



DEPARTMENT OF THE ARMY
U.S. ARMY ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER
PICATINNY ARSENAL, NJ 07806-5000



AD-A276 438



REPLY TO
ATTENTION OF

16 FEB 1994

①

SMCAR-AEP (1mm)

MEMORANDUM FOR Commander, Defense Technical Information Center,
Building 5, Cameron Station, Alexandria, VA,
22304-6145

SUBJECT: Release of Performance-Oriented Packaging Compliance
Report

1. The attached report, (DOD POP HM TR/AYD 94-004), entitled:
"Performance-Oriented Packaging (POP) testing of M879 Practice
Cartridge for 81mm Mortar Packed in a Wood Wirebound Box", is
hereby submitted for formal release. Notification of the
release should be sent to the letterhead address.

2. Address any questions or comments regarding this report to
Mr. Yuen H. Lam, telephone: 1-201-724-2228 (DSN 880-2228).

Encl

S DTIC
ELECTE
FEB 28 1994
A

Eugene Farrell
EUGENE FARRELL
Acting Chief, Pkg Div

This document has been approved
for public release and sale; its
distribution is unlimited.

DTIC QUALITY INSPECTED 1

lppj 94-06355

94 2 25 086

**Best
Available
Copy**

REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188
Exp Date Jun 30, 1986

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED		1b RESTRICTIVE MARKINGS None	
2a SECURITY CLASSIFICATION AUTHORITY N/A		3 DISTRIBUTION / AVAILABILITY OF REPORT Distribution Statement A. Approved for public release; distribution is unlimited.	
2b DECLASSIFICATION / DOWNGRADING SCHEDULE N/A			
4 PERFORMING ORGANIZATION REPORT NUMBER(S) DOD POP HM TR/AYD 94-004		5 MONITORING ORGANIZATION REPORT NUMBER(S)	
6a. NAME OF PERFORMING ORGANIZATION Packaging Division	6b. OFFICE SYMBOL (If applicable) SMCAR-AEP	7a. NAME OF MONITORING ORGANIZATION	
6c. ADDRESS (City, State, and ZIP Code) US Army ARDEC Picatinny Arsenal, NJ 07806-5000		7b. ADDRESS (City, State, and ZIP Code)	
8a. NAME OF FUNDING / SPONSORING ORGANIZATION	8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8c. ADDRESS (City, State, and ZIP Code)		10. SOURCE OF FUNDING NUMBERS	
		PROGRAM ELEMENT NO.	PROJECT NO.
		TASK NO.	WORK UNIT ACCESSION NO.
11 TITLE (Include Security Classification) Performance-Oriented Packaging (POP) testing of M879 Practice Cartridge for 81mm Mortar Packed in a Wood Wirebound Box. (U)			
12. PERSONAL AUTHOR(S) Yuen H. Lam, Mechanical Engineer			
13a. TYPE OF REPORT Final	13b. TIME COVERED FROM _____ TO _____	14. DATE OF REPORT (Year, Month, Day) 94-02-11	15. PAGE COUNT 4
16. SUPPLEMENTARY NOTATION			
17. COSATI CODES		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	Performance-Oriented Packaging POP Cartridge, M879	
		Mortar, 81mm 12630601	
19. ABSTRACT (Continue on reverse if necessary and identify by block number)			
<p>This report contains test results conducted on the M879 Practice Cartridge for 81mm Mortar packaged in wood wirebound box per drawing 12630601. The tests were conducted in accordance with the requirements of 49 CFR part 107 subpart M (18.600 et. al.). The packaging is submitted for Performance-Oriented Packaging certification.</p>			
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS		21 ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED	
22a. NAME OF RESPONSIBLE INDIVIDUAL Yuen H. Lam		22b. TELEPHONE (Include Area Code) (201)724-2228	22c. OFFICE SYMBOL SMCAR-AEP

I. **Report Number:** DOD POP HM TR/AYD 94-004

II. **Title:** Performance-Oriented Packaging (POP) testing of M879 Practice Cartridge for 81mm Mortar Packed in a Wood Wirebound Box

Drawing Number: 12630601

Author: Yuen H. Lam

Performing Activity: U.S. Army Armament Research, Development and Engineering Center (ARDEC)

Address: Commander, U.S. Army ARDEC
Attn: SMCAR-AEP
Picatinny Arsenal, N.J. 07806-5000

Date: February 1993

Distribution Statement A.

Approved for public release; distribution is unlimited.

Accession For	
NTIS CRA&I	↓
DTIC TAB	□
Unannounced	□
Justification	
By _____	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

1. Data:

Container:

Type: Box, Wirebound
UN Code: 4C1
Specification: MIL-B-46506
Drawing Number: 12630601
Material: Wood
Maximum net mass: 17.5 kg (38.5 lbs)
Dimensions: 63.8 cm X 33.0 cm X 13.5 cm
(25 1/8 in X 13 in X 5 5/16 in)
Gross Weight: 21.4 kg (47 lbs)

Product:

Name: Cartridge, 81mm: Practice, M879 with Fuze, M751
(Inner packaged in jungle wrap)
Drawing Number: 12944145
Cage Code: 19200
United Nations Proper Shipping Name: Cartridges for
Weapons, Inert Projectiles
United Nations Identification Number: 0328
United Nations Packaging Group: II
Physical State: Solid
Number of Cartridges per Container: 3
National Stock Number (NSN): 1315-01-352-0392
DOD Identification Code: C875

2. Reference Material:

- a. Federal Register, "49 CFR Part 107-179"
- b. United Nations, "Transport of Dangerous Goods"

3. Background:

This report details Performance-Oriented Packaging (POP) tests conducted on the 81mm M879 Practice Cartridge for 81mm mortar packed in a wood wirebound container in accordance with drawing 12630601. Each cartridge weighs approximately 9.0 lb. A package contains three cartridges. The POP tests were conducted using packages containing additional weights to insure container integrity. The weight of the packed out tested container was 58 lbs (26 kg). Tests were performed according to POP test regulations.

4. Test:

The following POP tests were performed at ambient temperature:

a. Vibration Test (178.608)

Procedure:

Three wirebound boxes (No. 1, 2, and 3) were individually vibrated on a vibrating platform unrestrained for a one hour period each. The double-amplitude (peak-to-peak displacement) was one inch and the frequency was 300 cycles per minute. The frequency was sufficient to allow the package to become completely airborne and enable a 1/16" piece of strapping material to be slid underneath the package during vibration.

Results:

After the tests, none of the wirebound boxes experienced any structural damage; there was no spillage of contents; the passing criteria was met.

b. Drop Test (178.603)

Procedure:

Five new packages (No. 4, 5, 6, 7, and 8) were used for the five orientation drop tests: flat on the bottom, flat on the top, flat on the long side, flat on the short side, and on the corner. The height for all five drops was 4.0 ft (1.22 m). Each container was only dropped once in accordance with the requirements of CFR 49.

Results:

There was no visible damage on the containers (No. 4, 5, 6, and 7) after the first four drops (flat on the bottom, flat on the top, flat on the long side, and flat on the short side). On the fifth drop (on the corner), the container (No. 8) received minor indentation at the impact corner. However, the container was in a sound condition. All contents remained inside the container and the package was capable of being handled without danger of spillage. It was determined that the container met the passing criteria of CFR 49.

c. Stacking Test (178.606)

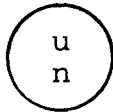
Procedure:

A new wirebound box (No. 9) was used for the stacking test. A dead load of 1,276 lbs was applied to the top of the container for a 24 hour period. This simulated a stack height of 10 ft (23 layers) of identical packages.

Results:

During the test, the container supported the load adequately. After the test, the container received a uniform compression of 1/16 of an inch. No structural damage was found on the container. The passing criteria was met.

5. Based on the above POP testing, the following POP symbol has been applied to wood wirebound containers in accordance with drawing 12630601.



4C1/Y26/S/**
USA/DOD/AYD

Insert the last two digits
of year packed.