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Towards an Understanding of Gas Permeation in Thermally Damaged PBX 9501 GARY PARKER, PETER DICKSON, BLAINE ASAY, LAURA SMILOWITZ, BRYAN HENSON, LEE PERRY, Los Alamos National Laboratory, HE PHYSICS TEAM TEAM — We will present data that indicate that thermally damaged PBX 9501 is substantially more permeable than the pristine material and that this may have a significant effect on the pre-ignition slow cook-off process, as well as the post-ignition flame spread process. experiments indicate that the mechanism responsible for the formation of interconnected matrix porosity is likely dominated by nitroplasticizer decomposition in the early stages of the permeability evolution history followed by secondary, slower HMX decomposition. Other experiments employing a planar section (simulating a constant aperture fracture) indicate that at elevated temperatures, the plastic nature of PBX 9501 can seal fractures and that the observed specific permeability is the likely result of matrix flow. Still there are many unanswered questions, and the continuation of parametric studies of the various dominant mechanisms is crucial in order to develop the modeling capabilities to eventually be able to make the*a priori* predictions required in the future.

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