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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 thecementation layer characterisation of 12 NC6 steels with a rang of 0.6 mm to 1.5 mm for thecementation thickness.The ultrasonic measurement are based on the reflection of signal at the interface of twomaterials having different impedance and on the determination of the longitudinal elastic wavesvelocity as well as the sound attenuation coefficients based on the Rayleigh model.The paper discuss also the microstructure influence on the ultrasonic measurement parametersand the precision obtained.We conclude our work by analysing the ability of the ultrasonic pulse echo for the cementationlayer measurement

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