

NON-DESTRUCTIVE EXAMINATIONS OF NON-METALLIC MATERIALS BY ULTRASONIC METHODS

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Rezumat. *Lucrarea prezintă metode nedestructive de evaluare a materialelor nemetalice: metoda impuls, metode de examinare, măsurarea directă a vitezei de propagare, metoda impuls-ecou, evaluarea acustică etc. Metodele sunt adecvate pentru materiale nemetalice, deoarece acestea au structură neomogenă și neregulată, coeficienți de atenuare ridicați pentru propagarea undelor ultrasonice în materiale. Prin utilizarea metodelor evaluării nedestructive ultrasonice parametrii principali de material și caracteristicile de material (coeficienți de elasticitate, densitatea, viteza de propagare, atenuarea ultrasunetelor etc.) se pot determina. De exemplu, metoda impuls-ecou se potrivește detecției fluxului în structura materialului, localizării golurilor, aspectului spongios, exfolierii, adâncimii deschiderii crăpăturii față de suprafață, măsurării grosimii etc.*

Abstract. *This paper presents some non-destructive evaluation methods of non-metallic materials: pulse method, examination methods, direct measurement of the propagation velocity, pulse-echo method, acoustic emission evaluation etc. The methods are suitable for non-metallic materials because they have rugged and non-homogeneous structure, high attenuation coefficients for ultrasound propagation waves into materials. Utilizing non-destructive ultrasonic evaluation methods of non-metallic materials it can be determined the main material parameters and material characteristics (elasticity coefficients, density, propagation velocity, ultrasound attenuation etc.). For instance, the pulse-echo method is suitable for flaw detection into material structure, locating voids, honeycombing, delaminating, depth of surface opening cracks, thickness measurement etc.*

Keywords: Non-destructive testing, Non-metallic materials, Ultrasound, Pulse-echo method

1. Introduction

Ultrasonic methods for the establishment of physical-mechanical properties of non-metallic materials are: pulse method, examination methods, and direct measurement of the propagation velocity and pulse-echo method. Utilizing these non-destructive evaluation ultrasonic methods it can be determined the main material parameters and material characteristics (elasticity coefficients, density, propagation velocity, ultrasound attenuation, etc.) of non-metallic materials. These methods are suitable for non-metallic materials because the non-destructive methods for metallic materials cannot be utilized, due to their rugged and non-homogeneous structures and great attenuation coefficients of ultrasound

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