Another step forward in ultrasonic testing

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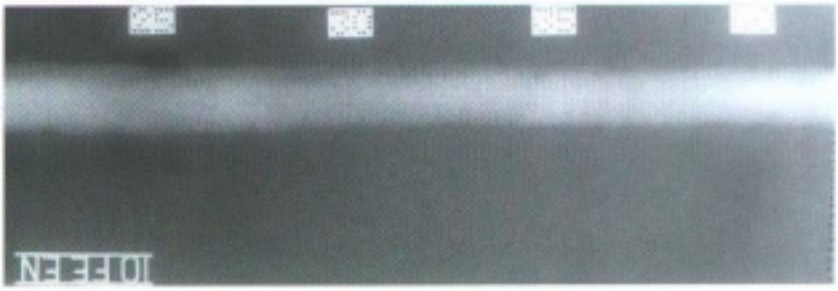
In 1895, Wilhelm Conrad Röntgen discovered the X-rays, called "Röntgen" after him in German. Ever since that time, nothing fundamental has changed in radiographic testing developed at that time, except that the X-ray films and the X-ray machines have been improved and become more efficient.

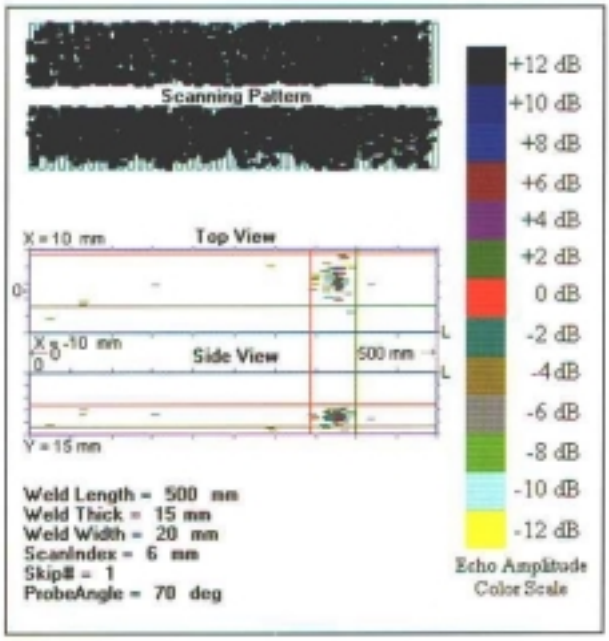
One of the great advantages of radiographic testing was always the documentation in the form of the X-ray film which could be filed. In the case of ultrasonic testing, it was previously common practice to draw up handwritten test reports, which is often seen as a disadvantage.

Ever since we started using the ISONIC test system, we have taken one step forward in this regard. We are now able to hand out a representative piece of documentation to the experts and to our customers. This comprises the demonstrated proof of the correct execution of the test and the real-time evaluation of all signals, including the echo indications from the ultrasonic instrument – even as true-to-scale and graphic representations.

Another aspect is based on the fact that an X-ray image or radiograph always only represents a shadow image – without any information as to the depth position of flaw indications. ISONIC offers not only a top view for this, but also the side view from which the depth position can be read. How often has a weld been repaired from the wrong side! This is avoided when using the ISONIC.

Moreover, it often happens that the ultrasonic inspection detects cracks and lack of side fusion more sensitively than the X-ray method. An example of this: We would like to describe our first experiences using a normal work specimen made of WstE355. The metal sheet specimen was radiographed after welding according to





top: X-ray film

middle: Extract from a test report

bottom: Microsection

standard specifications. No irregularities were noticed when the film was evaluated. The additional ultrasonic inspection using the ISONIC system, however, revealed a flaw measuring 17 mm in length. This flaw area was afterwards again radiographed using an X-ray tube as well as a more sensitive film quality and another beaming direction. Once again, no flaws were detected when evaluating the film (please see X-ray film range 37-39 cm). As the test object was a work specimen and not a finished tank, a microsection was taken from the location concerned. The defective spot could then be seen under the microscope (please see microsection photo).

Another characteristic feature of ISONIC is the reproducibility of the test: everything is documented by the system right from the start, from coupling via probe movement up to complete volume coverage, that means the whole test sequence (please see extract from the ISONIC report on the above-mentioned work specimen) - and not only for ferritic welds, but also for materials such as aluminium alloys. The requirements of the European and U.S. standard specifications can be met without reservations.

The step into the next century would thus already be traced out, the test is carried out by a certified inspector using a calibrated system, and the evaluation is made "at a round table" as with the X-ray film evaluation.

Summary:

- Documentation, ISONIC now makes it also possible for the ultrasonic inspection
- Determination and documentation of the flaw depth position
- Large-area flaws in welds can often be better detected ultrasonically than by means of the radiotechnology
- Improvement as against the conventional ultrasonic inspection: coupling monitor.