



SNS College of Technology

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COIMBATORE-641 035, TAMIL NADU



Department of Aerospace Engineering

19AST202 AIRCRAFT PRODUCTION TECHNOLOGY

UNIT V HEAT TREATMENT – SURFACE ENGINEERING – INSPECTION

Classify the different nondestructive testing method and explain the Liquid Penetrant Testing, Magnetic Particle Testing

What is nondestructive testing?

Non Destructive Testing (NDT) is the process of doing inspections, testing, or evaluating materials, components or assemblies for defects without destroying the material or component.

Who Uses NDT?

- NDT plays a vital role in assuring the safe operation of equipment and systems

- Industries that utilize NDT:

Airline and Aerospace

Automotive and Railroad

Construction

Hydroelectric, Fossil, and Nuclear Power

Textile and Manufacturing

Chemical and Petrochemical

Logistics and Supply

Medical and Pharmaceutical

The most frequently used test methods are:

Visual Testing (VT)

Liquid Penetrant Testing (PT)

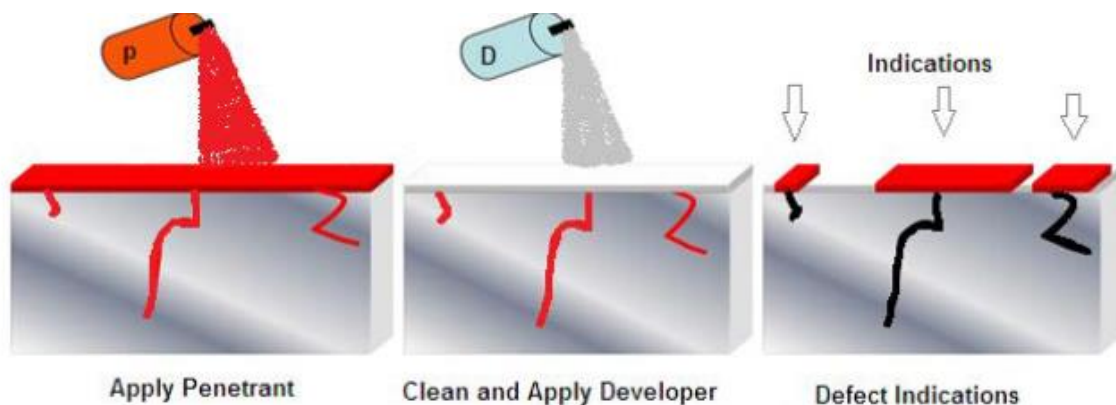
Magnetic Particle Testing (MT)

Ultrasonic Testing (UT)
Electromagnetic Testing (ET) (Eddy Current)
Radiographic Testing (RT) (X-ray)

Acoustic Emission Testing (AE)

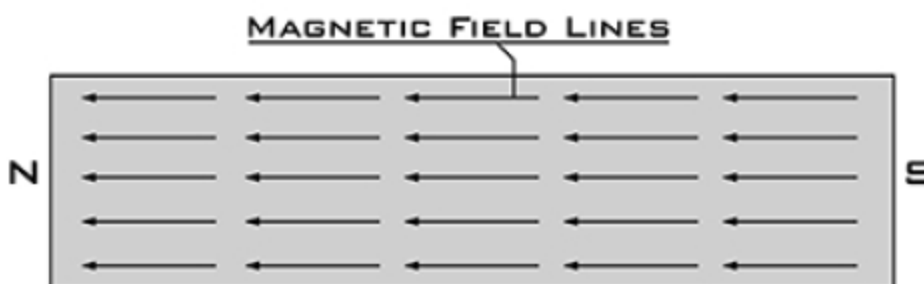
Liquid Penetrant Testing (PT)

PT uses a liquid with high surface wetting characteristics is applied to the surface and allowed to seep into defects and then excess liquid is removed. A developer is applied the trapped penetrant is pulled out of the defect where it can be seen. Visual inspection is then performed. The penetrant used is often loaded with a fluorescent dye and the inspection is done under UV light to increase test sensitivity.

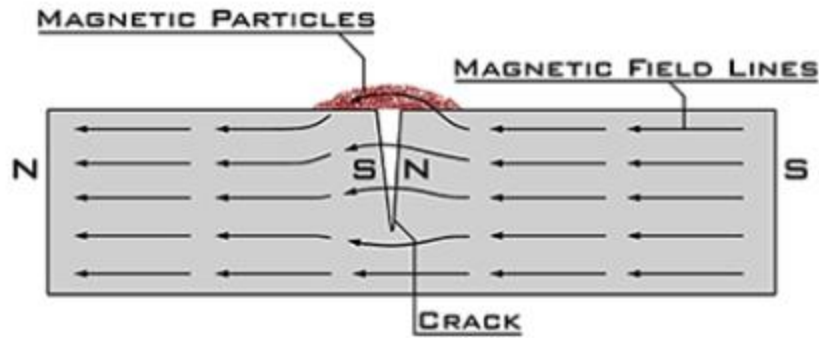


Magnetic Particle Testing

Magnetic particle Inspection, a non-destructive method of detecting defects on or near the surface of ferromagnetic materials by the accumulation of magnetic particles in the leakage field near the defect.



When ferromagnetic material (typically iron or steel) is defect-free, it will transfer lines of magnetic flux (field) through the material without any interruption.



But when a crack or other discontinuity is present, the magnetic flux leaks out of the material. As it leaks, magnetic flux (magnetic field) will collect ferromagnetic particles (iron powder), making the size and shape of the discontinuity easily visible.

Acoustic Emission Testing (AET)

Acoustic Emission Test is a type of Non – Destructive Test method generally used for detecting and locating imperfections in mechanically loaded structures or components. Flaw origination and progression in a stressed component can be identified by acoustic emission test method. This can be done when the component is subjected to repetitive or continuous stress.

