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### FS 3: Magnetic Particle Inspection (MPI)

MPI is a method of detecting both surface and subsurface flaws in ferromagnetic materials (carbon based steels/mild steel). The principle of MPI is that when a current is applied to a conductor, a magnetic field will occur. The induced magnetic field will produce a flux leakage field around any discontinuities in the item – this leakage field is revealed by applying ferrous iron particles (usually from an aerosol) to the surface of the item. These ferrous particles cluster at areas of flux leakage to give indications of flaw in the item.

MPI is a stock-in-trade technique that may be used as the primary means of inspection (on bare or rough surfaces) or as a means of further exploring flaws detected by Eddy Current Inspection.

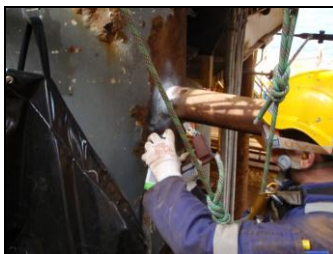
Typical applications are primary method NDT, post visual inspection, of welded fabrications and statutory inspections of in-service welded items.

The main advantages of MPI are that it can provide detailed information about both surface and internal flaws and is a relatively simple/robust and inexpensive technique.

A disadvantage of the technique is that the surface coating of the item to be inspected must be removed, usually by needle gunning, hence introducing the need for coating repair.

*Axiom NDT have developed approved procedures for inspection of galvanised (conductive) and non-conductive coated weldments using Eddy Current and this is strongly recommended as an alternative for in-service items.*

Note: MPI consumables are usually aerosol products, which are considered 'dangerous goods' for shipping purposes and are supplied by Axiom complete with dangerous goods paperwork, certificates of conformity and COSHH data sheets.



*An Axiom rope access technician using MPI on the Exxon Mobil Beryl Alpha 10k upgrade in 2009*

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