

Damage and Failure of Brittle Solids

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The aim of this paper is to study the process of the damage growth that results in material failure for rock-like cementitious brittle materials subjected to multi-axial state of stress. To this end the stress-strain curves and stress at failure were determined experimentally for cylindrical specimens of mortar under tri-axial state of stress. The programme of loading consisted of uni-axial compression that supplied the data necessary to calibrate the material and two cases of tri-axial loading. The first case was superposition of hydrostatic pressure and axial compression and the second case consisted in simultaneous action of hydrostatic pressure and bi-axial uniform compression. The experimental results were compared with the theoretical predictions obtained from the own theoretical model based on the methods of the damage mechanics.

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