# PHASED ARRAY

# New Ultrasonic method guarantees 100% weld inspection

Ramnäs has developed a new UT method for offshore chain. The new technique guarantees 100% inspection of the whole weld volume and is approved by DNV. Phased Array is today's State of the Art regarding UT control technique for offshore chain.

Phased Array is developed to handle complicated geometries and demanding material. The actual direction of the ultrasonic pulse can be selected with higher precision as the Phased Array method allows adjustable focus, linear scan, scan angle and dynamic focus. The fusion line is easily found and can be seen visually on the UT screen.

Phased Array is a high speed control method compared to the older UT methods. It allows easy defining of size and position of indications and has always 90° reflection from weld indications in the fusion line.

The signal-to-noise ratio from composite transducers is 10 to 30 dB greater compared to piezoceramic probes, which makes the Phased Array method suitable for various material thicknesses, with great depth of study possible for objects such as big H-shackles, triangle plates etc. Indications like small slag particles in the fusion line are also easy to find. Ramnäs uses linear electronic sector scanning technique for control of the weld.

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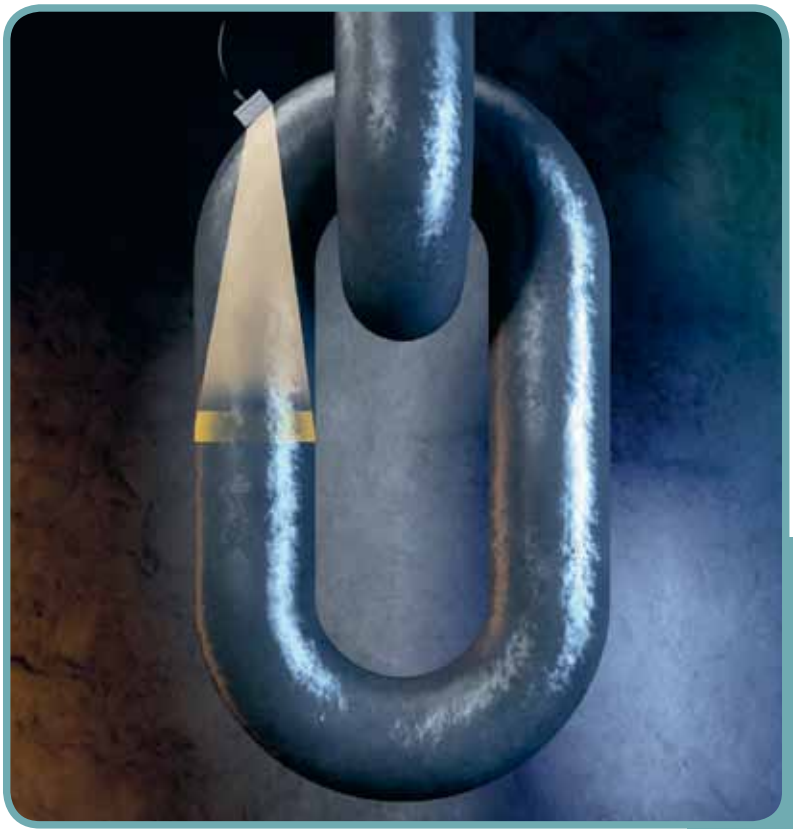


**Phased Array uses ultrasonic waves, which contains a large number of vibration sources that produce ultrasonic pulses.**

**The benefits are tangible; inspection period is shortened down to a tenth. The documentation is clear and can be stored and the vast majority of materials can be investigated. Compared with conventional ultrasound technique, Phased Array is an array of new opportunities.**

# Advantages with Phased Array

You can see 100% of the whole weld volume.

Always 90° reflection from weld defects in the fusion line.

Easy to find fusion line and other indications.

Sizing defects and position in the weld is easy and fast.

Phased Array is a much faster method compared to 45° and 70° probes.

Good contact between probe and link – always perfect surface outside bend.

Electronic documentation of test results – technical report incl. screen photo from defect and reporting levels.

Fast and efficient daily calibration control of machine and probe.

Phased Array is the best method for offshore chain – compared to TOFD and Tandem.

Find indications in the surface to higher extent than conventional UT-testing.

Major oil companies prefer Phased Array as UT method.

**Ramnäs Bruk has tested dimensions from 76 mm up to 165 mm, stud and studless chain with Phased Array.**

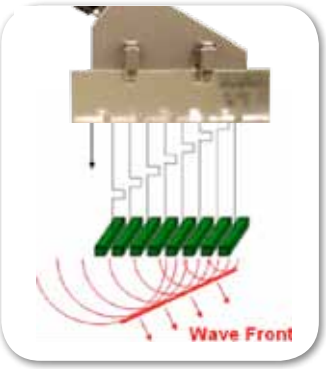
NEW NDT METHOD FOR CONTROL OF OFFSHORE CHAIN

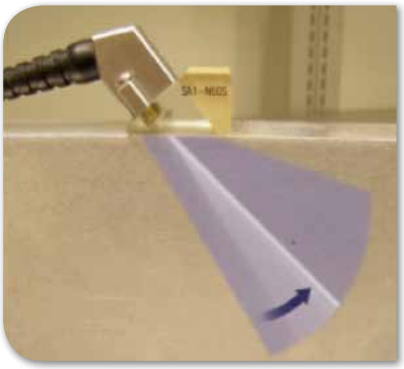
## 100% of weld volume can be guaranteed for offshore chains

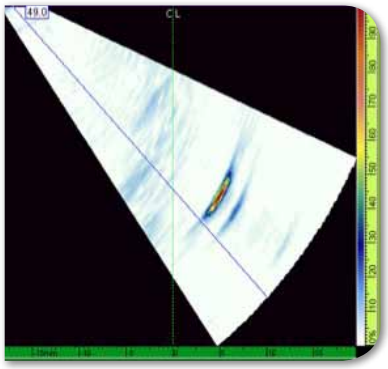
# How does Phased Array work?

Ultrasonic Phased Array consist of a series of individual elements, each with its own connector, time delay circuit and A/D converter. The elements are acoustically insulated from each other and each element are pulsed in groups with pre-calculated time delays for each element (i.e., "phasing").

Ramnäs uses Phased Array with sectorial scanning which implies that a volume can be scanned without any probe movement. This is very useful for inspection of complex geometries or geometries with space restrictions. Sectorial scanning combines the advantages of a wide beam and multiple focused probes in a single phased array probe and gives a very precise scan resolution.





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