

# **NDT LEVEL II**

# OVERVIEW

- **INTRODUCTION TO NDT.**
- **NDT TECHNIQUES.**
- **NDT LEVELS.**
- **NDT QUALIFICATIONS.**
- **NDT REFERENCE STANDARDS.**

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# INTRODUCTION TO NDT.

**Non-Destructive Testing (NDT)** is a group of testing techniques used to evaluate the properties of a material, component, or assembly without causing damage to it. NDT plays a crucial role in ensuring the safety, reliability, and performance of materials and structures in various industries, including aerospace, construction, automotive, and manufacturing.

NDT methods help detect internal and external flaws or defects in materials such as cracks, lack of fusion, lack of penetration, porosity, slag, corrosion, voids, and weld inconsistencies. These methods include visual inspection, ultrasonic testing, radiographic testing, magnetic particle testing, eddy current testing, and liquid penetrant testing, etc.

The main advantage of NDT is that it allows for inspection and evaluation without damaging the object being tested, meaning the object remains usable after the inspection. This makes it an essential tool in ensuring the quality and safety of critical structures and systems.

In short NDT helps us to examine the material/object without harming the material and same material can be use in future without any discrepancies.

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# NDT TECHNIQUES.

There are various NDT techniques which is being followed by various industries, the most common Non-Destructive Testing techniques are-

- ✓ Liquid Penetration Testing/Dye Penetration Testing (LPT/DPT).
- ✓ Visual.
- ✓ Ultrasonic Testing (UT).
- ✓ Radiographic Testing (RT).
- ✓ Magnetic Particle Testing (MPT).
- ✓ Particle magnetic Index (PMI).

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# Liquid Penetration Testing (LPT).

Liquid Penetration Testing is a very common NDT technique which is used to identify the surface defects of a material or an object.

Level-II Qualification required to examine this

## Testing Process-

Step 1- Clean the Test Piece (Inspecting Surface) with Clean and dry Lint free cotton cloth.

Step 2- Clean the Surface with Acetone/Cleaner with Lint free cotton.

Step 3- Let the surface dry then apply Red Penetrant to the test surface.

Step 4- Wait for minimum 12-15 Minutes, then clean the excess Penetrant with Dry cloth first.

Step 5- Clean excess penetrant with acetone/cleaner (With tight hand and in single direction only. Do not rub).

Step 6- wait for drying, then apply white developer on the test surface, wait for developing the defects on weld surface.

Step 7- Examine the Defects as per acceptance standards.

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# Visual.

Visual Inspection is a type of NDT, where we visually examine the test piece/job with naked eyes.

## Testing Processes-

- Examine weld defects like crack, Porosity, excess penetration etc with eyes and do rectification.
- Identify surface defects/nonconformities like dent rust corrosion painting blasting etc.

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# Ultrasonic Testing (UT).

Ultrasonic Testing (UT) is a type of NDT, where we examine the test piece/job with the application of ultrasonic sound waves, which identify the defects under the surface of the test piece/job.

## Testing Processes-

- We have a UT machine which send and receive Ultrasonic sound waves via probe.
- In UT we have multiple probe for multiple thicknesses and multiple angles like 45, 60 etc.
- While performing UT we apply liquid/gel/starch on the surface of the object where we have to perform UT, for ease of sound travel.
- While performing UT we send and receive ultrasonic sound which shows us where the defect is and how much deep it is.
- Level-II Qualification is required for examine this.

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# Radiographic Testing (RT).

Radiographic Testing (RT) is a type of NDT, where we examine the test piece/job with the application of Radiographic technique, which identify the defects under the surface of the test piece/job.

## Testing Processes-

- It is very harm full to health because we use radioactive elements for testing like X-Rays etc.
- We have a camera carrying radiographic material which release radiations while we need to inspections.
- Release rays passes through the test piece/job and reflect onto a film which have capacity to carry and gain shape and size of radio waves (required some time called exposure time).
- After this these films goes for processing.
- Ready to inspect but LEVEL-II person required.

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# Magnetic Particle Testing (MPT).

Magnetic Particle Testing (MPT) is a type of NDT, where we examine the test piece/job with the application of electro magnets, which identify the defects on the test piece/job.

## Testing Processes-

- We use electromagnet for testing.
- Required metal powder.
- We sprinkle the metal powder where we want to inspect (electromagnetic machine must turned on).
- That metal powder cover the defective weld surface and we found the defects then rectify and recheck.

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# Particle magnetic Index (PMI).

Particle magnetic Index (PMI) is a type of NDT, where we examine the test piece/job with the application of radiation, which identify the properties of the metal.

## Testing Processes-

- PMI is a machine looks like a gun, which contains radioactive material which shows the chemical properties of the metal.
- We have to aim on the metal which we need to identify then push the trigger then it will automatically start and then we can see the chemical properties of the metal.

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# THANKS

- **LEARNING IS NOT A PROCESS, IT'S AN ACT.**

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