



IIT ROORKEE



NPTEL ONLINE
CERTIFICATION COURSE

DEFECT DIAGNOSIS IN CASTINGS

Non destructive testing methods

Dr Pradeep Kumar Jha
MIED

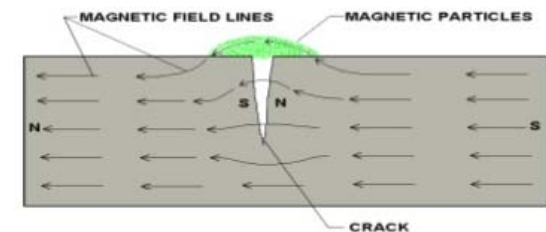


Nondestructive testing techniques

- NDT is carried out to check the soundness of casting, control of microstructure (in some cases) etc.
 - ☐ Visual
 - ☐ Magnetic
 - ☐ Penetrant
 - ☐ Radiography
 - ☐ Fluoroscopy
 - ☐ Ultrasonic
 - ☐ Eddy current
 - ☐ Pressure testing

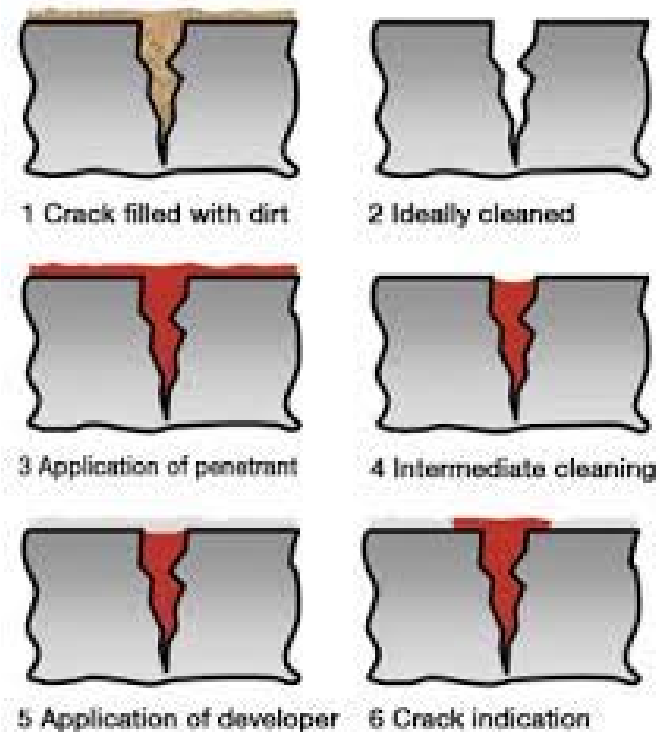
Magnetic particle test

- Magnetic field or flux in a ferromagnetic material is introduced.
- Surface discontinuity which cuts the magnetic field/flux causes flux leakage, that may be detected by surface application of a finely divided magnetic powder.
- For maximum sensitivity, surface discontinuity must cut the magnetic flux at right angles.



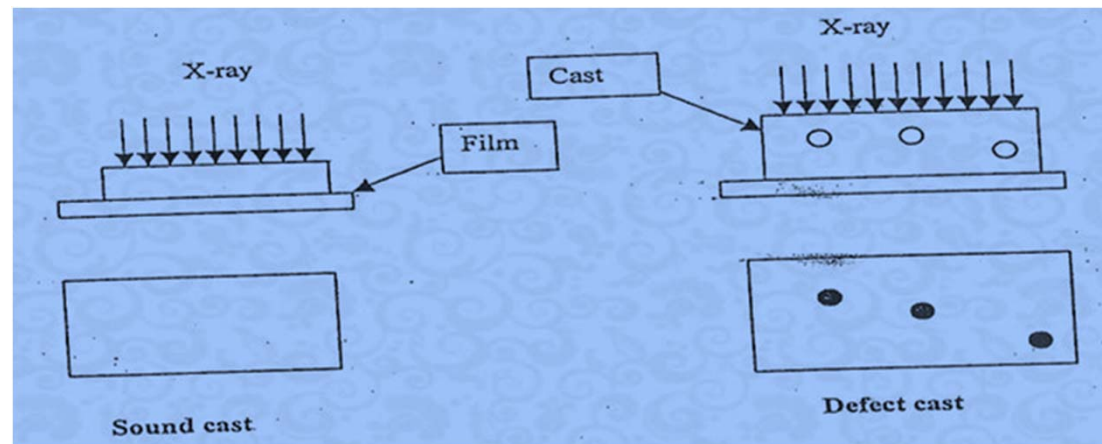
Penetrant test

- Dye penetrant test/Fluorescent penetrant test.
- liquid containing a coloured dye or a substance that emits a green or yellow light when illuminated with UV light.



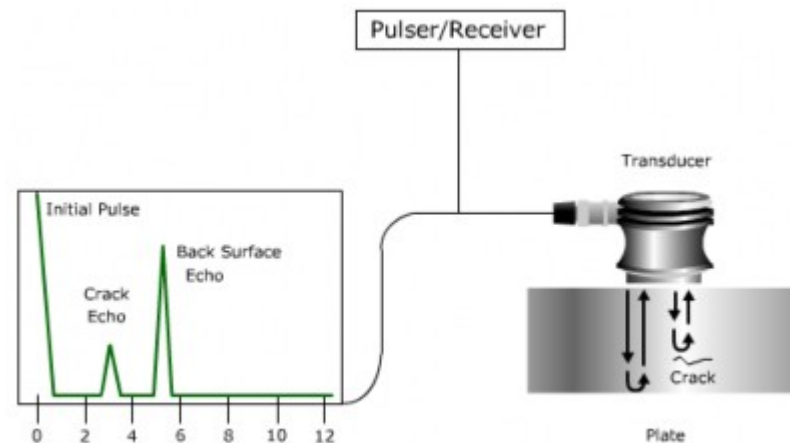
Radiographic testing/Fluoroscopy

- Penetrating ionizing radiation are passed through component.
- Selection of ionizing radiation is dependent upon absorption coefficient of material of component.
- In fluoroscopy, image is produced on a fluorescent screen.



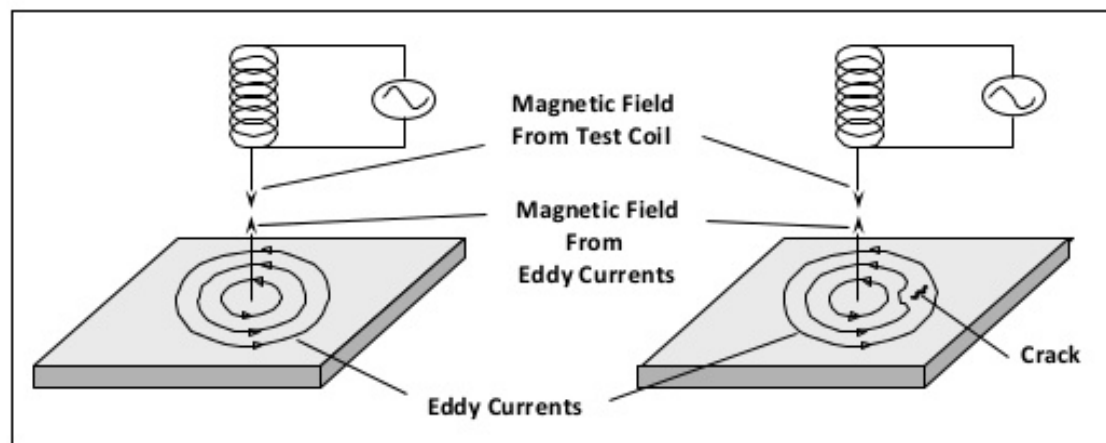
Ultrasonic testing

- Frequency of sound that penetrates the section gives an indication on the instrument screen.
- Layer of greese or a proprietary coupling agent between probe and casting surface to allow transmission of sound into casting.



Eddy current testing

- In this test, alternating current is passed through a coil which is when brought closer to part being tested, a disturbance in current flow is created.
- This disturbance is detected as voltage across secondary coil or perturbation of impedance of the primary coil.
- The method is used for detection of surface flaws, faulty metallurgical properties and dimensional inaccuracies etc.



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Leak detection testing

- Bubble test
- Helium mass spectrometer test

THANKS

