



Ultrasonic testing

Have your materials already been inspected for possible cracks or internal defects? Do these materials have complex shapes? Vinçotte carries out the necessary investigations to detect defects.

Your tailor-made solution

Ultrasonic testing is often done to detect cracks or internal defects in materials. The ultrasonic equipment generates sound waves for testing purposes. Sound is mainly propagated in a rectilinear manner. Sound waves are reflected at the point where there is a transition between two different materials - this is precisely the characteristic that is used to detect flaws in materials. The ultrasonic sound used has a frequency between 0.5 and 10 MHz.

Piezoelectric crystals are used to generate ultrasonic sound waves. AC voltage applied to a piezoelectric crystal makes it vibrate, thereby creating an ultrasonic sound signal that can be used for testing purposes. The crystal is incorporated into a probe that is applied to the surface to be tested. The ultrasonic sound waves emitted by the crystal enter the material, and rebound on the rear wall or on defects. If a workpiece contains impurities or defects, the ultrasound cannot pass through the workpiece undisturbed, and will rebound. The piezo-crystal converts the return signals detected by the probe into a voltage that generates an echo on an oscilloscope or digital screen.

Limitations:

- The material to be inspected must be permeable to ultrasonic waves. The material structure and the grain size have a decisive role to play in this context. The workpiece should also not be excessively irregular in shape.
- Excessively complex shapes in certain workpieces may give rise to too many geometric echoes. It is more difficult to test such workpieces.
- The condition of the surface over which the probe has to move must be clean and ensure good contact with the probe. A contact facilitation liquid is used.
- For a discontinuity to be properly detected, it must be perpendicular in relation to the ultrasonic beam to the maximum possible extent. This fundamental requirement cannot be met in the case of certain configurations.

This service offers you the following benefits:

- This method allows you to detect defects deep beneath the surface in different types of material over the entire thickness of the workpiece (if the geometric configuration permits this), without having to resort to destructive testing.
- This method is faster than radiography, where more resources have to be deployed.
- This method can be automated in the case of products that are manufactured in larger series (conventional pulse-echo as well as TOFD and Phased Array, as explained above).

Your result

Please note

ASME, EN and ISO standards. Other national standards.

In which situation?

This service is for manufacturers and / or users:

- materials that are permeable to ultrasonic waves (In the form of plates, pipes, castings, forgings, etc.)
- structural elements in various stages of manufacture, insofar as the configuration allows this, (e.g. welding joints)
- in-service equipment (fatigue cracks, corrosion, erosion, etc.).