



## Electromagnetic methods (ET)

Do you use electrically conductive material? Do you notice fatigue in your installation or do you find cracks caused by other degradation mechanisms? Do you expect possible corrosion in inaccessible areas? Our specialists would be happy to provide you with their expertise and will arrange for the necessary checks on your materials.

### Your tailor-made solution

Vinçotte proposes various checks based on electromagnetic principles, which can be used on all types of electrically conductive material, with or without a covering (paint, coating, etc.). These different methods are based on inducing electrical currents and magnetic fields, and observing the electromagnetic response. If the test configuration is correct, a defect in the component being tested will produce a measurable response. These test techniques can be used without contact or couplant. The most common electromagnetic methods are:

- Checks using eddy currents (ECT, Eddy Current Testing, see the respective data sheet).
- Checks using magnetic flux leakages (MFL, Magnetic Flux Leakage Testing).

This is a fast technique that is suitable for testing tubes, pipelines and storage tanks made of ferromagnetic materials. This technique can be used to detect internal faults and loss of thickness. MFL is also suitable for inspecting cables and tubes.

- Checking using magnetoscopy (MT, Magnetic Testing, see the respective data sheet). This is a type of MFL in which small magnetic particles are projected in liquid or powder form on the component to be tested, which is magnetised in advance, in order to detect imminent defects.
- Testing of the remote field (RFT, Remote Field Testing). This is a fast technique that is suitable for checking pipes and pipelines made of ferromagnetic materials. It is possible to detect internal and external defects using this technique.
- Checks using the Alternating Current Field Measurement (ACFM) method. This is a technique that is used for the detection and dimensioning of imminent cracks in each type of electrically conductive material, however, with a preference for carbon steel.
- Checks via pulsed or low frequency eddy currents (PECT, Pulsed Eddy Current Testing). This is a technique that enables a penetration depth that is distinctly higher than that of conventional eddy currents (ECT). This technique is primarily suitable for the checking of multilayer, thicker materials.
- There are still a large number of electromagnetic techniques, including NFT (Near Field Testing)/NFA (Near Field Array) for tube testing or EMAT (Electro-Magnetic Acoustic Transducers)(induced ultrasonic testing), etc.

These different checks can be conducted using various techniques: these are mostly conventional or multi-element probes (they can be used to screen a large surface area), the checks can be carried out manually, semi-automatically or fully automatically (an accurate mapping of possible indications can also be done).

### Your result

#### Examples

- Inspecting welding seams
- Dimensioning of cracks
- Inspection of cables
- Inspection for corrosion
- Characterisation of the material
- Inspection of tubes, bars or profiles
- Inspection of rivets

- Measurement of thickness of steel plate
- Measurement of thickness of coating

This service offers you the following advantages:

- The use of products is unnecessary (no (ultrasonic) couplant, no detection agent, etc.);
- It is possible to substitute checks by a liquid penetrant test (PT [Penetrant Testing]) in the zones that are not accessible;
- No contact is required;
- It is possible to inspect pipelines made of carbon steel without removing the insulation;
- Inspection of the finished product without surface degradation (no need to strip the surface to be inspected);
- High detection sensitivity;
- Productivity (possibility of high flow rates and/or a wide coverage with multi-element probes);
- Recordings for an accurate mapping of the indications and a computerised treatment;
- Possibility of combining this technique with other inspection techniques that use automated ultrasounds (for example, in nuclear power plants);
- High mobility (portable equipment and autonomous operation)

Vinçotte can also carry out advanced, tailor-made checks, in which connection, the equipment if any required can also be developed (scanner and probes), and specific procedures can also be implemented.

## **Please note**

The development and production activities are covered under our ISO 17020 and ISO 17025 accreditations. Thereafter, work can be done in accordance with all international standards.

## **In which situation?**

This service is relevant to the following sectors:

- The mechanical manufacturing sector
- Aerospace and aeronautical sector
- Petrochemical sector
- Energy generation sector (nuclear and conventional)
- Automobile sector
- R&D departments and consultancy firms