

Investigation of Sawing Response of PBX 9501 and PBX 9502

Scott A. Watkins*, Josh Williams*, Raimi Clark*, John Mankowski*, Jacob Brinkman**,
James Dickens*, Andreas A. Neuber*

* Texas Tech University, Lubbock, TX

** Consolidated Nuclear Security, Pantex Plant

The machining of explosive driven high current devices presents unique challenges in the safety of the operators, integrity of the part, and the timely completion of the operation. Previous works have shown that simple reduction in working speed can be detrimental to the safety of the operation and proper investigation into the machining parameters is needed to avoid dangerous conditions. This work investigates the operating conditions of a band saw in the cutting of polymer-bonded explosives (PBX). Samples of PBX 9501 and PBX 9502 are subject to a range of sawing speeds and feed speeds. Utilizing IR imaging and a force plate the heating of the blade is measured along with the overall forces on the work piece. Further, application of thermocouples in the work piece present more direct access to the conditions of the temperatures in the material of concern. Finite element simulation has been applied to give insight into the internal heat transfer occurring during sawing.

158 words; 500 allowed.

Abstract prepared for submission to the 2022 IEEE International Power Modulator and High Voltage Conference

ipmhvc-eic-2022.com

Deadline: February 1st, 2022