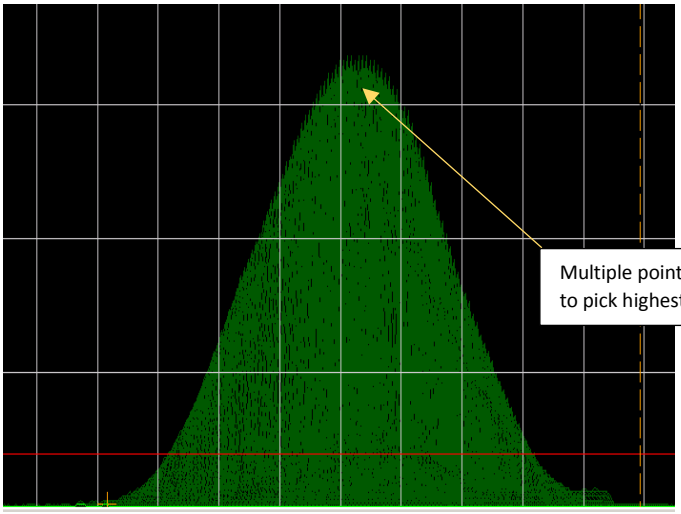
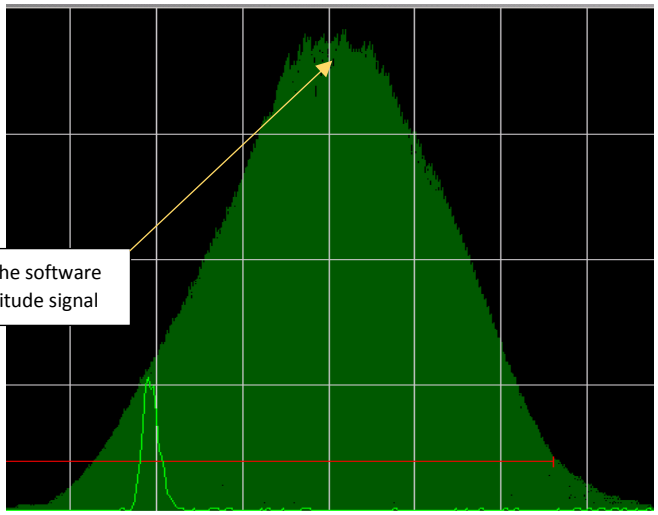
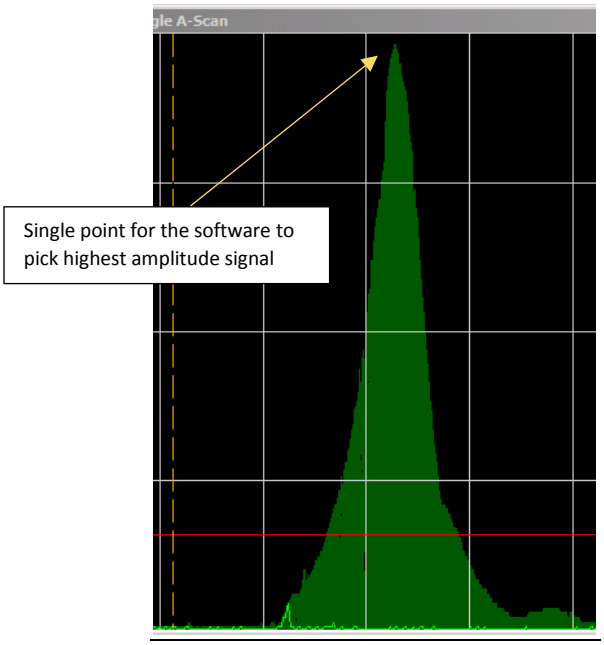
Echo Dynamic-Side Drilled Hole/Radius



Echo dynamic of 100mm radius on V1 block @ 45®



Echo dynamic of 100mm radius on V1 block @ 70®



Echo dynamic of 1.5mm S.D.H @ 15mm

(45®/70® No significant difference)

The reason we calibrate off a s.d.h as opposed to a radius is due to the amount of reflected energy received by the probe.

When calibrated on a radius, the echo dynamic has a wide envelope due to the large reflective surface. This will get worse the higher the angle due to increased beamspread.

This can lead to misinterpretation by the software as to precisely where the point of maximum amplitude is.

It is far more consistent to calibrate off a side drilled hole or notch as it gives a smaller return signal to the probe allowing the software to locate the area of max amp more consistently.

This comes down to basic ultrasonics and the smaller the calibration target the more accurate the system will be. This is common between PA systems and basic pulse echo equipment.

Always calibrate off as small a reflector as possible.

The 100mm radius was primarily designed to check index point and angle of skew.

I have calibrated one of our own systems on the 100mm radius and this led to s.d.h depths being misread +/- 1mm on a depth of 100mm (Beam path 300mm).

After calibrating on the 1.5mm s.d.h this gave a far more consistent result of +/- 0.1mm over the same areas.

To get the same amount of returned energy from a 100mm radius =

(approx +3db/ 0.5mm)

1.0mm s.d.h +15db.

2.5mm s.d.h +6db

Solutions

Calibrate off a s.d.h and compare amplitude to signal received from 100mm radius.

Could try moving s.d.h holes further apart to avoid overtrace.

Try changing your starting element to a lower number as this gives less Perspex for the sound to travel through and then less attenuation prior to entering the test surface.