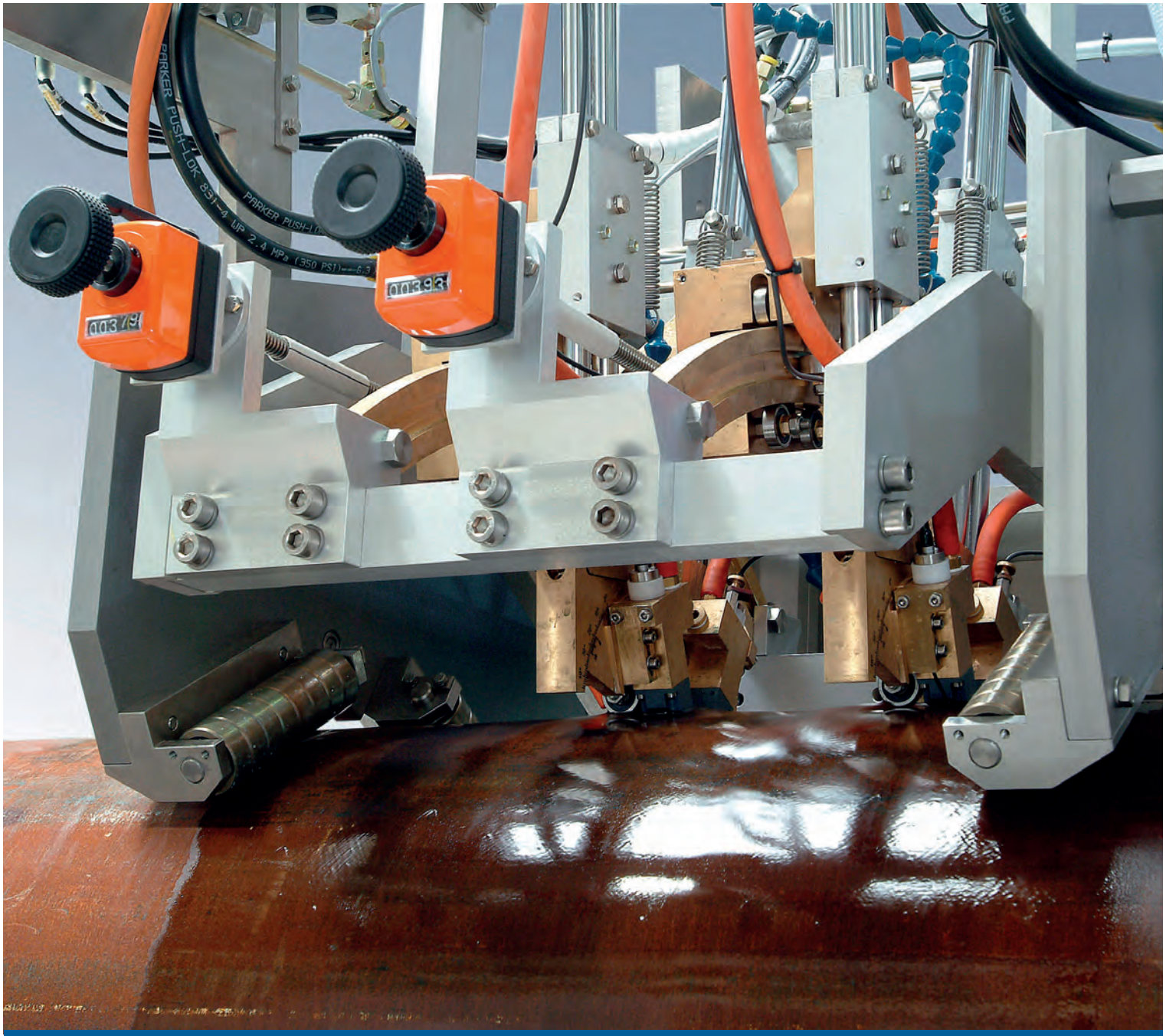


ECHOGRAPH-SNHF

Ultrasonic Inspection of ERW Pipes

KARL DEUTSCH

ECHOGRAPH-SNHF
Ultrasonic Inspection of ERW Pipes

Online Testing System for ERW-Pipes: The probe holders can be moved between the testing position and the calibration position. In the calibration position, a short pipe segment is used for the sensitivity setting of all probes.

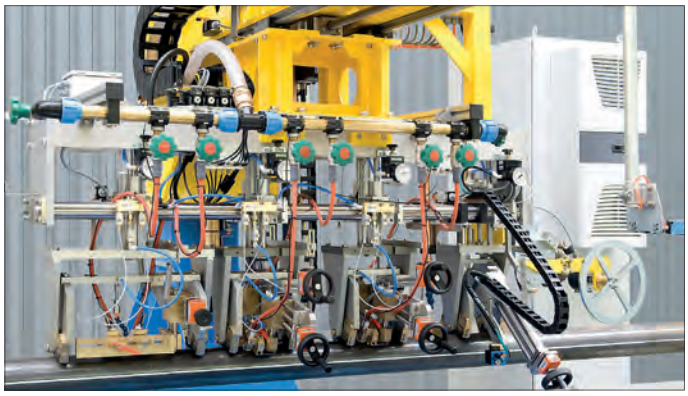
Ultrasonic Inspection of ERW Pipes

The production of ERW-pipes includes several steps of NDT. The usage of NDT has two major goals:

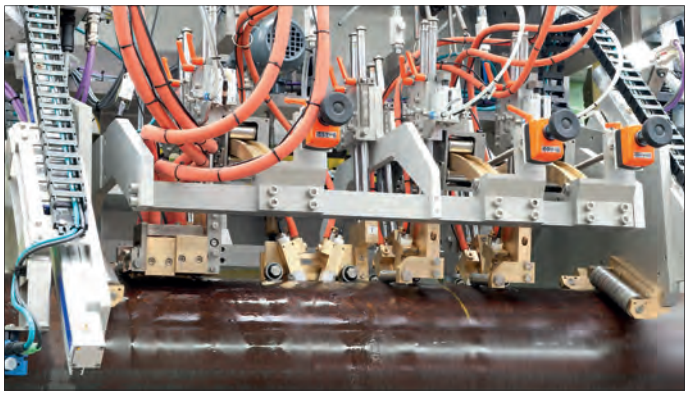
Early information about the welding procedure as a feedback for the production line and secondly, the final inspection of the finished pipe. Up to four ultrasonic systems are often encountered during the production process.

As a first step, a strip tester can be used. Linear or oscillating test traces of the probes are possible. Directly after welding, a first online weld test is carried out with ultrasound. It is common to check for longitudinal defects only. Sometimes, an oscillating deburring check is added to verify the proper descarfing of the internal pipe wall.

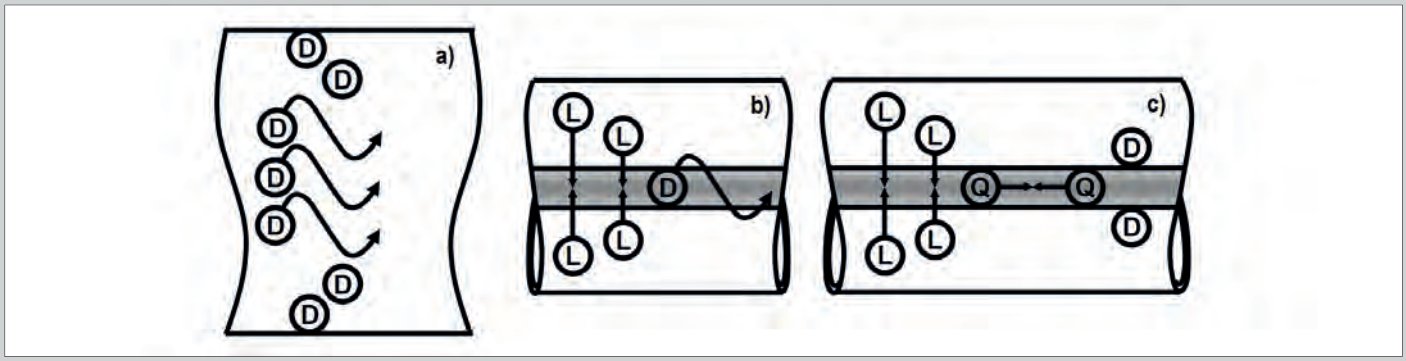
After pipe cutting, a final weld inspection is carried out (offline weld testing). A testing portal with moveable carriage is commonly used. The testing portal shows the advantage that the weld is inspected without pipe movement, thus avoiding vibrations which could degrade the test results. The pipe ends can be tested in the same testing system or in a separate setup.



Probe holders for online testing machine (transverse and longitudinal defects)



In this example ten probes are used for offline weld testing. The six angle beam probes use water jet coupling (also called squirter technique). The incidence angle can be adjusted without steps for a perfect setting with respect to pipe diameter and wall thickness and without changing the probe.



Typical testing tasks for the ERW-pipe inspection.
a) Strip inspection with edge probes and oscillating strip middle probes
b) online weld test with 4 probes for longitudinal defect detection and an oscillating deburring check
c) offline weld inspection with 4 probes for longitudinal defect detection, 2 on-bead probes for transverse defect detection and 2 probes for lamination testing in the heat-affected zone

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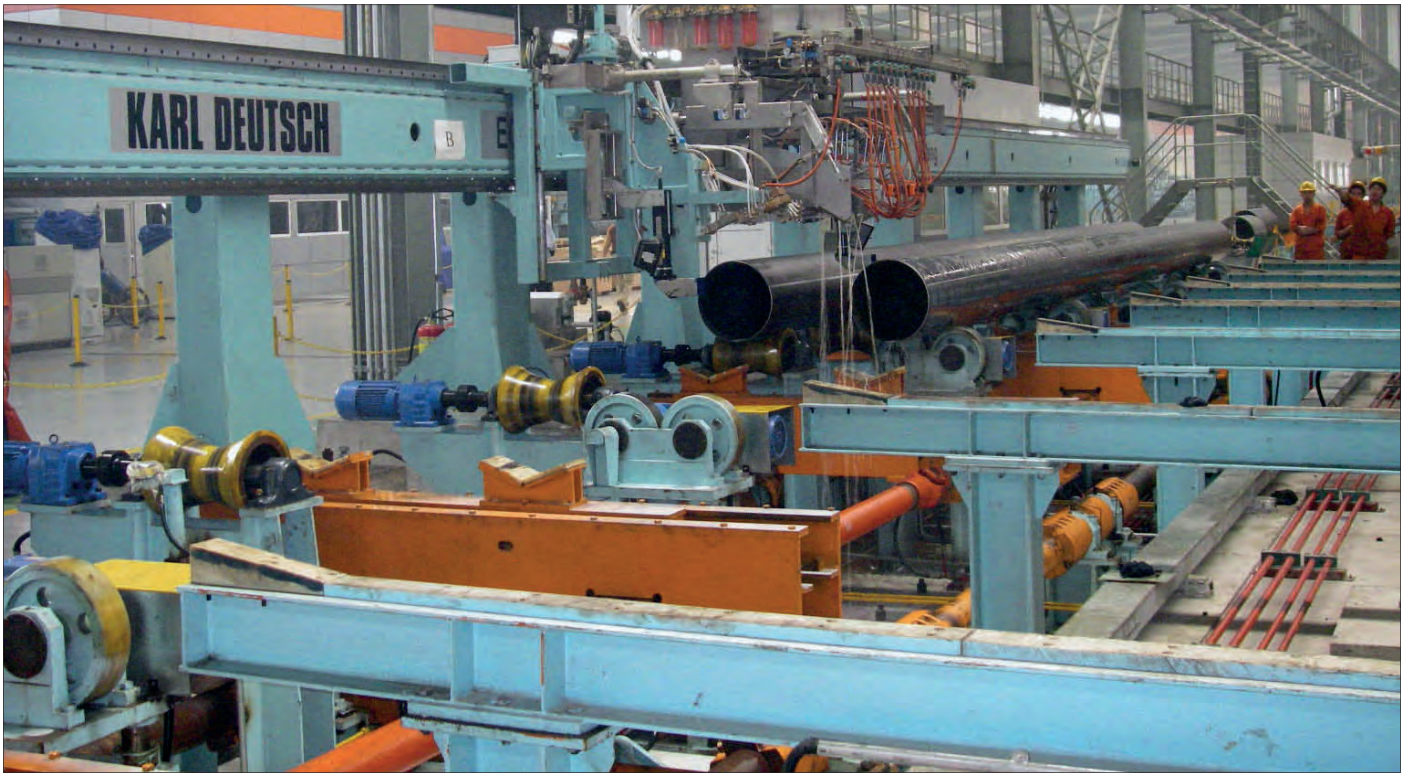
Ultrasonic Inspection of ERW Pipes

Test portal (offline test machine) during assembly at the KARL DEUTSCH workshop



Test portal (offline test machine): Onsite operation with transverse conveyor for pipe feeding and linear discharging of the pipes. This machine was also equipped with two additional probe holders for the pipe end inspection.

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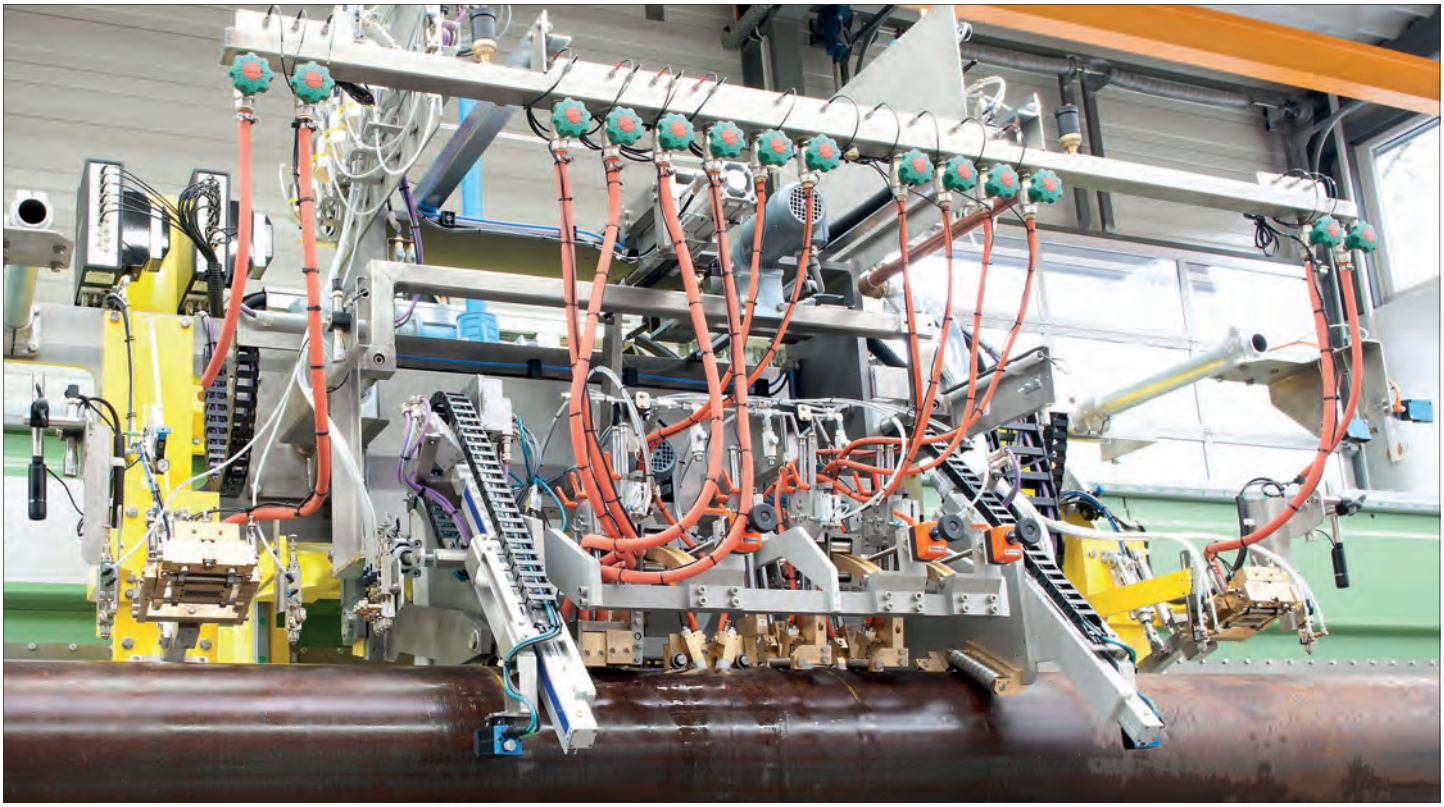
Ultrasonic Inspection of ERW Pipes



The inspection of the pipe body and/or the pipe end can be performed with separate testing systems or with additional probe holders in the offline portal. Separate systems offer a higher overall throughput (e.g. BAPS strip testing system, RPTR pipe testing portal, REPS pipe end testing system, see separate brochures). This example shows an SNHF weld test portal with two additional pipe end probe holders. The portal can be used bidirectionally. Depending on the test direction (left to right or right to left), the respective pipe end probe holder becomes active.

Specimens	
ERW-pipes (single or endless pipes)	
Material	ERW-welded steel pipes
Diameter range (D)	up to 630 mm (to be discussed)
Wall thickness (s)	3 - 30 mm
Length	endless (online test) or 3 - 25 m (offline test)
Ovality	± 0.5% of D
Straightness deviation	max. 2 mm/m
Surface condition	as rolled, without loose scale
Temperature	max. 80 °C
Detectable flaws	longitudinal and transverse flaws, laminations in heat-affected zone; option: laminations in pipe end and pipe body

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