

ULTRASONIC DETERMINATION OF CARBON CONTENT

A. Badidi Bouda, R. Halimi, A. Mebtouche, W. Djerir

Abstract : In this paper we are proposing an experimental study of the effect of low alloy steels carbon content on the velocity and propagation attenuation coefficient of the ultrasonic waves in these materials. We have observed simple relations between the velocities and the attenuations according to the carbon content. The same observations can be made for the Young modulus. These results, in conformity with the theory, show the possibility of characterizing the carbon content by a nondestructive method: ultrasounds. In parallel we have studied the effect of some heat treatments such as hardening, annealing and quenching on velocities and attenuations. The results obtained show a correlation between heat treatments and ultrasonic parameters. This opens ways to a more complete and nondestructive characterization of steels by ultrasonic methods.

Keywords : carbon content, velocity propagation, attenuation coefficient, ultrasonic methods, steel.