age, exposure to elevated temperatures, and/or exposure to a strong magnetic field may adversely affect particle redistribution.

Protect from sunlight. Storage containers should be tightly sealed when not in use. Cool, dry storage location is preferred. Refer to Safety Data Sheet for additional storage instructions.

PACKAGING

2 lb / 907 g jar (case of 6) 01-0196-73

DISCLAIMERS

*** The recommendations given for inspection under a combination of ultra-violet and visible light (mixed light) conditions are based on studies carried out under controlled laboratory conditions. As such, the results and conclusions may not apply to other applications. It is the responsibility of the user to determine the acceptable inspection conditions for their application.

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