

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified			1b. RESTRICTIVE MARKINGS None		
2a. SECURITY CLASSIFICATION AUTHORITY N/A			3. DISTRIBUTION / AVAILABILITY OF REPORT Distribution A: Unlimited		
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE N/A					
4. PERFORMING ORGANIZATION REPORT NUMBER(S) DODPOP/MTR/AYD 93-026			5. MONITORING ORGANIZATION REPORT NUMBER(S) None		
6a. NAME OF PERFORMING ORGANIZATION Packaging Division		6b. OFFICE SYMBOL (if applicable) SMCAR-AEP	7a. NAME OF MONITORING ORGANIZATION None		
6c. ADDRESS (City, State, and ZIP Code) U.S. Army Armament Research, Development and Engineering Center Picatinny Arsenal, NJ 07806-5000			7b. ADDRESS (City, State, and ZIP Code) None		
8a. NAME OF FUNDING / SPONSORING ORGANIZATION Same as 6a		8b. OFFICE SYMBOL (if applicable) SMCAR-AEP	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER		
8c. ADDRESS (City, State, and ZIP Code) Same as 6c			10. SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.
			WORK UNIT ACCESSION NO.		
11. TITLE (Include Security Classification) Annual retest of POP Requirements of PA120 Metal Container used for packaging 40mm cartridges.					
12. PERSONAL AUTHOR(S) Edgardo B. Silvestre					
13a. TYPE OF REPORT Final		13b. TIME COVERED FROM _____ TO _____		14. DATE OF REPORT (Year, Month, Day) 931105	15. PAGE COUNT
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	1. POP	4. Packaging	
			2. Ammunition Packaging		
			3. PA120		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) This report covers the annual retest of POP Requirements of PA120 Metal Container used as shipping container for 40mm cartridges. The PA120 contains different types of 40mm cartridges. Tests were conducted using additional test weight in order to insure the integrity of the shipping container.					
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="font-size: 2em; font-weight: bold; letter-spacing: 0.5em;">S</div> <div style="text-align: center;"> <p>DTIC ELECTE DEC 09 1993</p> <p>A</p> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>This document has been approved for public release and sale; its distribution is unlimited.</p> </div> </div>					
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION Unclassified		
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AD-A273 637



ANNUAL RETEST OF
PERFORMANCE ORIENTED PACKAGING REQUIREMENTS
OF
PA120 METAL CONTAINER USED FOR
PACKAGING 40MM CARTRIDGES

FOR
PACKING GROUP II

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Performing Activity
SMCAR - AEP
U. S. Army Armament Research, Development
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October 1993 - October 1994

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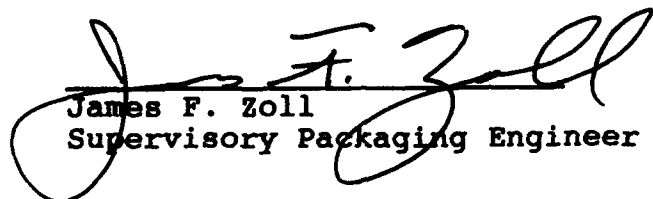
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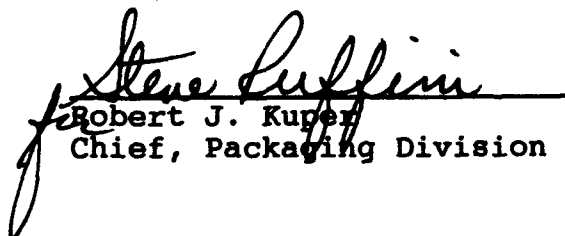
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INTRODUCTION

The Department of Transportation (DOT) per CFR 49, Parts 100-179, dated 1 October 91, requires that hazardous materials should be packed in a container that passes the Performance Oriented Packaging (POP) tests. Furthermore, these tests are to be repeated on an annual basis for items in production.

The PA120 metal container, part no. 12564414, is being used as shipping container for 40MM cartridges, both linked and bandoleer packed. This box contains a maximum gross weight of 20 kg.

POP tests were conducted using additional weight (22 kg test weight) to insure container integrity. The tests were conducted in accordance with the referenced sections of CFR 49 and are valid only when the approved 40MM cartridges are packed in the PA120 container for the DOD (see Table). The PA120 container was tested previously and certified for 20 Kg of gross weight of Packing Group II Items. This report represents the annual retest of the PA120 POP certification.

TESTS PERFORMED

1. Drop Test

Section 178.603 of CFR 49 specifies that one box each should be used for each drop orientation. Five (5) boxes were used for five different orientations. Containers were tested to Packing Group II requirements.

One box each was dropped from a height of 1.2 meters (3.9 ft.) in the following orientations: flat on bottom, flat on top, flat on long-side, flat on short-side and on a corner.

2. Vibration Test

Three (3) boxes were placed on the vibrating platform and vibrated for a duration of one hour. The boxes were unrestrained except horizontally to prevent them from falling off of the platform. The peak-to-peak displacement was one inch and the frequency was 4.6 Hertz/sec. This frequency was sufficient enough to allow the package to become completely airborne, enabling a 1/16 inch (.16 cm) thick piece of strapping material to be slid underneath the package during testing.

3. Stacking Test

Section 178.606 of CFR 49 requires that the minimum height of the stack including the test sample must be 3.0 meters (10 ft). Three test samples are required.

A 3.0 meter stack height of samples is equivalent to 511 lbs. (232 kg) of stack weight. Three different test samples were each subjected to a stack weight of 511 lbs for a period of 24 hours. The samples were then inspected and examined for any damage or distortion.

PASS/FAIL (DOT CRITERIA)

A package for explosives is considered to successfully pass the drop tests if for each sample tested, no rupture of the packaging occurs.

A packaging passes the vibration test if there is no rupture or leakage from any of the packages.

A test sample passes the stacking test when no test sample leaks. No test sample may show any deterioration which could adversely affect transportation safety or any distortion likely to reduce its strength or cause instability in stacks of packages.

TEST RESULTS

1. Drop Test - Result: pass, no spillage.

The first four drops did not do any damage on any of the four boxes. On the edge drop, the box was dented on the edge, but there was no spillage.

2. Vibration Test - Result: pass, no spillage or damage.

All three boxes were removed from the platform after one hour vibration. Each of the boxes was turned on its side and inspected for any damage and leakage. The packages were all tightly intact and showed no evidence of deterioration.

3. Stacking Test - Result: pass, no evidence of distortion.

The stacking test was performed with the use of a forklift to apply a dead load of 511 lbs on top of each of the three boxes. Each of the boxes adequately supported the applied load. No evidence of box distortion was noted.

REMARK

Based on the successful POP testing outlined in this report, the following POP symbol:

last two digits of
year packed

Ⓢ 4A1/Y20/S/□
USA/DOD/AYD

shall be applied to containers manufactured in accordance with drawing 12564414 when used to package the NSN's listed in the Table for 40MM cartridges packed from October 1993 through October 1994.

REFERENCE MATERIAL

1. Federal Register, "49 CFR Part 107, 1 Oct 91
2. MIL-C-70842

TEST DATA

DATA

Container:

Type: Box
 Model No.: PA120
 UN Code: 4A1
 Spec No.: MIL-C-70842
 Material: Metal
 Capacity: 15.0 liters

Dimensions

Inside: 43.97 cm x 14.05 cm x 24.29 cm
 (17.25+.06 in x 5.50+.03 in x 9.50+.063 in)

Outside: 47.65 cm x 16.15 cm x 26.39 c
 (18.76 in x 6.36 in x 10.39 in)

Weight(empty) : 5.9 kg (13.0 lbs)
 Closure (Method/Type): Removable Lid

PRODUCTS:

Identification No.: See Table
 UN Packing Group : II
 Physical State : Solid
 Amount/Container : See Table

TEST MATERIALS:

Name: Simulated Weights and Sand
 Physical State: Solid
 Size : 10 in (L) x 3 in (W) x 3 in (H)
 or 2 in dia x 7/8 in thick
 or granulated sand
 Quantity : Twelve (4) lead weights
 or lead tablets
 or 48 lbs
 Dunnage : Fiberboard
 Gross Weight : 48 lbs (22 kg)

DODFOHMR/AYD 93-026

TABLE

Line No.	DODIC or NALC	NSN	HM Item	Type	HC	UN No.	LBS/BX	KG/BX
1	B542	01-319-1541	40MM	HEDP	1.1E	0006	44	20
2	B576	01-316-9973	40MM	FRAC	1.4C	0338	44	20
3	B584	01-317-5948	40MM	TP	1.4C	0338	44	20