



UT Level II General exam study checklist

Built from the ASNT NDT Level II, Ultrasonic Testing (UT) General exam topic list, exams taken before 5 Feb 2027 (read 17 Oct 2026 on ASNT's exam page).

General exam: 50 multiple-choice items in 2 hours, computer-based at Pearson VUE or an ASNT Authorized Exam Center.

One line per thing to be able to do, grouped under the six topics ASNT lists for the UT General exam. ASNT publishes no topic weights, so give every topic a pass. Tick a line when you can do it without notes.

Review of Ultrasonic Techniques

- ☐ Name the wave modes (longitudinal, shear, surface, plate) and say how velocity and wavelength differ between them.
- ☐ Explain acoustic impedance and predict whether a boundary reflects a little or almost all of the sound.
- ☐ Use Snell's law for a refracted angle, and find the first and second critical angles for a wedge and part.
- ☐ Describe the near field, beam spread and attenuation, and what changes each one.
- ☐ Read an A-scan and set the main flaw detector controls.
- ☐ Choose a transducer, wedge and couplant for a job.
- ☐ Calibrate range and sensitivity on reference blocks.
- ☐ Compare contact, immersion, pulse-echo and through-transmission testing.

Evaluation of Base Material Product Forms

- ☐ For ingots and castings, list the typical discontinuities and how they lie.
- ☐ Do the same for plate, sheet, bar and rod, and pick a scan direction for each.
- ☐ Do the same for pipe and tubular products.
- ☐ Do the same for forgings, including how forging direction affects orientation.
- ☐ Describe what changes when testing composites and other product forms.

Evaluation of Weldments

- ☐ Sketch common welding processes and joint geometries.
- ☐ Name the weld discontinuities, where each forms and how it lies.
- ☐ Plan an angle-beam scan: skip distance, half skip, sound path, surface distance and depth.
- ☐ Tell a first-leg signal from a second-leg signal and work out depth for each.
- ☐ Explain how each weld discontinuity type tends to respond to an angle beam.

Evaluation of Bonded Structures

- ☐ Explain how bonded and laminated parts are made.
- ☐ Describe disbonds, delaminations and voids, and where each occurs.
- ☐ Choose a technique for testing a bond line.

Discontinuity Detection

- ☐ Say what makes a reflector easier or harder to detect: size, orientation, depth and surface.
- ☐ Define near-surface, axial and lateral resolution.
- ☐ Explain how pulse length, damping and bandwidth trade resolution against sensitivity.
- ☐ Sort indications into relevant, non-relevant and false.

General Evaluation

- ☐ Compare an indication with a reference reflector, build and use a DAC curve, and size an indication.
- ☐ Weigh the part's history, intended use and acceptance criteria before judging an indication.
- ☐ Follow a written procedure and record results in a clear report.

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Formulas to work by hand

Velocity in mm/μs and frequency in MHz give lengths in mm. Angles are measured from the normal.

Wavelength

$$\text{wavelength} = c / f$$

Near field (circular element)

$$N = D^2 \times f / (4c), \text{ or } N = D^2 / (4 \times \text{wavelength})$$

Beam spread

$$\sin a = k \times c / (f \times D), \text{ half-angle from the beam axis}$$

$$k = 0.514 \text{ at the } -6 \text{ dB edge; other sources use } 1.08 \text{ } (-20 \text{ dB}) \text{ or } 1.22 \text{ (extreme edge)}$$

Snell's law and critical angles

$$\sin(\text{incident}) / c_1 = \sin(\text{refracted}) / c_2$$

$$\text{1st critical: } \sin = c(\text{wedge}) / c(\text{longitudinal in part}); \text{ 2nd: } \sin = c(\text{wedge}) / c(\text{shear in part})$$

Angle-beam geometry (thickness T, refracted angle a)

$$\text{leg} = T / \cos a; \text{ skip distance} = 2T \times \tan a; \text{ surface distance} = \text{sound path} \times \sin a$$

$$\text{depth, first leg} = \text{sound path} \times \cos a; \text{ depth, second leg} = 2T - \text{sound path} \times \cos a$$

Decibels

$$\text{dB} = 20 \log_{10} (A_2 / A_1); \text{ about } 6 \text{ dB doubles amplitude, } 20 \text{ dB is } 10 \text{ times}$$

Impedance and reflection

$$Z = \text{density} \times \text{velocity}; \text{ reflected amplitude } R = (Z_2 - Z_1) / (Z_2 + Z_1); \text{ reflected energy} = R^2$$

Formulas as given in Evident's ultrasonic flaw detection tutorial and transducer technical notes, and TWI's beam spread FAQ. Our UT formulas guide works one example of each and cites the page.

Check your numbers

[Snell's law calculator: anglebeam.com/tools/snells-law-calculator](https://anglebeam.com/tools/snells-law-calculator)

[Skip distance calculator: anglebeam.com/tools/skip-distance-calculator](https://anglebeam.com/tools/skip-distance-calculator)

[UT beam calculator \(wavelength, near field, beam spread\): anglebeam.com/tools/ut-beam-calculator](https://anglebeam.com/tools/ut-beam-calculator)

[Decibel calculator: anglebeam.com/tools/decibel-calculator](https://anglebeam.com/tools/decibel-calculator)

Read next

[UT formulas guide: anglebeam.com/guides/ut-level-2-formulas](https://anglebeam.com/guides/ut-level-2-formulas)

[UT Level II General exam guide: anglebeam.com/guides/ut-level-2-general-exam](https://anglebeam.com/guides/ut-level-2-general-exam)

[UT outline change guide \(exams after 5 Feb 2027\): anglebeam.com/guides/ut-outline-change-2027](https://anglebeam.com/guides/ut-outline-change-2027)

How to use this checklist

- Take the free 10-question check first and start with the topic it shows as weakest.
- Work each formula by hand, then check the answer with the matching calculator.
- Draw the beam path for every angle-beam problem.

Ready to test yourself? 10 free UT Level II questions

Find your weakest topic in minutes. Every answer is explained as you go, and there is no signup.

[Take the free check: anglebeam.com/ndt-level-2](https://anglebeam.com/ndt-level-2)

[NDT UT Level II General course: \\$149. Lessons, practice exams and a study plan.](https://anglebeam.com/ndt-level-2-general-exam)