

Steady-Flow of a Non-Homogeneous Bingham Material Over a Wedge

Oana Cazacu⁽¹⁾, N.D. Cristescu⁽²⁾

(1) *University of Florida/GERC, Florida, USA*

(2) *University of Florida, Florida, USA*

A study of the steady-state motion of a porous medium over a rigid wedge-shaped penetrator was conducted. In order to describe the combined effects of strain rate and compaction on yielding of porous materials, a rigid viscoplastic constitutive equation was used. The deviatoric response of the target medium was modeled with a non-homogeneous Bingham type equation with shear yield limit dependent on the current density. The system of partial differential equations consisting of the constitutive equation, the continuity equation, and the balance of momentum was solved for different interface conditions. The resistance to penetration as a function of the striking velocity, target properties (density dependent yield, locking pressure, locking density), friction coefficient as well as wedge semi-angle was obtained. The wedge semi-angle corresponding to a minimum in resistance to penetration in mortar for various impact conditions also resulted from this investigation.

[View the extended summary](#)