

## magnetic particle inspection faq

Magnetic Particle ▾

### What is Magnetic Particle Inspection?

A nondestructive test method which provides for the detection of linear, surface and near surface discontinuities in ferromagnetic (material that can be magnetized) test materials.

### What is a linear indication?

Any indication having a length dimension at least 3-times greater than its width ( $L=3 \times W$ )

### What are the advantages of magnetic particle inspection?

1. Test method process is quick and simple in principle and application
2. Highly sensitive to the detection of surface and slightly subsurface linear indications
3. Indications appear on the actual test part
4. Test method process may often work through contaminant layers and coating thickness
5. The method lends itself to automation and high volume production inspection
6. Less expensive than other more sophisticated methods of quality assurance

### What are the limitations of magnetic particle inspection?

1. Test material must be ferrous
2. Provides limited and variable potential for detection of subsurface indications
3. Care is required to avoid burning and arcing of test part surface at points of electrical contact
4. The magnetic field direction must intercept the major dimension of the discontinuity
5. Complex test part geometry may sometimes pose problems with proper amperage determination and magnetic field intensity
6. Demagnetization of test part following the inspection is often necessary

### Are there different types of magnetic particles?

Yes, the different types are:

1. Dry method non-fluorescent
2. Wet method fluorescent
3. Wet method non-fluorescent

### What are the properties of dry powder and wet suspension magnetic particles?

They are Iron Oxide particles, finely divided in sizes varying between .125 and 60 microns with a high permeability (easily magnetized) and low retentivity (ability to stay magnetized). Dry particles are chemically dyed to provide contrast against the background of the test surface. Stock colors are gray, red, black and yellow. Application is either with a squeeze bulb or spray gun. Wet suspension particles are suspended in an oil based or water based liquid vehicle or carrier. With water you must add conditioners in addition to a wetting agent and corrosion inhibitors.

### What is the sensitivity comparison between wet vs. dry methods?

Wet method provides improved sensitivity for the detection of very fine surface flaws. Dry method provides improved sensitivity for the detection of subsurface flaws.

### What is the maximum depth that magnetic particles can detect a discontinuity?

1/4 inch, however .050 to .100 inch is a more realistic depth.