

AD-A259 095



DOCUMENTATION PAGE

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

Unclassified

4 1992

1b. RESTRICTIVE MARKINGS
None2a. SECURITY CLASSIFICATION AUTHORITY
N/A

3. DISTRIBUTION/AVAILABILITY OF REPORT

2b. DECLASSIFICATION/DOWNGRADING SCHEDULE
N/A

Distribution A. Unlimited

4. PERFORMING ORGANIZATION REPORT NUMBER(S)

DODPOPHMTR/AYD 92-023

5. MONITORING ORGANIZATION REPORT NUMBER(S)

None

6a. NAME OF PERFORMING ORGANIZATION

6b. OFFICE SYMBOL
(If applicable)

Packaging Division

SMCAR-AEP

7a. NAME OF MONITORING ORGANIZATION

None

6c. ADDRESS (City, State, and ZIP Code)

US ARMY ARMAMENT RESEARCH, DEVELOPMENT
AND ENGINEERING CENTER, PICATINNY ARSENAL, NJ
07806-5000

7b. ADDRESS (City, State, and ZIP Code)

None

92-31305



SPR

8a. NAME OF FUNDING/SPONSORING
ORGANIZATION

Same as 6a

8b. OFFICE SYMBOL
(If applicable)

SMCAR-AEP

9. PROCUREMENT IN

8c. ADDRESS (City, State, and ZIP Code)

Same as 6a

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) Test of Wirebound Box, Part Number 5581378 for Small
Caliber Ammunition Packed in M19A1 Metal Containers

12. PERSONAL AUTHOR(S)

Edgardo B. Silvestre

13a. TYPE OF REPORT

Final

13b. TIME COVERED

FROM _____ TO _____

14. DATE OF REPORT (Year, Month, Day)

921130

15. PAGE COUNT

16. SUPPLEMENTARY NOTATION

17. COSATI CODES

FIELD	GROUP	SUB-GROUP

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)

1. Performance Oriented Packaging
2. Ammunition Packaging
3. M19A1 Container
4. Wirebound Box
5. Packaging

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

This report covers the POP testing of wirebound box, part number 5581378 used as shipping container for small caliber ammunition. The exterior wirebound box contains four M19A1 metal inner containers (Dwg 7553315) containing various 7.62mm ammunition. Tests were conducted using containers containing additional weights to ensure that tested weight is higher than heaviest pack to ensure safe shipment.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT

☐ UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT. ☐ DTIC USERS

21. ABSTRACT SECURITY CLASSIFICATION

Unclassified

22a. NAME OF RESPONSIBLE INDIVIDUAL

Edgardo B. Silvestre

22b. TELEPHONE (Include Area Code)

(201) 724-2173

22c. OFFICE SYMBOL

SMCAR-AEP

92 12 11 038

PERFORMANCE ORIENTED PACKAGING TESTING
OF
WIREBOUND BOX FOR SMALL CALIBER AMMUNITION
PACKED IN M19A1 METAL CONTAINER
FOR
PACKING GROUP II
SOLID HAZARDOUS MATERIALS

Author:

EDGARDO B. SILVESTRE
PACKAGING TECHNOLOGIST

DHS QUALITY ASSURED

Performing Activity

SMCAR-AEP
U.S. Army Armament Research, Development
and Engineering Center
Picatinny Arsenal, New Jersey 07806-5000

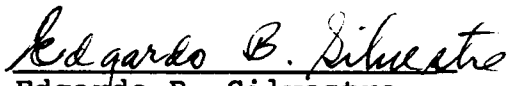
November 1992

FINAL

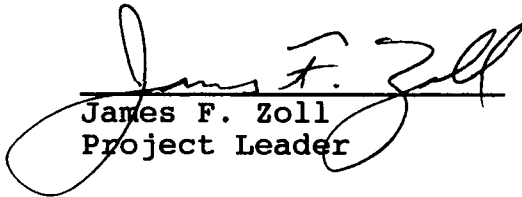
Distribution Statement A.
Approved for Public Release;
Distribution is Unlimited.

Accession For	
NTIS	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

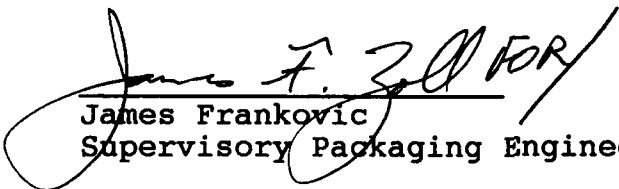
PREPARED BY:


Edgardo B. Silvestre
Packaging Technologist

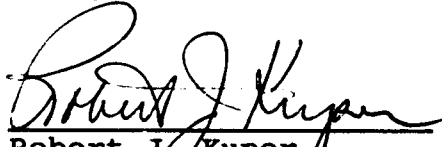
REVIEWED BY:


James F. Zoll
Project Leader

REVIEWED BY:


James Frankovic
Supervisory Packaging Engineer

APPROVED BY:


Robert J. Kuper
Chief, Packaging Division

INTRODUCTION

The Department of Transportation (DOT) per CFR 49, Parts 100-179, dated 1 Oct 91, requires that hazardous materials should be packed in a container that passes the Performance Oriented Packaging (POP) tests.

Wirebound box, part no. 5581378, is used as shipping container for 7.62mm small caliber ammunition. This box contains four (4) M19A1 metal containers containing 7.62mm small arms ammunition.

POP tests were conducted using containers containing additional weights to insure that the tested weight is higher than the heaviest pack. The tests were conducted in accordance with the referenced sections of CFR 49 and are valid only when approved ammunition is packed in the M19A1 container for the DOD.

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.

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 276 hz. 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 1239 lbs. (563 kg) of stack weight. Three different test samples were each subjected to a stack weight of 1239 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 corner drop, one of the long-side of the box cracked, 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 1239 pounds on top of each of the three packages. Each of the packages adequately supported the applied load. No evidence of package distortion was noted.

REMARK

Based on the successful POP testing outlined in this report, the following POP symbol shall be applied to containers manufactured in accordance with drawing 5581378 when used to package the NSN's listed in the Table.

(u) 4C1/Y41/S/□□
n USA/DOD/AYD

last two digits of year
packed.

REFERENCE MATERIAL

1. Federal Register, "49 CFR Part 107, 1 Oct 91"
2. Federal Specification PPP-B-585

TEST DATA

DATA:

Container (Outer):

Type: Box, wirebound

Part No.: 5581378

UN Code: 4C1

Spec No.: PPP-B-585

Material: Wood

Capacity: 21.0 liters

Dimensions:

Inside: 39.29 cm x 28.26 cm x 18.73 cm
(15 1/4+7/32 in x 11+1/8 in x 7 1/4+1/8 in)

Outside: 44.13 cm x 29.21 cm x 20.64 cm
(17 3/8 in x 11 1/2 in x 8 1/8 in)

Weight: 2.0 kg (4.3 lbs)

Container (Inner):

Type: Box

Model No.: M19A1

Spec No.: MIL-B-3060

Material: Metal

Capacity: 3.8 liters

Dimensions:

Inside: 25.68 cm x 8.76 cm x 16.66 cm
(10 5/64+1/32 in x 3 7/16+1/64 in x 6 15/32+3/32 in)

Outside: 27.94 cm x 9.68 cm x 18.42 cm
(11 in max x 3 13/16 in max x 7 1/4 in max)

Weight: 1.8 kg (4.0 lbs)

Closure (Method/Type): Hinged Lid

TEST DATA (Continued)

PRODUCT(S):

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

TEST MATERIALS:

Name: Simulated Weights and Sand
Physical State: Solid
Size: 2 in dia x 7/8 in thick
or granulated sand
Quantity: 24 lead tablets
or 70 lbs
Dunnage: Polyethylene foam per PPP-C-1752
Gross Weight: 90 lbs (41 kg)

TABLE

DODIC OR NALC	NSN	HM ITEM	TYPE	HAZARD CLASS	UN NO.	#/CNTR	WT KG
A111	1305-00-166-6371	7.62mm	Blank	1.4S	0014	2438	27
A124	1305-00-301-1679	7.62mm	Tracer	1.4S	0012	3130	35
A159	1305-00-460-2600	7.62mm	Dummy	None	None	3157	35
A129	1305-00-580-0131	7.62mm	HPT	1.4S	0012	3218	36
A111	1305-00-752-8087	7.62mm	Blank	1.4S	0014	2438	27
A151	1305-00-889-2169	7.62mm	O.F. Ball	1.4S	0012	3165	35
A131	1305-00-892-2150	7.62mm	Ball Tracer	1.4S	0012	3181	35
A143	1305-00-892-2330	7.62mm	Ball	1.4S	0012	3181	35
A146	1305-00-892-2335	7.62mm	Tracer	1.4S	0012	3178	35
A147	1305-00-892-4242	7.62mm	Frangible Ball	1.4S	0012	2849	32
A159	1305-00-926-4009	7.62mm	Dummy	None	None	3197	36
A136	1305-00-926-9436	7.62mm	Ball	1.4S	0012	3192	36
A111	1305-01-181-1750	7.62mm	Blank	1.4S	None	2432	27