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NONDESTRUCTIVE EVALUATION OF THE CARBON CONTENT IN STEEL

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Abstract: The aim of this work is to propose an experimental method to evaluate the steel carbon content by ultrasound. The sample is immersed in a water tank in order to analyze it under various incidences of sound waves. Longitudinal wave velocities are measured by immersion by using a 5-MHz frequency probe. Transverse wave velocities are measured in a contact mode by using a 4-MHz transverse wave transducer. The attenuation coefficients of ultrasonic longitudinal and transverse waves are deduced from three successive basic echoes through the sample. The effects of some heat treatments on ultrasonic parameters are also studied. The measurement of ultrasonic parameters in steel offers an interesting possibility of tracing the carbon content and, at the same time, provides information on the steel structure and its elasticity

Keywords : carbon content, steel, ultrasonic waves.