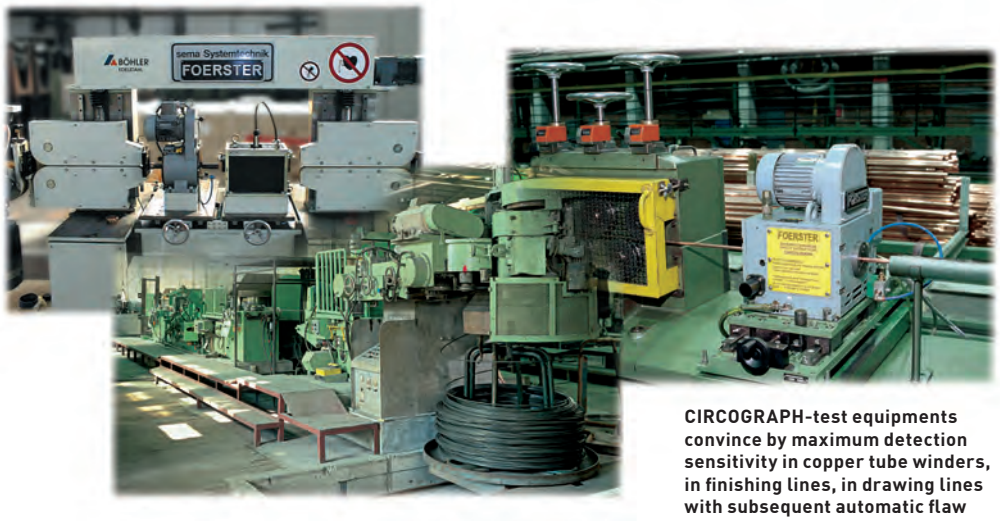
EDDY-CURRENT TESTING
WITH CIRCOGRAPH®

FOERSTER

Eddy-current method
Application and basic function

Economy aspects for testing with FOERSTER®

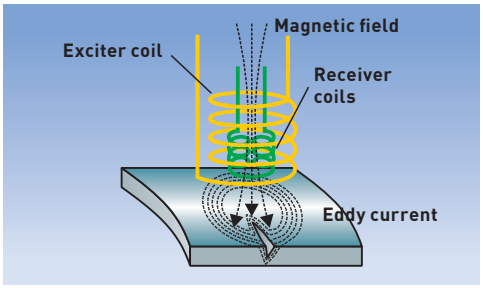
Eddy-current testing with rotating sensors guarantees maximum detection sen-si-tivity for surface-open, lon-gitudinally oriented flaws on bright material. FOERSTER offers multi-channel systems in various expansion levels which may also integrate a DEFECTOMAT channel. Rotating heads for use on round stock cover the diameter range from 2 - 130mm. Typical fields of application include wire drawing machines, copper tube winders or finishing lines in the bright steel sector.
Individual arrays with rota-ting disks scan flat and profile section material, e.g. when testing rails and shot-blasted rectangular billets. Modern test systems allow uncompro-mising integration in the production process, includ-ing extensive documen-tation. So-called testing sections of various designs guaranteeing optimum transport of the test materi-al through the sensor sys-tem are available for estab-lishing separate testing lines. When combining various FOERSTER test instruments in one test-ing line in particular, but also when integrating test instruments of other man-ufacturers, the so-called multi-test blocks are the ideal solution.
The aim is to cooperate with our customers on a part-nership basis by developing intelligent, series products and individual system solutions.



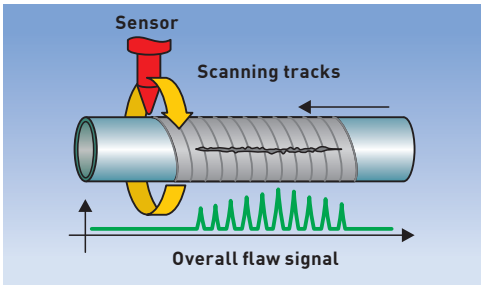
CIRCOGRAPH-test equipments convince by maximum detection sensitivity in copper tube winders, in finishing lines, in drawing lines with subsequent automatic flaw removal system prior to final drawing process

Eddy-current method

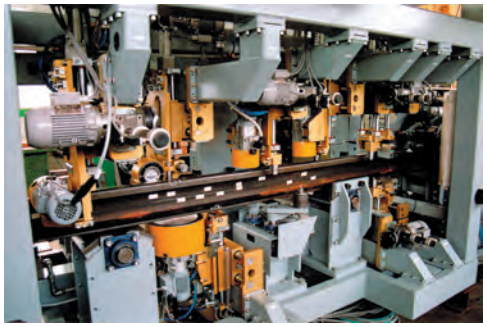
The eddy-current rotating probe rotates at high speed around the test material which is moved longitudi-nally and scans its surface helically. The rotating probe with „punctiform" action scans only a small area of the material surface at any one moment, i.e. when testing, it concentrates on a very small part of the overall surface. Thus, even an extremely small material flaw represents a major disturbance percent-age-wise with respect to this relatively small materi-al surface area. One oth-er advantage of the rotat-ing probe method: Long-drawn-out material flaws are indicated over their full length. The rotating probe generates a signal with each revolution.



Signal generation when testing with rotating sensor



Principle of the eddy-current scanning probe: The surface of semi-finished products is scanned with sensors



Eddy-current system for testing rails for surface flaws with rotating disks CIRCOSCAN® and shape-adapted segment coils

CIRCOGRAPH® DS
THE TOP-OF-THE-RANGE MODEL

CIRCOGRAPH DS

The instrument system, based on Windows®, allows convenient operation and network integration. Modern touch screen technology and application wizards facilitate dialogue and prompt you reliably when making all instrument settings.
Clearance compensation with automatic adjustment. The system utilises the power of Windows® in relation to network capability and multi-tasking. Thus, FOERSTERnet allows access to the test instrument from any number of computer workstations simultaneously even if the various users require different information, e.g. current test status, test result of the last tested job or a batch from last month for reasons relating to research.

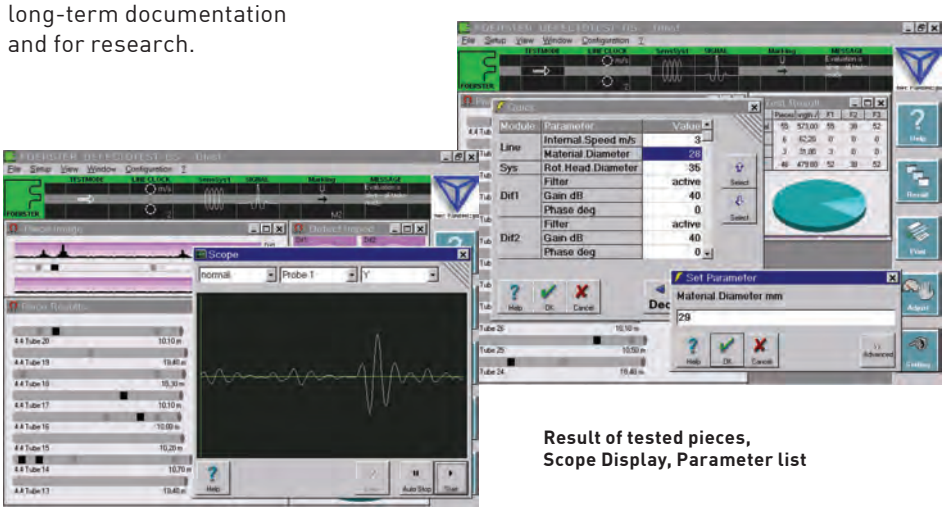
Production

CIRCOGRAPH DS is the top-of-the-range model for eddy-current testing with rotating probes

CIRCOGRAPH DS – meets the most stringent demands. On drawbenches, in winders and on finishing lines ...

DEFECTOTEST® DS 2000

This is the instrument concept for electromagnetic testing using digital technology which forms the platform of the CIRCOGRAPH DS for multi-channel applications and allows adaptation to individual requirements. FOERSTERnet offers access to the CIRCOGRAPH DS test instrument from any number of computers and allows network integration in existing production and quality systems. Implementing the system on the basis of Windows® ensures easy integration and convenient operation and offers Active X interfaces to other Windows programs. Application wizards prompt you interactively, allowing you to reliably achieve the right instrument setting. Automatic adjustment and compensation procedures guarantee reproducible testing. Integrated diagnostic functions ensure that the automatic test result is reliable. Archiving of all test results allows individual result summaries for short and long-term documentation and for research.



Result of tested pieces, Scope Display, Parameter list

ECONOMICAL SOLUTIONS FOR YOUR PRODUCTION

Shipment

Statistics

Remote Servicing

Production

The touch screen allows easy operation by simply touching the screen surface. A keyboard is available for text input. Real-time visualization of the test sequence supports the operator at anytime.

Shipment

Documented quality to ISO 9000 thanks to user-specific, automatic logging.

Statistics

Extensive documentation for each test piece and each flaw allow subsequent research and form the basis for product liability.

Remote servicing

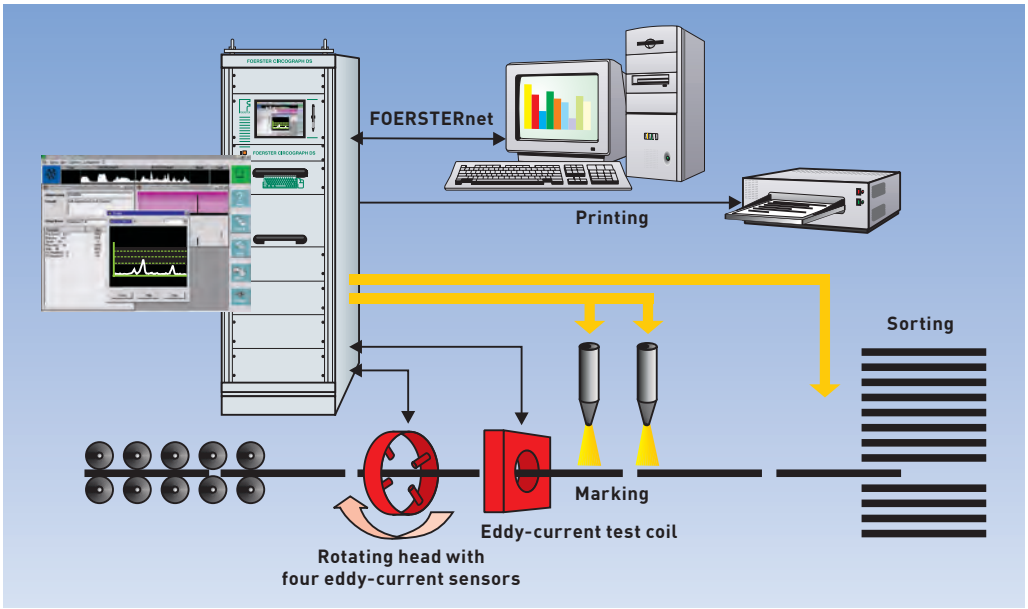
Direct communication with the test instrument through connecting to other networks (LAN and WAN). allows remote servicing by qualified FOERSTER Support Center staff

Production-integrated eddy-current test system CIRCOGRAPH DS with DEFECTOMAT channel

System technology

Eddy-current test system with digital system tech-no-logy for automatic, high-resolution, multi-channel flaw testing on wires, bars, tubes and pipes made of ferromagnetic and austenitic steels and non-ferrous metals. Universal test sys-tem, which can be adapted to individual applications and requirements. Configurable test sequence programs for piece testing, continuous testing and testing with subsequent cutting simplify matching to production conditions.

Extensive documentation for each part and each flaw allow subsequent research and form the basis for product liability. Continuous monitoring of operational safety and reliability is a foregone conclusion.



The eddy-current test system CIRCOGRAPH DS with DEFECTOMAT channel

SENSOR SYSTEMS

Compact, robust, long-life and easy-to-service

Sensor systems

Four rotating heads are available for round stock from 2 - 130mm diameter. Special solutions with stationary sensors and rotating test pieces are possible in the case of larger sizes.
CIRCOSCAN rotating disks are used to test profile section material.

Rotating head Ro20

Small and compact for diameters 2 - 20mm, fitted with two test heads of pin design. Maximum test speed of 3m/s can be implemented with two test heads, each with 5mm track and 18,000rpm. The Ro20 can be operated with the two-channel CIRCOGRAPH DS.

Rotating head Ro35P and Ro35L

Designed for material diameters 2 - 35mm and optionally equipped with two or four test heads of pin design (P) or lever design (L).
The maximum test speed is 3m/s with scanning without omission, 9,000rpm and fitted with four test heads with 5mm track. On the Ro35L, two levers can be used for material diameters larger 5mm and the test speed is then halved. The field of application of the Ro35P relates to the bright steel sector when testing bars with good end condition and in copper tube winders. The field of application of the Ro 35L mainly relates to drawing lines where the conditions of the ends may pose difficulties on entry and exit. The levers are able to deflect if they contact the material.

Rotating head Ro65

Designed for material diameters from 5 - 65mm the Ro65 is equipped with two test heads. A maximum test speed of 4m/s is achievable with two test heads at 2 x 10mm probe track and 6,000rpm. A rugged special version exists for use in drawing lines for diameters up to approx. 50mm.

Rotating head Ro130

Designed for material diameters from 10 - 130mm and optionally equipped with two or four test heads of lever design. A maximum test speed of 4m/s can be achieved with four test heads with 2 x 10mm probe track and 3,000rpm.

CIRCOSCAN

Rotating disks with corresponding actuators are available for scanning profile sections and flat material. Solutions with adapted mechanical system are avail-able for rail and rectangular billet testing.

Rotating head Ro 20

Rotating head
Ro 35 P / Ro 35 L

Rotating head Ro 65

Rotating head Ro 130

CIRCOSCAN

Reg.-Nr. 001159 QM08

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Printed in Germany 04/2014 • Order No. 1676202 • Edition 04/2014