

CBIP Examination Paper - UT thickness testing

Level 2 Specific

- 1 Apart from transfer loss, other signal losses can be caused by:
- A. Beam spread
 - B. Attenuation
 - C. Test piece geometry
 - D. All of the above
- 2 Provided that the orientation of the following discontinuity types is at 90 degrees to the incident ultrasonic beam, and are all of comparable size, which of the following types would be most easily detected?
- A. Planar longitudinal
 - B. Threadlike
 - C. Spherical
 - D. Threadlike longitudinal
- 3 Which of the following test frequencies would generally provide the best penetration in a 300mm thick item of course-grained steel?
- A. 1MHz
 - B. 2.25MHz
 - C. 5MHz
 - D. 10MHz
- 4 In immersion testing, the first echo after the initial pulse is:
- A. The water / item interface
 - B. The item backwall echo
 - C. The water backwall echo
 - D. The probe / water interface
- 5 A base line survey is normally taken:
- A. Repeatedly at intervals
 - B. On plant at manufacture or commissioning
 - C. At key points determined by performance history
 - D. At key points of anticipated material loss
- 6 When using an open grid (OG) method, measurements can be taken:
- A. By the single spot single measurement method
 - B. By the single spot double measurement method
 - C. By the single spot multiple measurement method
 - D. All of the above, or as specified by the purchaser

- 7 To detect corrosion running longitudinally along a pipe, the probe acoustic barrier should be aligned:
- A. At 45 degrees to the pipe axis
 - B. Along the pipe
 - C. Across the pipe
 - D. Any of the above
- 8 When a plate contains coarse inclusions, what effect do they have on the A-scan signal?
- A. Large defect indications
 - B. Total loss of back echo
 - C. Both A and B
 - D. None of the above
- 9 According to AS 2452.3, in the formula $CL1 = T_m \times CL2 / T_i$, which value represents the velocity which is known:
- A. CL1
 - B. T_m
 - C. CL2
 - D. T_i
- 10 When performing a lamination test to AS 1710, a lamination 50mm x 100mm is detected. This is acceptable to:
- A. Level 1
 - B. Level 2
 - C. Level 3
 - D. No level of AS 1710
- 11 Sketch neatly and label the various parts of a twin crystal compression wave probe used for wall thickness measurement
- 12 Discuss factors which influence the amplitude of the signal from a backwall reflector when thickness testing (1 each)
- 13 You are to perform a thickness test, expecting thickness measurements in the range 10-15mm. Explain which thickness or thicknesses you would typically calibrate on, and why. What would you do if you encountered readings of 6-8mm.
- 14 You are thickness testing uncorroded plates over a wide range of thicknesses from 4mm to 60mm. Discuss probe selection, calibration and any other changes you would expect to make for the different thicknesses.
- 15 In order to improve accuracy and "gate out" the paint you are measuring the thickness using the fourth echo on a painted surface. Show how this is done, using screen trace sketches.