



COURSE CURRICULUM- MAGNETIC PARTICLE TESTING LEVEL I & II

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.

About the course:

This course is designed to provide the participants, a better understanding about theory and application of MPI in welds, to train them and qualify them as PCN Level I or II in Magnetic Particle Testing.

Experience requirements: For Level I: Minimum work experience of 1 month as Trainee.

For Level II: Minimum work experience of 3 months as Level I in Magnetic Particle Testing or 4 months as a trainee involved in Magnetic Particle Testing is a mandatory requirement to appear for examination and certification.

Vision requirements: Vision requirements as per PSL-44 (<http://www.bindt.org/downloads/psl44.pdf>)

Last date for registration: One week prior to the commencement of the course (subject to availability)

Training Hours: PCN Level I: 16 hours
PCN Level II: 24 Hours (For qualified Level I) or 40 hours (For Trainee)

Course content:

Level I course outline

- Basic of Magnetism
- Magnetization Techniques
- Inspection Mediums
- Inspection Techniques
- Indication Classification



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Test Equipments and Accessories
Demagnetization
Types of Discontinuities.

Level II course outline:

Basics of NDT
Basic of Magnetism
Magnetization Techniques
Inspection Mediums
Inspection Techniques
Indication Classification
Test Equipments and Accessories
Demagnetization
Indication- interpretation and Recording
Product technology- Discontinuities in Casting, Forging, Wrought & Forming process
Understanding of codes
Welding technology- major weld process SMAW, SAW, TIG, MIG, FCAW etc

Learning outcomes:

- Identify suitability of MT for material and inspection procedure
- Develop inspection techniques and procedure that shall be followed
- Analyze, interpret and evaluate the test results.

Examination and validity: Training program comprises of daily assessment after completion of each chapter and the participants are required to get above 70% marks. Based on daily assessment exams, candidate is awarded with successful completion of training. Then the participants are required to undergo examination which consists of specific and practical examination. Candidate has to obtain a minimum of 70% in each examination to get certified as PCN MPT level I or II (As appropriate). This certificate is valid for 5 years from the date of certification. The certificate has to be renewed as per PCN requirements.

Documents to be submitted for registration:

1. PSL 57-A Initial Examination application
2. PSL 30- Log of Experience
3. PSL 44-Vision Requirements (which has to be certified by a registered medical practitioner)
4. PCN Wallet card copy
5. PCN MPT level I Certificate copy(If applicable)

Note:

1. TIW reserves the right to disqualify the participants from certification program when the personnel is found that they he/she shall not meet the PCN requirements



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2. Participants are not allowed to use their own equipment during the training and examination. TIW provides candidate with Equipment, consumables and other accessories needed for practical inspection.