

Electromagnetic acoustic resonance: Wall thickness measurement of a copper mould in steel production

Description:

An electromagnetic acoustic transducer (EMAT) is an ultrasonic transducer capable of generating and measuring ultrasonic waves in solid structures without contact. With this transducer, a thickness gauging method referred to as Electromagnetic acoustic resonance (EMAR) can be performed in order to measure thicknesses in the sub-mm region. EMAR shall be used in this thesis to measure the wall thickness and wear of a copper mould used in a continuous casting process for steel making.

Goal:

The aim of this work is to characterize the EMAR method for the wall thickness measurement of the copper mould and to identify possible cross-sensitivities (e.g. temperature) and their influence on the accuracy of the EMAR method.

Working steps:

- EMAT and EMAR working principle
- Simulation of temperature influence on copper and ultrasonic wave propagation
- Measurement based verification of the EMAR method over temperature in laboratory environment

Contact: Alexander Siegl (alexander.siegl@tugraz.at), Inffeldgasse 23/2

