Rotomac® Rotaries
Eddy Current Rotary Mechanism to Detect Seam Type Defects in Tube and Bar
Rotary Test Technology

Method of Choice for Seam Type Defects

MAC Rotaries use the unique qualities of eddy current rotary probe technology to detect long continuous surface flaws which may not be detected by encircling test coils.

MultiMac® eddy current electronics provide the controls, processing and analysis for the Rotary. MultiMac can also assign channels to an encircling coil test to detect short, intermittent defects, in combination with the rotary test, where needed.

Principles of Operation

Rotary probe technology requires relative motion between the probe and the test material. Two or more probes rotate around the test material, inducing eddy currents.

When the induced eddy currents are disrupted by a surface defect, the change is sensed by the probe, and a flaw signal is sent to the instrumentation for processing and display. The amplitude of the signal for any surface seam is highly proportional to its depth.

In general, either a higher rotational speed, or a greater number of test probes, at a given throughput speed, enables shorter defects to be detected.

TYPICAL SYSTEM COMPONENTS INCLUDING ROTARY PROBE & ENCIRCLING COIL TESTS

- MultiMac Instrument
- Remote Monitor
- Printer
- Paint Markers
- Demagnetizer to eliminate residual magnetism
- Outgoing conveyors to throw off rolls, sorting, cut off saws and other devices
- Eddy Current Rotary Probe test to detect long, continuous surface defects
- Eddy Current Encircling test coil to detect short defects
- Controls test system parameters, processing, and operation
- Incoming conveyor system
- Pinch Stand with “V” roll drive assures proper alignment of material
- To be consistently detected, the defect length must be greater than the helical pitch (HPI) of inspection. The HPI is a function of the probe’s rotational speed and the throughput speed of the test material.
Rotomac® Rotary Features

- Operate with MultiMac® eddy current electronics.
- Systems with two, four, or six probes, each with its own detector channel.
- Accurate Distance Compensation ensures a uniform defect signal, even with off center or out of round material.
- Choose test headplates for surface or air ride configurations, depending on surface conditions, sizes, and test specifications.
- Dynamic breaking for quick stop of test probe headplate rotation.
- Rotary probes, unlike encircling test coils, are not affected by throughput speed changes such as occur in parts forming, because the probes spin continually around the test material at a fixed speed.
- Operates automatically as defects in the bar or wire create flaw signals, activate alarms, paint markers and other devices.

Rotomac Applications

High Speed Testing of Wire, Rod & Bar

- Test cold drawn wire & cut length bar stock.
- Test magnetic & nonmagnetic material from 1/8" (3mm) to 7.1" (180mm) diameter.
- Test material 6mm to 40mm with the new Rotomac® 40 and 2mm - 20mm diameter with the Rotomac HS 20mm.
- Test in line with continuous wire operations such as drawing, parts forming, or straight and cut.
- Operate in-line with straighteners or off-line in a separate test station.
- In parts forming, such as in springmaking, Rotomac can identify a flaw prior to forming, and reject the piece after cutting and forming operations.
<table>
<thead>
<tr>
<th>ROTARY MODEL</th>
<th>MATERIAL DIAMETER</th>
<th>ROTARY SPEED</th>
<th>NUMBER OF TEST PROBES</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotomac-100</td>
<td>1/8” - 1” (3 mm - 25.4 mm)</td>
<td>Up to 6000 RPM Continuously variable</td>
<td>Two</td>
<td>Heavy Duty Hub to prevent vibration of wire when installed in conjunction with a draw block.</td>
</tr>
<tr>
<td>Rotomac-150</td>
<td>1/8” - 1-1/2” (3 mm - 38.1 mm)</td>
<td>Up to 6000 RPM Continuously variable</td>
<td>Two or Four</td>
<td></td>
</tr>
<tr>
<td>Rotomac-350</td>
<td>1/2” - 3-1/2” (12.7 mm - 88.9 mm)</td>
<td>Up to 3000 RPM Continuously variable</td>
<td>Two, Four, or Six</td>
<td></td>
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<tr>
<td>Rotomac-40mm</td>
<td>6.0mm - 40mm (15/64” - 1-37/64”)</td>
<td>Up to 6000 RPM</td>
<td>Two</td>
<td>Exterior access for dimensional changes</td>
</tr>
<tr>
<td>Rotomac-150mm</td>
<td>12.7mm - 150mm (1/2” - 5 1/2”)</td>
<td>Up to 1800 RPM</td>
<td>Two or Four</td>
<td></td>
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<tr>
<td>Rotomac-180mm (4C)</td>
<td>50mm - 180mm (2.0” to 7.0”)</td>
<td>Up to 1200 RPM</td>
<td>Two or Four</td>
<td></td>
</tr>
<tr>
<td>Rotomac-180mm (6C)</td>
<td>100mm - 180mm (4.0” to 7.0”)</td>
<td>Up to 1200 RPM</td>
<td>Two, Four, or Six</td>
<td>6 Probes available only on Air Ride</td>
</tr>
<tr>
<td>Rotomac-150E</td>
<td>3 mm - 38.1mm (1/8” -1-1/2”)</td>
<td>Up to 6000 RPM Continuously variable</td>
<td>Two or Four</td>
<td>Includes Triple Roll Inlet &amp; Outlet Guides.</td>
</tr>
<tr>
<td>Rotomac-350E</td>
<td>12.7mm - 88.9 mm (1/2” - 3-1/2”)</td>
<td>Up to 3000 RPM Continuously variable</td>
<td>Two or Four</td>
<td>Includes Triple Roll Inlet &amp; Outlet Guides.</td>
</tr>
<tr>
<td>Rotomac-550E</td>
<td>12.7mm - 139.7mm (1/2” - 5-1/2”)</td>
<td>Up to 1800 RPM Continuously variable</td>
<td>Two or Four</td>
<td>Includes Triple Roll Inlet &amp; Outlet Guides.</td>
</tr>
<tr>
<td>Rotomac HS - 20mm</td>
<td>2mm - 20mm (0.0787” - 0.787”)</td>
<td>Up to 18,000 RPM</td>
<td>Two</td>
<td>Quick twist-on bushing holders</td>
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</table>

NOTES: Surface or Air Ride Probes, LH or RH feed, Different Headplates & Small Diameter Package, are some of the available selections.