



## Magnetic Particle Testing - level -II

Course Duration: 20 Hours ( Level -I ( 12 hours) & Level -II ( 08 Hours)

Magnetic particle Inspection (MPI) is a non-destructive testing (NDT) process for detecting surface and shallow subsurface discontinuities in ferromagnetic materials such as iron, nickel, cobalt, and some of their alloys. The process puts a magnetic field into the part. The piece can be magnetized by direct or indirect magnetization. Direct magnetization occurs when the electric current is passed through the test object and a magnetic field is formed in the material. Indirect magnetization occurs when no electric current is passed through the test object, but a magnetic field is applied from an outside source. The magnetic lines of force are perpendicular to the direction of the electric current, which may be either alternating current (AC) or some form of direct current (DC) (rectified AC).

The presence of a surface or subsurface discontinuity in the material allows the magnetic flux to leak, since air cannot support as much magnetic field per unit volume as metals. To identify a leak, ferrous particles, either dry or in a wet suspension, are applied to a part. These are attracted to an area of flux leakage and form what is known as an indication, which is evaluated to determine its nature, cause, and course of action, if any.

### Training Course Objective:

- To provide a basic Knowledge of MPT to enable a participant to carry out tests according to a established procedure under supervision of a level II or III personnel. The course is especially designed to provide a sound theoretical knowledge and practical skill for MPT required for a level II technician.
- As per SNT-TC 1A 2016 Edition is the Recommended Practice for NDT Level II Personnel.
- Select proper test technique and Related Source
- Perform testing and interpret the results as per applicable standards
- Have knowledge of the scope and limitations of MPT
- Be familiar with production processes of the test material and knowledge of type & location of expected defects
- Prepare test report for to accept or reject or to retest / rework.
- Guide and check test results of Level-I operators.
- Responsible for care and maintenance of the NDT/MPT equipment
- To select proper test technique and equipment as per established procedure.
- To calibrate, set and carry out test or supervise testing by level I operator.
- Prepare test report for acceptance/rejection as per standard.
- Have knowledge of merits and limitations of MT and other common NDT methods.
- Prepare written procedure for level I operator.
- Responsible for care and maintenance of testing machines and accessories..

### Course Outline

- Introduction of Magnetic Particle Testing
- Theory of Magnetism
- Field Strength and Distribution
- Magnetization Techniques
- Current Selection
- Magnetic Medium for Magnetic Particles Inspection.
- Magnetic Field Direction and Intensity Reference Standards.
- Illumination for Magnetic Particle Inspection
- Demagnetization
- Interpretation of MPI Indications
- Performing an MPT on a finished or partial weld pre-test requirements
- Codes, Standards and Procedures
- Acceptance Standards
- Manufacturing Process and / Issued By: Discontinuities
- Evaluation of Test Equipment

### Training & Examination Entry Requirements: -

- Mandatory Training has to be undergone for Level 1 (12 Hrs) & Level II (8 Hrs) combined total of 20 hrs.
- Minimum Experience for attending Level -1 is 90 Hours and Level II is 170 Hours.
- Candidate seeking admission into the particular course method shall duly fill in an application form and submit his ID proof with two (02) passport size photographs.
- Candidate Educational Qualifications to be also submitted (10th Std, S.S.C, Inter, Diploma in Eng. or B.E / B.Tech/ B.Sc.).
- Candidates shall submit his verifiable experience certificate from his present employer.
- Minimum Passing is 70% and Overall Grading Pass is 80%.
- Experience Minimum of 530 Hours in Total NDT Methods is required for Level 2 and 280 Hours in MPI Method.

### Career Enhancement:

After successful completion of Training & Examination candidates further seeking career in NDT can attend ET, VT & Certified Welding Inspector (Level -II or Visual Welding Inspector (Level-1) and can also attend MPT Level III.

### Validity of Certification:

- 5 years from the Date of Issue of Certification (renewal to be done by Re-examination or Continuous Satisfactory Performance only)

### Certification Scheme / Issued By:



### Examination Module :

**General Examination: 60 Minutes**  
40 Multi Choice Questions

**Specific Examination: 30 Minutes**  
20 Multi Choice Questions

**Practical Examination: 120 Minutes**  
01 Weld Plate  
01 Weld Pipe  
01 Weld Tee Joint

**Viva Examination: 15 Minutes**  
15 Questions