A Complete EOS for Non-Reacted Explosives BRIAN LAM-
BOURN, AWE, Aldermaston, Reading RG7 4PR, UK — A complete EOS for non-
reactive (NR) explosives is proposed and results are given for PBX9501. The EOS
uses the principal isentrope, written in finite strain form, as reference curve for a
Mie-Gruneisen EOS. The principal isentrope is defined by fitting available Hugoniot
data, after extrapolating it to theoretical maximum density. Temperature can be
calculated at any (v,e) state, for any given variation of specific heat at vo. The
improvements of this model over other proposed EOS are: 1 The inclusion of initial
porosity as a variable, using the Snowplough model; 2 A higher order finite strain
representation to fit the Hugoniot more accurately; 3 A second value of Gruneisen
Gamma gives the correct Hugoniot asymptote; 4 More accurate temperatures can
be evaluated. An improved NR EOS is needed because of the sensitivity to the EOS
of SDT reaction rate models, particularly if NR temperature is a parameter.

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