

Determination of moisture content in mortar at near relaxation frequency 17 GHz.

ABSTRACT

The knowledge of moisture content in cement based material is important especially for the safety in field work. In this paper, a non-destructive and contactless free space method is used for measurement of moisture content in cement based materials (mortar) at microwave frequencies. The measurement system consists of a 17 GHz dielectric resonator oscillator (DRO) as a microwave source, a Power Meter as the detector, and a pair of lens horn antennas to transmit and receive the microwave signal. An empirical formula of moisture content was obtained by using a relationship between attenuation and moisture content. This model is best for prediction of moisture content greater than 2% with percentage mean error of 3%.

Keyword: Mortar; Attenuation; Moisture content; Nondestructive technique (NDT); Free space; Transmission.