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Void collapse in energetic structural materials[1] DEREK REDING,
SATHYA HANAGUD, Georgia Institute of Technology — A spherically symmetric pore collapse model is introduced that incorporates internal and physical state variable plasticity models for a mixture. This model is based on the modified Carroll-Holt model by Nesterenko. Mixture rules are formulated for the density and yield strength. Previous spherically symmetric model studies consider single constituent porous mixtures. This study investigates the pore collapse in the Ni+Al + void system during shock loading. This material is part of a larger class of energetic structural materials. The proposed model is incorporated into a gas-gun simulation via an algorithm that uses the bisection method for robustness. Results show close agreement between simulation and experiments for shock pressures up to 6 GPa. The proposed mixture pore collapse model is useful for incorporation into a continuum level simulation of the gas-gun experiment.

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