



MAGNETIC ANALYSIS CORPORATION

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Testing Small Diameter, High Precision Tubes March, 2020

Magnetic Analysis Corporation provides several technologies, including eddy current and ultrasonic techniques, for accurate inspection of small diameter high performance tubes destined for critical applications such as aerospace and nuclear.

MAC's ultrasonic instruments handle inspection of core flaws, ID/OD defects, wall thickness, and dimensional measurement. The Echomac® UT 25mm rotary provides 100% coverage at high throughput rates on thin wall product ranging from 5 to 25mm diameter, and is especially well suited for challenging applications requiring high performance, such as tubular product for nuclear and aerospace installations. Used with MAC's Echomac® instrumentation, the rotary system offers superior inspection of ID/OD, longitudinal and transverse flaws, wall thickness and dimensional evaluation including conditions of eccentricity and ovality. The Echomac® FD-6A electronics has received GE qualification for P3TF31, Class A & B, & P29TF82 Class A & B, a typical requirement for nuclear and aerospace applications. The FD-6/6A software can be equipped with a C scan for ease of test result analysis.

With an overall length of 630mm, the 25mm Rotary also allows trouble-free upgrades for inspection lines where space may be limited. Wall thickness down to 0.3mm, and tubes as short as 1 meter, can be successfully tested. Features include a transformer design which ensures improved signal to noise ratio, a wide range of selectable band pass filter settings, precise thickness resolution (1 μ m) and excellent repeatability and reliability. With 8,000 RPM running speed, precision test blocks and transducer holders, and convenient adjustment of the transducer angle, this Rotary provides optimum results using FD-6/6A electronics or with existing instruments to upgrade a line.

Adept at detecting longitudinal surface flaws such as seams and laps, MAC's 20mm Rotomac® eddy current rotary, operating at speeds up to 18,000 RPM, provides highly sensitive non-contact testing with superior results on tube ranging from 2 to 20mm (0.0787" – 0.7874") diameter. Features include an improved, easy to set-up distance compensation which helps compensate for un-straight material during testing, and a small bearing hub which produces a much more precise rotation of the test probes as they rotate around the mechanical center, an important factor in testing diameters as small as 2mm. A dial in guide operates with simple adjustment tools to simultaneously adjust both test probes to the desired diameter. Probes which are easily centered on the product, center of rotation and quick twist-on bushing holders add to the convenient operation of this rotary. The Rotomac® operates with MAC's Multimac® eddy current instrumentation to complete the system. Applications include straight and cut operations as well as continuous lines such as drawing, spring-making, and parts forming.

Rotomac® can be installed in-line with straighteners or off-line in a separate test station. Ferromagnetic, non-ferromagnetic, and austenitic materials can be inspected.

MAC experienced Engineers can provide complete information on the full range of MAC's eddy current, flux leakage and ultrasonic test solutions, including MAC's new Phased Array system for weld zone profiling and detecting weld defects in ERW tube, multi-test systems ranging up to 500mm for OCTG pipe, as well as other nondestructive test solutions for tube producers. MAC's 90+ years developing and supplying nondestructive test equipment and systems to tube, bar, and wire manufacturers ensures a thorough understanding of customer inspection needs.



Echomac® 25mm ultrasonic rotary on a test bench for inspecting small diameter material.



Rotomac® 20mm eddy current rotary for detecting longitudinal surface seam type defects in small diameter tube.