

AD-A242 777

PAGE

Form Approved
OMB No 0704-0188

2

This report is published and distribution is unlimited.



Der response, including the time for reviewing instructions, searching existing data sources of information. Send comments regarding this burden estimate or any other aspect of this Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank) 2. REPORT DATE
10/31/91

3. REPORT TYPE AND DATES COVERED
POP Test (08/91)

4. TITLE AND SUBTITLE
Performance Oriented Packaging Testing of Container, Shipping and Storage, CNU-434/E and CNU-435/E for Packing Group II Solid Hazardous Materials

5. FUNDING NUMBERS

6. AUTHOR(S)
Victor D. Saul

DTIC
SELECTE
NOV 13 1991
S C D

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Naval Weapons Station Earle
Test and Evaluation Branch (Code 5023)
Colts Neck, NJ 07722-5000

8. PERFORMING ORGANIZATION REPORT NUMBER
DODPOPHM/USA/DOD/
NADTR91025

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Commander, Naval Air Systems Command (AIR-41822B)
Department of the Navy
Washington, DC 20361-8050

10. SPONSORING / MONITORING AGENCY REPORT NUMBER
Same as above

11. SUPPLEMENTARY NOTES
N/A

12a. DISTRIBUTION / AVAILABILITY STATEMENT

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

Qualification tests were performed to determine whether the in-service CNU-434/E Shipping and Storage Container could be utilized to contain properly dunnaged solid type hazardous materials weighing up to a gross weight of 345 kg (760 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 and the Department of Transportation's Title 49 CFR 107. The container has conformed to the POP performance requirements; i.e., the container successfully retained its contents throughout the specified tests.

In addition, due to their similarities in size and weight, this test is considered representative of qualification testing for the CNU-435/E Shipping and Storage Container as per the variation in Title 49 CFR 107, Sec. 178.601h.

91-15313



14. SUBJECT TERMS
POP Test of CNU-434/E and CNU-435/E Shipping and Storage Containers

15. NUMBER OF PAGES
6

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT
UNCLASSIFIED

18. SECURITY CLASSIFICATION OF THIS PAGE
UL

19. SECURITY CLASSIFICATION OF ABSTRACT
UL

20. LIMITATION OF ABSTRACT
UL

GENERAL INSTRUCTIONS FOR COMPLETING SF 298

The Report Documentation Page (RDP) is used in announcing and cataloging reports. It is important that this information be consistent with the rest of the report, particularly the cover and title page. Instructions for filling in each block of the form follow. It is important to *stay within the lines* to meet optical scanning requirements.

Block 1. Agency Use Only (Leave blank).

Block 2. Report Date. Full publication date including day, month, and year, if available (e.g. 1 Jan 88). Must cite at least the year.

Block 3. Type of Report and Dates Covered. State whether report is interim, final, etc. If applicable, enter inclusive report dates (e.g. 10 Jun 87 - 30 Jun 88).

Block 4. Title and Subtitle. A title is taken from the part of the report that provides the most meaningful and complete information. When a report is prepared in more than one volume, repeat the primary title, add volume number, and include subtitle for the specific volume. On classified documents enter the title classification in parentheses.

Block 5. Funding Numbers. To include contract and grant numbers; may include program element number(s), project number(s), task number(s), and work unit number(s). Use the following labels:

C - Contract	PR - Project
G - Grant	TA - Task
PE - Program Element	WU - Work Unit Accession No

Block 6. Author(s). Name(s) of person(s) responsible for writing the report, performing the research, or credited with the content of the report. If editor or compiler, this should follow the name(s).

Block 7. Performing Organization Name(s) and Address(es). Self-explanatory.

Block 8. Performing Organization Report Number. Enter the unique alphanumeric report number(s) assigned by the organization performing the report.

Block 9. Sponsoring/Monitoring Agency Name(s) and Address(es). Self-explanatory.

Block 10. Sponsoring/Monitoring Agency Report Number (if known).

Block 11. Supplementary Notes. Enter information not included elsewhere such as: Prepared in cooperation with; Trans. of; To be published in. When a report is revised, include a statement whether the new report supersedes or supplements the older report.

Block 12a. Distribution/Availability Statement. Denotes public availability or limitations. Cite any availability to the public. Enter additional limitations or special markings in all capitals (e.g. NOFORN, REL, ITAR).

DOD - See DoDD 5230.24, "Distribution Statements on Technical Documents."

DOE - See authorities.

NASA - See Handbook NHB 2200.2.

NTIS - Leave blank.

Block 12b. Distribution Code.

DOD - Leave blank.

DOE - Enter DOE distribution categories from the Standard Distribution for Unclassified Scientific and Technical Reports.

NASA - Leave blank.

NTIS - Leave blank.

Block 13. Abstract. Include a brief (*Maximum 200 words*) factual summary of the most significant information contained in the report.

Block 14. Subject Terms. Keywords or phrases identifying major subjects in the report.

Block 15. Number of Pages. Enter the total number of pages.

Block 16. Price Code. Enter appropriate price code (*NTIS only*).

Blocks 17. - 19. Security Classifications. Self-explanatory. Enter U.S. Security Classification in accordance with U.S. Security Regulations (i.e., UNCLASSIFIED). If form contains classified information, stamp classification on the top and bottom of the page.

Block 20. Limitation of Abstract. This block must be completed to assign a limitation to the abstract. Enter either UL (unlimited) or SAR (same as report). An entry in this block is necessary if the abstract is to be limited. If blank, the abstract is assumed to be unlimited.

DODPOPHM/USA/DOD/NADTR91025

PERFORMANCE ORIENTED PACKAGING TESTING
OF
CONTAINER, SHIPPING AND STORAGE,
CNU-434/E AND CNU-435/E
FOR PACKING GROUP II SOLID HAZARDOUS MATERIALS

Author:
Victor D. Saul
Mechanical Engineering Technician

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

31 October 1991

FINAL

DISTRIBUTION UNLIMITED

Sponsoring Organization:
Commander, Naval Air Support Center (AIR-41822B)
Department of the Navy
Washington, DC 20361-8050

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC Tab	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or
A-1	Special

INTRODUCTION

The CNU-434/E Shipping and Storage Container tested, contained a load of four sand-filled dummy shapes weighing 345 kg (760 pounds). Overall weight of the container was 627 kg (1,381 pounds). This Performance Oriented Packaging (POP) test was performed to ascertain whether this standard container (Packing Group II) would meet the requirements as 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 Title 49 CFR 107 dated 1 October 1991. A base level vibration test was also conducted in accordance with the final rulings specified in the Department of Transportation's Performance Oriented Packaging Standards. Due to unavailability and the high cost of the containers, the number of containers used was less than the number required by the regulations. This has been approved by the Under Secretary of Defense, Memorandum for the Joint Logistics Commanders dated 22 February 1990.

In addition, due to their similarities in size and weight, this test is considered representative of qualification testing for the CNU-435/E Shipping and Storage Container as per the variation in Title 49 CFR 107, Sec. 178.601h.

TESTS PERFORMED

1. Base Level Vibration Test

This test was performed in accordance with Title 49 CFR 107, Part 178, Subpart M, Sec. 178.608. One sample container was placed on the repetitive shock platform. The container was restrained during vibration in all but the vertical direction. The frequency of the platform was increased until the container left the platform 1/16 of an inch at some instant during each cycle. Test time was 1 hour at a frequency of 3.8 Hz.

2. Stacking Test

This test was performed in accordance with Title 49 CFR 107, Part 178, Subpart M, Sec. 178.606. One container was used for this test. The container was 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 sample). A weight of 3,138.6 kg (6,905 pounds) was stacked on the sample container. The test was performed for 24 hours. After the allowed time, the weight was removed and the container examined.

3. Drop Test

This test was performed in accordance with Title 49 CFR 107, Part 178, Subpart M, Sec. 178.603. One container was used throughout the test. Five drops were 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

All tests were performed at an ambient temperature of $+70 \pm 20$ °F.

PASS/FAIL

1. Base Level Vibration Test

The criteria for passing the base level vibration test is outlined in Title 49 CFR 107, 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 107, 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 107, 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 any evidence of leakage. There was no leakage to the container as a result of this test.

2. Stacking Test

The container was visibly checked after the 24-hour period was over. There was no leakage, distortion, or deterioration to the container as a result of this test.

3. Drop Test

After each drop, the container was inspected for any damage which would be a cause for rejection. Final inspection indicated damage was minimal with only minor denting noted. The container remained intact and functional upon completion of the tests.

REFERENCE MATERIAL

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

B. Title 49 CFR 107, et al., Performance Oriented Packaging Standard; Changes to Classification, Hazard Communication, Packaging and Handling Requirements Based on UN Standards and Agency Initiative.

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.

DISTRIBUTION LIST

Defense Technical Information Center (2 copies)
ATTN: DTIC/FDA
Bldg. 5, Cameron Station
Alexandria, VA 22304-6145

Defense General Supply Center (1 copy)
ATTN: DDRV-TMPA, D. Gray
Richmond, VA 23219

Commander, Naval Air Systems Command
ATTN: AIR-41811F
Washington, DC 20361

Commander, Naval Air Systems Command
ATTN: AIR-41821D
Washington, DC 20361

TEST DATA SHEET

DATA SHEET:	
Container: CNU-434/E and CNU-435/E Shipping and Storage Container	
Type: 4B1	Container P/N or NSN: NSN 8E 8140-01-268-2872
Specification Number:	Material: Aluminum
Gross Weight: 627 kg (1,381 pounds)	Dimensions: 133.880" L x 36.000" W x 19.680" H
Closure (Method/Type): Over-center swing bolt latches	Tare Weight: 282 kg (621 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:	Physical State:
Consistency: N/A	
Density/Specific Gravity: N/A	
Test Pressure (Liquids Only): N/A	
Amount Per Container: N/A	Net Weight: 345 kg (760 pounds)

TABLE 1
 CNU-434/E and CNU-435/E Shipping and Storage Container

NALC	NSN	Type	Packing Drawing	UN Code	UN Number	#/ Ctr	Weight (lb)
PC06	1410-01-197-8996	AGM-122A	1596AS06	1.1E	0181	4	230
PV40	1410-01-305-8889	CATM-122A	1596AS06	1.1D	0276	4	230
1W12	1410-01-201-4011	Missile Training	1596AS06	--	--	4	190

**CNU-434/E AND CNU-435/E
SHIPPING AND STORAGE CONTAINER
POP MARKING**

UN 4B1/Y627/S/*/USA/DOD/NAD**

**** YEAR LAST PACKED OR MANUFACTURED**