14A

Wet Method Fluorescent Magnetic Particles



A highly sensitive magnetic particle powder, 14A fluorescent magnetic particles are engineered to locate very fine discontinuities in critical parts and applications. 14A can be suspended in either a petroleum-based vehicle (oil), such as Magnaflux Carrier II, or in water. The resulting ink gives clear bright yellow/green indications when viewed in a darkened area under UV(A) of peak wavelength 365 nm.

Designed with strong fluorescent properties, 14A magnetic powder is made with a carefully optimized range of particle sizes & shapes to ensure particles move quickly and easily to indications, while minimizing background and particle clumping. The result is faster inspections with better reliability and greater confidence.

A great choice for inspecting a wide range of ferromagnetic parts, 14A particles meet all major industry and NDT specification requirements, including Aerospace, ASTM, and ISO 9934. 14A is listed on the QPL SAE AMS 3044-1S & AMS 3044-2S Qualified Product List and is approved for use by Pratt & Whitney.

BENEFITS

Increases indication detection

- Find smaller, finer indications in critical applications using the highly sensitive, strong ferromagnetic 14A particles
- Optimized particle size and shape help particles move freely to stick to a wide variety of discontinuities with less particle clumping

Minimizes inspection time

- Clear, bright fluorescent indications form quickly due to the highly fluorescent, highly mobile particles
- Minimal background fluorescence help indications stand out so inspectors need to spend less time examining each part

Improve inspection consistency and reliability

- Maintain magnetic particle system performance over greater periods of time thanks to the highly-durable, easily-dispersed 14A particles
- Reduced particle clumping helps maintain particle concentration in the suspension bath for dependable inspections

FEATURES

- Can be suspended in water or petroleum distillate (oil) vehicle
- High sensitivity
- Excellent fluorescent contrast
- Excellent particle mobility
- Optimized particle size and shape distribution
- Durable particles
- Easily dispersed

SPECIFICATION COMPLIANCE

- ASTM E709
- ASTM E1444/E1444M
- ASME BPVC / BPVC-V
- Boeing PS 21201
- ISO 9934 / EN ISO 9934-2
- MIL-STD-2132
- MIL-STD-271
- NAVSEA 250-1500-1
- NAVSEA T9074-AS-GIB-010/271
- QPL SAE AMS 3044-1S
- QPL SAE AMS 3044-2S
- Rolls Royce RRP 58004 (CSS 231)
- SAFRAN IN 5300

APPLICATIONS

Defect location: surface and slightly subsurface

Ideal for:

- Detecting very fine to fine discontinuities
- Critical applications
- Machined parts
- Smooth surface finish
- After secondary processing
- In-service inspections

Ideal for:

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

PRODUCT PROPERTIES

Appearance	Fine, dry powder
Composition	Compounded fluorescent pigment and magnetic iron oxide
Color in Visible Light	Brown
Color in UV Light	Fluorescent yellow-green
Odor	Odorless
Particle Size Range*	5-12 µm
SAE Sensitivity**	8-9

* 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, Wet Method
Suspension Vehicle	Water*** or petroleum distillate (oil)
Required Equipment	Magnetizing device, UV light source
Usage Temperature†	42 to 120°F / 6 to 48°C
Storage Temperature	50 to 86°F / 10 to 30°C
Settling Volume	0.1 – 0.4 mL

*** When using water as suspension vehicle, it is recommended to add a conditioning agent to the bath to improve particle mobility, wetting, and corrosion inhibition.

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

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. 14A is a hygroscopic (moisture absorbing) powder so 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.

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.

PREPARATION INSTRUCTIONS

Oil Bath: Weigh out the appropriate amount of 14A and add to the appropriate amount of Carrier II. Mix for a minimum of 15 minutes, until the particles are completely and evenly dispersed in the suspension. Check concentration before use.

Water Bath: In water-based suspensions, conditioning agents are required to improve particle suspendibility, mobility, and surface wetting.

1. Measure out the appropriate amount of water conditioner*, add to water and mix for 5 minutes.
2. Next, measure out the appropriate amount of 14A magnetic particles and add particles to the conditioned water.
3. Add particles directly over the pump for more rapid dispersion.
4. Mix for 15 minutes or until the particles are completely dispersed.
5. Check particle concentration before use.

* Various water conditioners are available, depending on your region; for example: WA-1, AX-52, WA-2, WA-2B, ZAF-2. Please consult the Product Data Sheets for your chosen conditioner. If you are unsure, contact a Magnaflux representative for assistance choosing the best product for your application.

Suspension vehicle	14A
1 gallon	0.17 oz**
1 liter	1.25 g

** If a scoop is included in packaging, it measures enough 14A particles for one gallon of Carrier II or water.

INSTRUCTIONS FOR USE

Use 14A 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.

1. Check particle concentration before use.
2. The suspension can be applied by gently spraying or flooding the area to be tested using the continuous or residual application method (see ASTM guidelines for more details on these processes).
3. Inspect under ultra-violet black light.

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 14A, Magnaflux centrifuge tube 8493 is recommended: 100 ml capacity, stem graduated from 0 to 1 mL in 0.05 mL increments.

PART NUMBERS & PACKAGING

Packaging	Country of Origin	Part Number
1 lb / 453 g jar (case of 6)	United States	01-0130-71
20 lb / 9.07 kg pail		01-0130-75
1 kg *	United Kingdom	059C025
5 kg *		059C026

* Packaging for these products is made from recycled materials and is recyclable.

HEALTH AND SAFETY

Review all relevant health and safety information before using this product. For complete health and safety information, refer to the product Safety Data Sheet, which is available at **www.magnaflux.com**.