



Magnetic Particle Testing

Product Data Sheet

MR[®]76F

MAGNETIC POWDER SUSPENSION - FLUORESCENT

for wet method testing (ready to use)

The Method

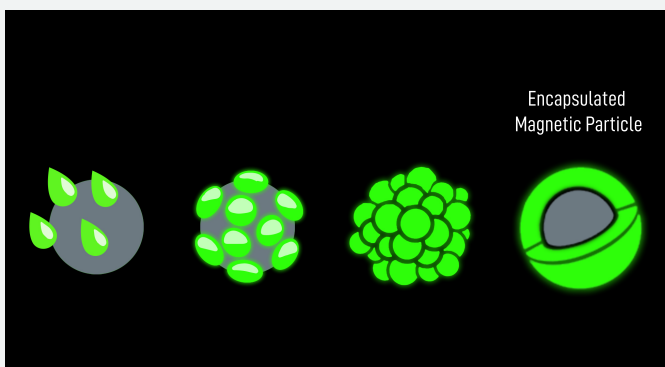
Wet fluorescent magnetic particle inspection (MPI) is a non-destructive testing technique used to detect surface and near-surface defects in ferromagnetic materials. It involves magnetising the material and applying a water-based suspension containing magnetic particles coated with fluorescent dyes. The particles align with the magnetic field and settle on the surface, highlighting the defects. When illuminated with ultraviolet (UV) light, the coated fluorescent dyes emit visible light, enhancing the visibility of the indications. This method is highly sensitive and can detect cracks, seams, laps, and inclusions. It offers excellent visibility even in low-light conditions. The water-based nature of the solution reduces environmental and safety concerns. Wet fluorescent water-based MPI ensures thorough inspections and helps maintain the integrity and quality of critical components and structures.

Description

MR®76F is a high-performance ultra-sensitive oil-based magnetic particle suspension aerosol which serves to indicate clear, strong background-free cracks when performing fluorescent magnetic particle inspection. Its user-friendly aerosol packaging is ideal for on-site assessments, spontaneous inspections, and scenarios where bulk handling is unfeasible. The spray distribution simplifies the task of coating extensive surfaces, expediting the examination process during remote evaluations of tubing, piping, and sizable structures. The product's formulation incorporates proprietary Super Wetting Technology (SWT), MR's Encapsulation technology which enhances particle mobility ensuring excellent particle build-up for improved sensitivity and stability of magnetic particles.



The Technology



MR's proprietary encapsulation technology involves the precise encapsulation of magnetic iron particles with a black dye resulting in an optimum protective coating around the particles, preventing oxidation and degradation over time which significantly enhances the stability and visibility of cracks, and extends the bath life, reducing the need of frequent replacement of bath and improving overall product longevity and test reliability.

Furthermore, the encapsulation process enhances the dispersion and suspension properties of the magnetic particles for various carrier-media. This allows for better control and uniform distribution of the particles in the solution, resulting in improved inspection outcomes. The encapsulated particles maintain a consistent size and shape, enabling more accurate indications of defects during MPI.

Benefits

- Heavy particle build-up for strong detection
- Background free indications under fluorescent light
- Cost-effective technique for detecting defects in ferromagnetic materials
- Ready-to-use aerosol.
- Quick and reliable results for efficient defect detection
- Applicable to a wide range of ferromagnetic materials
- No-odour
- User-friendly
- Very low toxicity

Applications

Defect Location: Surface to slightly sub-surface

Test Surface Type: Super-finished to semi-finished

Test Environment: Dark to semi-dark

Defect Types:

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

Compliances

ASME Code V, Art. 7

DIN ISO 9934 (BS 5044)

ASTM E 709

RCC-M

PMUC (EDF)

AMS 2641- Type 1

AMS 3045

AMS 3046 (Aerosols)

ASTM E3024

ASME BPBC

MIL-STD-2132

MIL-STD 271

ASTM E1444/1444M

Features

- Ultra sensitive
- MR's Proprietary encapsulation technology
- MR's Super wetting technology (SWT)
- Excellent Particle stability
- Clear indications under fluorescent light
- Minimal to No background for easy and precise crack detection
- Controlled application with wide spray pattern
- Excellent particle mobility
- Toluene free

Usage Instructions

NDT Method	Magnetic Particle Inspection; wet method
Carrier Media	Oil (AMS 2641 - Type 1)
Equipments required	Magnetising device, UV source
Recommended Usage	-10°C to +65°C / 14°F to 149°F

Physical & Chemical Properties

Appearance	Brown oily liquid
Chemical Composition	Mixture of magnetic powder, additives and oil
Basis	Hydrocarbon
Colour in visible light	Brown-Green
Colour in UV light	Yellow-Green
Odour	Characteristic
Flash Point (Slurry)	>93°C / 200°F
Particle Size	1 – 3 µm
SAE Sensitivity	8-9 **
Sediment	0.2-0.4 ml/100 ml (1h)

**as determined by industrial typical method for measuring particle size*

***as per indications on Ketos ring as defined in ASTM E1444/1444M*

Surface Preparation

Before applying MR®76F, ensure that the surface to be inspected is thoroughly cleaned and free from any form of contamination that could interfere with the test. Remove grease, oil, dirt, or any other substances that may affect the accuracy of the inspection.

Corrosion protection

MR®Chemie's water-based powders and liquid concentrates are formulated with corrosion inhibitors at low levels. These inhibitors provide adequate protection to parts during magnetic particle inspection testing. When using water-based inks, it is essential to prepare them in stainless steel tanks to avoid any contamination.

To prevent corrosion, it is crucial to keep the parts clean and dry both before and after inspection. After using water-based inks, it is especially important to promptly remove any excess water to minimise the risk of corrosion.

For longer-lasting corrosion protection, it is recommended to apply a temporary protective film coating to cleaned components. It's important to note that the duration of corrosion protection depends on various factors such as the job type, working conditions, and pre and post-care of the test object.

Suggested Products

MR®71: A solvent based cleaner for removing contaminants such as oil, grease and dirt.

MR®975: UV LED Light

Application:

Shake the can well before use. Apply MR®76F to the test surface in a thin and uniform layer. Multiple light applications are preferable to a single heavy one.

Please note: Maintain a distance of 7 to 9 inches (18 to 24 cm) between the can and the test area.

Concentration Control

In our aerosol products, the particle concentration remains constant. However, in bulk versions, the particle concentration may deplete as particles are used up during inspections. It is important to check the bath strength daily, typically using a graduated ASTM pear-shaped centrifuge tube.

Regarding the carrier fuel, flux oil MR®82 has low volatility, minimising the chances of evaporation. However, with water-based inks, there may be some water evaporation. In such cases, only water should be added to top up the bath to maintain balance, as adding additives could disrupt the bath's composition, which includes wetting agents, anti-foam and corrosion inhibitors.

Safety

Magnetic particle inspection (MPI) is generally safe when conducted by trained professionals who follow appropriate safety measures. However, individuals with pacemakers or implanted medical devices should take precautions due to potential risks from the magnetic field and UV light used in the inspection process.

Wear the appropriate safety gears while using the product. Use in a well-ventilated area.

Please read the Material Safety Data Sheet before use!

(Available at: <https://www.3akchemie.com/resources-mrchemie>)

Scan To Download
TDS / MSDS / TC



Ingredients: Fluorescent magnetic powder, flux oil, propane-butane.

Storage Temperature: 41°F to 113°F / +5°C to +45°C

Notice

3AK Chemie makes no warranties expressed or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose. User is responsible for determining whether our product is fit for a particular purpose and suitable for users method of application.

Limitation of Remedies & Liabilities

If this product is proved to be defective, the exclusive remedy at 3AK CHEMIE's option shall be to refund the purchase price or to repair or to replace the defective MR® CHEMIE product. The company shall not otherwise be liable for loss or damages, whether direct or indirect, special, incidental or consequential regardless of the legal theory asserted including negligence, warranty or strict liability.

Packaging & Order Instructions

SKU	Pack Size	Case
2511-0013	Aerosol - 400ml	10



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