

SCANNING ULTRASONIC SYSTEM FOR TUBE AND BAR INSPECTION



This equipment is to provide both ultrasonic and eddy current inspection of tube and bar products. The ultrasonic inspection is achieved using a number of adjustable **Water Column Coupled Probe (WCCP)** units for shear wave longitudinal flaw detection and fixed **WCCP** unit for thickness monitoring. The eddy current inspection uses differential probes mounted in holder attached to the **WCCP** units. See the reverse of this brochure.

Diameter range 50mm to 400mm.

WCCP ultrasonic probe units.

**Longitudinal, oblique and transverse ultrasonic
shear wave testing.**

Compression wave testing.

Eddy current inspection for surface defects.



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This ultrasonic inspection system will rotate a bar or tube on a precision set of heavy duty polyurethane covered drive rolls and to scan the ultrasonic test heads along the length of the product in a controlled helix. The product rotational speed and the inspection helix are continuously variable in order that the optimum inspection speed is obtainable, for the specific flaw types to be detected and the product diameter.

The test heads incorporate **WCCP** type probe units for ultrasonic testing and can include eddy current probes for surface testing. The **WCCP** (**Water Column Coupled Probe**) units are designed to give a high signal to noise ratio without requiring immersion testing. The test heads ride on the product upper surface and give excellent access and ease of adjustments. Units are available for longitudinal, transverse and oblique ultrasonic shear wave testing, and also lamination and thickness ultrasonic compression wave testing. Multiple function test heads are readily configured for specific test requirements with up to ten **WCCP** units in each test head. The **WCCP** units may also be combined with an eddy current test for high sensitivity surface inspection. Adjustable oblique shear wave **WCCP** units are available. The compact configuration of the **WCCP** unit enables testing to less than 20mm from the product ends.

WCCP Ultrasonic Probe Units

The **WCCP** units have been developed to replace existing water jet type probe units and to obtain an inspection signal to noise ratio similar to that of immersion systems. Units have been supplied for longitudinal shear wave and compression wave inspection. In addition a mode conversion technique is available for inspecting the bores of low **Diameter/Thickness** ratio tubes using easily interchangeable probe top blocks.

The units are very compact and permit multi-probe heads to be configured using a simple modular construction. The latest **WCCP** twin units can configure ten probes in a 100mm length. The index between probes is selected to ensure full interlacing of probe

scans. Standard multiple probe configurations have been defined such that full interleaving of probe scans is achieved for detection of a specific minimum flaw length or full ultrasonic coverage.

The **WCCP** units offer the following advantages:

- Units applied to product top surface to give easy access for setting up
- Good signal to noise ratio with performance similar to immersion systems
- Minimal adjustment when changing tube diameters
- No immersion tank required
- Inspect within 20mm of the product ends, with instantaneous coupling
- Incorporate end detection facilities using small receiver probes to monitor product position
- Supplied with probe top blocks to permit low **Diameter/Thickness** ratio tubes to be tested.

Mechanical Handling Systems

A range of scanning tube and bar inspection systems is available; these can be configured for varying product diameters, lengths and weights.

A complete system typically comprises:

- Inlet roll down rack
- Stack catchment arms
- Automatic Load
- Roller drive for the product with variable speed
- Automatic unload to the left and right
- Single accept collector
- Twin reject collectors with diverter
- Overhead gantry to support the probe head which houses a number of **WCCP** units, with a drive system to scan this probe head along the length of the product while it rotates
- re-circulating water system with purging and catchment, ultrasonic system only
- Optional paint marking system
- Electrical control desk with PLC unit for full facilities for automatic, manual and investigate flaw modes of operation