Detonation Failure in Ideal and Non-Ideal Explosives

P.J. Haskins, M.D. Cook — In this paper we revisit and extend the classic treatment of detonation failure developed by Eyring et. al. [1]. We recently published a development of this theory [2] in which a pressure dependant rate law was substituted for the Arrhenius temperature dependant law originally considered. Here we show that by assuming a 2-component rate law based upon a temperature dependant ignition phase and a pressure dependant growth phase we are able to rationalise the very different failure characteristics (critical diameter and velocity decrement at failure) of ideal and non-ideal explosives.