Use of Portable Cryofracture Process for the Destruction of FASCAM and Potentially Other High Explosive (HE) Munitions

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• Involved Organizations
• Project Objective
• Background
• Portable Cryofracture System Description
• Potential Uses
• Project Tasks
• Status
INVOLVED ORGANIZATIONS

• Product Manager for Demilitarization
  – Sponsor and Management Oversight

• US Army RDECOM-ARDEC
  – Project Management

• Crane AAA
  – Installation and Operation Site

• Tooele Army Depot (TEAD)
  – Kiln Operational Rates
Using cryofracture gives us the option of processing a greater variety of munitions in the kiln. Fracturing the munition breaks the containment of the explosive so that it burns instead of detonating.

This project is set to develop an effective/efficient alternative method of demilitarization for FASCAM (Family of Scaterable Mines) Items with potential use for other HE munitions.
A portable cryofracture system was developed and constructed in a prior project. This system is currently in storage at Crane AAA. It was developed as a modular system so that it could be easily transported to where the mines are stored so the demil could be done ‘on-site’.

We are looking to adapt the system for FASCAM and potentially other HE munitions.

A similar system (for the demilitarization of ADAM mines) is currently being tested at McAlester AAP.
PORTABLE CRYO PROCESS
FLOW DIAGRAM
Munitions Load Conveyor
Manual Load Area
Fixture Warmup System Area
Cryobath (with LN2) and overhead robot
Press Munition Loader Robot
Press Munition Loader Robot with Fixture
Press Munition Loader Robot and Press
200 Ton Cryofracture Press
Control Room Container
Electrical Distribution Room
CANDIDATE ITEMS

M139 Volcano
CANDIDATE ITEMS

DISPENSER & MINES, AIRCRAFT: CBU-89A/B (GATOR)

DISPENSER

MINE ANTITANK BLU-91/B

- MAIN CHG
- BOOSTER CHG

4.755 IN.

MINE ANTIPERSONNEL BLU-92/B

- MAIN CHG
- BOOSTER PELLET (4)

4.755 IN.

(Note: Mines shown without aeroballistic housings)
CLUSTER, MK 20, ROCKEYE
MK 118 SHAPED CHARGE BOMBLETS

MK 7 Dispenser

MK 118 Bomblet
M42 Grenade – Drawing & Cryofractured Picture
Other Potential Items:

- Other CBUs, small projectiles, hand grenades
- Destructor assemblies, burster tubes
- Other medium/small energetic/explosive items
Download:
There is no line set up at this point to download. Downloading would also be required for OB/OD.

Kiln/Cryo System:
A safe processing rate (for each item) through the kiln must be established. This will set the maximum allowable rates for the kiln. The plan is to tailor the cryofracture rate to the kiln rate. This could involve design adjustments to the cryofracture system. A conveyor and feed system will also need to be developed.

Safety Site Plan:
The rate data must be incorporated into the plan.
# BLU Cryofracture / APE-1236 Compatibility Tests

<table>
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<tr>
<th>#</th>
<th>Item</th>
<th>DODIC</th>
<th>Weight (lbs.)</th>
<th>NEW (lbs.)</th>
<th>ProWt (lbs.)</th>
<th>Length (in)</th>
<th>Diameter (in)</th>
<th>Notes:</th>
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<tr>
<td>1</td>
<td>MK118 Mod 0</td>
<td>E916*</td>
<td>1.35</td>
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<td>4.00</td>
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<td>5</td>
<td>M42 and M46</td>
<td>D563**</td>
<td>0.46</td>
<td>0.07</td>
<td>1.24</td>
<td>3.27</td>
<td>1.50</td>
<td>Data per TM 43-0001-28</td>
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* DODIC for CBU-99/B

**DODIC for M483A1
• Tests were run on the preceding items to determine projected safe feed rates for the APE-1236 Kiln.

• The maximum processing time used in these trials was 30 minutes. There is a risk that running for a prolonged time could give us cause to reevaluate the projected safe feed rates.
• Evaluation of a variety of methods to demilitarize these items is ongoing.

• Evaluation of adjustments to the cryofracture system is ongoing.

• Preparation work for a Safety Site Plan is ongoing.