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Solid Hazardous Materials

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Eric Wu

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Naval Weapons Station Earle
Test and Evaluation Branch (Code 5023)
Colts Neck, NJ 07722-5000

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13. ABSTRACT (Maximum 200 words)

Qualification tests were performed to determine whether the in-service CNU-162/E Shipping and Storage Container could be utilized to contain properly dunnaged solid type hazardous materials weighing up to a gross weight of 72.5 kg (160 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-162/E Shipping and Storage Container

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**PERFORMANCE ORIENTED PACKAGING TESTING
OF
CONTAINER, SHIPPING AND STORAGE, CNU-162/E
FOR PACKING GROUP II SOLID HAZARDOUS MATERIALS**

Author:
Eric Wu
Mechanical Engineer

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

January 1992

FINAL

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INTRODUCTION

This Performance Oriented Packaging (POP) test was performed to ascertain whether the CNU-162/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 61 kg (134.5 pounds) of sand. Gross weight of the loaded container was 73 kg (161 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 container 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 377 kg (832 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-162/E Shipping and Storage Container	
Type: 4H1	Container P/N or NSN: P/N 67A243F1
Specification Number: Drawing 30003-67A243F3	Material: Poly Foam
Gross Weight: 73 kg (161 pounds)	Dimensions: 22-1/4" H x 39-3/4" L x 22-1/2" W
Closure (Method/Type): Close with PPP-T-97 Tape	Tare Weight: 12 kg (26.5 pounds)
Additional Description: PPP-T-60E, Type 4, Class 1 tape was used	
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: 1	Flash Point: N/A
Net Weight: See table	
TEST PRODUCT:	
Name: Sand	Physical State:
Consistency: N/A	
Density/Specific Gravity: N/A	
Test Pressure (Liquids Only): N/A	
Amount Per Container: N/A	Net Weight: 61 kg (134.5 pounds)

TABLE 1
CNU-162/E Shipping and Storage Container

NALC	NSN	Type	Packing Drawing	UN Code	UN Number	#/ Cntr	Weight (lb)
PF55	1420-00-272-1835	DCU-190/B	67A243F1	1.4C	0276	1	115
PF55	1420-00-272-1835	DCU-190A/B	67A243F1	1.4C	0276	1	115
PF55	1420-00-272-1835	DCU-190B/B	67A243F1	1.4C	0276	1	115
PG60	1420-01-235-6900	WCU-7B/B	67A243F1	1.4C	0276	1	113.2

NOTE: The container is qualified for a maximum net weight of 134.5 pounds.

CNU-162/E
SHIPPING AND STORAGE CONTAINER
POP MARKING

UN 4H1/Y73/S//USA/DOD/NAD**

**** YEAR LAST PACKED OR MANUFACTURED**