

Abstract Submitted  
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**PBX 9501 versus a New Thermomechanical Density Mock: Brazilian Disk Compression Test Comparison** CHENG LIU, DARLA GRAFF THOMPSON, CAITLIN WOZNICK, JOHN YEAGER, AMANDA DUQUE, RACCI DELUCA, Los Alamos National Laboratory — Due to safety concerns, it is a common practice to use inert surrogates or mocks to replace high explosives in complex experiments. To better understand and simulate these complex experiments, it is desirable that the inert mock can match the real explosive in a wide spectrum of parameters, like density, elastic constants, hardness, coefficient of thermal expansion (CTE), or even mechanical failure/cracking processes. We found that the pharmaceutical material idoxuridine (IDOX) mimics several single crystal properties of the HMX closely, and we have formulated IDOX with the PBX 9501 binder system to generate a new plastic-bonded mock for PBX 9501. Here, we study the mechanical performance of the formulated IDOX mock and compare to PBX 9501 using Brazilian disk compression combined with the digital image correlation (DIC) technique. Samples were tested under quasi-static loading conditions while the test temperature was varied. We thus compare the similarities and differences in their deformation, damage, and failure when subject to mechanical loading. We also investigate formulation and pressing conditions for the IDOX mock, finding that small changes in production were sufficient to enable the mock to be tailored to match specific PBX 9501 properties.

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