



TUBE TESTING

MB – MAGNETIC BIAS



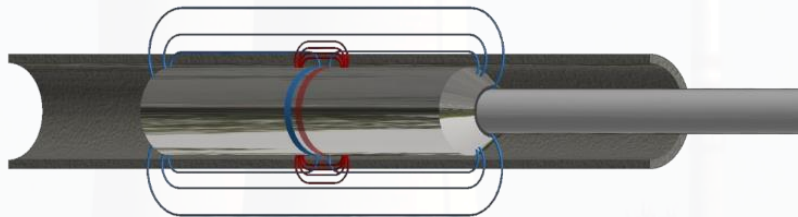
Definition of Magnetic Bias: A steady magnetic field applied to the magnetic material for partial or full saturation.

Magnetic Bias (MB) also known as Partial Saturation Eddy Current (PSEC) or Full Saturation Eddy Current (FSEC) is being used to inspect magnetic or partially magnetic tubing such as Carbon Steel, Duplex and Ferritic Stainless steel.

This technology offers good sensitivity when detecting metal discontinuities such as corrosion, erosion, pitting, baffle fretting, wall loss, and cracks in partially magnetic materials. In full ferro-magnetic materials, only localized pitting/corrosion is detected.

Method of Inspection

When standard eddy current is applied to ferrous tubes the eddy current field is affected by the magnetic properties of the material. The Magnetic Bias probe creates a magnetic field in the material and is set to exactly the correct intensity to saturate the material and limit the effects of the magnetic properties of the material. This allows enough of the eddy currents to bypass the skin effect and penetrate the material. Defects in the material will cause a change in the permeability of the material at that position as well as the amount of eddy currents at that point. The detector coil will then pick up this change in eddy currents and the system will then visually present that information on the computer screen. Full saturation can be achieved in partial magnetic materials.



Inspection Capabilities

- Partial magnetic materials can be inspected the same as nonmagnetic materials with normal Eddy Current.
- It is a very quick screening technique for Ferro Magnetic Materials.
- The Magnetic Bias eddy current technique can measure localized defects (pits) as small as 2mm and sized to an accuracy of $\pm 10\%$ of the wall thickness. (Volumetric dependent for magnetic materials)
- In the region of 300 to 500 tubes inspected per shift.
- Tube sizes are limited to internal diameters between 14mm and 32mm for tubes with a wall thickness less than 3mm. Linked to Magnetism.