Ultrasonic Thickness Gauging and Lamination Assessments

This application note describes the types of probes and transducers used for thickness gauging and lamination assessments in areas with difficult access.

Why Ultrasonics

It is clear that to be able to critically asses the thickness of materials from where there is access from only one side of the part is very important, especially for measuring metal loss in pipework and pressure vessels.

Ultrasonics (with the UT8000 in this case) delivers precise flaw detection for many types of materials and components, and at high temperatures if required.

The kind of probes used for thickness gauging and lamination assessments are 0° Compression probes commonly known as longitudinal wave probes, and they are either single crystal or twin crystal probes.

Twin Crystal Transducers

Twin Crystal probes are commonly chosen whenever the probe will be used on rough and pitted surfaces, which is often the case when measuring metal loss, for example, in refinery situations.

There is also a range of Single Crystal probes that are useful for thicker, more attenuating materials and are commonly used on smoother contact surfaces.

Single Crystal Transducers

Single crystal transducers have a single transmitting and receiving element which is situated very close to the contact surface of the transducer. Thickness measurements with single crystal transducers is more accurate than twin crystal variants but are not as effective for corrosion survey applications.

Single crystal

Ultrasonic transducers used for metal loss and lamination examination have frequencies generally between 1MHz and 20 Mhz, the lower frequency probes being used for the examination of coarse-grained material, the higher frequency probes for the detection and measurement of thin materials.

Probes for Metal Loss and Lamination Evaluation

Example of Twin Crystal Transducer

TC10-5o(ML)

TC = Twin Crystal

10 = 10 MM diameter

-5o = 5MHz with no roof angle

(ML) = Mini Lemo (Lemo 00) Connectors

caption

Example of Single Crystal Soft Face Transducer

SCSF10-5(ML) SCSF = Single Crystal Soft Face

10 = 10mm diameter crystal

-10 = 10MHz frequency

(ML) = Mini Lemo (Lemo 00) Connector

caption

Proceq UT8000 Flaw detection is compatible with the majority of the UT transducers present on the market.

caption

The wear face of the TC probes is approximately twice that of many of the competitive equivalent probes leading to twice the in-service life when used in the same testing conditions. The single element probes offer high sensitivity as well as higher than industry standard resolution.

See more application notes and articles about flaw detection with ultrasonics on our Tech Hub.

Terms Of Use
Website Data Privacy Policy