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Performance Oriented Packaging Testing of Container,
Shipping and Storage, CNU-234/E for Packing Group II
Solid Hazardous Materials

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James M. Dwyer

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Test and Evaluation Branch (Code 5023)
Colts Neck, NJ 07722-50008. PERFORMING ORGANIZATION
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13. ABSTRACT (Maximum 200 words)

Qualification tests were performed to determine whether the in-service CNU-234/E Shipping and Storage Container could be utilized to contain properly dunnaged solid type hazardous materials weighing up to a gross weight of 359 kg (790 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 container has conformed to the POP performance requirements; i.e., the container successfully retained its contents throughout the specified tests.

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POP Test of CNU-234/E Shipping and Storage Container

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**PERFORMANCE ORIENTED PACKAGING TESTING
OF
CONTAINER, SHIPPING AND STORAGE, CNU-234/E
FOR PACKING GROUP II SOLID HAZARDOUS MATERIALS**

Author:
James M. Dwyer
Mechanical Engineering Technician

Performing Activity:
Naval Weapons Station Earle
Colts Neck, New Jersey 07722-5000

January 1992

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INTRODUCTION

This Performance Oriented Packaging (POP) test was performed to ascertain whether the CNU-234/E Shipping and Storage Container (Packing Group II) meets the requirements specified by the United Nations Recommendation on the Transportation of Dangerous Goods Document, ST/SG/AC.10/1, Revision 6, Chapters 4 and 9 and the Code of Federal Regulations, Title 49 CFR, Parts 107 through 178, dated 1 October 1991. The container contents consisted of a simulated load of 93 kg (204 pounds) of sand. Gross weight of the loaded container was 359 kg (790 pounds). Due to unavailability only one container was available for testing. This is less than the number required by the regulations. Approval for this deviation has been granted by the Under Secretary of Defense, Memorandum for the Joint Logistics Commanders dated 22 February 1990.

TESTS PERFORMED

1. Base Level Vibration Test

This test shall be performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.608. The container shall be placed on a repetitive shock platform which has a vertical linear motion of 1-inch double amplitude. Movement of the containers shall be restricted during vibration in all but the vertical direction. The frequency of the platform shall be increased until the container leaves the platform 1/16 of an inch at some instant during each cycle. Test time shall be 1 hour.

2. Stacking Test

This test shall be performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.606. The container shall be subjected to a force applied to its top surface equivalent to the total weight of identical packages stacked to a height of 3 meters (including the test container). A weight of 1,075 kg (2,370 pounds) shall be stacked on the test container. The test shall be performed for 24 hours. The weight shall then be removed and the container examined.

3. Drop Test

This test shall be performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.603. Five drops shall be performed from a height of 1.2 meters (4 feet), impacting the following surfaces:

- a. Flat bottom.
- b. Flat top.
- c. Flat on long side.
- d. Flat on short side.
- e. One corner.

PASS/FAIL

1. Base Level Vibration Test

The criteria for passing the base level vibration test is outlined in Title 49 CFR, Sec. 178.608(c): "A packaging passes the vibration test if there is no rupture or leakage from any of the packages."

2. Stacking Test

The criteria for passing the stacking test is outlined in Title 49 CFR, Sec. 178.606(d): "No test sample may leak. In composite packagings or combination packagings, there must be no leakage of the filling substance from the inner receptacle, or inner packaging. 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."

3. Drop Test

The criteria for passing the drop test is outlined in Title 49 CFR, Sec. 178.603(f): A package is considered to successfully pass the drop tests if for each sample tested--

(1) For removable head drums for solids, the entire contents are retained by an inner packaging (e.g., a plastic bag) even if the closure on the top head of the drum is no longer sift-proof;

(2) For a composite or combination packaging, there is no damage to the outer packaging likely to adversely affect safety during transport, and there is no leakage of the filling substance from the inner packaging;

(3) For a drum, jerrican or bag, any discharge from a closure is slight and ceases immediately after impact with no further leakage;

(4) For packagings for explosives, no rupture of the packaging occurs.

TEST RESULTS

1. Base Level Vibration Test

Satisfactory.

2. Stacking Test

Satisfactory.

3. Drop Test

Satisfactory.

DISCUSSION

1. Base Level Vibration Test

Immediately after the vibration test was completed, the container was removed from the platform, turned on its side and observed for evidence of leakage. No leakage was observed.

2. Stacking Test

The container was visibly checked after the 24-hour period was over. No leakage, distortion, or deterioration was observed.

3. Drop Test

After each drop, the container was inspected for evidence of leakage. No leakage was observed.

REFERENCE MATERIAL

A. United Nation's "Recommendation on the Transportation of Dangerous Goods," ST/SG/AC.10/1, Revision 6.

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

C. Bureau of Explosives Tariff No. BOE 6000K Hazardous Materials Regulations of the Department of Transportation by Air, Rail, Highway, Water including Specifications for Shipping Containers.

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TEST DATA SHEET

DATA SHEET:	
Container: CNU-234/E Shipping and Storage Container	
Type: 1A2	Container P/N or NSN: 8E 8140-01-045-7201
Specification Number: 799AS100	Material: Steel Cylinder and Skids
Gross Weight: 359 kg (790 pounds)	Dimensions: 84.000" L x 31.9000" W x 33.390" H
Closure (Method/Type): 1/4 turn fastener	Tare Weight: 266 kg (586 pounds)
Additional Description:	
PRODUCT:	
Name: See table	NSN(s): See table
United Nations Number: See table	
United Nations Packing Group: II	
Physical State (Solid, Liquid, or Gas): Solid	
Vapor Pressure (Liquids Only): N/A At 50 °C: N/A At 55 °C: N/A	
Consistency/Viscosity: N/A	Density/Specific Gravity: N/A
Amount Per Container:	Flash Point: N/A
Net Weight: See table	
TEST PRODUCT:	
Name: Sand	Physical State: Solid
Consistency: N/A	
Density/Specific Gravity: N/A	
Test Pressure (Liquids Only): N/A	
Amount Per Container: N/A	Net Weight: 93 kg (204 pounds)

TABLE 1
CNU-234/E Shipping and Storage Container

NALC	NSN	Type	Packing Drawing	UN Code	UN Number	#/ Cntr	Weight (lb)
PT76	1420-01-267-9693	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT83	1420-01-267-9700	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT70	1420-01-267-6958	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT86	1420-01-267-9703	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT73	1420-01-267-9690	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT79	1420-01-267-9696	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT85	1420-01-267-9702	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT71	1420-01-267-9688	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT72	1420-01-267-9689	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT74	1420-01-267-9691	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT75	1420-01-267-9692	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT77	1420-01-267-9694	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT78	1420-01-267-9695	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT80	1420-01-267-9697	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT81	1420-01-267-9698	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT82	1420-01-267-9699	WGU-17A/B	799AS100	N/A	N/A	1	184.3
PT84	1420-01-267-9701	WGU-17A/B	799AS100	N/A	N/A	1	184.3

NOTE: The container is qualified for a maximum net weight of 204 pounds.

CNU-243/E
SHIPPING AND STORAGE CONTAINER
POP MARKING

UN 1A2/Y359/S//USA/DOD/NAD**

**** YEAR LAST PACKED OR MANUFACTURED**