

Magnetic imaging concept using giant magnetoresistance (GMR) sensor

ABSTRACT

Metal embedded in walls or floors cannot simply be determined by visual inspection. Thus, this paper presents regarding the development of a magnetic imaging system based on giant magneto-resistance (GMR) sensors for metal shape detection inspection. The system function based on the magnetic flux leakage testing (MFLT) principle for shape detection of ferromagnetic materials. The operation system is made up of a 21 linear GMR sensors array which detect changes of induced magnetic field on a ferromagnetic metals shape under evaluation. All the experimental result presents the effect of perpendicular gap towards accuracy of system in magnetic imaging of ferrous SS400 mild steels specimens; which are square, round and triangle in shape. These experimental results proved the functionality of the system in magnetic imaging of ferrous object shapes. Magnetic images produced from the actual ferromagnetic metals specimens are illustrated according to their respective finite shape.

Keyword: Giant magneto-resistance (GMR) sensors; Magnetic flux leakage testing; Shape detection