

GRAINS SIZE CHARACTERIZATION BY WAVES ULTRASONIC FREQUENCY

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

Abstract : In this paper we propose an experimental study of the steel grains size effect on the shift frequency of the ultrasonic waves being propagated in this material. By suitable heat treatment on samples resulting from the same bar, we have obtained identical samples but with different mean grains sizes. We have then measured the ultrasonic shift frequency after propagation in the material. The results obtained show a direct effect on the mean grains sizes on the ultrasonic frequency. These results, in conformity with the theory, show the possibility of characterizing a material grains size by a nondestructive method: ultrasounds. It is known that a material characterization is possible through the measurement of some ultrasonic parameters such as propagation velocities and attenuation coefficients. We propose a method which exploits the frequency and whose measurement is easy. These results open way to a more inclusive and nondestructive characterization of materials by ultrasounds.

Keywords : ultrasonic frequency, propagation velocities, attenuation coefficients, nondestructive characterization