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# MAGNETIC PARTICLE TESTING – SYLLABUS

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## **Introduction**

- The History Of Magnetic Particle Testing
- Basic Procedure
- Principle of Magnetic Particle testing
- Advantages
- Limitations

## **Magnetic Flux Theory**

- Magnetism & Magnet
- Magnetic Flux Lines
- Magnetic Hysteresis Curve
- Flux Leakage
- Basic Magnetic Particle Testing Theory
- Working principle of Magnetic Particle testing

## **Theory of Magnetism**

- Types of Magnetic Material
- Magnetic Domains
- Magnetic Poles
- Sources of Magnetism

## **Types of Magnetic Fields**

- Methods of Inducing Magnetic Field
- Direct method
- Indirect method
- Longitudinal Magnetic Fields
- Circular Magnetic Field

## **Magnetic Particle Testing Equipment**

- Longitudinal Magnetic Fields
  - Electromagnetic yoke
  - Permanent magnet
  - Coil shot
  - Cable wrapping
- Circular Magnetic Field
  - Head shot
  - Prods
  - Central conductor

## **Magnetic Particle Testing Particles.**

- General Requirements
- Application Methods
- Dry Particles
- Wet Particles
- Settling test

## **Types of current**

- Electrical Currents
- Alternating Current
- Half Wave Direct Current
- Full Wave Direct Current
- Three phase Full Wave Direct Current
- Portable equipment
- Mobile equipment

## **Method Selection Criteria**

- Standards and Specifications
- Part Geometry
- Part Size
- Types of Discontinuities
- Selection of Method
- Current
- Particles
- Application
- Magnetism
- Amperage
- Equipment and Environment
- Determination of Field Strength
- Part Preparation
- Sequence of Operations

## **Testing and Evaluation of Indications**

- Discontinuity Categories
  - Surface
  - Subsurface
- Indication
  - Relevant Indication
  - Nonrelevant Indication
  - True Indication
    - True with Relevant Indication
    - True with Nonrelevant Indication
  - False Indication
- Acceptance and Rejection Criteria
- Aids for Indication Evaluation

## **Types of Inspection**

- Visual Inspection
- Fluorescent Inspection
- Ultraviolet Light
- Visible Light

## **Demagnetization Principles**

- Residual Magnetism
- Reasons for Demagnetization
- Retentivity and Corecive Force
- Demagnetization Methods
  - Heat Treating Demagnetization
  - Alternating Current Demagnetization

- Direct Current Demagnetization
- Electromagnetic Demagnetization
- Demagnetization Verification Methods

**Post cleaning**

