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2015 Global Demilitarization Symposium

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

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# PRESENTATION OUTLINE

- 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

# PROJECT OBJECTIVE

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.

# BACKGROUND

- 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’.

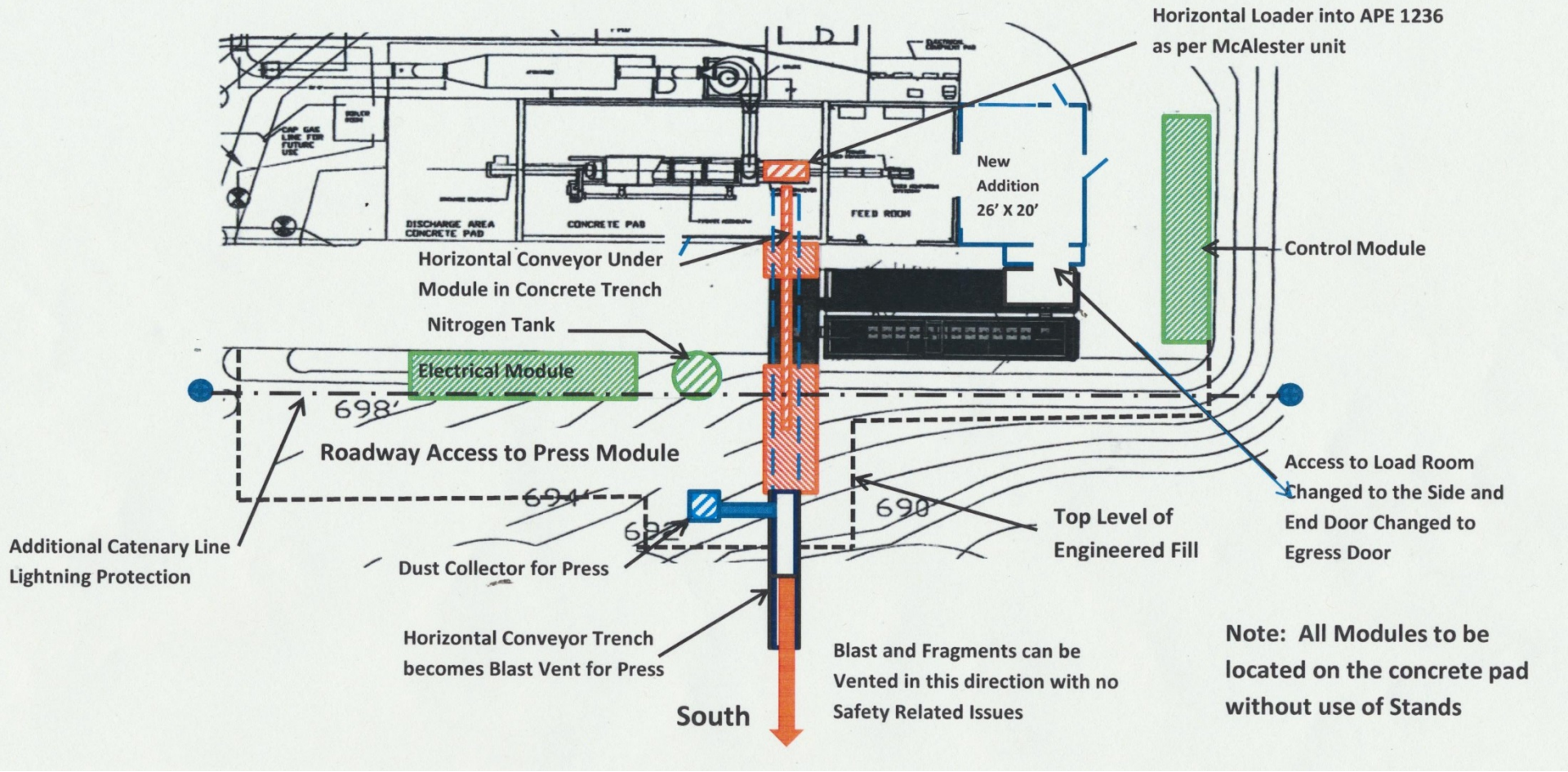
- We are looking to adapt the system for FASCAM and potentially other HE munitions.

- A similar system (for the demilitarization of ADAM mines) is currently being tested at McAlester AAP.

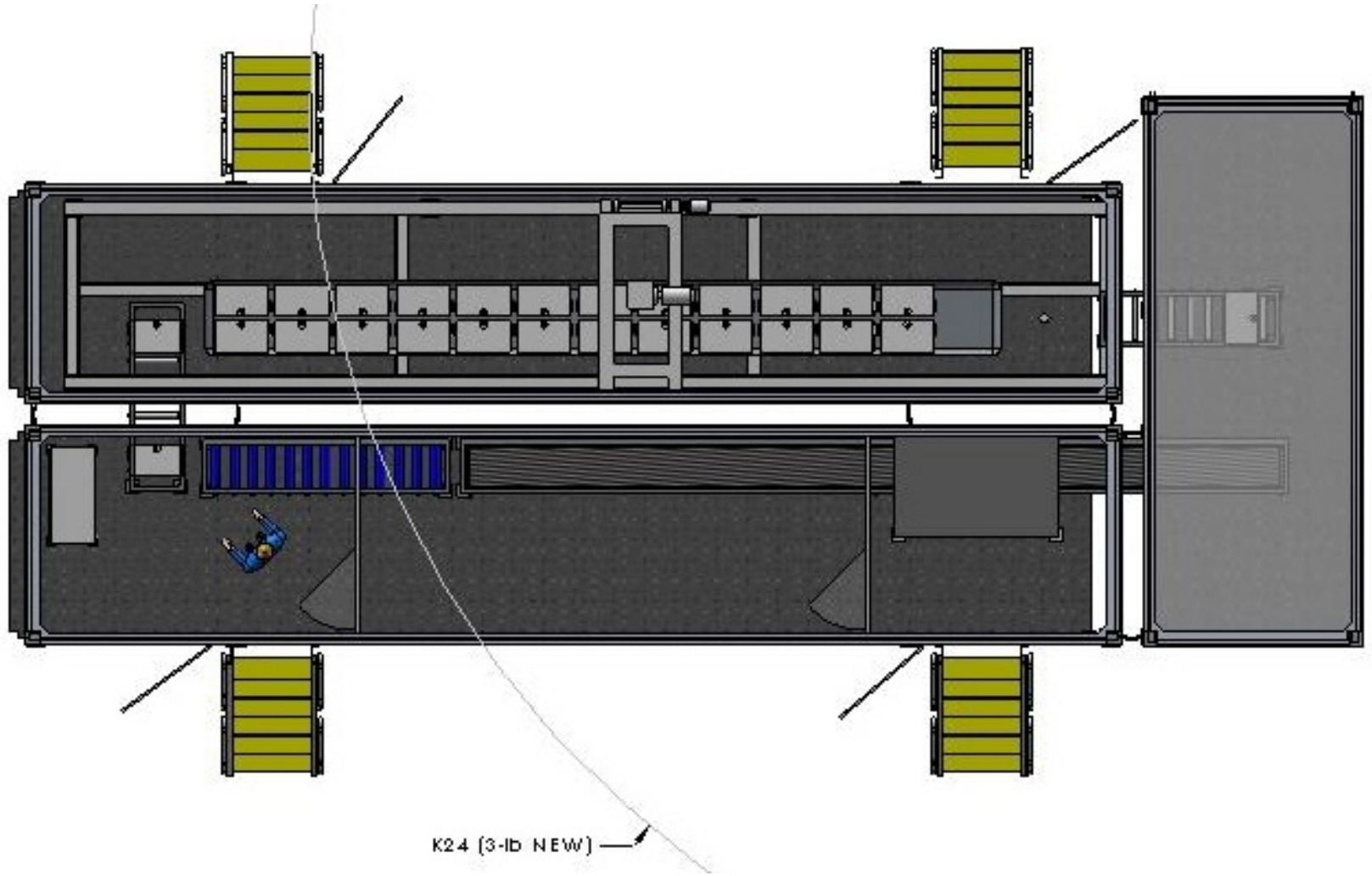
# POTENTIAL PROCESS FLOW



## PROPOSED LAYOUT



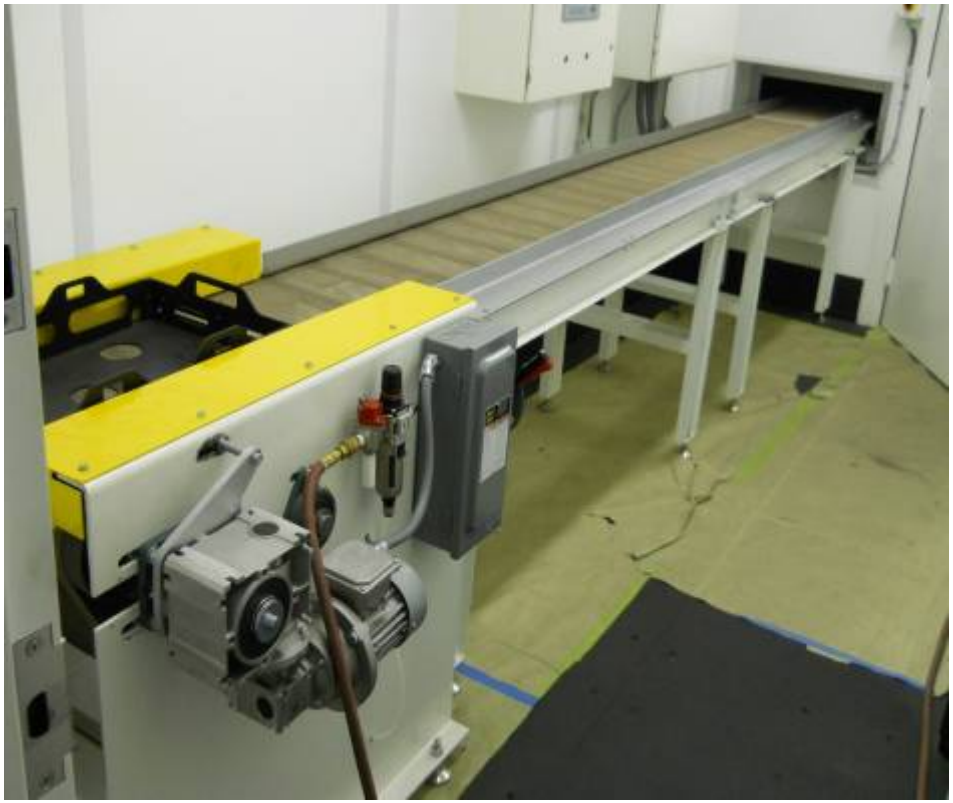
# PORTABLE CRYO PROCESS FLOW DIAGRAM



# Munitions Preparation Container

# Munitions Load Conveyor Manual Load Area

# Fixture Warmup System Area



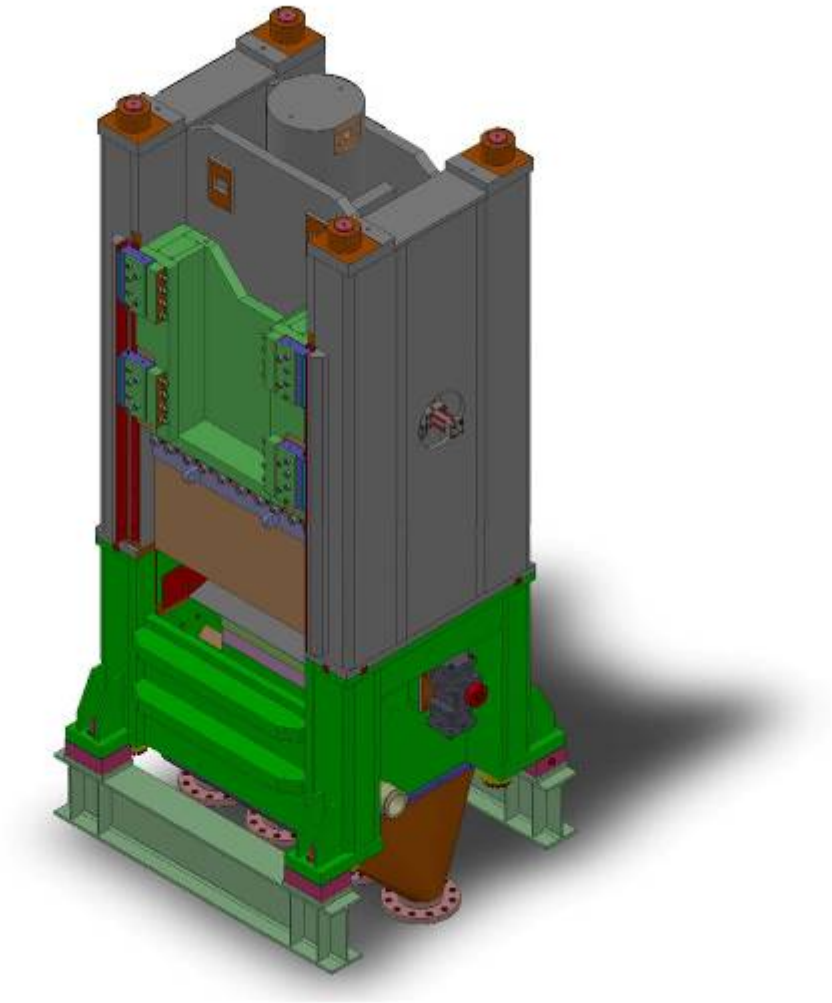
# Cryobath (with LN2) and overhead robot

# Press Munition Loader Robot

# Press Munition Loader Robot with Fixture

# Press Munition Loader Robot and Press

# 200 Ton Cryofracture Press



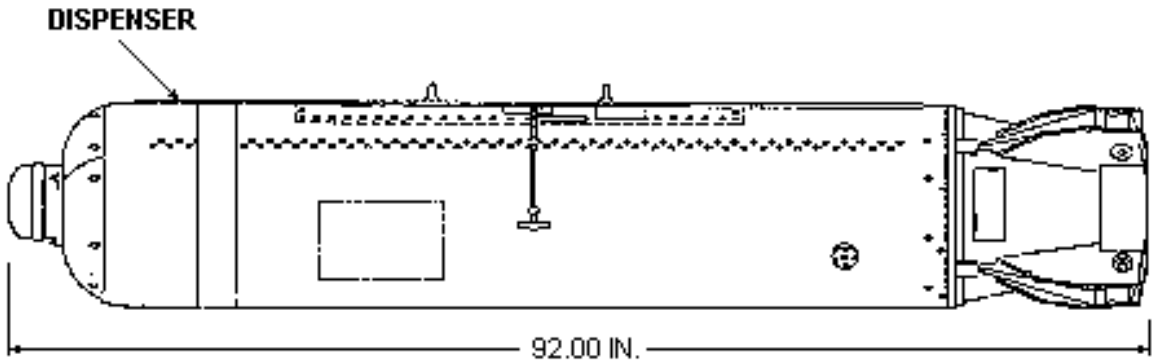
# Control Room Container

# Electrical Distribution Room

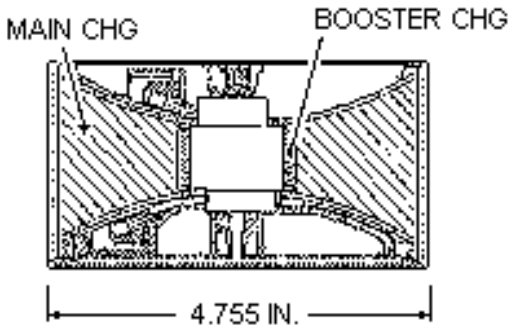
# M139 Volcano

# CANDIDATE ITEMS

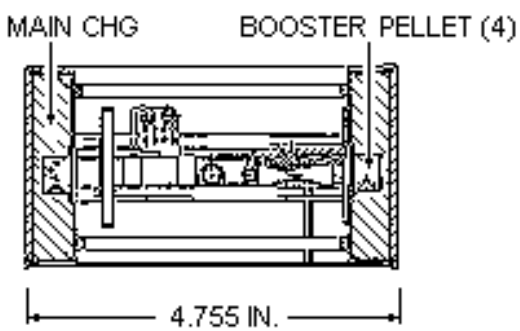
## DISPENSER & MINES, AIRCRAFT: CBU-89A/B (GATOR)




**MINE ANTITANK BLU-91/B**



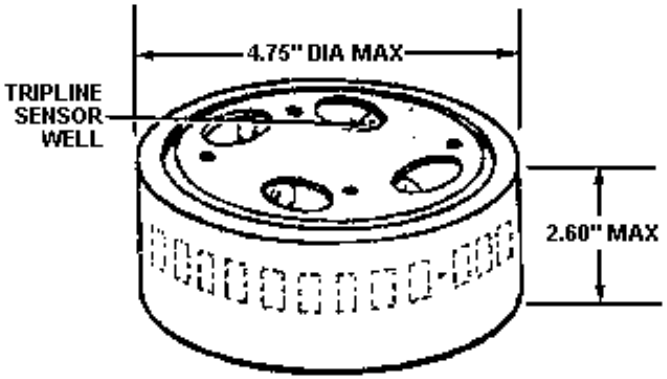

**MINE ANTIPERSONNEL BLU-92/B**



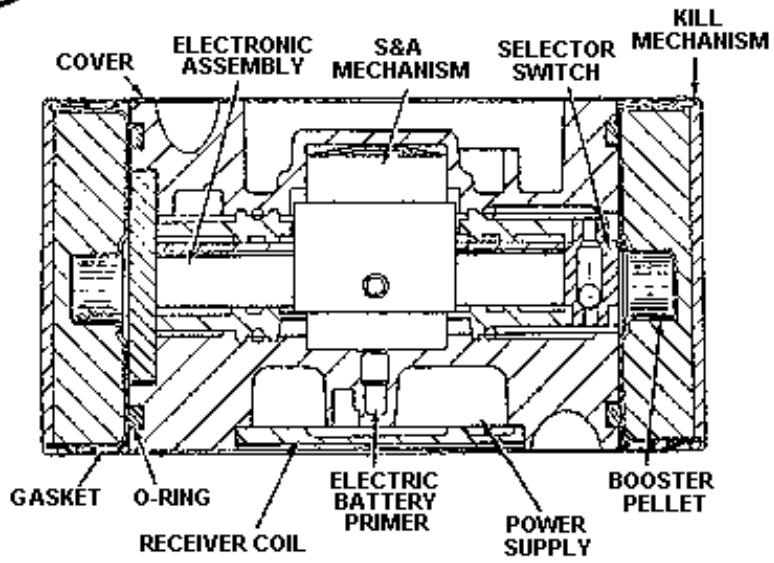

(NOTE: MINES SHOWN WITHOUT AEROBALLISTIC HOUSINGS)

# CANDIDATE ITEMS





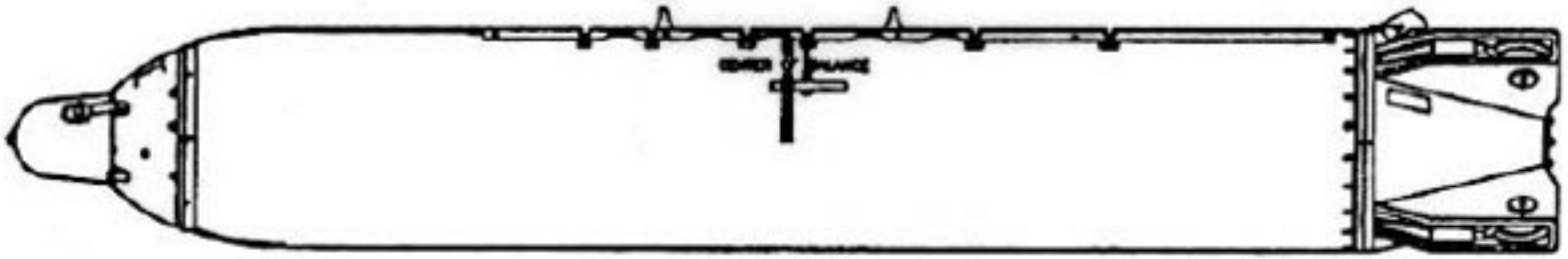

**MINE, ANTIPERSONNEL:**
**HE, M74 (GEMSS)**



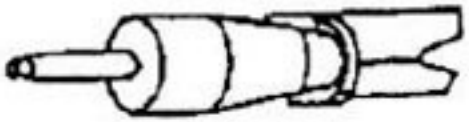
# POTENTIAL ITEM



## CLUSTER, MK 20, ROCKEYE
## MK 118 SHAPED CHARGE BOMBLETS

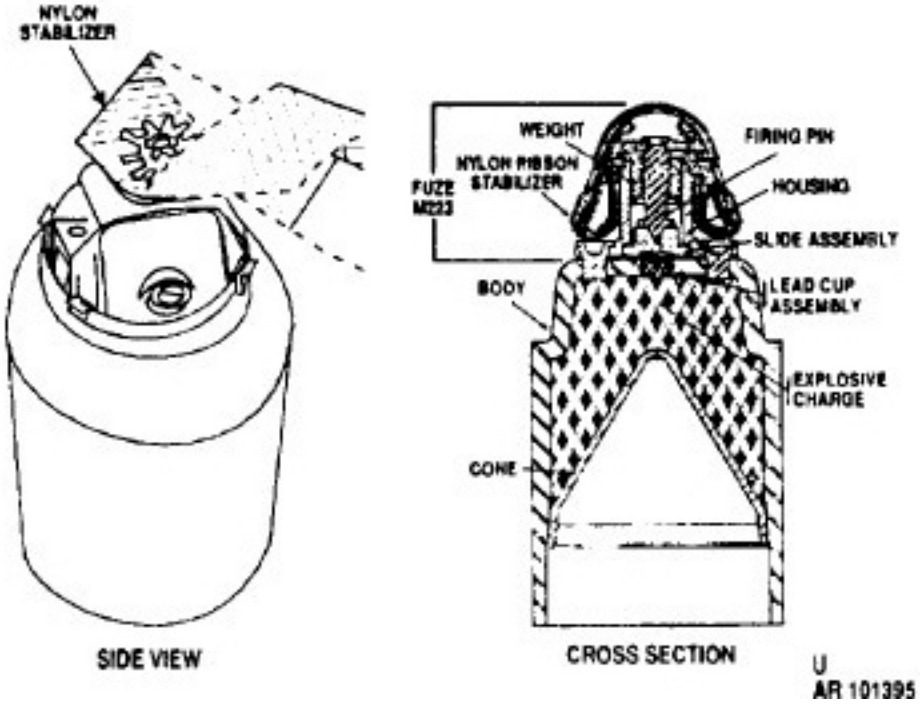


MK 7 Dispenser



MK 118 Bomblet

# M42 Grenade – Drawing & Cryofractured Picture




# CANDIDATE ITEMS



Other Potential Items:

- Other CBUs, small projectiles, hand grenades
- Destructor assemblies, burster tubes
- Other medium/small energetic/explosive items

# MAJOR PROJECT TASKS

## 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 Compatiblity Tests

| Items Evaluated | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| # | Item | DODIC | Weight (lbs.) | NEW (lbs.) | ProWt (lbs.) | Length (in) | Diameter (in) | Notes: | |
| 1 | MK118 Mod 0 | E916* | 1.35 | 0.42 | 3.04 | 13.50 | 2.10 | Data from MIDAS | |
| 2 | M74 | K151 | 3.10 | 0.90 | 4.90 | 2.60 | 4.75 | Data per TM 43-0001-36 | |
| 3 | M75 | K184 | 4.00 | 1.26 | 5.48 | 2.60 | 4.75 | Data per TM 43-0001-36 | |
| 4 | BLU-97 | E985 | 3.50 | 0.64 | 4.75 | 6.65 | 2.51 | Data from MIDAS | |
| 5 | M42 and M46 | D563** | 0.46 | 0.07 | 1.24 | 3.27 | 1.50 | Data per TM 43-0001-28 | |
| | | | | | | | | | |
| | * DODIC for CBU-99/B | | | | | | | | |
| | **DODIC for M483A1 | | | | | | | | |

# BLU Cryofracture / APE-1236 Compatiblity Tests at TEAD



- 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.

# PROJECT STATUS

- 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.