

Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

Modeling the Burning Rate Enhancement of a Propellant Containing Ultrafine Particles CLINTON RICHMOND, NSWCIHD — Burning laws for ultrafine particles have been used in previous work to develop models for the burning of single and agglomerated particles. These ultrafine particles are usually reactive metal particles. In a rocket propellant, aluminum particles are often added to other energetic materials to enhance the burning rate and increase the energy released. In this effort, the laws describing the burning of metal particles and those describing the burning of energetic materials will both be coupled into a model for deriving the surface regression rate of the burning rocket propellant. Also from this model, an enhancement factor will be derived for the increase in the burning rate of a propellant when the size of the metal particles is decreased. Examples are shown that illustrate how this concept conforms to experimental results.

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Date submitted: 24 Feb 2009

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