



Solutions for a World of Steel



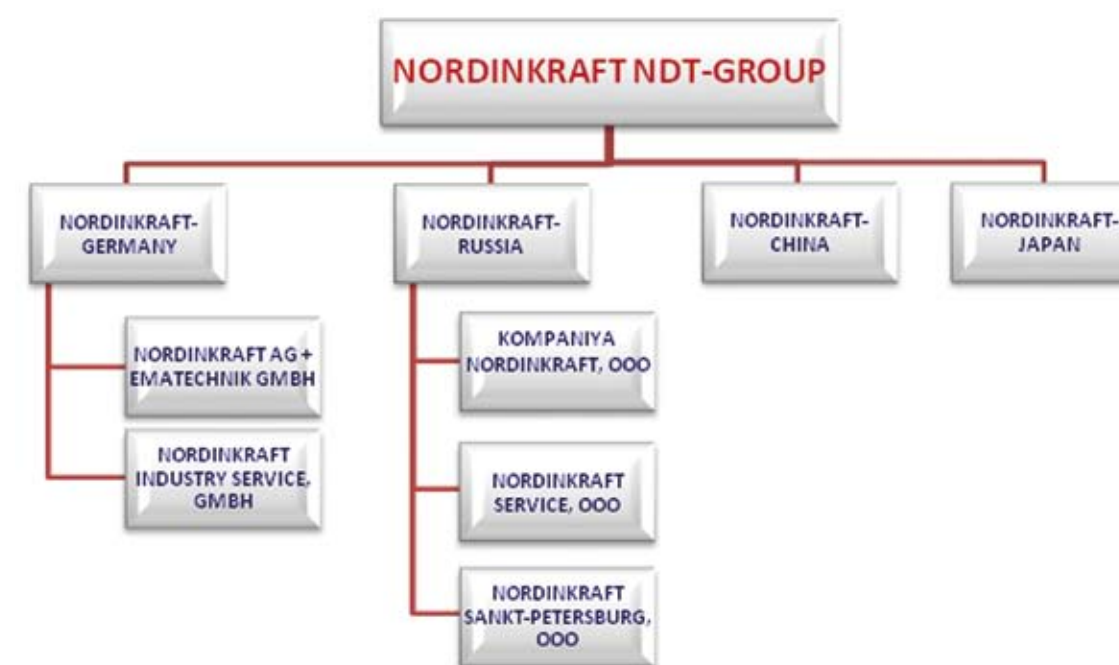


The Nordinkraft NDT Group

Nordinkraft is known the world over for its high-quality, technically excellent, industrial nondestructive testing (NDT) systems. In continuous use throughout the globe, the precision and robustness of Nordinkraft's ultrasonic testing systems have been tried and tested under the toughest of conditions. Let us introduce ourselves. The Nordinkraft NDT Group is an amalgamation of companies, all concerned with the development, production and implementation of NDT procedures for testing the most diverse materials and components.

The perfect combination of research on the one hand and the practical implementation of cutting-edge technology on the other, has established Nordinkraft as a global leader in the nondestructive testing of materials in the production cycle. Our clients are spread throughout the world, from Turkey to Vietnam, China and Japan, via Kuwait and Russia. A corresponding net of distributors in Turkey, China and Japan provides a strong basis for the expanding Asian steel sector.

Nordinkraft's impressive range of testing solutions encompasses a wide spectrum of industrial applications. Amongst our global clients are metallurgical companies (i.e. manufacturers of pipelines, planes or construction steel), as well as manufacturers of electronic components for the automotive industry, all of whom have to meet strict international standards. During the 20 years of its existence, the name Nordinkraft has become a synonym for cutting-edge testing systems which are characterized by quality, efficiency and economic viability.



The individual companies within the Nordinkraft NDT Group are joined by open communication channels and interlinking production strategies, all of which enable an efficient use of Nordinkraft's combined resources. A group-wide quality management system as per ISO 9001, guarantees a constantly high level of quality in our processes, as well as enabling us to meet internal and external quality standards.

Knowledge cloud

On a materials level, Nordinkraft functions like a virtual cloud, collating the combined knowledge and experience of all our technicians and engineers in available technology and techniques, production and research. This collated knowledge can then be used for the benefit of all in creating optimal solutions.

The most important factor in this process is the customer, with his individual needs, wishes and industry-specific requirements.

From the consultancy stage via development, installation and implementation through to the commissioning of the equipment, training personnel in its use and after-sales service, Nordinkraft stands for expertise, flexibility and quality.





EMAT (Electro-Magnetic Acoustic Transducer)

A global leader in this industry for the past 15 years, the Nordinkraft group has continually developed and honed this liquid free technology, which can be used far more versatily than conventional alternatives.

What is it?

EMAT is a non-destructive testing system which, requiring no couplant and able to withstand extreme temperatures, can be used whilst or shortly after the machine is in operation.

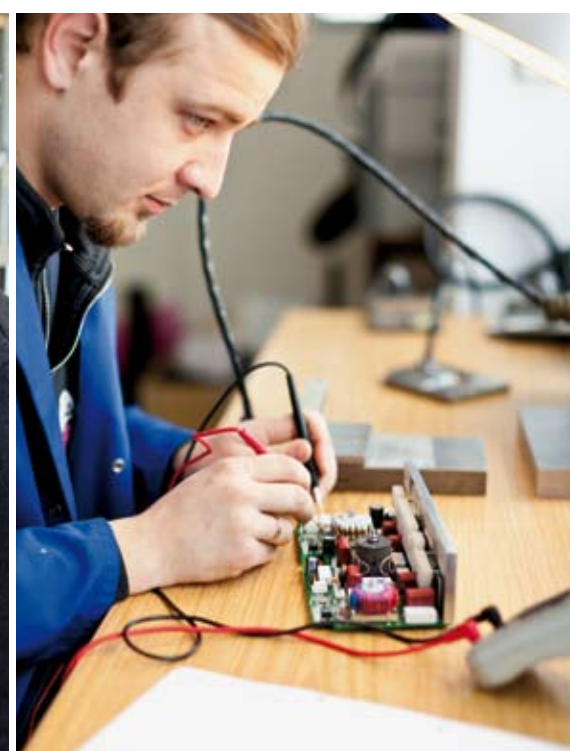
How does it work?

EMAT generates and receives ultrasonic waves through electromagnetism.

The transducer contains a permanent or electro magnet and an electric coil, connected to an AC-generator. The coil induces eddy currents on the surface of the material being tested. These currents generate a periodic force within the magnetic field (known as a Lorentz-Force), which in turn create ultrasonic waves.

Unlike more conventional (i.e. piezo) testing, as the ultrasonic waves originate from the surface of the material itself, no couplant (i.e. liquid) is required in the process. This means that EMAT can also be used to test materials with a high or very low surface temperature.

By changing either the direction of the superimposed magnetic field or the coil design, EMAT can create and measure longitudinal and transverse Rayleigh or Lamb waves. Transverse waves - also known as shear waves - are very sensitive to flaws in milled materials (plates and pipes, for instance).



Advantages of EMAT

- No water supply required: EMAT needs neither water nor other mediums as a couplant
- Environmentally friendly technology: a great deal of fresh water is saved
- No danger of corrosion; neither for tested materials, nor for the roller conveyer
- EMAT is relatively insensitive to the surface conditions of the material. As waves are generated directly on the surface of the test object; the angle of wave generation does not depend on the inclination of the probe.
- Fewer obstacles: paint, oil, rust, dust, scale, roughness of the surface do not normally interfere with the test process
- Go where no man has gone before: unlike conventional piezo testing, EMAT can reach up to 100% test coverage
- Huge time savings: adjustment and calibration take next to no time for EMAT-based systems
- Less personnel training required for EMAT testing as compared to conventional technologies
- EMAT is far less sensitive to noise than piezo testing
- Testing can often be done during operation: EMAT can withstand surface temperatures ranging from -40oC to +650oC
- Higher productivity: EMAT-based systems can reach testing speeds of upto 10 m/s




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Phased Array Technologies

Phased array technology is the most common, simple and cost effective way for ND testing with ultrasonic waves. This technology has become a modern, sophisticated and extremely effective way to test tubes, bars, pipes etc. on an industrial scale.

What is it?

Phased array piezo probes are the most common, simple and cost effective devices for nondestructive testing. Using a couplant such as liquid or gel, ultrasonic waves generated and received by the probes, test for flaws in the metal.

This "state-of-the-art" technology takes ultrasonic testing to the highest level, successfully solving a range of practical NDT issues such as operational reliability, safety and improving the quality of the tested products and materials.

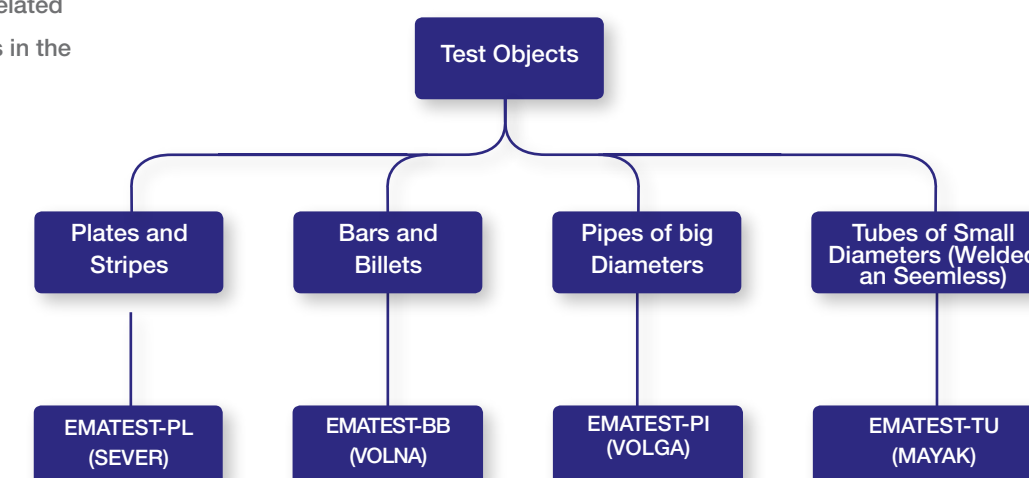
Over ten years ago, NORDINKRAFT took up the challenge of creating an effective yet moderately priced automatic flaw-detecting system based on phased array probes.

Nowadays, the group produces every element required by the system, including electronic flaw detectors, logic controller and phased array probes, and can proudly say that Nordinkraft's phased array -based equipment has been accepted by industry all over the globe, with the range of its industrial applications increasing year by year .



NORDINKRAFT's PRODUCTS

We produce ultrasonic and eddy current testing equipment and related services for a number of sectors in the metallurgy and pipe industries.



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Plates Testing Systems

EMATEST-PL is a family of systems for the ultrasonic inspection of steel plates. The systems can be equipped with either EMAT, conventional piezoelectric probes, or phased-array transducers.

The Ultrasonic testing equipment we provide has some quite special features.

For example, our EMAT probe systems can operate successfully from temperatures as low as -60°C and as high as +650°C.

Neither water nor any other liquid couplant is needed when testing plates or strips, which can have a width of upto 5500mm!

We produce both "online" and "off line" systems with upto 740 independent channels. EMAT is simply the best choice for plate testing!

Pipes & Tubes Testing Systems

EMATEST-PI and EMATEST-TU are UT-systems for testing pipes and tubes, whether moulded or welded. These systems can be fitted with EMAT, phased array, or conventional probes, depending on the customer's specific requirements.

It is our mission to offer technically excellent yet cost effective NDT solutions to our customers!

Our systems can test pipes ranging from a diameter of 10mm to upwards of 2000mm and with a wall thickness of 0,5mm to upwards of 50mm. The EMAT-equipped systems can even deal with surface temperatures of 650C or more. EMATEST-PI and EMATEST-TU meet all current EU standards.

Whereas phased array probes are the most effective way to perform an acceptance test on welded pipes, EMAT can be used to test pipes immediately after welding when the temperature of the welded seam area is still relatively high.





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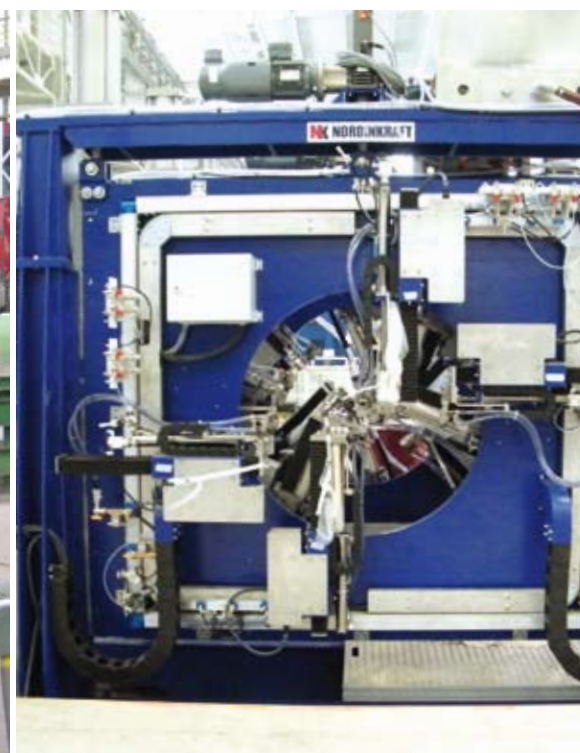


Bar Stock (Billet) Testing

EMATEST-BB bar stock testing systems can be used for a wide range of dimensions up to 560 mm in diameter (for bars).

EMAT, phased array or conventional technologies can be used in bar stock testing. Internal cracks can be easily detected by the Rayleigh waves generated and received by EMAT; a very effective yet economical solution.

Internal flaws can be detected using both EMAT and phased array technologies. Our qualified personnel will gladly advise you on the best method for your specific needs. As is also the case with the other UT-systems, ultrasonic billet inspection is fully automatic, with the testing process directed by a logic controller. Our systems are capable of testing up to 6-8 bars a minute.



Handheld Thickness Gauge

Nordinkraft AG's tried and tested EMAT-Technology is available in miniature, in the form of a compact Handheld Device.

The portable Ultrasonic thickness gauge NKD-019E is an easy to use, handy electronic measuring tool, making use of EMAT to acoustically measure thickness.

A major application of EMAT is under conditions where the use of a couplant is either not desired or not possible, e.g. an item with a particularly high surface temperature (up to +200°C). In these temperature ranges, water would immediately evaporate. NKD-019E offers excellent test results, even if the test object is coated or varnished.

The Handheld Ultrasonic thickness gauge combines all the advantages of the EMAT-Technology with the flexibility of a portable device. Non-destructive and surface-efficient Ultrasonic testing is now a viable option for a vast amount of industrial applications in conventionally less accessible areas.

With an average run time of over 12 hours, measurements can be taken in complex facilities or under difficult conditions without worrying about an external power source. The test results are displayed as an A-Scan (graphic display of the signal) on a TFT-display. Model NKD-019E offers a fully-automatic processing of the test results and saves the data in an internal storage unit for future reference. Putting the gauge into manual mode also allows for extremely high-precision measuring.

With a range of 1.5mm to 100mm, and an exceptional measuring accuracy, the NKD-019E can be put to use for a wide range of metallurgical needs.



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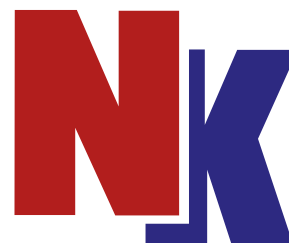
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