



# ABOUT OUR COMPANY

## A Brief Story About The Company

We are providing Industrial Trainings, Testing and Inspection services in Mechanical Engineering field.

We experienced that many students struggle to find suitable jobs because of a lack of awareness about different industries and career options, as well as factors like unrealistic expectations, lack of skills, and limited opportunities.

When they get the degree, there are of no use for the industries due to the wide differences in the engineering syllabus and actual technology used in the company. A company wants to hire ready-made engineers but they are not getting those students.

An engineer should try to get required skills during their course itself by attending internships, industrial trainings. If not possible, they should join the small industries to get the experience for at least one year and then apply for the multi national company. During this one year they should not worry about salary because companies are training them for the future job.

So, we decided to fill the gaps between industry and academia by providing the best quality content with real time industry demand in the area of NDT, DT, Fabrication, Inspection, QA/QC, ISO, TPI etc.



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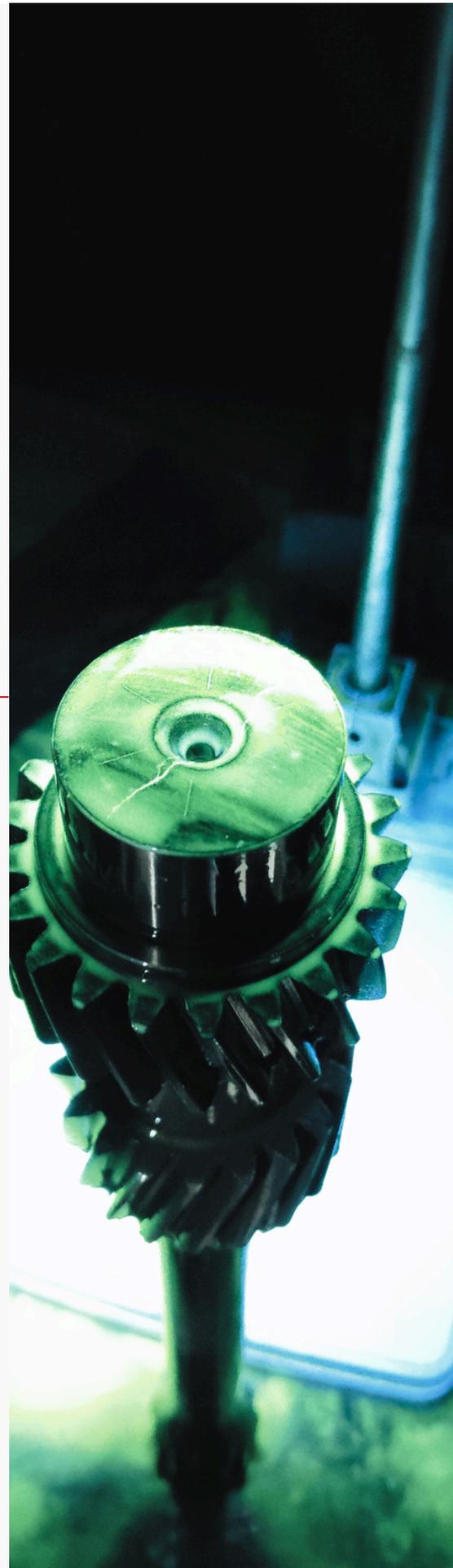
# VISION

To be a reputed institution in training and skill development, empowering individuals and organizations to achieve excellence.

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# MISSION

To provide high-quality education and training programs that are responsive to the evolving needs of industries, communities, and learners.



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# OUR SERVICES

## NDT Level II Training & Certification

As per (ASNT-SNT-TC-1A) UT, RT, PT, VT, MT, ET

## NDT Services: Testing and Procedure making

Ultrasonic Testing (UT), Radiographic Testing & Film Interpretation (RT), Liquid Penetrant Testing (PT), Magnetic Particle Testing (MT), Visual Testing (VT)

## Welding Inspector Preparatory Training & WPS/PQR/WQR

TWI CSWIP 3.1 Welding Inspector and AWS CWI Certified Welding Inspector

## ASNT NDT LEVEL III/ISO 9712/ISNT Preparatory Training

Preparatory Training for UT, RT, PT, VT, MT, ET

## Destructive Testing and Training

Tensile test, Impact test, Hardness test, Bend test, Fracture test, Macroscopic Examination

## Setting up DT/NDT labs, ISO, Quality audits, QA/QC

ISO 9001, 14001, 45001, 17020, 17025 Certification preparatory work.



# QA/QC

## (Quality Assurance and Quality Control)

QA/QC is the combination of methods to ensure products or services meet quality standards and customer expectations. QA focuses on preventing defects through process improvement and planning, while QC focuses on identifying and fixing defects after they occur.

### Key Components of QA/QC Processes

Establishing Quality Standards and Procedures.

Lack of standardized processes leading to inconsistency.

Implementing Effective Document Control and Management.

Challenges in managing documentation and version control.

Training and Qualification of Personnel.

Difficulty in ensuring team competency and skill development

### Practicable Techniques for QA/QC Implementation

Inspection and Testing Methods.

Issues with identifying and addressing defects.

Concerns about damage assessment and risk mitigation.

Statistical Process Control (SPC) for Continuous Improvement.

Corrective and Preventive Actions (CAPA).

### QA/QC benefits for mechanical field

Improved product reliability and performance.

Reduction in defects and rework.

Cost savings through efficient processes.

Enhanced customer satisfaction and trust.

Addressing Audience Pain Point: Overcoming obstacles and roadblocks in the QA/QC journey



# WELDING

# INSPECTION

CSWIP (TWI) | CWI (AWS)

## CSWIP (Certification Scheme for Welding and Inspection Personnel)

It's an internationally recognized certification scheme managed by TWI (The Welding Institute) in the UK. CSWIP provides a range of certifications related to welding inspection, welding, and non-destructive testing (NDT).

### Benefits of CSWIP Certification

- Recognized globally, especially in industries like oil & gas, aerospace, and construction.
- Enhances career opportunities and earning potential.
- Ensures a strong understanding of welding and inspection principles.

### How to Get Certified

1. Meet the Experience Requirements (varies by level).
2. Complete the Training Course (typically offered by different training bodies).
3. Pass the Examination (includes theoretical and practical tests).



## Common CSWIP Certifications

### CSWIP 3.0 – Visual Welding Inspector

Entry-level for individuals with little or no experience in welding inspection. Focuses on basic visual inspection techniques.

### CSWIP 3.1 – Welding Inspector

Requires some industry experience. Covers welding processes, inspection techniques, and codes/standards. Widely recognized in oil & gas, construction, and manufacturing industries.

### CSWIP 3.2 – Senior Welding Inspector

For experienced inspectors. More in-depth on welding metallurgy, defects, and advanced inspection methods.

### CSWIP Welding Quality Control Coordinator

Focuses on welding quality assurance and documentation.

### CSWIP NDT Certifications

Cover techniques such as Ultrasonic Testing (UT), Radiographic Testing (RT), Magnetic Particle Testing (MT), and Penetrant Testing (PT).

# WELDING

# INSPECTION CSWIP (TWI) | CWI (AWS)

## AWS CWI (American Welding Society Certified Welding Inspector)

It's also an internationally recognized certification scheme managed by AWS (American Welding Society).

### Benefits of AWS CWI Certification

- Global recognition in the welding and fabrication industry.
- Higher earning potential and job opportunities.
- Authority to sign off weld inspections and certify work meets code.

## Eligibility Requirements

AWS uses a point system based on education + work experience:

Education Level	Required Work Experience
Bachelor's degree in Welding	1 year
Associate degree	2 years
High school / diploma	5 years
Less than high school	9 years



## The AWS CWI Exam Structure

The exam has 3 parts, taken on the same day:

### Part A – Fundamentals (2 hours)

1. Welding processes, NDT, destructive testing, welding metallurgy, symbols, safety, etc.

### Part B – Practical (2 hours)

1. Hands-on with weld replicas, gauges, and inspection tools.  
2. Interpret discontinuities and measurements using welding gauges.

### Part C – Code Book (2 hours)

1. Open-book exam using a specific welding code (usually AWS D1.1 or ASME Section IX).  
2. Tests your ability to locate and interpret code requirements.



# ISO ( INTERNATIONAL ORGANIZATION FOR STANDARDIZATION )

ISO develops international standards across a wide range of industries – from technology and manufacturing to agriculture and healthcare. These standards are designed to:

- Improve product and service quality
- Promote global trade
- Ensure safety and reliability
- Support innovation and compatibility

## **ISO 9001**

QUALITY MANAGEMENT SYSTEMS (QMS) – ENSURES CONSISTENT QUALITY IN PRODUCTS/SERVICES.

## **ISO 14001**

ENVIRONMENTAL MANAGEMENT – HELPS ORGANIZATIONS REDUCE THEIR ENVIRONMENTAL FOOTPRINT.

## **ISO 45001**

OCCUPATIONAL HEALTH AND SAFETY – FOCUSES ON WORKER SAFETY AND RISK REDUCTION.

## **ISO 17020**

CONFORMITY ASSESSMENT – REQUIREMENTS FOR THE OPERATION OF VARIOUS TYPES OF BODIES PERFORMING INSPECTION

## **ISO 17025**

GENERAL REQUIREMENTS FOR THE COMPETENCE OF TESTING AND CALIBRATION LABORATORIES



# DESTRUCTIVE TESTING ( DT )

## ☐ A Brief Story About Destructive Testing

Destructive testing (DT) includes methods where your material is broken down in order to determine mechanical properties, such as strength, toughness and hardness. strength, toughness and hardness.

In practice it means, for example, finding out if the quality of a weld is good enough to withstand extreme pressure or to verify the properties of a material.

## Benefits of Destructive Testing (DT)

It verifies properties of a material.

It determines quality of welds.

It helps you to reduce failures, accidents and costs.

It ensures compliance with regulations.

## Types of Destructive testing

Bend test

Break test

Tensile test

Hardness test

Impact test



# NON-DESTRUCTIVE TESTING (NDT)

## A Brief Story About Non Destructive Testing

Non Destructive Testing involves techniques based on application of physical principles employed for purpose of determining characteristics of materials or components and for detecting and assessing inhomogeneity and harmful defects without breaking the product.

### **Advantages of NDT**

- Flaw Detection and Evaluation.
- Leak Detection in Components.
- Location Determination and Orientation of Defects.
- Dimensional Measurements.
- Assistance in Product Development.
- Improve and control Manufacturing Process.

### **Industrial Use**

- Inspection of Raw Products – Forgings, Castings, Extrusions.
- Inspection following Secondary Processing – Machining, Welding, Grinding, Heat Treatment, Plating.
- Inspection for In-Service Damage – Cracking, Corrosion, Erosion/Wear, Heat Damage.



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# NON DESTRUCTIVE TESTING (NDT) METHODS

- 1. Visual Testing (VT)**
- 2. Liquid Penetrant Testing (PT)**
- 3. Radiographic Testing (RT)**
- 4. Ultrasonic Testing (UT)**
- 5. Magnetic Particle Testing (MT)**
- 6. Electromagnetic Testing (ET)**
- 7. Acoustic Emission Testing (AE)**
- 8. Ground Penetrating Radar (GPR)**
- 9. Guided Wave (GW)**
- 10. Thermal or Infrared Testing (IR)**
- 11. Neutron Radiographic Testing (NR)**
- 12. Laser Testing (LM)**
- 13. Leak Testing (LT)**
- 14. Magnetic Flux Leakage (MFL)**
- 15. Microwave Testing (MW)**
- 16. Vibration Analysis (VA)**

Selecting the right Non-Destructive Testing (NDT) method depends on several key factors, including:

1. Type of Material (Ferromagnetic, non-ferromagnetic materials, Non-metallic)
2. Type of Defect (Surface defects, Subsurface defects, Internal volumetric flaws)
3. Geometry & Size of the Component
4. Accessibility
5. Surface Condition
6. Cost and Time Constraints
7. Safety & Regulatory Requirements

NDT methods are used to make sure that important parts on airplanes, trains, and automobiles are free of defects that could lead to an accident. NDT make sure that parts do not have defects that would lead to unhappy customers.



# CERTIFICATION LEVELS IN NDT TRAINING

**Level I:** One who passed 10th standard

**NDT Level II:** +2, diploma or graduate in engineering or science

**Level III:** Level II + 4 years experience OR Graduated a 4-years degree in engg. or science + 1 year Experience

**NDT Level I:** An NDT Level I individual should have sufficient technical knowledge and skills to be qualified to properly perform specific calibrations, specific NDT, and specific evaluations for acceptance or rejection determinations according to written instructions and to record results. The NDT Level I should receive the necessary instruction and supervision from a certified NDT Level II or III individual.

**NDT Level II:** An NDT Level II individual should have sufficient technical knowledge and skills to be qualified to set up and calibrate equipment and to interpret and evaluate results with respect to applicable codes, standards, and specifications. The NDT Level II should be thoroughly familiar with the scope and limitations of the methods for which qualified and should exercise assigned responsibility for on-the-job training and guidance of trainees and NDT Level I personnel. The NDT Level II should be able to organize and report the results of NDT tests.

**NDT Level III:** An NDT Level III individual should have sufficient technical knowledge and skills to be capable of developing, qualifying, and approving procedures, establishing and approving techniques, interpreting codes, standards, specifications, and procedures; and designating the particular NDT methods, techniques, and procedures to be used.

The NDT Level III should have sufficient practical background in applicable materials, fabrication, and product technology to establish techniques and to assist in establishing acceptance criteria when none are otherwise available.

The NDT Level III should have general familiarity with other appropriate NDT methods, as demonstrated by an ASNT Level III Basic examination or other means. The NDT Level III, in the methods in which certified, should have sufficient technical knowledge and skills to be capable of training and examining NDT Level I, II, and III personnel for certification in those methods.

Level	Responsibilities
Level I	Perform specific calibrations, tests, and evaluations under supervision. Cannot interpret results.
Level II	Set up equipment, conduct tests, interpret results, and supervise Level I personnel.
Level III	Develop procedures, qualify personnel, audit programs, and ensure code compliance.

# RECOMMENDED INITIAL TRAINING AND EXPERIENCE LEVELS AS PER SNT-TC-1A

NDT Method	NDT Level	Training Hours	Experience	
			Minimum Hours in Method	Total Hours in NDT
Visual Testing (VT)	I	8	70	130
	II	16	140	270
Liquid Penetrant (PT)	I	4	70	130
	II	8	140	270
Magnetic Particle (MT)	I	12	70	130
	II	8	210	400
Radiographic Testing (RT)	I	40	210	400
	II	40	630	1200
Ultrasonic Testing (UT)	I	40	210	400
	II	40	630	1200
Eddy Current Testing (ET)	I	40	210	400
	II	40	630	1200

The **SNT-TC-1A** document recommends that **NDT LEVEL I and NDT LEVEL II** technicians be examined in the following areas:

- A. General examination
- B. Specific examination
- C. Practical examination

The **SNT-TC-1A** document recommends that **NDT LEVEL III** personnel be examined in the these areas:

- A. Basic examination
- B. Method examination
- C. Specific examination

## Vision Examinations

**Near-Vision Acuity:** The examination should ensure natural or corrected near-distance acuity in at least one eye such that the applicant is capable of reading a minimum of **Jaeger Number 2 (J2)** or equivalent type and size letter at the distance designated on the chart but not less than **12 in. (30.5 cm)** on a **standard Jaeger test chart. This should be administered annually.**

**Color Contrast Differentiation:** The examination should demonstrate the capability of distinguishing and differentiating contrast among colors or shades of gray used in the method as determined by the employer. This should be conducted upon initial certification and at **five-year intervals thereafter. (ISHIHARS'S CHART TEST)** Vision examinations expire on the last day of the month of expiration.

# INTRODUCTION TO NDT METHODS

## Visual Testing

Primary method of NDT.

A simple visual test reveals gross surface defects.

Physical Principle : Illumination of the test specimen with light.

Equipment used are very simple and portable.

Most Valuable NDT Tool – Human Eye.

Mainly performed to obtain the general condition of components.

### Methodology

Use of Optical Instruments : Magnify defects, permit visual checks of inaccessible areas, presence of foreign objects, formation of corrosive layer or even damage.

### Applications

Inspection of plant components for leakage.

Misalignment in equipment parts.

Corrosion, erosion, cracks, fracture.

Minute discontinuities on parts like pumps, compressors.

### Limitations

Detects only surface defects.

Cannot be used at places with bright exposure or no light.

Equipment cannot be exposed to hazardous places.



Fig: Videoscope



Fig: Advanced Videoscope

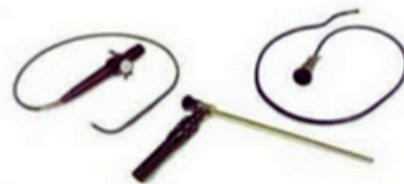


Fig: Borescopes



Fig. Microscope



Fig: Magnifying glass

# INTRODUCTION TO NDT METHODS

## Liquid Penetrant Testing

Any material with relatively smooth, non porous surface on which discontinuities or defects are present.

Physical Principle : Capillary Action of Liquid.

Use of Penetrant, Developer and Cleaner on test specimen.

Defects open to surface like cracks after rolling, casting, weld cracks, hot tears, cold shuts, shrinkages can be detected.

### Methodology

Use of Penetrant and Developer : Penetrant enters discontinuities and cracks by capillary action mechanism and a developer is used to pull penetrant to surface.

### Applications

For surface defects and flaw detection.

Applied on materials during in-service testing.

Large surfaces can be detected easily with low cost and short time.

### Limitations

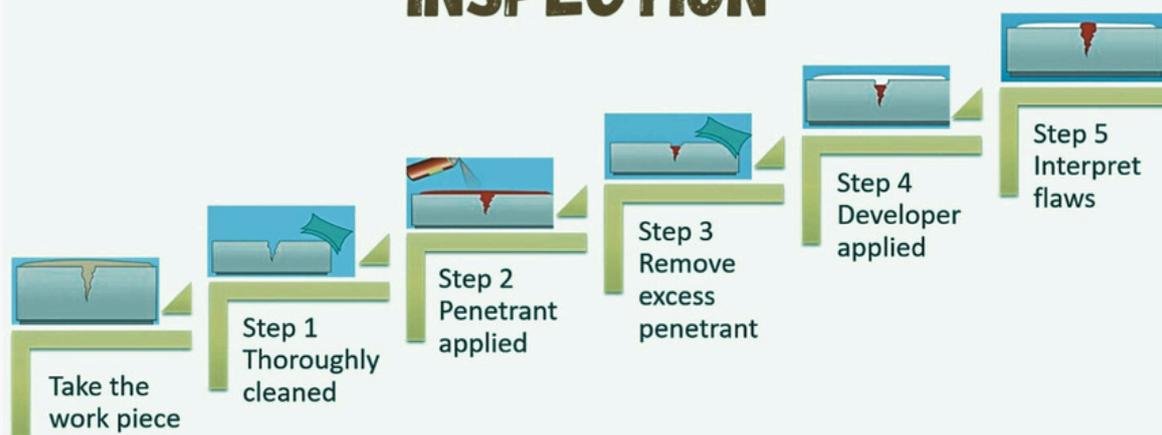
Detects only surface defects. Requires smooth, non porous material.

Penetrant used should neither be highly viscous nor less viscous.

Pre-cleaning is critical. Contaminants can mask defects.

Post-cleaning is essential to remove the chemicals.

## STEPS FOR DYE PENETRANT INSPECTION



# INTRODUCTION TO NDT METHODS

## Radiography Testing

Involves use of penetrating X- Ray or Gamma Rays to examine volumetric defects.

Source of Radiation – X-ray machine or Radioactive isotopes.

Physical Principle : Penetrating power of High Frequency Wave.

Resulting shadowgraph is in the visible region zone.

Material thickness and density change are indicated on the film.

### Methodology

It is based on the principle that radiation is absorbed and scattered as it passes through an object. If there are variations in thickness or density (e.g. due to defects like slag inclusion, tungsten inclusion) in an object, more or less radiation passes through and affects the film exposure.

### Applications

Whenever interior of an object needs to be checked.

To check internal faults and construction defects.

To perform measurements of size, i.e. thickness.

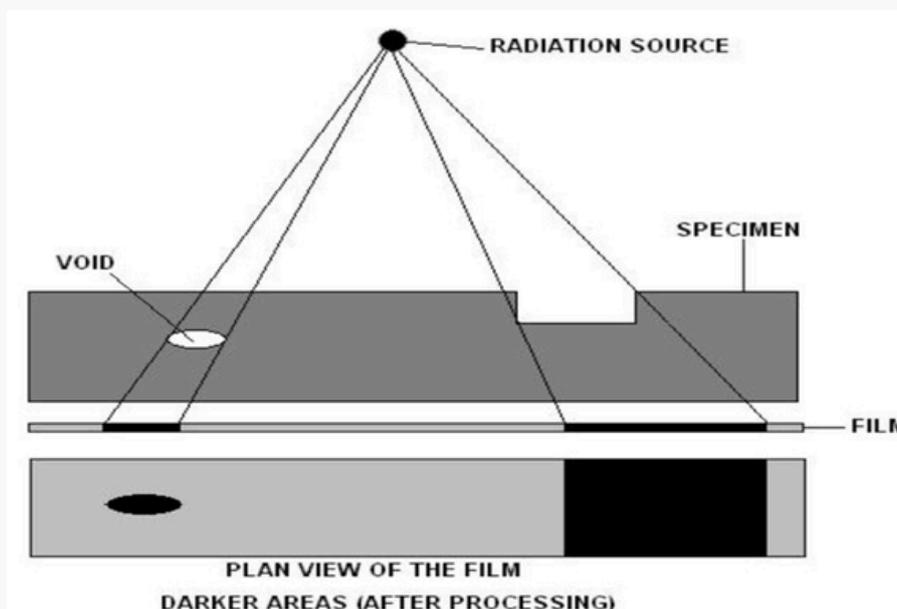
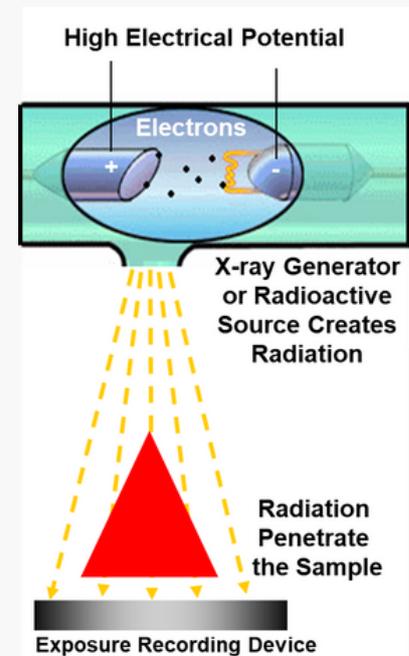
### Limitations

Impracticable to use on specimens of complex geometry.

The specimen must lend itself to two-side accessibility.

Safety considerations imposed by x and gamma rays must be considered.

It is a relatively expensive means of non-destructive testing.



# INTRODUCTION TO NDT METHODS

## Ultrasonic Testing

Use of High Frequency Sound Waves to detect imperfections or to locate changes in material properties.

Physical Principle : Acoustic impedance mismatch.

Time travel between transmission and reception of pulses gives clues regarding internal structure of the material.

The probe used is of split type, having transmitter on one end and receiver on the other end.

### Methodology

The reflected sound energy versus time plot is shown on the oscilloscope screen.

The high trace indicate full thickness of the test-piece whereas the short trace indicates the crack.

### Applications

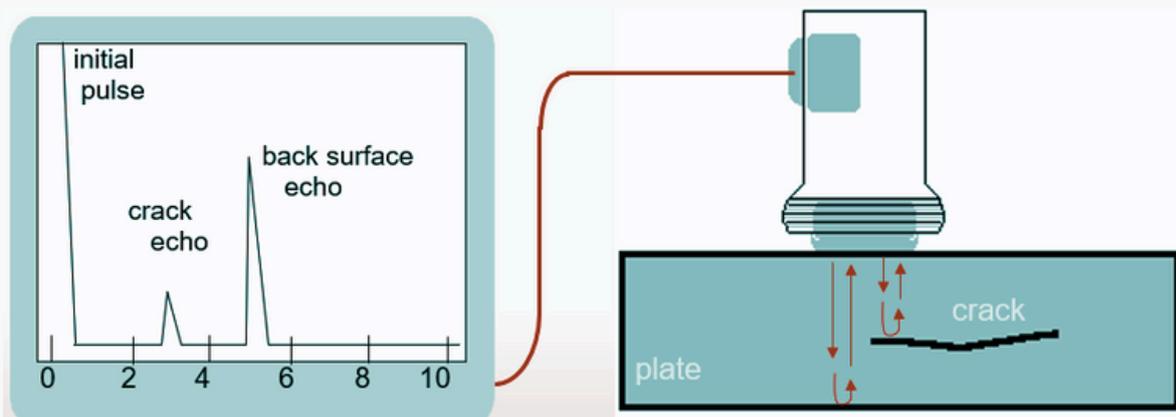
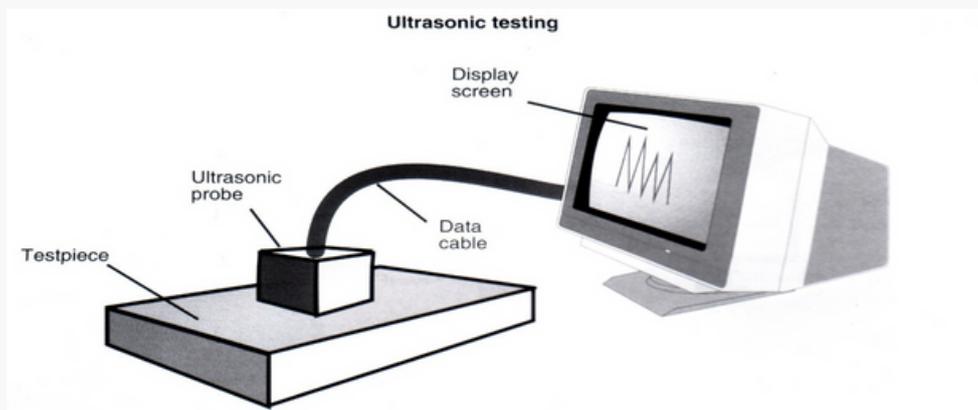
Applicable to almost all materials.

Testing can be carried out from one accessible surface only.

At a time, very large section thickness can be evaluated.

### Limitations

Test method is operator dependent. Needs highly skilled operator.



# INTRODUCTION TO NDT METHODS

## Magnetic Particle Testing

Testing performed on Ferromagnetic materials with a smooth surface.

Fast approach, relatively easy to apply and surface preparation is not critical.

Physical Principle : Leakage of Magnetic Flux

Applicable for surface, sub-surface defects and all other defects (excluding transverse direction)

### Methodology

Magnetization (Faradays Law of Magnetic Induction)

### Applications

Detection on Ferromagnetic materials only.

Cracks oriented perpendicular to the current direction best observed.

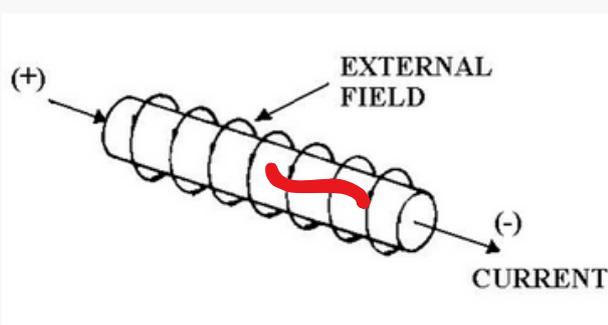
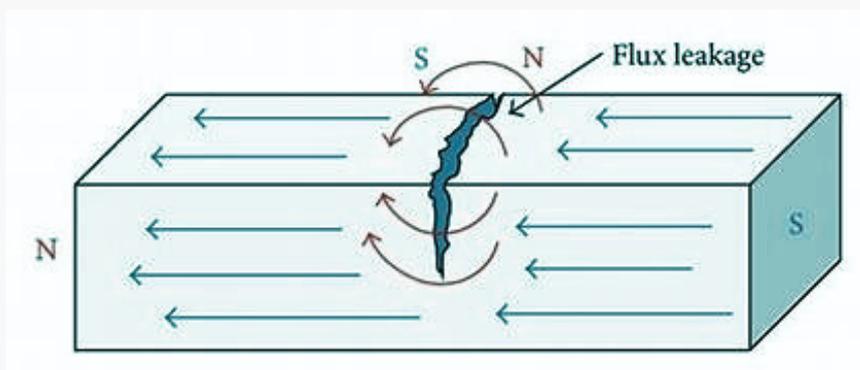
Sensitivity also depends on the type of current used.

### Limitations

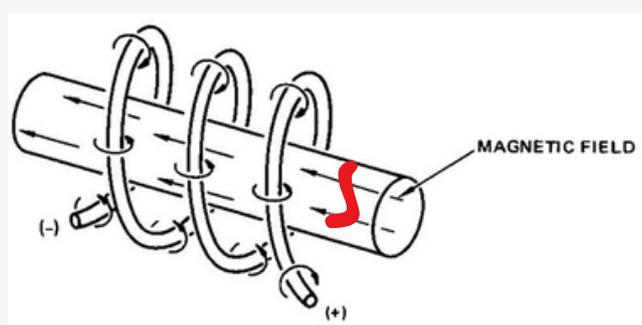
Non Magnetic substances cannot be evaluated.

Avoid local heating and burning of substances.

Demagnetization is important after performing the test.



Longitudinal (along the axis)



Transverse (perpendicular the axis)

# INTRODUCTION TO NDT METHODS

## Electromagnetic Testing By Eddy Current Testing Technique

Applied to electrically conducting materials for defect detection.

Sensitive to small cracks and near surface cracks.

Physical Principal : Electromagnetism.

Used for sorting materials, control of dimensions, measuring coating thickness.

### Methodology

It involves passing an alternating current through a coil, which generates a magnetic field. When this field interacts with a conductive material, it induces "eddy currents" within the material. Changes in these eddy currents, caused by defects like cracks or corrosion, are then detected and analyzed.

### Applications

In-service examination of Heat Exchanger tubes.

Material sorting and Coating thickness.

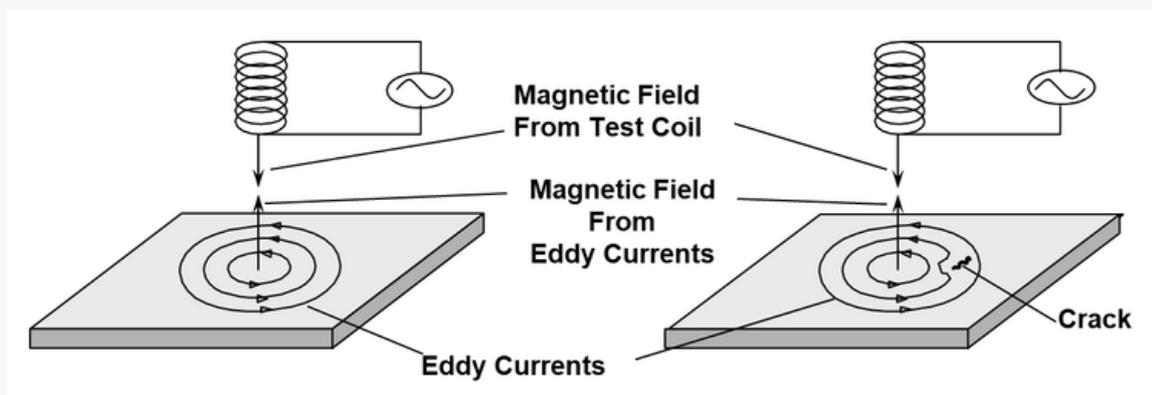
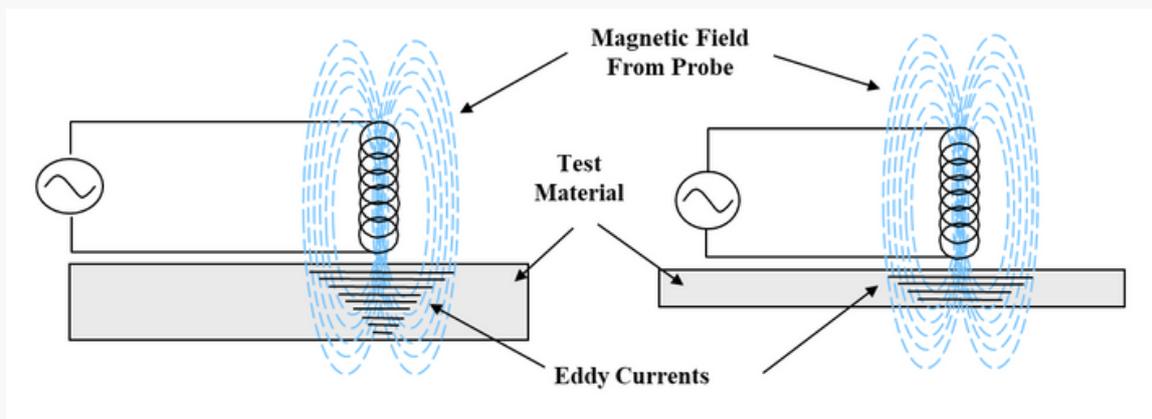
Estimating the distribution of hardness and strength.

### Limitations

Only for electrically conducting material.

Too many parameters affect the eddy probe impedance.

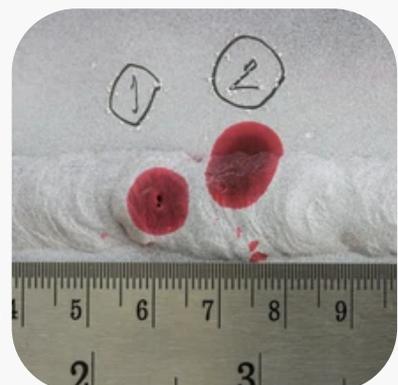
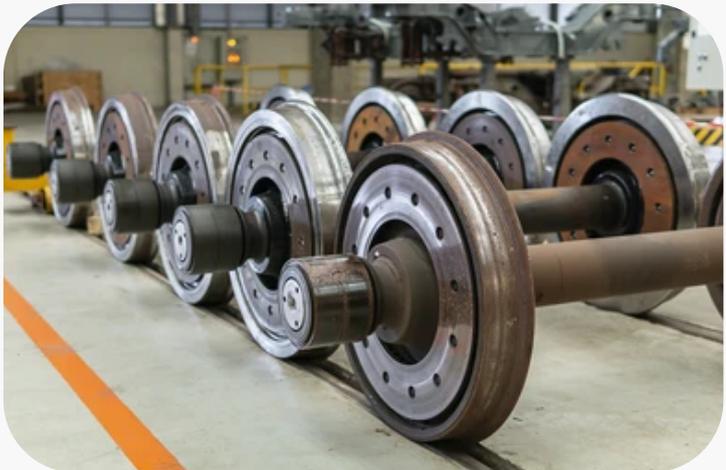
For critical applications, results need to be verified by another NDT method.



# OPPORTUNITIES

## Career in India and Abroad in these fields:

- Production and Manufacturing Companies
- Inspection Companies
- Mechanical Construction Company
- Oil and Gas Industries
- Refinery
- Piping and Pipeline Industries
- Railways
- Aerospace
- Maritime
- Boiler and Pressure Vessels
- and many more.....



# THANK YOU

We are ready to assist you

## Get More Information



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