Western Instruments

Established 1965

Ultrasonic Testing Probes for Resistance Welded Tube and Pipe

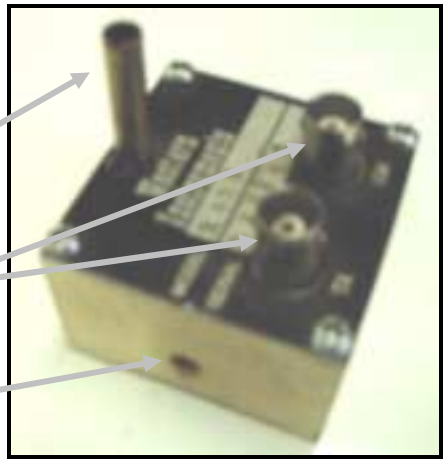
Western Instruments Probes, outlined in this article, are designed specifically for the Ultrasonic Testing of Tube and Pipe. Probes are equipped with either Shear Wave Transducers (for Flaw Detection) or Dual Element Transducers for Lamination/Thickness Testing. The unique 51mm (2") Probe case, with the contoured face, has also been used for mounting other types of devices, that require exacting surface following capability. Probes for Testing SAW Spiral Welded Pipe are of a different design, however have excellent surface following characteristics as well.

When used for Longitudinal Weld Testing, a single element transducer, 9.5mm (3/8") in diameter is used for sizes between 38mm and 76mm (1.5" to 3") OD. A 12.7mm (1/2") diameter transducer is used for Sizes Above 76mm (3") OD. For less stringent testing applications, transducer diameters up to 15.8mm (⅝") and 19mm (¾") have been used. Standard frequencies, for optimum flaw detection on curved surfaces, is 3.5 MHz, with a resultant 45º Shear Wave. Hear again, other angles (35º, 55º, 60º, & 70º) have been provided at the customer's request.

When used for either Lamination or Thickness Testing a 12.5mm (1/2") dual element transducer (Pitch/Catch) is used, but upon special request the size is adjusted (up to 25mm) to increase the coverage area. Standard frequencies for optimum testing is again 3.5 MHz, however 5MHz have been provided for Plate and Strip Testing.

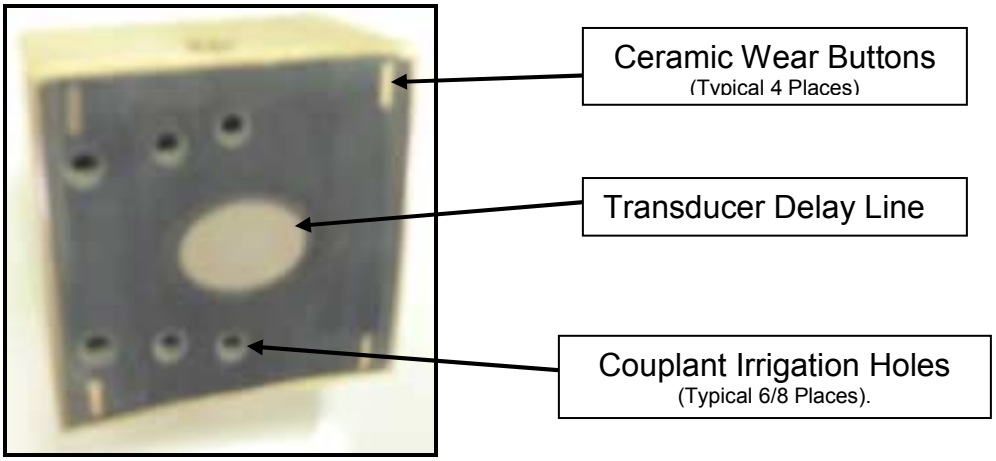
All Probes have an Integral Coupling/Cooling manifold cast into the assembly. This ensures couplant is optimally place within the Water Wedge of the Probe. Furthermore, for hot testing, the couplant media is also used to cool the Probe Assembly to keep the piezo-ceramic crystals cool and below their currie point.

Pipe Mill Probe



The Pipe Mill Probe

All testing Probes are equipped with ceramic Wear Buttons, which provide the lowest co-efficient of friction possible between steel and the ceramics, when they are lubricated with couplant (Mill Solubles). When probes are new and initially installed, these ceramic wear points will wear a small amount, however, as they wear, there surface area increases, and the amount of wear decreases drastically. finally, the Potting material used to encapsulate the probe assemblies is filled with an anti-wear additive as well.



The probes are designed to have only the wear buttons contacting the surface at any given time, which leaves a “Water Wedge” as the coupling (and cooling) area. Therefore, the probe Delay Lines should never contact the surface, however, foreign material is always present on the surface, and may scratch the delay line. If the surface of the delay lines becomes scratched, a very fine emery cloth (400 grit or finer) can be used to simply polish the surface so it is as smooth as possible.

The following Diagrams are data from;

Probe Position testing (1963) (left).

Probe Sensitivity Tests (2001) (right).