

Characterization of the cementation layer by the ultrasonic pulse echo method

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Abstract : it is necessary to measure this layer with a sufficient precision. In this study, we use the ultrasonic pulse echo method as a non destructive testing in the cementation layer characterisation of 12 NC6 steels with a range of 0.6 mm to 1.5 mm for the cementation thickness. The ultrasonic measurement are based on the reflection of signal at the interface of two materials having different impedance and on the determination of the longitudinal elastic wave velocity as well as the sound attenuation coefficients based on the Rayleigh model. The paper discusses also the microstructure influence on the ultrasonic measurement parameters and the precision obtained. We conclude our work by analysing the ability of the ultrasonic pulse echo for the cementation layer measurement.

Keywords : Cementation process, ultrasonic attenuation, reflection coefficient, pulse –echo method