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AD-A225 498

Part 1. Report Cover

- A. Report Number: DODPOPHM/USA/DOD/AF82/TR90031
- B. Title: "Performance Oriented Packaging Testing of Fiberboard Container, PPP-B-636"

Responsible Individual: M. A. Garcia

Performing Activity: Packaging Management Branch  
DSTD, Bldg. 169  
Kelly AFB, Texas 78241-5000

Date: 27 July 1990

Report Type: Interim

\*\*\*\*\*  
\* Final \*  
\*\*\*\*\*

Specific Authority

- C. Sponsoring Organization: SA-ALC/DSTD  
Kelly AFB, Texas 78241-5000

Sponsor's Reference:

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## REPORT DOCUMENTATION PAGE

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FIELD	GROUP	SUB-GROUP				
			PERFORMANCE ORIENTED PACKAGING, OF HAZARDOUS MATERIALS.			
19. ABSTRACT (Continue on reverse if necessary and identify by block number)						
<p>The container and its contents were subjected to the drop test and stacking test in accordance with the requirements specified in the UN Recommendations on the Transport of Dangerous Goods, Fifth Edition, dated 1988. There were no indications of damage, deformation, or deterioration on the test specimens which would adversely affect transportation safety, reduce their strength, or cause instability. The test specimen complies with the special UN requirements and were successfully tested for Packing Group I.</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		
22a. NAME OF RESPONSIBLE INDIVIDUAL W. R. HOLMES			22b. TELEPHONE (Include Area Code) (512) 925-6511		22c. OFFICE SYMBOL DSTD	

Part 3. Data Sheet

A. Exterior Shipping Container

Type: Box

UN code: 4G

Specification Number(s): PPP-B-636, Style RSC, Type CF,  
Class WR, Variety SW, Grade V3c

Material: PPP-F-320, corrugated fiberboard

NSN: N/A

Capacity (I.D.): N/A

Tare Weight: 1.36 kg. (3 lb.)

Dimensions (O.D.): 72.07 cm. x 31.43 cm. x 32.39 cm.  
(12.375 in. x 12.375 in. x 12.75 in.)

Closure (Method/Type): Taping

Banding: N/A

Banding Specification Number(s): N/A

Additional Description: N/A

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DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution/	
Availability Codes	
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Part 3. Data Sheet (continued)

B. Inner Packaging of Combination Packaging

Specification Number(s): Preservation submethod IA8 in accordance with Mil-P-116.  
Mil-B-81705 type I & II, barrier material, electrostatic free  
Mil-P-26514 cushioning material

Type: 5H4

Material: Plastic film, electrostatic free material

NSN: N\A

Capacity: N\A

Tare Weight: 1.59 kg. (3.5 lb.)

Closure (Method/Type): Heat seal bag

Closure Specification Number(s): Mil-P-116.

Additional Description: Method of preservation is submethod IA8 using Mil-B-81705 type I & II electrostatic free material in accordance with Mil-P-116. The item is cushioned using Mil-P-26514 cushioning material and placed into the exterior fiberboard container.

Part 3. Data Sheet (continued)

C. Actual Products: Used

\*\*\*\*\*  
\* Not Used \*  
\*\*\*\*\*

Name: Electron Tube

NSN: 5960-00-485-2887 DP

Proper Shipping Name: Magnetized material

United Nations Number: 2807

United Nations Packing Group: I II

\*\*\*\*\*  
\* III \*  
\*\*\*\*\*

Hazard Class: ORM-C

Physical State: \*\*\*\*\*  
\* solid \* liquid gas  
\*\*\*\*\*

Amount Per Container: N/A

Item Weight: 2.72 kg. (6 lb.)

Density/Specific Gravity: N/A

Drop Height: N/A

Stacking Weight/Force: N/A

Vapor Pressure: N/A

Flash Point: N/A

Altitude: 690 Ft. above sea level

Air Pressure: 29.92 in. of Hg. at 32 degrees F.

Part 3. Data Sheet (continued)

D. Test Product:                   \*\*\*\*\*  
                                  \* Used \*                               Not Used  
                                  \*\*\*\*\*

Name: wood

United Nations Packing Group:    I       II                               \*\*\*\*\*  
  \* III \*  
  \*\*\*\*\*

Physical State:                   \*\*\*\*\*  
                                  \* solid \*                   liquid                               gas  
                                  \*\*\*\*\*

Amount Per Container: N/A

Gross Weight: 5.6 kg. (12.5 lb.)

Density/Specific Gravity: N/A

Drop Height: 1.8 m (70.875 in.)

Stacking Weight/Force: 46.72 kg. (103 lb.)

Test Pressure (liquids only): N/A

Consistency/Viscosity: N/A

Flash Point: N/A

Altitude: 690 ft. above sea level

Air Pressure: 29.92 in. of Hg. at 32 degrees F

E. Test Applicability: Based on the drop height and stacking weight computed, this test report is applicable for the NSN: 5960-00-485-2887 DP. This container and its contents were successfully tested for Packing Group I.

Part 4. Introduction:

1. The exterior shipping container used to package NSN: 5960-00-485-2887 DP, electron tube, is a fiberboard container, style RSC, type CF, class WR, variety SW, and grade V3c.
2. The method of preservation used is a submethod IA8 in accordance with Mil-P-116. It consists of wrapping the item in Mil-B-81705, type II barrier material, and heat sealed in Mil-b-81705, type I electrostatic shield bag. The item is cushioned with Mil-P-26514 cushioning material before placing into the exterior shipping container.
3. One container was fabricated for the drop test. The container was used for all the flat drops and the corner drop. A drop tester was used in conjunction with a 1/2 inch steel impact plate.
4. The stack test was performed on the same container used for the drop test. The stacking weight was calculated using the following formula.

$$W=[m(118-h)]/h \quad \text{or} \quad W=[m(3000-h)]/h$$

Where W=constant load in kilograms or pounds.

m=container gross weight in kilograms or pounds.

h=package height in millimeters or inches.

5. The leakproofness test, internal hydraulic pressure test, and the cooperage test is not applicable for this fiberboard container.
6. The fiberboard containers were conditioned in the test lab for 24 hours. The average temperature recorded in a 24 hour period was 24.8 degrees C. (76.6 degrees F.), with the relative humidity of 79.5 %. The relative humidity exceeded the requirements of the Orange Book, making the test conditions for the fiberboard more extreme.

Part 5. Test Required/Performed:

A. Drop Test - One drop per container

Boxes: Five Drops - 1st Drop: Flat on the bottom  
2nd Drop: Flat on the top  
3rd Drop: Flat on the long side  
4th Drop: Flat on the short side  
5th Drop: On a corner

Drop Height: Packing Group I - 70.9 in. (1.8m)  
Packing Group II - 47.2 in. (1.2m)  
Packing Group III - 31.5 in. (0.8m)

The container shall strike a target which shall be rigid, nonresilient, flat and horizontal steel surface.

B. Stacking Test - One test per container

The container shall be subjected to a compression force applied to the top surface equivalent to the total weight of identical packages which might be stacked on it during transport. The minimum height of the stack including the test sample shall be 3 meters (9.8m). The stack test should be maintained for 24 hours.

The containers shall be tested for stability by placing two loaded containers on top of the test samples for at least 1 hour.

Note: Fiberboard containers should be conditioned for a minimum of 24 hours prior to testing. Standard conditions shall be 23 plus or minus 2 degrees C (73 plus or minus 2 degrees F), and 50 plus or minus 2% relative humidity.

C. Leakproofness Test: Not Applicable for wooden or fiberboard containers carrying solids.

D. Internal (Hydraulic) Pressure Test: Not applicable for wooden or fiberboard containers carrying solids.

E. Cooperage Test: Not applicable for wooden or fiberboard containers carrying solids.

Part 6. Criteria for Passing the Test: (UN Criteria)

Pass/Fail

- A. Drop Test: Each packaging containing liquid should be leakproof when equilibrium has been reached between the internal and external pressures, except for inner packagings of combination packagings when it is not necessary that the pressures be equalized.

Where a packaging for solids undergoes a drop test and its upper face strikes the target, the test sample passes the test if the entire contents are retained by the inner packaging or inner receptacle (e.g. plastic bag), even if the closure is no longer sift-proof.

The packaging or outer packaging of a composite or combination packaging should not exhibit any damage liable to affect safety during transport. There should be no leakage of the filling substance from the inner receptacle or inner packaging(s).

Neither the outermost ply of a bag nor an outer packaging should exhibit any damage liable to affect safety during transport. A slight discharge from the closure(s) upon impact should not be considered to be a failure of the packaging provided that no further leakage occurs.

No rupture is permitted in packagings for goods of Class 1 which would permit the spillage of loose explosive substances or articles from the outer packaging.

- B. Stacking Test: No test sample should leak. In composite packagings or combination packagings, there should be no leakage of the filling substance from the inner receptacle or inner packaging. No test sample should show any deterioration which would adversely affect transport safety or any distortion liable to reduce its strength or cause instability in stacks of packages. In instances (such as guided load tests of drums and jerricans) where stacking stability is assessed after completion of the test, this may be considered sufficient when two filled packagings of the same type placed on each test sample maintain their position for one hour. Plastics packagings should be cooled to ambient temperature before the assessment.

Part 6. Criteria for Passing the Test: (UN Criteria) continued

- C. Leakproofness Test: Not applicable for wooden or fiberboard containers.
- D. Internal Pressure (hydraulic) Test: Not applicable for wooden or fiberboard containers.
- E. Cooperage Test: Not applicable for wooden or fiberboard containers.

Part 7. Discussion:

- A. Drop Test: The test specimen was tested for Packing Group I drop height of 1.8 m (70.875 in.). The container did not sustain any form of damage on the four flat drops. On the corner drop, the container was slightly bent but not enough to cause failure.
- B. Stacking Test: The total weight used for the stacking test was 46.72 kg. (103 lb.) and was maintained for a period of 24 hours. There were no signs of failure to the container. The containers were successfully tested for stability for 1 hour.
- C. The test samples used for the drop test and stacking test successfully passed.

Part 8. Test Results:

A. Drop Test	***** * Pass * *****	Fail	N/A
B. Stacking Test	***** * Pass * *****	Fail	N/A
C. Leakproofness Test	Pass	Fail	***** * N/A * *****
D. Internal (Hydraulic) Pressure Test	Pass	Fail	***** * N/A * *****
E. Cooperage Test	Pass	Fail	***** * N/A * *****

In order to be certified, the container must pass all applicable tests

Part 9. Markings on container for NSN: 5960-00-485-2887 DP

(u) 4G/X5.7/S/\*\*  
(n) USA/DOD/AF82

\*\* denotes the last two digits of the year during which the packaging was manufactured.

Part 10. References:

- A. Recommendations on the Transport of Dangerous Goods, Fifth Revised Edition, United Nations, New York, 1988.
- B. Federal Test Method Std. No. 101C, 13 March 1980.
- C. DOD Hazardous Materials Packaging Test Plan.

Part 1. Report Cover

- A. Report Number: DODPOPHM/USA/DOD/AF82/TR90034
- B. Title: "Performance Oriented Packaging Testing of Cleated Plywood Box, PPP-B-601, for Solids"

Responsible Individual: M. A. Garcia

Performing Activity: Packaging Management Branch  
DSTD, Bldg. 169  
Kelly AFB, Texas 78241-5000

Date: 9 August 90

Report Type: Interim

\*\*\*\*\*  
\* Final \*  
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Specific Authority

- C. Sponsoring Organization: SA-ALC/DSTD  
Kelly AFB, Texas 78241-5000

Sponsor's Reference:

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**SUPPLEMENTARY**

**INFORMATION**

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# ERRATA

Report Number: DODPOPHM/USA/DOD/AF82/TR90031

## Part 3. Data Sheet

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NSN: N/A

Capacity (I.D.): N/A

Tare Weight: 1.36 kg. (3 lb.)

Dimensions (O.D.): 72.07 cm. x 31.43 cm. x 32.39 cm.  
(28.375 in. x 12.375 in. x 12.75 in.)

Closure (Method/Type): Taping

Banding: N/A

Banding Specification Number(s): N/A

Additional Description: N/A

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Part 4. Introduction:

1. The exterior shipping container used to package NSN: 5960-00-485-2887 DP, electron tube, is a fiberboard container, PPP-B-636, style RSC, type CF, class WR, variety SW, and grade V3c.
2. The method of preservation used is a submethod IA8 in accordance with Mil-P-116. It consists of wrapping the item in Mil-B-81705, type II barrier material, and heat sealed in Mil-B-81705, type I electrostatic shield bag. The item is cushioned with Mil-P-26514 cushioning material before placing into the exterior shipping container.
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Additional Description: N/A

Part 4. Introduction:

1. The exterior shipping container used to package NSN: 5960-00-485-2887 DP, electron tube, is a fiberboard container, PPP-B-636, style RSC, type CF, class WR, variety SW, and grade V3c.
2. The method of preservation used is a submethod I<sup>2</sup> in accordance with Mil-P-116. It consists of wrapping the item in Mil-B-81705, type II barrier material, and heat sealed in Mil-B-81705, type I electrostatic shield bag. The item is cushioned with Mil-P-26514 cushioning material before placing into the exterior shipping container.
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