

Process Optimization for the Manufacture of Premix Intermediates for Melt Cast and Cast Cure IM Explosives

Mr. Crane Robsinson
RDECOM-ARDEC
AMSRD-AAR-AEE-P
Picatinny NJ 07806
Phone: 973-724-5839
Email: melissa.hobbs@baesystems.com

The Program Manager, Combat Ammunition Systems at the U. S. Army, Armament Research, Development and Engineering Center at Picatinny Arsenal, New Jersey has sponsored BAE Systems at Holston Army Ammunition Plant to develop and optimize a manufacturing process for the premix intermediate CXM-AF-6 for use in the IM melt cast formulation PAX/AFX-196.

The use of coated premix intermediates in IM melt cast and cast cure formulations offers advantages to the both the explosives manufacturing and loading facilities. The process optimization program for the manufacture of CXM-AF-6 has been completed by BAE Systems at Holston Army Ammunition Plant in partnership with the Picatinny Arsenal based RDECOM-ARDEC.

The CXM-AF-6 is a DOA-coated premix used in the melt-cast formulation PAX/AFX-196, an IM melt cast explosive being evaluated IM melt cast explosive for the 155mm IM enhanced M107/M795 artillery projectiles. Using Six Sigma techniques, a design of experiments was applied to develop a test plan to optimize the manufacture of the CXM-AF-6 premix.

The lessons learned from this optimization program have been applied to other melt cast and cast cure premixes. These include the following:

v CXM-11 v CXM-10 Types I, II, and III v CXM-AF-7 v CXM-AF-5 v CXM-AF-1 v ROWANEX

Additional premix intermediates are in the development stages.

This paper will discuss the optimization test plan, results and lessons learned. It will further discuss the IM test results of formulations made from premix intermediates, viscosity data, LSGT results, and cost and savings comparisons of various formulations utilizing premix intermediates.