Krautkramer Testing Machines

ROT 65 VIS
ROT 140 VIS
ROT 350 VIS

Ultrasonic rotation tube testing machines

Seamless tubes in the lower to medium diameter range are usually tested for flaws on the outer and inner surface as well as inside the wall using rotation testing machines. Besides these tube types, pressure-welded tubes having worked-off weld seams are also tested on rotation units if the later tube application specifies a corresponding test.

The tubes are transported to the testing machine via linear roller conveyors having speeds from about 30 to 120 m/min. The test can be carried out in single tube testing mode or in continuous end-to-end testing mode to reduce the untested ends. Several triple or double roller drivers overtake the guidance and the constant transport of the tubes directly before and after the rotation mechanics. The smaller the tube diameter, the more accurate the guidance of the tubes has to be during the test. Guided by additional guide bushes in the ROT mechanics, the tubes are immersed in the rotating water jacket.

The rotor contains up to 4 (ROT 350) or 6 (ROT 65/140) test modules which are equipped with probes for the required test types and which are successively released for testing in order to obtain as short untested tube ends as possible. The probes are not in direct contact with the tube surface. The ultrasonic coupling is effected via the rotating water jacket (water delay line). Different probe

ROT 140 VIS with double driver

systems can ce activated within the rotatation mechanics, depending on the current test task. The ultrasonic signals are transmitted from the high-speed rotor to the stator via special slipring systems equipped with triple brush units.

The newly developed, PCB-based and fully parallel operating ultrasonic test and evaluation electronics, type VIS, processes all returning signals and carries out a separate evaluation according to flaw type and position. In order to avoid or to limit misinterpretations due to electrical interferences, a noise suppression takes place by means of a dynamic dual-threshold method prior to issuing the flaw result. Thanks to this noise suppression method, no test shot is lost, and every single pulse is evaluated. Electronically stored single tube and production lot results complete an immediate marking of the defective areas at the output end of the guide device and the subsequent sorting of the tubes.

GE imagination at work

Technical Data

Data of the test objects ROT 65 VIS

Outside diameter: 10 to 90 mm
Wall thickness: 1 to 12 mm
Minimum tube length: approx. 3 m

Data of the test objects ROT 140 VIS

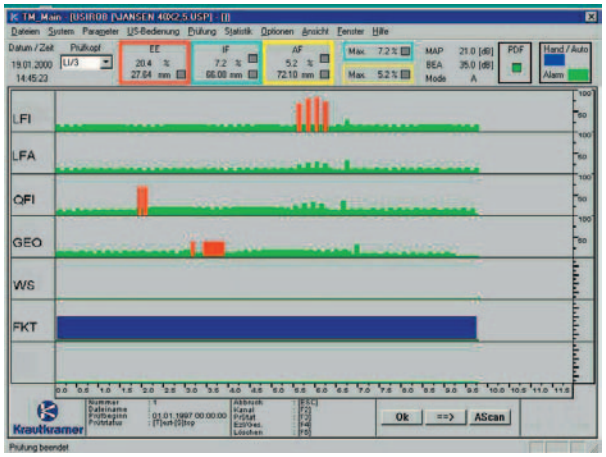
Outside diameter: 15 to 168 mm
Wall thickness: 1.5 to 20 mm
Minimum tube length: approx. 3 m

Data of the test objects ROT 350 VIS

Outside diameter: 60 to 340 mm
Wall thickness: 3 to 35 mm
Minimum tube length: approx. 3 m

Data of the testing machines

Test speed depending on the probe assembly and on the flaw length to be detected:
max. 120 m/min (ROT 65);
max. 90 m/min (ROT140);
max. 60 m/min (ROT 350)
Test channels:
max. 18 (ROT 65);
max. 18 (ROT140);
max. 40 (ROT 350)
Probe assembly:
max. 22 probes (ROT 65);
max. 22 probes (ROT 140);
max. 56 probes (ROT 350),
of which max. 18 probes (ROT 65);
max. 18 probes (ROT 140);
max. 40 probes (ROT 350)
activated via coding plugs
(different test modes are possible)



Online evaluation graphics

Probe module-
longitudinal flaw testing

Rotational speed:
max. 2500 RPM (ROT 65);
max. 1500 RPM (ROT 140);
max. 1000 RPM (ROT 350)

Measuring accuracy for wall thickness:
+/- 0.03 mm
(higher accuracy is possible by means of averaging)

Test electronics

Modern PC systems electronics VIS
- User interface under WINDOWS NT
- Max. 20kHz pulse repetition frequency
- VME bus controller
- Parameter storage
- Automatic sensitivity adjustment or check
- Extensive monitoring functions, self-tests and diagnostic supports
- State-of-the-art PC technology

Wall thickness or geometry measurements using the UMW electronics. Display and storage of wall thickness profile of individual tubes during testing.

Test specifications

SEP 1915, 1918, 1919
API 5 CT, API 5 D, API 5 L
other specifications on request

Options

- Tube cleaning and prewetting system
- Water circulation system
- Tube guiding and transport device

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