

Title: Calibration of STD3 Ultrasonic Calibration Block

1 Scope

Work Instruction for calibration of a STD3 ultrasonic calibration block. To be used in the absence of a manufacturers calibration instruction.

Note If calibrating STD2 and STD3 together, refer to CAL609 Section 5.

2 Preparation

The calibration shall be carried out using the minimum of Category 'A' Master instruments.

Equipment required:

- 150mm vernier calliper
- Ultrasonic flaw detector meeting the requirements of BS-EN-12668
- CB87 calibration block or similar
- Ultrasonic couplant
- 0° 5MHz double crystal 10mm transducer
- 40° 2.5Mhz single crystal 15mm transducer
- 70° 2.5Mhz single crystal 15mm transducer
- Engineers square
- 1000mm straight edge
- 10mm numeric stamps

All Instrumentation shall have the appropriate certificate of calibration traceable through United Kingdom Accreditation Service and shall be rechecked at intervals of no more than 1 year.

The ultrasonic transducers shall be beam plotted and used for calibration purposes only. The maximum angle error shall be not greater than $\pm 1^\circ$.

3 Method

3.1 Check that the identification number is clearly visible on the frame and the side of the block. If the serial number is not on the side of the block re-stamp the serial number onto the **side** away from any corner or change in section.

3.2 Check there is no paint on the upper surface of the calibration block or in the 7mm hole (if visible).

3.3 Check that there is no surface corrosion on the upper surface. It is not expected to have highly polished surfaces, but the surface should be clean and free from contaminates and corrosion pitting. Where corrosion exists and it is not possible to remove with a **brass** wire brush, the block shall be repaired. The calibration block shall be stored in a lightly oil impregnated rag to minimise surface corrosion.

3.4 Check for surface damage to the calibration blocks paying particular attention to areas where "corner reflectors" are used to set sensitivity, and where the transducer makes contact with the block. Indentations or bruises greater than 2mm in diameter shall be repaired.

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3.5 Check the horizontal and lateral alignment of the STD3 and block frame using the straight edge and feeler gauges, maximum deviation $\pm 1.0\text{mm}$.

3.6 Check the depth of the block, 40.0mm dimension. The maximum deviation shall be $\pm 0.1\text{mm}$.

3.7 Check the ultrasonic response from the 7mm hole using the 0° probe and flaw detector. Calibrate flaw detector to 40mm full screen, scan from the top obtain signal from 7mm hole at a range of 16.5mm and set to 80% FSH. Scan the length of the hole the maximum deviation shall be depth $16.5 \pm 2.0\text{mm}$, signal amplitude 80% FSH $\pm 2\text{dB}$ along length. Figure 1.

3.8 Check the ultrasonic response from the 7mm hole using the 70° probe and flaw detector. Calibrate flaw detector to 100mm full screen, scan from the top obtain signal from 7mm hole and set to 80% FSH. Use engineers square to guide transducer scan along the hole, the maximum deviation shall be 80% FSH $\pm 2\text{dB}$. Figure 2.

3.9 Check the ultrasonic response from the 7mm hole using the 40° probe and flaw detector. Calibrate flaw detector to 100mm full screen, scan from the top skip the sound from the bottom of the block, obtain signal from 7mm hole and set to 80% FSH. Use engineers square to guide transducer scan along the hole, the maximum deviation shall be 80% FSH $\pm 2\text{dB}$. Figure 2

3.10 Results shall be recorded on the calibration form (see Appendix A) and retained for audit purposes.

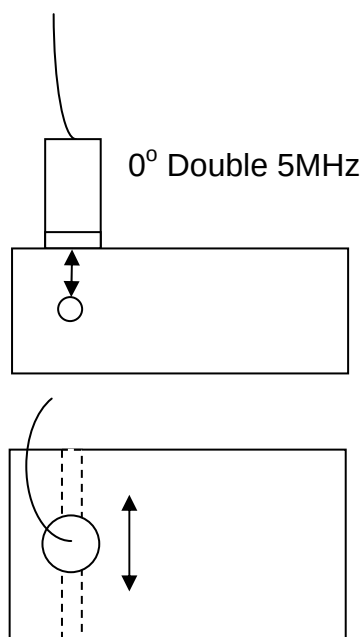


Figure 1 showing 0° scan (not to scale)