ROTOMAT® DA
TRANSOMAT® DA

A New Dimension in Electromagnetic Inspection

proof.

The Company

FOERSTER is a global technology leader for non-destructive testing of metallic materials. One of the "Hidden Champion" companies, FOERSTER operates worldwide with an extensive network of ten subsidiaries plus qualified representatives in more than 60 countries and works closely with its customers.

FOERSTER Division Test Systems (TS)
Division TS specializes in developing and manufacturing turnkey technical systems for the automated, non-destructive testing of metallic long products and heavy plates. Electromagnetic methods such as eddy current and flux leakage testing, ultrasound and inductive heat flow thermography are used to inspect these semi-finished products for defects that are invisible to the naked eye.

These systems are made for the metal producing and metalworking industries, where tubes, wires, bars, billets, rails, profiles, metal sheets and similar items are produced on rolling mills, drawing lines, welding lines or processed in various finishing operations. FOERSTER products perform many critical test applications during these processes.

Tube Testing with ROTOMAT® DA / TRANSOMAT® DA

Quality Assurance of Seamless and Welded Steel Tubes on a Completely New Level

OCTG tube manufacturers are currently confronted with various challenges:

- Rising quality requirements
- Undetected natural defects lead to high costs due to customer complains
- Economic losses due to untested ends
- High maintenance costs of the test equipment

Reinventing Flux Leakage Testing

The new ROTOMAT DA / TRANSOMAT DA flux leakage system helps customers meet these challenges by enabling the reliable detection of natural and oblique defects, regardless of their angle or length, in addition to standardized longitudinal and transversal defects. The miniaturization of sensors together with highly integrated electronic components dramatically increases the number of channels. This makes a more precise and finer scan of the surface possible, giving customers a more complete set of information regarding detected defects. The newly introduced C-Scan, which visualizes these defects in high-definition and real-time, results in a completely new evaluation of the test material to meet rising quality requirements.

The Highlights

- Reliable detection of natural and oblique defects regardless of length and angle
- Improved detectability of inner defects
- More precise decision between outer and inner defects
- Reduction of untested ends

ROTOMAT® DA

Improved Defect Detection

The ROTOMAT DA, used for flux leakage testing of tubes with a diameter of 20 – 520 mm, sets new standards in the detection of longitudinal and especially oblique defects. The use of a high-resolution sensor array allows for improved defect detection. Digitization takes place directly at these arrays in the rotating part, thereby enabling new forms of data transmission to the stationary part of the sensor system. The number of test channels can therefore be increased up to 192. This creates the ability for high-definition C-Scan images. The new evaluation algorithms (patent pending) enable for the detection of oblique and natural defects.

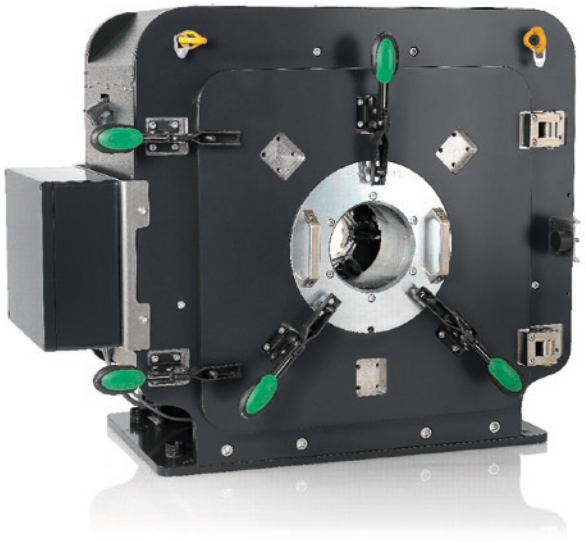
Robust and Maintenance-Friendly

With digitization taking place directly at the sensors, the length of analog signal paths is reduced dramatically, thereby increasing noise immunity. Furthermore, test signals and power for magnetization are transmitted without contact between the rotor and stator. Transmission between the sensor system and the electronic cabinet is done with just one Ethernet cable. With the new system, slip rings and brushes are now no longer required, leading to a significant reduction in maintenance costs. Consequently, the availability and reliability of the system increase.

Advantages at a Glance

- Testing for inner and outer defects, longitudinal and oblique up to ± 45°
- Maintenance-free transmission of power and electronic signals
- Completely digitized sensor system
- High noise immunity through digitization directly at sensor array
- Up to 192 full channels for high-definition tube images

TRANSOMAT® DA



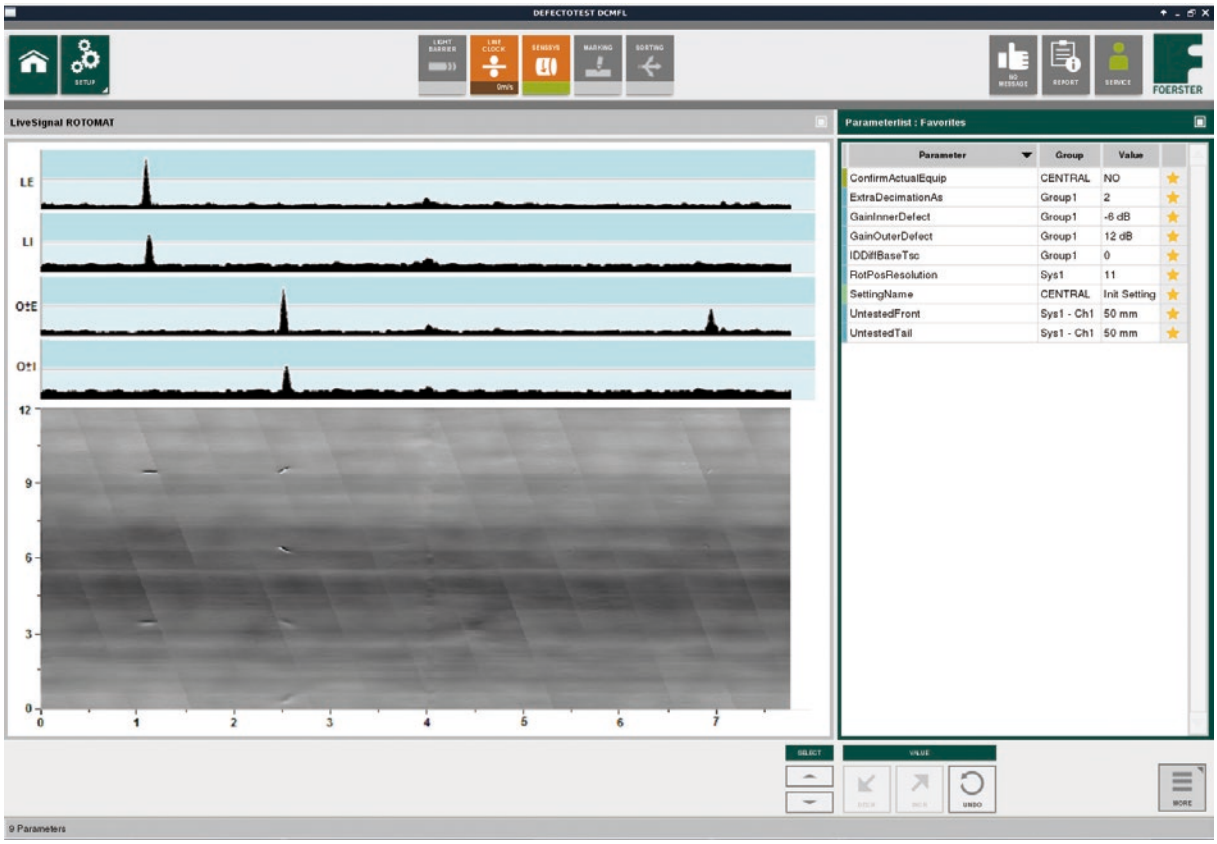
High-Channel-Count TRANSOMAT® DA
With the new TRANSOMAT DA sensor system, tubes with a diameter of 27 – 520 mm can be tested. High-resolution arrays are directly digitized at the sensors. Up to 768 channels enable a unique sensibility while testing for transversal and oblique defects.

Reduced Untested Ends by New Servohead Technology
The servohead technology allows manufacturers to very precisely control the movements of the test heads towards the tube under inspection. This precise control allows to set the touchdown point close to the tube ends. Further, the optimized touchdown speed avoids bouncing when the test heads arrive at the tube surface. Thus, testing can start immediately at the touchdown point, leading to significantly reduced untested ends. Moreover, as a result of the improved control, lifetime of the test heads considerably increases due to the slower touchdown speed.

Extremely Fast Dimension Change
Current systems on the market require up to 40 minutes for a dimension change. During this time, production stands still, and valuable time is lost. To enable a dimension change that only needs half of the time, FOERSTER has developed a completely new solution: All exchangeable parts of the TRANSOMAT DA are attached by quick releases. No tools are necessary. Additionally, the test heads are automatically contacted electrically during installation. No connectors are necessary. With this quick release, customers save up to 50 % of the time normally needed for a dimension change.

Advantages at a Glance
- Testing for inner and outer defects, transversal and oblique up to ± 45°
- Significantly reduced untested ends through new servohead technology
- Extremely fast and easy dimension change by quick release technology
- Longer lifetime and less maintenance of test heads due to precise motion control
- Completely digitized sensor system
- Up to 768 full channels for high-definition images of the tube

New Software Features for ROTOMAT® DA



Easy-to-Use Operation Software

The highly modular software design allows for customer-specific solutions achieving optimally adapted configurations. The software offers an easy to operate grafical user interface (GUI). The different windows of the GUI can be tailored to individual preferences. It is also possible to split the GUI on several screens, e.g. to have the signals of the ROTOMAT DA on one screen and the signals of the TRANSOMAT DA on another screen.

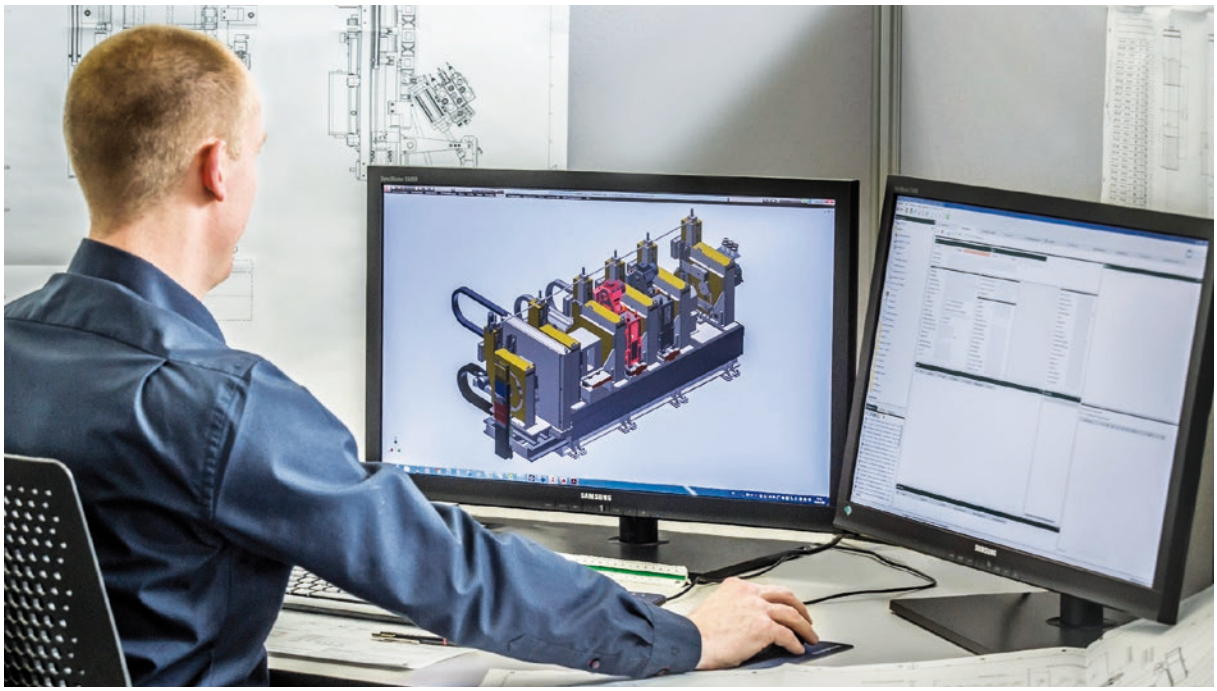
High-Definition C-Scan to Detect Oblique Defects 360°

The newly developed high-resolution sensor array technology of the ROTOMAT DA / TRANSOMAT DA allows the detection of even the finest changes in the material surface. Smallest stray fluxes can be detected by the highly sensitive sensors. Special algorithms (patent pending) working on the high-definition C-Scan enable the detection of defects on the outer and inner tube surface in all directions. Therefore, it is possible to find oblique defects of all angles as well as short defects.

Reliable Detection of Natural Defects

This opens up completely new testing possibilities. In addition to oblique defects, natural defects of all angles and lengths can be reliably detected. High reproducibility for any defect length down to ¼'' is achieved. For the first time, defects can be visualized in high-definition quality on the C-Scan, so that all defects can be seen in real time on the screen. This significantly reduces processing costs in terms of time-consuming manual or visual inspections at the proof up station, as well as the special end area testing. In cases when the untested ends would normally be cut and scrapped, material waste losses are significantly reduced as well.

System Configurations



Systems for Every Customer Requirement
With the new flux leakage test systems ROTOMAT DA / TRANSOMAT DA, tube manufacturers can ensure that their tubes meet highest quality requirements of any customer. With FOERSTER, manufacturers are prepared for the future.

FOERSTER offers two alternatives for individual customer requirements:

Upgrade of Existing Mill Systems
For tube manufacturers who already have integrated a ROTOMAT DS and/or TRANSOMAT DS in their testing lines, FOERSTER offers upgrade packages to DA technology. No further mechanical changes of the testing line are required. Customized upgrade packages are available to suit different customer requirements.

New Mill Systems
For new testing lines, FOERSTER offers customized solutions developed in close cooperation with its customers, starting from project planning, to construction, commissioning and far beyond. The robust and environmentally compatible design of the Mill Systems offers tube manufacturers maximum lifespan and performance.

Customer-Specific Solutions
Individual solutions are possible to meet diverse customer requirements. ROTOMAT DA and TRANSOMAT DA sensor systems are available for diverse material diameter ranges and testing speeds. FOERSTER offers V-roller testing sections for tubes with plain ends and centric solutions for tubes with upset ends. It is also possible to integrate third-party devices into the testing sections, such as ultrasonic devices or diameter measuring systems. An optional Instrumentation Software allows easy handling of the different test instruments and third-party systems from one central screen. FOERSTER also takes care of the overall automation resulting in a complete turnkey solution.

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