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PERFORMANCE ORIENTED PACKAGING TESTING OF PPP-B-621 WOOD BOX FOR MK 2 MOD 1 SUBMARINE FALSE TARGETS FOR PACKING GROUP I SOLID HAZARDOUS MATERIALS

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13. ABSTRACT (Maximum 200 words)

Qualification tests were performed to determine whether the in-service PPP-B-621 Wood Box used for shipping and storage of MK 2 Mod 1 Submarine False Targets could be utilized to contain properly dunnaged solid type hazardous materials weighing up to a gross weight of 30 kg (66 pounds). The tests were conducted in accordance with Performance Oriented Packaging (POP) requirements specified by the United Nations Recommendations on the Transportation of Dangerous Goods, ST/SG/AC.10/1 and the Code of Federal Regulations, Title 49 CFR, Parts 107 through 178. The wood box has conformed to the POP performance requirements; i.e., it successfully retained its contents throughout the specified tests.

14. SUBJECT TERMS

POP Test of PPP-B-621 Wood Box for MK 2 Mod 1 Submarine False Targets

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INTRODUCTION

This Performance Oriented Packaging (POP) test was performed to ascertain whether the PPP-B-621 wood box used for shipping and storage of MK 2 Mod 1 Submarine False Targets meets the Packing Group I requirements specified by the Code of Federal Regulations, Title 49 CFR, Parts 107 through 178, dated 31 December 1991. The objectives were to evaluate the adequacy of the container in protecting the hazardous materials.

The box tested conforms to PPP-B-621 and contains five targets. Three steel straps were used to secure the box during the tests.

TESTS PERFORMED

1. Drop Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.603. One container was used for each drop orientation. The drop height was 1.8 meters and the drop sequence was as follows:

a. Flat on Bottom
b. Flat on Top
c. Flat on Long Side
d. Flat on Short Side
e. One Corner

The test was performed at ambient temperature (70° $\pm$ 20°F). The contents of the container should be retained within its packaging and exhibit no damage liable to affect safety during transport.

2. Stacking Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.606. Three different containers were used, each with a stack weight of 2100 pounds. This represents the weight imposed on the bottom container of a sixteen-foot stack of like containers weighing 66 pounds each. The test was performed for 24 hours. After the allowed time, the weight was removed and the container examined. Any leakage, deterioration, or distortion which could adversely affect transport or reduce its strength or cause instability in stacks of packages is cause for rejection.

3. Vibration Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.608. Three sample containers were loaded with weighted fiber tubes and closed as for shipment. Each container was placed on a vibrating platform that had a vertical double-amplitude (peak-to-peak displacement) of one inch. The packages were constrained horizontally to prevent them

from falling off the platform, but were free to move vertically, bounce and rotate. The test was performed for one hour at a frequency that caused each point of the container bottom to be raised from the platform 1.6 mm. A 1.6 mm thick metal strip was passed between the bottom of the container and the platform.

PASS/FAIL

1. Drop Test

The criteria for passing the drop test is outlined in Title 49 CFR, Part 178, Subpart M, Sec. 178.603(f): A package is considered to successfully pass the drop test if for each sample tested, no rupture occurs which would permit spillage of loose explosive substances or articles from the outer packaging.

2. Stacking Test

The criteria for passing the stacking test is outlined in Title 49 CFR, Part 178, Subpart M, Sec. 178.606: No test sample may show any deterioration which could adversely affect transportation safety or any distortion likely to reduce its strength, cause instability in stacks of packages, or cause damage to inner packagings likely to reduce safety in transportation.

3. Vibration Test

The criteria for passing the Vibration Test is outlined in Title 49 CFR, Part 178, Subpart M, Sec. 178.608: Immediately following the period of vibration, each package must be removed from the platform, turned on its side and observed for any evidence of leakage. A packaging passes the vibration test if there is no rupture or leakage from any of the packages. No test sample should show any deterioration which could adversely affect transportation safety or any distortion liable to reduce packaging strength.

TEST RESULTS

1. Drop Test

Satisfactory.

2. Stacking Test

Satisfactory.

3. Vibration Test

Satisfactory.

DISCUSSION

1. Drop Test

After each drop the container was inspected for any damage which would be cause for rejection. The box used for the corner drop is shown after the test in Figure 1. In all cases, the container remained intact and there was no spillage of contents.

2. Stacking Test

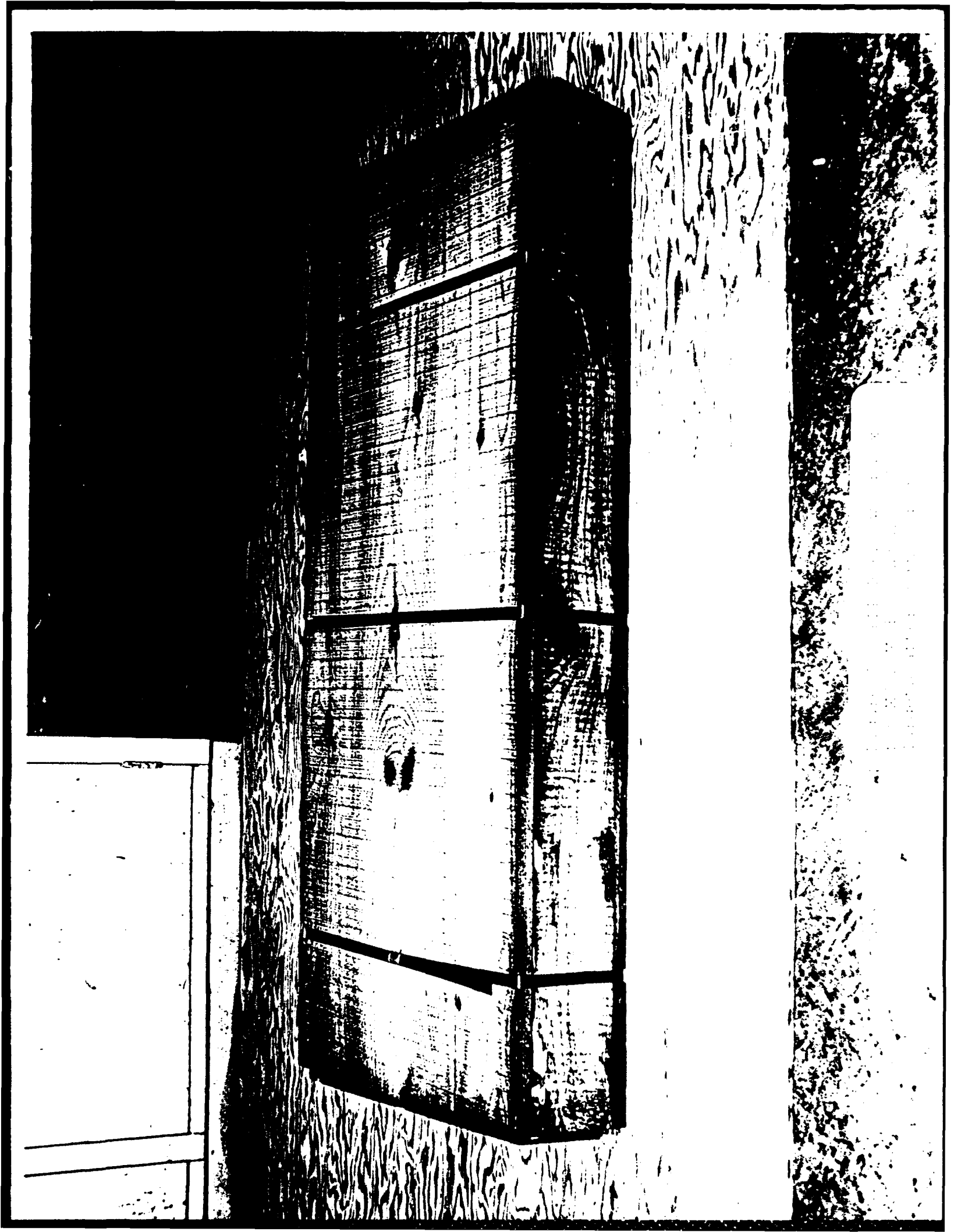
Three containers were individually tested. Each container was visibly inspected after the 24-hour period was over. There was no leakage, distortion, or deterioration of the container as a result of this test.

3. Vibration Test

Immediately following the vibration test, each container was removed from the platform, turned on its side and observed for any evidence of leakage. All containers remained securely closed and there was no evidence of leakage of contents.

REFERENCE MATERIAL

Code of Federal Regulations Title 49 CFR, Parts 107-178.



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DATA SHEET

CONTAINER:	**POP MARKING:**
PPP-B-621 Wood Box for MK 2 Mod 1 Submarine False Target	(u n) 4C1/X30/S/** USA/DOD/NAD
Type: 4C1	UN Code: 4.3
Specification Number: PPP-B-621	Material: Wood
Gross Weight: 30 kg (66.0 pounds)	Dimensions: 1.10m L x .50m W x .15m H (43.50" L x 19.75" W x 5.75" H)
Closure (Method/type): 3 Steel straps	Tare Weight: 10.5 kg (23.0 pounds)

Additional Description:
Outer pack Drawing is 10001-2128437.

PACKAGED COMMODITY:
False Target, Submarine, MK 2 Mod 1
L125, 1370-00-115-5447

Proper Shipping Name: Calcium Phosphide

United Nations Number: 1360

United Nations Packing Group: I

Physical State: Solid

Amount Per Container: 5

Net Weight: 14.9 kg (32.8 pounds)

PACKAGED COMMODITY USED FOR TEST:
Name: Weighted fiber tubes
Physical State: Solid

Size :.06m Dia x .30m L
(2.50" Dia x 12.0" L)
Quantity : 7
Net Weight: 19.5 kg (43.0 pounds)

Dunnage: Polyethylene foam