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**BINDT**  
 THE BRITISH INSTITUTE OF  
 NON-DESTRUCTIVE TESTING



**APPROVED TRAINING ORGANISATION**

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## NASA 282

### Ultrasonic Wall Thickness Curriculum

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Revision control sheet:

Rev No:	Date:	Compiled by:	Reviewed by:	Revision Description:
0	20-May-2019	Meyuri Moodley	Nish Kanaye	Implemented into QMS.
1	02-Apr-2025	Acacia Sureschandra	Nishaan Kanhaye	The document format was updated.

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**1.0 Course Duration:**

1.1 Level 2 Limited:

- a) The minimum training hours administered in Level 2 shall be 24.

**2.0 Course Content:**

2.1 Theory: The table below shows theory aspects covered:

Chapter Reference:	Level 2:
Chapter 1:	Course Overview Stationery Requirements Student conduct during classroom training End of Course and PCN Examination Breakdown Passing grade End of Course Examination Rules

Chapter 2:	Qualification and Certification
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Chapter 3:	History The History of NDT The History of Ultrasonic Testing
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Chapter 4:	<ul style="list-style-type: none"> <li>Basic principles</li> <li>Objectives</li> <li>Advantages and Limitations</li> <li>Vibrations</li> <li>The Acoustic Spectrum</li> <li>Units and Abbreviations</li> <li>Shear (Transverse) Waves</li> <li>Surface (Rayleigh) Waves</li> <li>Lamb (Plate) Waves</li> <li>Velocity of sound Propagation</li> <li>Period:</li> <li>Frequency:</li> <li>Amplitude:</li> <li>Wavelength:</li> <li>Properties of Sound Waves</li> <li>Reflection</li> <li>Acoustic Impedance</li> <li>The Ultrasonic Beam</li> <li>The Dead zone</li> <li>Beam spread</li> <li>Resolution</li> <li>Pulse repetition frequency (P.R.F)</li> <li>Couplant</li> <li>Understanding Purposes and Properties</li> <li>Purposes of a Couplant</li> <li>Properties of a Couplant</li> <li>Commonly used couplant</li> <li>Attenuation</li> <li>Scatter</li> <li>Absorption</li> <li>Sound generation</li> <li>The Piezo electric effect</li> <li>Piezo electric crystals</li> <li>Piezo electric crystal materials</li> <li>Properties of Piezo electric materials</li> <li>The polarisation of ceramics</li> </ul>
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Chapter 5:	<ul style="list-style-type: none"> <li>Sources of Error</li> <li>Velocity Correction</li> <li>Curved Surfaces</li> <li>Coated Surfaces</li> <li>Low Wall Thickness</li> <li>Non-Parallel Surfaces</li> <li>Pitting</li> <li>Laminations</li> <li>Rough Surfaces</li> <li>Large Grain Structure on Castings</li> <li>Temperature Difference</li> <li>Echo-Echo Measurements</li> <li>Corrosion and Erosion</li> <li>Non-Relevant Indications</li> </ul>
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Chapter 6:	<p>Equipment</p> <p>Probes types</p> <p>Probe Selection</p> <p>Immersion transducers</p> <p>Single Crystal zero degree probe</p> <p>Twin Crystal Zero degree probe</p> <p>Pulse Echo Instruments</p> <p>Digital Equipment</p> <p>Pulse-Echo Thickness Gauges</p> <p>Echo-Echo Thickness Gauges</p>
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Chapter 7:	<p>Calibration and Calibration Blocks</p> <p>V1 BLOCK (also called A2)</p> <p>V2 BLOCK (also called A4)</p>
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Chapter 8:	Common Discontinuities Related to Manufacturing Processes.
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Chapter 9:	Velocity and Acoustic Impedance Data Sheet.
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Chapter 10:	Formula Sheet
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Chapter 11:	<p>Sample Wall Thickness Procedure</p> <ol style="list-style-type: none"> <li>1. Scope</li> <li>2. Referenced Documents</li> <li>3. Personnel</li> <li>4. Safety</li> <li>5. Information required prior to testing (Conducting UTM)</li> <li>6. Test Surface Preparation</li> <li>7. Equipment Requirements</li> <li>8. Consumable Requirements</li> <li>9. Technique</li> <li>10. Interpretation</li> <li>11. Evaluation of Results</li> <li>12. Recording and Reporting</li> <li>13. Post cleaning</li> </ol>
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2.2 Practical: The table below shows practical aspects covered:

Level 2:
Equipment checks Calibrations Ultrasonic wall thickness testing of various materials and configurations utilizing an ultrasonic thickness gauge.

**3.0 Learning outcomes:**

3.1 Upon completion of training, students should be able to carry out and understand the following regarding Ultrasonic Wall Thickness testing:

Level 2:
Basic principles General advantages and limitations Discontinuity categories Carry out pre-test checks Set up equipment Carry out tests and report results according to written instructions

**4.0 Course Outcome:**

4.1 Successful Completion of Training:

Upon successful completion of the course, a successful completion of training certificate at the level attempted will be issued.

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