

Electro-Mechanical Response and Engineering Properties of Piezocomposite with Imperfect Interface

Authors : Rattanan Tippayaphalapholgul, Yasothorn Sapsathiarn

Abstract : Composites of piezoelectric materials are widely use in practical applications such as nondestructive testing devices, smart adaptive structures and medical devices. A thorough understanding of coupled electro-elastic response and properties of piezocomposite are crucial for the development and design of piezoelectric composite materials used in advanced applications. The micromechanics analysis is employed in this paper to determine the response and engineering properties of the piezocomposite. A mechanical imperfect interface bonding between piezoelectric inclusion and polymer matrix is taken into consideration in the analysis. The micromechanics analysis is based on the Boundary Element Method (BEM) together with the periodic micro-field micromechanics theory. A selected set of numerical results is presented to investigate the influence of volume ratio and interface bonding condition on effective piezocomposite material coefficients and portray basic features of coupled electroelastic response within the domain of piezocomposite unit cell.

Keywords : effective engineering properties, electroelastic response, imperfect interface, piezocomposite

Conference Title : ICBMCE 2016 : International Conference on Building Materials and Civil Engineering

Conference Location : Singapore, Singapore

Conference Dates : March 03-04, 2016