

Numerical Prediction of Effects of Location of Across-the-Width Laminations on Tensile Properties of Rectangular Wires

Authors : Kazeem K. Adewole

Abstract : This paper presents the finite element analysis numerical investigation of the effects of the location of across-the-width lamination on the tensile properties of rectangular wires for civil engineering applications. FE analysis revealed that the presence of the mid-thickness across-the-width lamination changes the cup and cone fracture shape exhibited by the lamination-free wire to a V-shaped fracture shape with an opening at the bottom/pointed end of the V-shape at the location of the mid-thickness across-the-width lamination. FE analysis also revealed that the presence of the mid-width across-the-thickness lamination changes the cup and cone fracture shape of the lamination-free wire without an opening to a cup and cone fracture shape with an opening at the location of the mid-width across-the-thickness lamination. The FE fracture behaviour prediction approach presented in this work serves as a tool for failure analysis of wires with lamination at different orientations which cannot be conducted experimentally.

Keywords : across-the-width lamination, tensile properties, lamination location, wire

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020