

# MAGNETIC PARTICLE TESTING



**TOMTEC NDT MARINE SERVICES PTE LTD**

**MAGNETIC PARTICLE TESTING (MT)** is a non-destructive testing (NDT) method for detecting surface and subsurface discontinuities in ferromagnetic materials such as iron, nickel, and cobalt. This method is based on the principle that magnetic flux in a magnetized object is locally distorted by the presences of a discontinuity in the test object. This distortion creates a leakage flux which can attract fine particles of magnetic materials and form an indication of the discontinuity.

**Magnetic Particle Inspection** is the economical and comparative faster non-destructive test method used widely in Construction, Marine, Locomotive, automotive, power generation, nuclear, petrochemical industries. The most common examples are testing of crank shafts, cam shafts, connecting rods, engine gears, landing gear, bearing caps, engine blocks, motor shafts, engine bolts, nuts, washers, threaded bars, studs, valves, piping joints (fabricated joints, welds) in power generation and petrochemical industries, etc.

**Magnetic Particle Testing** is a fast, simple, inexpensive and highly portable NDT technique for detecting fine or shallow surface cracks in pipes and fixtures made of ferromagnetic material. It is a versatile evaluation technique that can be used to detect imperfections on test specimens of widely varying shapes and sizes. Further, the use of Magnetic Particle Testing does not require extensive surface preparation of testing materials. In fact, it can be used to detect discontinuities even through thin exterior coatings.

**Magnetic Particle Test (MT)** is very sensitive test method. It can detect tight in-service fatigue cracks in rotating parts or creep cracks on steam piping. Magnetic Particle Inspection cannot be used for non-ferrous materials and non-magnetic ferrous materials such as austenitic stainless steels.

TOMTEC provides a variety of Magnetic Particle Testing services including dry powder, wet visible, wet fluorescent using an electromagnetic/permanent yoke, coils, etc.



## Advantages

- ✓ Sensitive to both surface and surface discontinuities
- ✓ Quick and simple method
- ✓ Provide immediate results
- ✓ Can be portable and deploy in automated operations
- ✓ Inexpensive
- ✓ Large or small objects can be examined
- ✓ Large surface areas or complex parts can be inspected rapidly
- ✓ Surface preparation is less critical than with penetrant inspection
- ✓ Equipment costs are relatively low
- ✓ The method can be adopted for site or workshop use

At TOMTEC, we ensure that all our technicians are competent and certified to internationally recognized standards.

TOMTEC performs both visible and fluorescent magnetic particle testing in accordance with ASTM E1444, ASTM E125, ASTM E709, ASME BPVC Section V – Article 7, AWS D1.1, BS 6072, EN 1290, BS EN ISO 17638, BS EN 1369, BS EN 10228 – 1 and similar national and international standards.

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