ENGINEERING CHANGE NOTICE

1. ECN 640851

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	D. L. Kelly/03E00/H1-15/ 372-2276	[] Yes [X] No	07/10/97
	6. Project Title/No./Work Order No.	7. Bldg./Sys./Fac. No.	8. Approval Designator
	DOT-7A Test Program/YHX09	NA	SQ
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.)	10. Related ECN No(s).	11. Related PO No.
	HNF-SD-TP-OTP-004, Rev. 0	NA	NA

12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	NA	NA Design Authority/Cog. Engineer Signature & Date	NA Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? [] Yes [X] No

During testing, the riser design was modified on two occasions; therefore, the test plan required modification during the testing process. Strikeout and highlighted text indicate what was revised during testing. Information regarding the changes made to the risers has been added into Appendix A. The test data sheets included in Appendix C are now included in this revision.

14a. Justification (mark one)

Criteria Change	[]	Design Improvement	[X]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

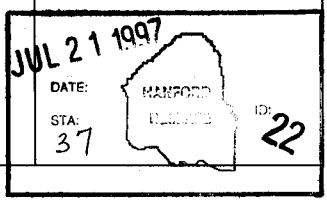
14b. Justification Details

Because of the failure of the risers during testing, a design change was made by the sponsor to improve the performance of the packaging.

15. Distribution (include name, MSIN, and no. of copies)

J. G. Field	H1-15	(1)
C. R. Hoover	H1-15	(1)
D. L. Kelly	H1-15	(2)
D. W. McNally	G1-15	(1)
J. H. O'Brien	H1-15	(1)
DOT-7A Files	H1-15	(1)
Central Files	H1-15	(1)

RELEASE STAMP



A-7900-013-2 (05/96) GEF095

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 640851

16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]	NA	[X]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
NA		

21. Approvals

Signature	Date	Signature	Date
Design Authority J. G. Field/	7-17-97	Design Agent	
Cog. Eng. D. L. Kelly/	7-10-97	PE	
Cog. Mgr. J. G. Field/	7-17-97	QA	
QA C. R. Hoover/	7/17/97	Safety	
Safety D. W. McNally/	7/17/97	Design	
Environ. NA		Environ.	
Other J. H. O'Brien/	7/17/97	Other	
		DEPARTMENT OF ENERGY	
		Signature or a Control Number that tracks the Approval Signature	
		NA	
		ADDITIONAL	
		NA	

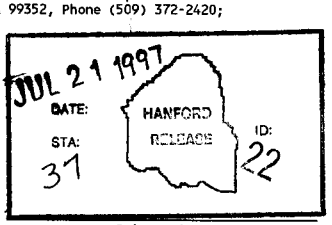
TEST PLAN FOR THE M-100 CONTAINER, (MODEL M-101/7A/12/90) DOCKET 96-43-7A, TYPE A CONTAINER

D. L. Kelly
Rust Federal Services Inc., Northwest Operations, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 640851 UC: 2020
Org Code: 03E00 Charge Code: YHX09
B&R Code: HC1103000 Total Pages: 121 cw 7-21-97

Key Words: Type A Packaging, M-100, Radioactive, M-101/7A/12/90, Docket 96-43-7A

Abstract: This document describes the test plan for the M-100 Container, Model M-101/7A/12/90. This packaging system is designed to ship Type A solid, radioactive materials, normal form, Form Nos. 1, 2, and 3. The nominal overall dimensions, including risers, of the M-100 Container are 79 x 54 x 42 inches. The capacity of the container is approximately 89.9 ft^3. The estimated gross weight of the packaging and contents is 9000 lb.



Chris Willingham 7-21-97
Release Approval Date

Release Stamp

Approved for Public Release

RECORD OF REVISION	(1) Document Number HNF-SD-TP-OTP-004	Page 1

(2) Title

Test Plan for the M-100 Container, (Model M-101/7A/12/90) Docket 96-43-7A, Type A Container

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) EDT #621082		
1 RS	ECN #640851	D.L. Kelly/	J.G. Field/
RS	Complete revision. Strikeout and highlighted text indicate what was revised during testing. Information regarding riser design changes has been added into Appendix A. The completed test data sheets are included into Appendix C.	D.L. Kelly 7/10/97	7/17/97

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LIST OF TABLES

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TEST PLAN FOR THE M-100 CONTAINER, (MODEL M-101/7A/12/90) DOCKET 96-43-7A, TYPE A CONTAINER

1.0 INFORMATION

NOTE: During testing, the initial fixed and removable riser designs failed. The sponsor revised the riser configuration twice. Due to these changes and the number of test units received, the test plan required modification during the testing process. Strikeout and highlighted text indicate what was revised during testing. Changes were made with the concurrence of the sponsor, the test engineer, and the project engineer. Information pertaining to the Revision 1 and Revision 2 riser modifications is included in Appendix A.

The packaging configurations being tested by use of this Test Plan are designed and constructed for the U.S. Department of Energy (DOE), Office of Environmental Restoration and Waste Management (EM-43), under the direction of Mr. Stephen Warren. Mr. James D. Greaves, Brainard Associates, Inc., Solon, Ohio, has served as the sponsor's technical point-of-contact for this activity. The packaging is being tested for use by the DOE and its contractors, and according to U.S. Department of Transportation Specification 7A Type A (DOT-7A) requirements. The DOE-approved test facility and personnel that will be utilized are located at the Hanford Site in Richland, Washington. Testing is being conducted by Rust Federal Services Inc., Northwest Operations (RFSNW).

The objective of this Test Plan is to describe the testing for the qualification of the M-100 Container, Model M-101/7A/12/90 as a DOT-7A Type A packaging. This packaging system is designed to ship Type A solid, radioactive materials, normal form, Form Number 1, Form Number 2, and Form Number 3 (refer to Section 2.0 of this Test Plan). The nominal, overall external dimensions, including risers, of the M-100 Container, Model M-101/7A/12/90 are 200.66 cm (length) x 137.16 cm (width) x 106.68 cm (height) [79 in. (length) x 54 in. (width) x 42 in. (height)]. The capacity of the container is 2.55 m^3 (89.9 ft^3). The container weight is estimated to be 435.45 kg (960 lb). The estimated gross weight of the packaging and contents is 4082.33 kg (9000 lb). Actual measurements and gross weight for the packaging configurations will be obtained at time of testing.

Refer to Appendix A of this Test Plan for drawings showing information regarding the M-100, Model M-101/7A/12/90 configurations being tested. Two packaging configurations are planned for testing. Each is identical, with the exception that one configuration has risers welded to the underside of the container body, and the other has removable risers.

NOTE: Due to the failure of the packaging design with the initial removable and fixed riser configurations, the risers were modified as shown in Appendix A under "Revision 1 Riser Modification." This design failed during testing. The Revision 1 riser modification was removed from the remaining test units, and three 17.78-cm (7-in.) plates were then welded to the

underside of the containers. The Revision 1 riser modification was then secured onto this plate. This second design change is shown in Appendix A under "Revision 2 Riser Modification."

The packaging to be tested is single-piece wall construction, consisting of 12 gauge HR ASTM A569 carbon steel. The containers are produced using a press-brake method. A NucFil[1] -013, 3/4-in. NPT filter is located at one end. The containment system includes a 1/2 x 1 1/2-in. Neoprene[2] ASTM D-1056 SCE-42 gasket that adheres to the cover by use of Trubond contact cement, Federal Specification MMM-A-130B, or equivalent; and twenty-six 3/8-in. - 16 x 7/8 hex head cap screws (ANSI B18.2.1, SAE Grade 8), 3/8-in. lock washers (ANSI B18.21.1, SAE Grade 8), and 3/8-in. SAE flat washers. The bolt holes are slotted, not drilled. A 3/8-in. chain link lift lug is located at each corner (four total). Further information regarding the description of the packagings to be tested is provided in Section 2.0 and Appendix A of this Test Plan.

For testing purposes, the M-100, Model M-101/7A/12/90 will be filled with simulated contents as described in Section 2.0 and Appendix B of this Test Plan. A mixture of flour and fluorescein will be added for ease of any leak detection or simulation of solid, Material Form Number 1. Visual and ultraviolet light will be used for leak detection.

Test Date: June 2 - 9, 1997

Docket No: 96-43-7A

Packaging Name: M-100, Model M-101/7A/12/90

Applicant Name and Address: Mr. Stephen Warren
U.S. Department of Energy
Office of Environmental Restoration
and Waste Management (EM-43)
Washington, DC 20585

Applicant Phone: 301-903-7673

2.0 PACKAGING DATA

Packaging Manufacturer: Jim Greaves
Brainard Associates, Inc.
5381 Brainard Road
Solon, Ohio 44139

216-498-9199
e-mail: ba@en.com

[1]NucFil is a trademark of Nuclear Filter Technology, Incorporated.

[2]Neoprene is a trademark of E.I. duPont de Nemours & Company.

Manufacturer Drawing No.: Waste Container Model M-101/7A/12/90, Issue #4, 1017A-01 through 1017A-08
(Refer to Appendix A of this Test Plan for drawings)

NOTE: At the time of testing, corrected information and drawings had been provided by the sponsor noting the change to the lift lugs (from 7/16-in. to 3/8-in.), and that the vent filter fitting is part number S-220C not 5-220C. These drawings have been included in Appendix A. Due to the redesign of the riser configuration during testing, updated drawings will not be incorporated into this test plan. However, corrected drawings will be included into the final evaluation report (HNF-SD-TP-OTR-004).

Table 2-1. Dimensions.

Description		Length cm (in)	Width cm (in)	Height cm (in)
Outside Dimensions (closed) with 4-in. risers		200.66 (79.0)	137.16 (54.0)	106.68 (42.0)
Interior Volume = 2.55m^3 (89.9 ft^3)				
Internal Dimensions:	Cover	193.04 (76.0)	129.54 (51.0)	5.08 (2.0)
	Body	193.04 (76.0)	129.54 (51.0)	90.49 (35.625)

Materials of Construction:

Container Body, Cover, Risers, & Stiffeners	12 gauge HR ASTM A569 carbon steel.
Gasket	1/2-in. x 1 1/2-in. Neoprene ASTM D-1056 SCE-42 (Alternate - Ethylene Propylene Diene Monomer [EPDM]).
Gasket Adhesive	Trubond contact cement, Federal Specification MMM-A-130B, or equivalent.
Fasteners	Twenty-six, 3/8-in. - 16 x 7/8 hex head cap screws, ANSI B18.2.1, SAE Grade 8; 3/8-in. lock washers, ANSI B18.21.1, SAE Grade 8; and 3/8-in. SAE flat washers.
Vent Filter	NucFil-013, 3/4-in. NPT.

Vent Filter Fitting	2-in. Rieke steel plug with 3/4-in. opening. Part No. S-220C.
Lift Lug	Chain link, four places. Crosby Spectrum 4, 3/8-in. trade size, or equivalent.

Weight (estimated): Actual weights for all configurations will be obtained at time of testing.

Gross weight is estimated to be 4082.33 kg (9000 lb).

Approximate weight of empty package is 435.45 kg (960 lb).

Approximate weight of payload is 3646.88 kg (8040 lb).

Physical Form: Form Number 1: Solids--any particle size.

Form Number 2: Solids--large particle size only (e.g., sand, concrete, debris, soil).

Form Number 3: Solids--objects with no significant dispersible or removable contamination.

Simulated Contents:

The packagings described herein are designed to ship Type A quantities of radioactive materials, normal form, Form No. 1, Form No. 2, and Form No. 3.

The simulated payload used for testing purposes for all configurations will be six, 208-L (55-gal) drums filled to approximately 453.59 kg (1000 lb) each. A mixture of sand and soil will fill the void between the drums and the container body. A mixture of approximately ~~907 grams (2 lb)~~ 4535.92 grams (10 lb) flour and ~~85 grams (3 oz)~~ 226.8 grams (8 oz) fluorescein will be added to simulate Form No. 1 materials and for leak detection. The flour and fluorescein mixture will be added as necessary for testing purposes (e.g., around the base of the container prior to adding test contents; over the top of the test contents prior to closure; or both). Refer to Appendix B of this Test Plan, Section B6.0, for specific loading of simulated contents per test unit. Care is to be taken so that clumping of the flour and fluorescein mixture will not occur due to the natural moisture that is found in sand/soil.

3.0 TEST UNIT MARKING

The test applicant will supply the following:

- One M-100, Model M-101/7A/12/90 container with removable risers.
- Six M-100, Model M-101/7A/12/90 containers with risers welded to the underside of the container base.
- Additional Neoprene gasket material and Trubond adhesive.

Each test unit should be marked in accordance with *DOT-7A Type A Packaging Test and Evaluation Procedure*, Section 6.3 (Kelly 1996). The components to be marked are the container body and cover. The numbers to be used in marking the test units are listed below. Mark the exterior, assembled surface with four axis lines, 90° apart. The axis lines shall be labelled W, X, Y, and Z. Orientation angles for drop test locations will be measured from the shortest horizontal centerline axis of the package in its normal upright position. Refer to (Kelly 1996) Sections 1.3 and 6.3.

Marking	Configuration
43-TU-01	This test unit has removable risers that are located under the container body. For testing purposes only, this container will contain a typical drum plug, not a NucFil filter. The drum plug is identical to the filter in material and external geometry. Load packaging to the specified testing weight with the selected simulated contents. This test unit will undergo drop testing.
43-TU-02 through 43-TU 07:	These test units have risers welded to the underside of the container body. For testing purposes only, one container will incorporate the NucFil filter; the remaining five containers will contain a typical drum plug. The drum plug is identical to the filter in material and external geometry. Load packaging to the specified testing weight with the selected simulated contents. One of these test units will be empty and will undergo the stacking test. The remaining five test units will be undergo drop testing. The packaging containing the filter will be drop tested.

4.0 PRE-LOADING INSPECTIONS

Perform preloading inspections on each test unit in accordance with *DOT-7A Type A Packaging Test and Evaluation Procedure*, Section 6.4 (Kelly 1996). Record the data on the supplied test data sheets 6.4.1, 6.4.2, and 6.4.3 (see Appendix C of this Test Plan). A separate set of data sheets is supplied for each test unit.

Refer to the instructions found in Appendix B of this Test Plan when handling, opening, loading, and closing the M-100 Container.

Perform a visual inspection in accordance with *DOT-7A Type A Packaging Test and Evaluation Procedure*, Section 6.4.1 (Kelly 1996). Visually inspect all surfaces of all units received to ensure that they are in good condition. The visual inspection shall include the following:

Component:

- **Container body and cover** - Verify made from 12 gauge (thickness range is 0.1046 in. to 0.0946 in.), carbon steel. Ensure that there are no significant dents that could affect the closure or performance of the packaging. All welds must be continuous--break all sharp edges.
- **Gasket sealing surface** - Ensure that surface is clean and smooth.
- **Gasket** - Ensure that surface is clean, smooth, and continuous with no rips or tears.
- **Bolts and bolt holes** - Ensure these are clean and no fouled threads exist.
- **Plug and filter** - Ensure there are no visible cracks. Ensure installation is to the proper torque according to applicant-supplied instructions.
- **Lift lugs** - Ensure there are no visible cracks.

Note any deviations from the specifications or drawings; defects in construction, deterioration, deformation; or distortion of features. Record the data on the Packaging Visual Inspection Data Sheet (6.4.1) (see Appendix C of this Test Plan). Use a separate data sheet for each test unit.

After inspection, close the packaging in accordance with instructions found in Appendix B of this Test Plan.

Weigh the major components of all major packaging parts. The major components to be weighed are the container body and cover.

Conduct the weighing in accordance with *DOT-7A Type A Packaging Test and Evaluation Procedure*, Section 6.4.2 (Kelly 1996). Measure the net weight of the assembled and closed packaging without contents; measure the gross weight of the package loaded with simulated contents. Note the weight of the inspected parts on the Packaging Component Weight Data Sheet (6.4.2) (see Appendix C of this Test Plan). Use a separate data sheet for each test unit.

Measure the exterior and interior dimensions of the container body and cover. Measure the thickness of the gasket material. Note the measurements on the Packaging Component Wall Thickness Data Sheet (6.4.3) (See Appendix C of this Test Plan). Use a separate data sheet for each test unit.

5.0 SIMULATED PAYLOAD

The simulated payload to be used is described below. Follow the opening, loading, and closure instructions found in Appendix B of this Test Plan.

43-TU-01: This test unit has removable risers that are located under the container body. For testing purposes only, this packaging will contain a typical drum plug, not a NucFil filter. Load the packaging to the specified testing weight with the selected simulated contents. Use a mixture of flour and fluorescein for leak detection and Form No. 1 simulation. Refer to Appendix B, Section B6.0 for the position of this mixture. This test unit will undergo drop testing.

43-TU-02 through 43-TU-07: These test units have risers welded to the underside of the container body. For testing purposes only, one packaging will contain the NucFil filter; the remaining five packagings will contain a typical drum plug. Load the packaging to the specified testing weight with the selected simulated contents. Use a mixture of flour and fluorescein for leak detection and Form No. 1 simulation. The position of this mixture will depend on the feature of the packaging being tested. The position is identified in Appendix B, Section B6.0. One test unit will be an empty packaging used for the stacking test. The remaining five test units will undergo drop testing. The filtered packaging will be drop tested.

6.0 DESIGN CONFIRMATION SEQUENCE

6.1 CONTAINMENT BOUNDARY VERIFICATION

This is a filtered packaging; therefore, a Reduced Pressure Test will not be conducted. Containment is provided by the container body, lid, gasket, filter, and fasteners (26 hex head cap screws). A visual check for release of simulated contents will be completed prior to each test and after each test.

6.2 SHIELDING VERIFICATION

The container body and cover provide shielding. The container body, cover, gasket, filter, and fasteners provide containment of contents. A visual check of the exterior container body and cover will be made prior to each test and after each test. A visual check for release of simulated contents will be completed prior to each test and after each test.

7.0 TEST SEQUENCE: TEST UNITS 43-TU-01 THROUGH 43-TU-07

Test units will undergo marking, inspection, and assembly. Due to the materials of construction and design of the packaging configurations being tested, the water spray test will not be conducted as a prerequisite to any other testing. The M-100 containers are made from 12 gauge ASTM A569 carbon steel, include a NucFil-013 filter, gasket, and 26 hex head cap screws, lock washers, and flat washers. Based on materials and methods of construction, closure mechanisms, gasket, and filter, the water spray would have no effect that could be interpreted as decreasing the ability of the steel boxes to meet all Specification 7A performance criteria. There are years of experience demonstrating that lengthy exposure to rain has no negative effect on containment integrity of similar metal box designs. Based on comparison of similarity in materials and methods of construction of the steel boxes tested and evaluated in DOE's *Test and Evaluation Document for DOT Specification 7A Type A Packaging* (DOE/RL-96-57), one can readily conclude that the packaging configurations being tested also meet this requirement.

The penetration bar drop will not be conducted on the M-100 packaging configurations discussed in this Test Plan. By evaluation and comparison (lid, lid reinforcing angle, bolt size, bolt spacing, container flange, filter, and materials of construction) with the performance of the metal boxes and drums previously tested and evaluated in DOE's *Test and Evaluation Document for DOT Specification 7A Type A Packaging* (DOE/RL-96-57), the materials and methods of construction of the M-100 packaging are equal to or better than those previously tested and evaluated. One can readily conclude that the packaging configurations being tested also meet this performance requirement.

The packages must perform adequately when subjected to the applicable performance tests which are described Table 7-1. There should be evidence that the integrity of the packaging would remain with no release of the

hazardous materials to the environment (49 CFR 173.24), no loss or dispersal of radioactive contents, and no significant increase the radiation levels recorded or calculated at the external surfaces for the condition before the test [49 CFR 173.412(j)].

Each configuration will be considered a unique package for testing purposes. Failure of one configuration does not eliminate the further satisfactory completion of testing for the remaining configurations. In the event of a failed configuration, the test and project engineer, conjunction with the test sponsor, may make an evaluation order to determine whether an alternative internal packaging arrangement may warrant further testing.

Table 7-1. Testing Sequence.

Type of test	Reference	Test unit number
Stacking test	(Section 7.2)	43-TU-07
Drop test - 1.2 m (4 ft)	(Section 7.3)	43-TU-01 through 43-TU-07

7.1 ASSEMBLY, LOADING, AND CLOSURE

Test No/Event	Event/Test Description
43-TU-01-1 through 43-TU-07-1	Except where noted, assemble, load, and close the packaging with simulated payload in in position in accordance with Section 5.0 and Appendix B of this Test Plan.
	Take pretest photographs.

NOTE: Based on evaluation, the packaging design passes the water spray test and suffers no change in strength that would affect the outcome of the other DOT-7A Type A packaging tests. Therefore, as stated in Section 7.0 of this Test Plan, the water spray test will not be conducted prior to any testing described within this Test Plan.

7.2 STACKING TEST

Test No/Event	Event/Test Description
43-TU-07-3	For this test, this will be an empty packaging. Assemble and close the packaging in accordance with Appendix B of this Test Plan. An empty packaging is being tested as it is more likely to fail than a loaded packaging. This test unit incorporates the original fixed riser configuration for this test.
	Photograph the pretest condition.

Perform a stacking test in accordance with *DOT-7A Type A Packaging Test and Evaluation Procedure*, Section 7.3 (Kelly 1996) for at least 24 hours with the compressive load specified below. The load is applied uniformly to two opposite sides of the package, one of which must be the base on which the package would normally stand.

Test Unit Number	Compressive Load, kg (lb)
43-TU-07	20,411.65 kg (45,000 lb)
	Apply 46,000 lb weight

Calculations were determined as follows:

a) Five times the estimated weight of the package is calculated to be:

5 x 4082.33 kg = 20,411.65 kg (5 x 9000 lb = 45,000 lb)

b) The weight based on the vertically projected area of the package is calculated to be:

200.66 cm (length) x 137.16 cm (width) = 27,522.5 cm^2 = 2.75225 m^2

2.75225 m^2 x 1300 kg/m^2 = 3577.925 kg
= (38,512.46 lb)

The compressive load was determined by using the greater of the vertically projected area of the packaging and five times the estimated weight of the package. The load is applied uniformly to two opposite sides of the package, one of which must be the base on which the package would normally stand.

Photograph the package upon the initial test condition setup. Take photographs of the package at the end of the 24-hour test period prior to removing the compressive load and after removal.

After removing the compressive load from the packaging, conduct a visual inspection of the container body, lid, gasket, fasteners, and risers. If the packaging shows signs of damage, take measurements the same locations as were used for the pretest measurements to document any change. The package will be considered to pass if there is no rupture of or signs of cracks on the container.

Record the results on the Stacking Test Data Sheet (see Appendix C of this Test Plan). Use a separate data sheet for each test unit.

If the package passed the testing conducted in the previous step, conduct the 1.2 m (4 ft) drop test outlined in Section 7.3 of this Test Plan.

7.3 DROP TEST - 1.2 m (4.0 ft)

Test No/Event	Event/Test Description
43-TU-01-4 43-TU-02-4 43-TU-03-4 43-TU-04-4 43-TU-05-4	Assemble, load, and close the packaging with simulated payload position in accordance with Section 5.0 and Appendix B of this Test Plan.
43-TU-06-4	Photograph the pretest condition.
43-TU-07-4	

Perform the drop test* in accordance with *DOT-7A Type A Packaging Test and Evaluation Procedure*, Section 7.5 (Kelly 1996), with the following parameters:

Drop Height: 1.2 m (4.0 ft), +2.5 cm (1.0 in.), -0.

(use a height of 49 inches)

Impact Angle: See orientation instructions.

*During the drop test, personnel shall be excluded from the impact area to the extent to be clear of any fragments which could result from the impact. As a minimum, this distance shall be 9.1 m (30 ft).

Orientation: The orientation angles for the drop test locations will be measured from the shortest horizontal centerline axis of the package in its normal upright position. Refer to (Kelly 1996) Sections 1.3 and 6.3.

43-TU-01 Drop onto bottom short edge, center of gravity (CG)
This test unit incorporates the original removable riser configuration for this test.

If the test and project engineers determine that the following test unit can undergo a second drop, and upon the agreement of the sponsor, perform the following drop:

43-TU-01 Drop onto bottom corner, CG, on side opposite that of previous drop.

NOTE: This test was not conducted.

During testing, the initial fixed and removable riser designs failed. The sponsor revised the riser configuration twice. Due to these changes and the number of test units received, the test plan required modification during the testing process. Changes were made with the concurrence of the sponsor, the test engineer, and the project engineer. Revision 1 and Revision 2 riser modifications are included in Appendix A.

~~43-TU-02 Drop onto bottom short edge, CG~~
~~43-TU-03 Drop onto bottom corner, CG~~
~~43-TU-04 Drop onto top corner, CG~~
~~43-TU-05 Drop onto top short edge, CG~~
~~43-TU-06 Drop onto the end to impact the filter~~

43-TU-04 Drop onto top short edge, CG
This test unit incorporates the original fixed riser configuration for this test.

43-TU-04 Drop onto bottom short edge, CG
This test unit incorporates the original fixed riser configuration for this test.

43-TU-02 Drop onto bottom short edge, CG
This test unit incorporates the Revision 1 Riser Modification for this test.

43-TU-02 Drop onto top corner at lifting ring, CG
This test unit incorporates the Revision 1 Riser Modification for this test.

43-TU-06 Drop flat onto the end to impact the filter
This test unit incorporates one riser having the Revision 1 Riser Modification. The Revision 1 riser modification was made at the filtered end of the packaging. The remaining two risers incorporate the original fixed riser configuration.

43-TU-03 Drop onto bottom corner, CG
This test unit incorporates the Revision 2 Riser Modification for this test.

43-TU-05 Drop onto bottom short edge, CG
This test unit incorporates the Revision 2 Riser Modification for this test.

43-TU-07 Drop onto bottom long edge, CG
This test unit incorporates the Revision 2 Riser Modification for this test.

Take photographs and video coverage during and after each test to ensure any damage is photographed.

The packagings will be judged to pass if there is no significant damage to the packagings and no release of contents. Any change from the pretest condition will be evaluated by the test and project engineers to determine if the packaging passed or failed the test and if any additional testing will be necessary.

Record the results on the test data sheets provided in Appendix C of this Test Plan. Use a separate data sheet for each test unit.

If the package passed the testing conducted the previous step, go to Section 8.0 of this Test Plan.

8.0 POST-TEST ACTIONS

This process will be performed as noted at the completion of the drop tests as indicated in Section 7.0 of this Test Plan.

8.1 CONTAINMENT BOUNDARY VERIFICATION

This is a filtered packaging. The packaging provides containment for solids, Material Form No. 1, Material Form No. 2, and Material Form No. 3. Containment is provided by the container body, lid, gasket, filter, and fasteners (26 hex head cap screws). A visual check for release of simulated contents will be completed prior to each test and after each test.

8.2 SHIELDING VERIFICATION

The container body and cover provide shielding. The container body, cover, gasket, filter, and fasteners provide containment of contents. A visual check the exterior container body and cover will be made prior to each test and after each test. A visual check for release of simulated contents will be completed prior to each test and after each test.

8.3 ADMINISTRATIVE ACTIONS

A written description of the packaging condition and measurements will be thoroughly documented on the appropriate test data sheets after each drop test has been performed. Photographs of damage and video coverage of the tests performed will also be used as documentation.

Perform post-test activities outlined in Section 8.0 of *DOT-7A Type A Packaging Test and Evaluation Procedure* (Kelly 1996).

Upon test completion, test units shall be marked as follows:

a. Packaging is a test unit belonging to "Brainard Associates, Solon, Ohio."

b. Package testing completed "[enter month/date/year.]"

c. Packaging is an on-hold test unit. Do not return or dispose of without the approval of 7A Testing Support Program Project Engineer, RFSNW.

d. Packaging "does not contain" radioactive material.

e. Packaging "does not contain" hazardous material.

f. Packaging "does not contain" material that requires disposal as a hazardous waste.

g. Packaging surface "does not contain" radioactive contamination.

Refer to TP-D01, *Transportation and Packaging Desk Instructions* (O'Brien 1992) for guidance on returning test units to the test sponsor.

9.0 REFERENCES

49 CFR 173, "Shippers - General Requirements for Shipments and Packaging," *Code of Federal Regulations*, as amended.

49 CFR 178, "Shipping Container Specification," *Code of Federal Regulations*, as amended.

DOE/RL-96-57, 1996, *Test and Evaluation Document for DOT Specification 7A Type A Packaging* Rev. 0, Vol. 1, U.S. Department of Energy, Richland Operation Office, Richland, Washington.

Kelly, D. L., 1996, *DOT-7A Type A Packaging Test and Evaluation Procedure*, WHC-SD-TP-RPT-018, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Kelly, D. L., 1997, *Test and Evaluation Report for the M-100 Container (Model M-101/7A/12/90), Docket 96-43-7A, Type A Container*, HNF-SD-TP-OTR-004, Rev. 0, Waste Management Federal Services, Inc., Northwest Operations, Richland, Washington.

O'Brien, J. H., 1992, *Transportation and Packaging Desk Instructions*, TP-D01, "Return/Disposal of Test Packaging," Rev. 00, Westinghouse Hanford Company, Richland, Washington.

10.0 GLOSSARY

ABBREVIATIONS AND ACRONYMS

ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations
CG	center of gravity
DOE	U.S. Department of Energy
DOT-7A	U.S. Department of Transportation, Specification 7A Type A
EPDM	Ethylene Propylene Diene Monomer
RFSNW	Rust Federal Services Inc., Northwest Operations
WMNW	Waste Management Federal Services, Inc., Northwest Operations

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APPENDIX A

DRAWINGS

NOTE: At the time of testing, corrected information and drawings had been provided by the sponsor noting the change to the lift lugs (from 7/16-in. to 3/8-in.), and that the vent filter fitting is part number S-220C not 5-220C. These drawings have been included in Appendix A. Due to the redesign of the riser configuration during testing, updated drawings will not be incorporated into this test plan. However, corrected drawings will be included into the final evaluation report (HNF-SD-TP-OTR-004).

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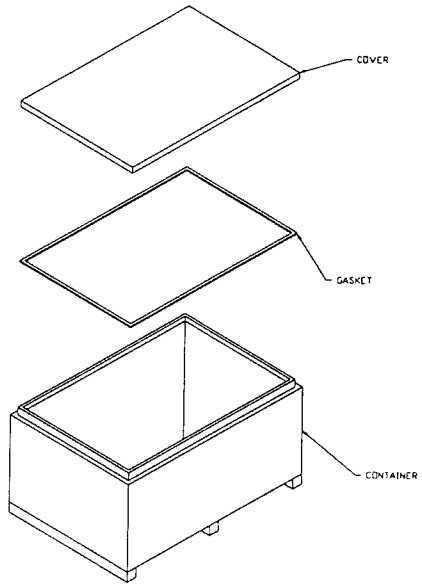
NOTE: (UNLESS OTHERWISE NOTED)

CONTAINER SPECIFICATIONS

PACKAGING DESIGNATION - 7A TYPE A
MODEL - M-101/7A/12/90
CAPACITY 89.9 CU FT
CONTAINER WEIGHT 960 LBS (THEORETICAL)
PAYLOAD - 8040 LBS
MAXIMUM GROSS WEIGHT - 9000 LBS
EXTERNAL CUBE W/ RISERS - 104 CU FT
EXTERNAL CUBE W/O RISERS - 94 CU FT
STORAGE EFFICIENCY, W/ RISERS - 87%
STORAGE EFFICIENCY W/O RISERS - 96%
OUTSIDE DIMENSIONS -79 IN X 54 IN X 42 IN, W/ RISERS
STACKING LOAD - 100,000 LBS (NTS RATED)
LIFT LUG WORKING LOAD - 9,000 LBS
MATERIAL - 12 GA HR ASTM A569 EXCEPT AS NOTED
GASKET - 1/2 X 1-1/2 NEOPRENE ASTM D-1056 SCE - 42
  ALTERNATE - ETHYLENE PROPYLENE DIENE MONOMER (EDPM)
GASKET ADHESIVE - TRUBOND CONTACT CEMENT, FEDERAL SPECIFICATION
  MMM - A - 130B, OR EQUIVALENT
FASTENERS
  3/8 - 16 X 7/8 HEX HEAD CAP SCREW, ANSI B18.2.1, SAE GRADE 8
  3/8 LOCK WASHER, ANSI B18.21.1, SAE GRADE 8
  3/8 SAE FLAT WASHER
VENT FILTER - NUCFIL - 013, 3/4 NPT
VENT FILTER FITTING RIEKE P/N S-220C
TAMPER PROOF SEAL - STRANDED WIRE LEAD SEAL, 2 EACH.
  PORTER SAFETY SEAL OR EQUIVALENT
CHAIN LINK - CROSBY SPECTRUM 4 3/8 SIZE
ALTERNATIVE FEATURES
  REMOVABLE RISERS
  ALTERNATE RISERS
  FORK LIFT COVER LUGS
  MANUAL COVER HANDLES
FINISH - AS REQUIRED
MARKINGS - AS REQUIRED

GENERAL NOTES

ALL EXTERNAL WELDS MUST BE CONTINUOUS AND WATERTIGHT
BREAK ALL SHARP EDGES
THE GASKET SURFACE MUST BE SMOOTH AND CONTINUOUS
CEMENT THE GASKET TO THE COVER BEFORE SHIPMENT
ALL FASTENERS MUST BE CERTIFIABLE AS DOMESTICALLY MANUFACTURED
PACKAGE THE FASTENERS AND THE FILTER, AND SUSPEND WITHIN THE
  CONTAINER SUCH THAT THEY MAY BE READILY RETRIEVED AT DESTINATION
COVER MUST FIT IN BOTH POSITIONS



5/28/97

M-101/7A/12/90 CONTAINER

UNITED STATES
DEPARTMENT OF ENERGY

LOCKHEED MARTIN ENERGY SYSTEMS

BRAINARD ASSOCIATES 5381 BRAINARD RD. SOLON, OHIO 44139

TOLERANCES UNLESS OTHERWISE NOTED: DECIMAL .XX ± 0.010, .X ± 0.050, ANGULAR ± 1/2°, FRACTIONAL ± 1/16	DRAWN BY: PM	DATE: 04.15.97	WASTE CONTAINER MODEL M-101/7A/12/90 ISSUE #4
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	APPROVED BY:	DATE:	SIZE: B
	SCALE: NONE		DRAWING NO. 1017A-01

HNF-SD-TP-OTP-004, Rev. 1

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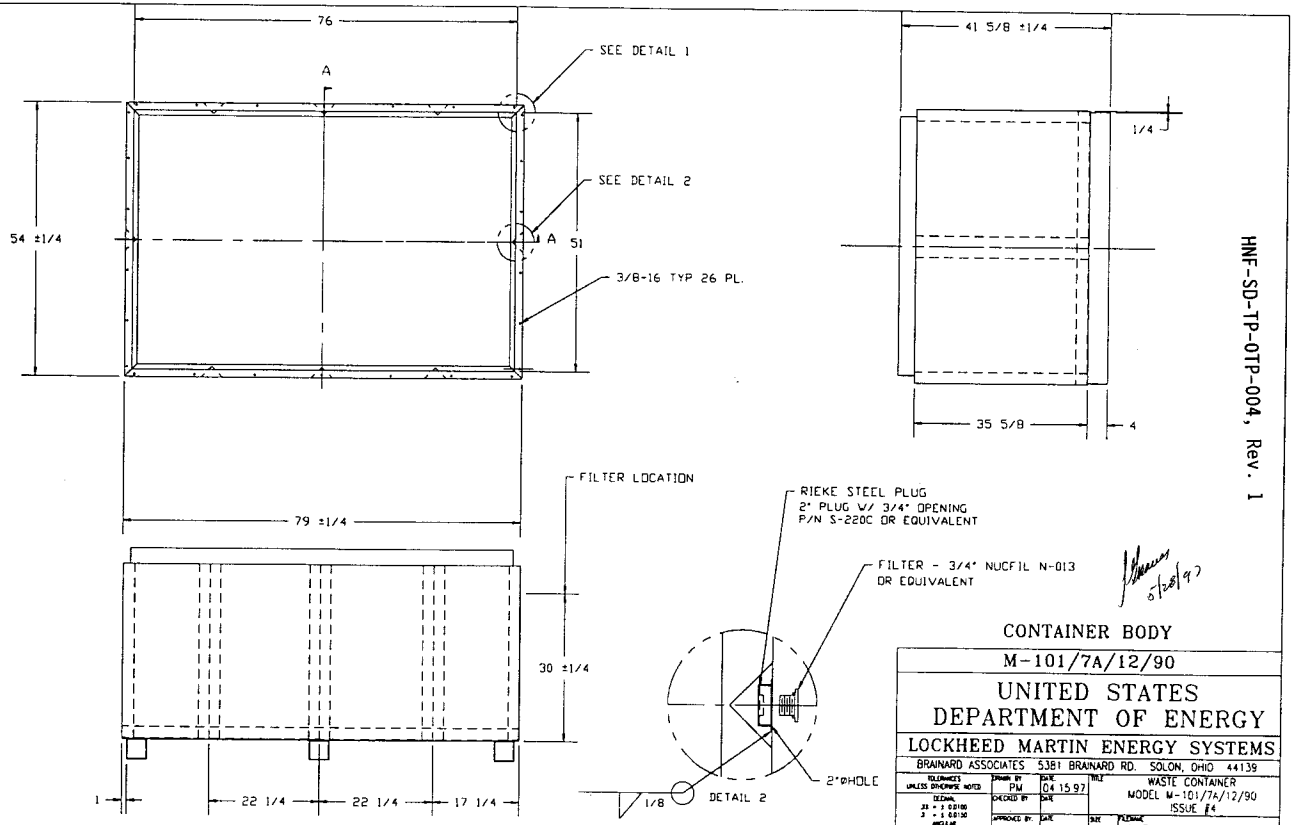

5/28/97

CONTAINER BODY

M-101/7A/12/90

UNITED STATES
DEPARTMENT OF ENERGY

LOCKHEED MARTIN ENERGY SYSTEMS

BRAINARD ASSOCIATES 5381 BRAINARD RD. SOLON, OHIO 44139

TOLERANCES UNLESS OTHERWISE NOTED: DECIMAL .XX ± .02 / .X ± .1 ANGULAR ± 1/2° FRACTIONAL ± 1/16	DRAWN BY: PW	DATE: 04.15.97	TITLE: WASTE CONTAINER MODEL M-101/7A/12/90 ISSUE #4
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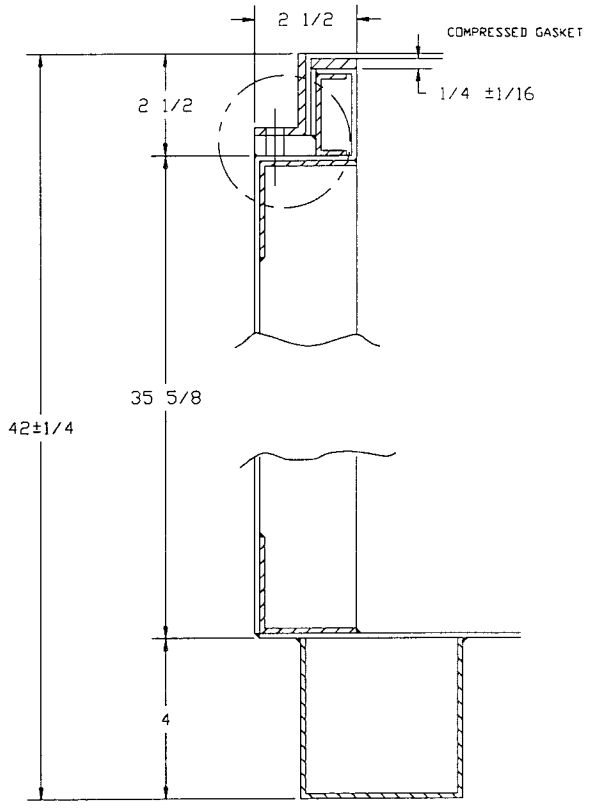

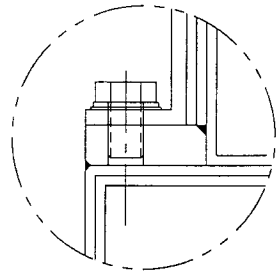

FASTENER DETAIL

WALL CROSS SECTION

M-101/7A/12/90				
UNITED STATES DEPARTMENT OF ENERGY				
LOCKHEED MARTIN ENERGY SYSTEMS				
BRAINARD ASSOCIATES 5381 BRAINARD RD. SOLON, OHIO 44139				
TOLERANCES UNLESS OTHERWISE NOTED: DECIMAL .XX ± 0.010 .X ± 0.030 ANGULAR ± 1/2 FRACTIONAL ± 1/16	DRAWN BY: PM	DATE: 04.15.97	TITLE: WASTE CONTAINER MODEL M-101/7A/12/90 ISSUE #4	
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	APPROVED BY:	DATE:	SIZE: B	FILENAME: 1017A-03
	SCALE: 1=2			

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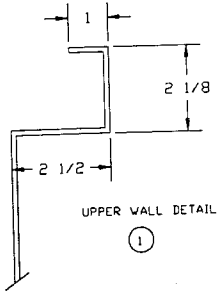
ALL FRACTIONAL DIMENSIONS SHALL BE WITHIN ±1/16
ALL CUT LENGTHS SHALL BE DETERMINED AT FABRICATION
LENGTHS SHALL ACCOUNT FOR MATERIAL GAUGE THICKNESS
VARIATION AND OVERALL BOX DIMENSIONAL TOLERANCES



UPPER WALL DETAIL
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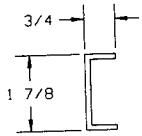
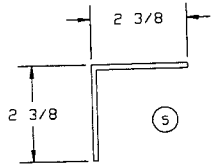
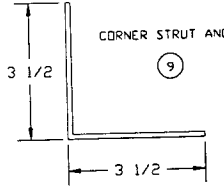


UPPER WALL CHANNEL
(2)



(5)

CORNER STRUT ANGLE
VERTICLE WALL STRUT
UPPER & LOWER
PERIMETER ANGLES



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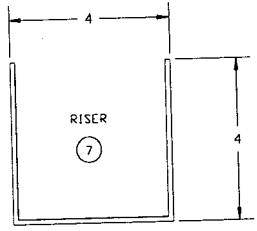

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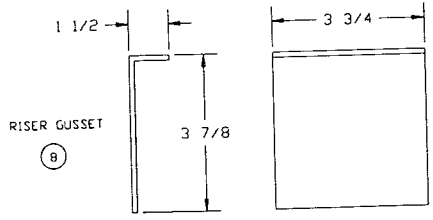

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6/20/97

CONTAINER SECTION DETAILS
M-101/7A/12/90

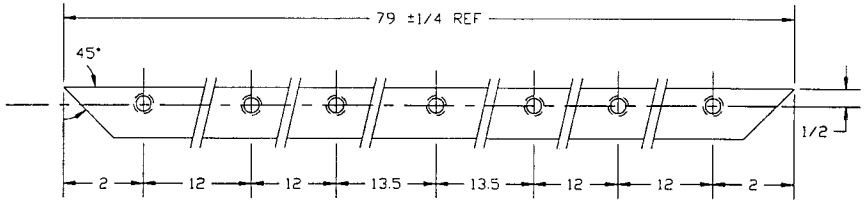
UNITED STATES
DEPARTMENT OF ENERGY

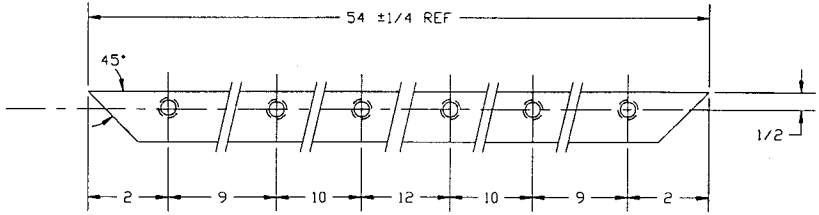
LOCKHEED MARTIN ENERGY SYSTEMS

BRAINARD ASSOCIATES 5381 BRAINARD RD. SOLON, OHIO 44139

TOLERANCES UNLESS OTHERWISE NOTED	DRAWN BY RF	DATE 04 15 97	TITLE WASTE CONTAINER MODEL M-101/7A/12/90 ISSUE #4
DECIMAL .X = ± 0.0100 .X = ± 0.0050 ANGULAR ± 1/2° FRACTIONAL ± 1/16	CHECKED BY	DATE	
	APPROVED BY	DATE	SIZE B DRAWING 1017A-04
	SCALE 1=2		

NOTE:
1. MAT'L 1/2 X 1 1/2 FLAT - A36/M-1020





DETAIL ITEM #4

M-101/7A/12/90			
UNITED STATES DEPARTMENT OF ENERGY			
LOCKHEED MARTIN ENERGY SYSTEMS			
BRAINARD ASSOCIATES 5381 BRAINARD RD. SOLON, OHIO 44139			
TOLERANCES UNLESS OTHERWISE NOTED: DECIMAL .XX ± 0.01 .X ± 0.10 ANGULAR ± 1/2 FRACTIONAL ± 1/16	DRAWN BY: RF	DATE: 04.15.97	TITLE: WASTE CONTAINER MODEL M-101/7A/12/90 ISSUE #4
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	APPROVED BY:	DATE:	SIZE: B
	SCALE: 1=2		FILENAME: 1017A-05

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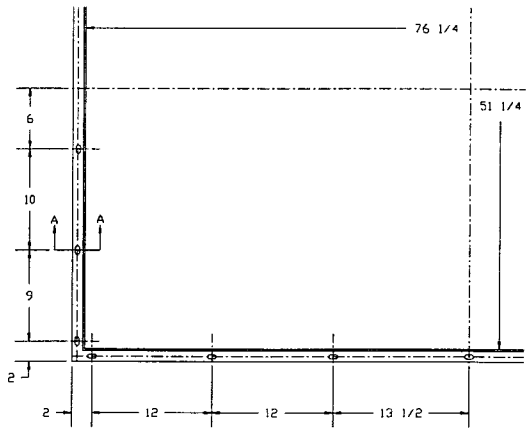
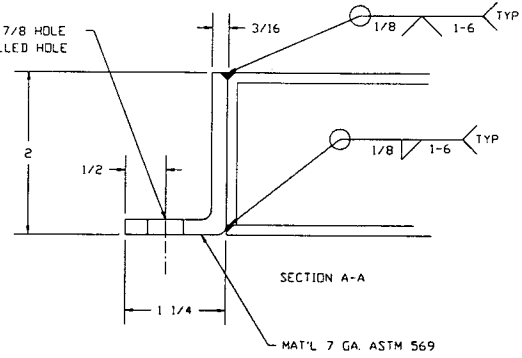
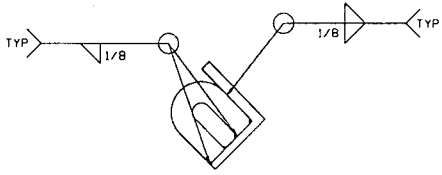
A-7

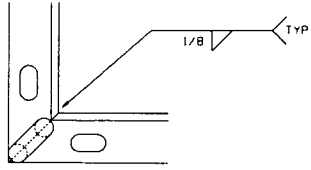
NOTE:
1. ALL WELDS ARE CONTINUOUS FOR THE FIRST 20" FROM CORNERS
2. CHAIN LINK SHALL NOT EXTEND ABOVE COVER SURFACE







CHAIN LINK - TYP 4 PL.
MAT'L
CROSBY SPECTRUM 4
3/8 TRADE SIZE
OR EQUIVALENT



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5/28/97

CONTAINER COVER

M-101/7A/12/90

UNITED STATES
DEPARTMENT OF ENERGY

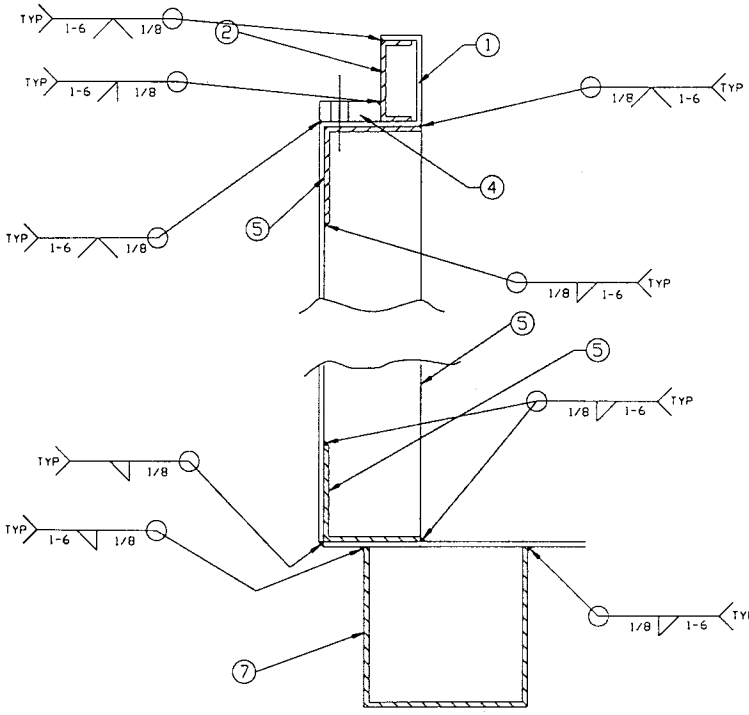
LOCKHEED MARTIN ENERGY SYSTEMS

BRAINARD ASSOCIATES 5381 BRAINARD RD. SOLON, OHIO 44139

TOLERANCES UNLESS OTHERWISE NOTED	DRAWN BY: PW	DATE: 04.15.97	TITLE: WASTE CONTAINER MODEL M-101/7A/12/90 ISSUE #4
DECIMAL .XX = ± 0.010 .X = ± 0.030	CHECKED BY:	DATE:	
ANGULAR ± 1/2° FRACTIONAL ± 1/16	APPROVED BY:	DATE:	SIZE: B FSCM NO: 1017A-06
	SCALE: 1=8		

A-8

NOTE:
1. ALL HORIZONTAL UPPER WALL WELDS ARE TO BE CONTINUOUS FOR THE FIRST 20" FROM CORNERS
2. VERTICAL CORNER STRUT WELDS ARE TO BE CONTINUOUS FOR THE FIRST 18" FROM UPPER CORNERS



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CONTAINER BODY WELDMENT

M-101/7A/12/90

UNITED STATES DEPARTMENT OF ENERGY

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BRAINARD ASSOCIATES 5381 BRAINARD RD. SOLON, OHIO 44139

TOLERANCES UNLESS OTHERWISE NOTED: DECIMAL .XX ± 0.010, .X ± 0.100, ANGULAR ± 1/2°, FRACTIONAL ± 1/16	DRAWN BY: PW	DATE: 04 15 97	TITLE: WASTE CONTAINER MODEL M-101/7A/12/90 ISSUE #4
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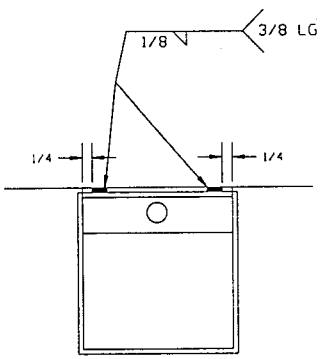
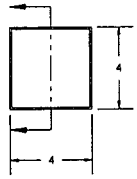
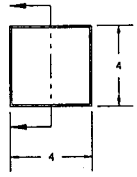
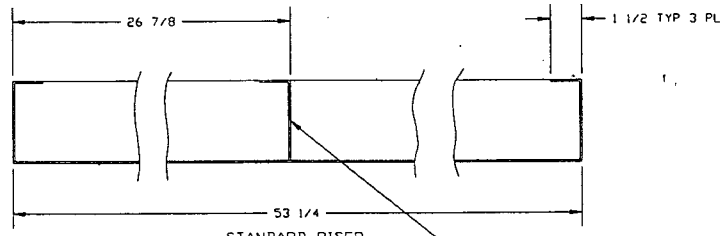


REMOVABLE RISER WELDMENT
VIEW A

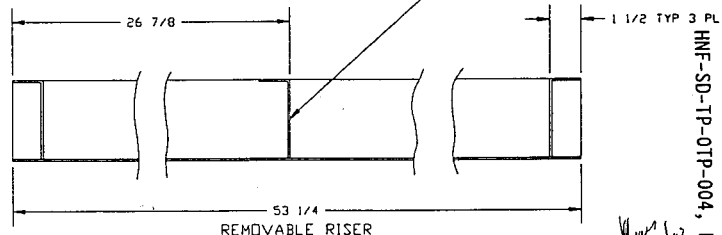






STANDARD RISER

1/8 TYP 3 PL



REMOVABLE RISER

RISER - THREE REQUIRED

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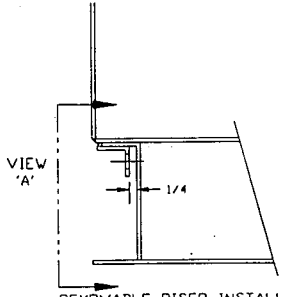
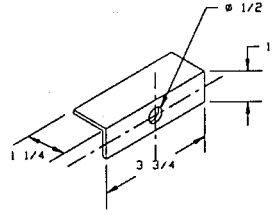


REMOVABLE RISER INSTALLATION



REMOVABLE RISER CLIP

A-10

M-101/7A/12/90

UNITED STATES
DEPARTMENT OF ENERGY

LOCKHEED MARTIN ENERGY SYSTEMS

BRAINARD ASSOCIATES 5381 BRAINARD RD. SOLON, OHIO 44139

TOLERANCES UNLESS OTHERWISE NOTED	DRAWN BY PM	DATE 04 15 97	TITLE RISERS M-100/7A/12/90 ISSUE 14
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	APPROVED BY	DATE	SIZE B
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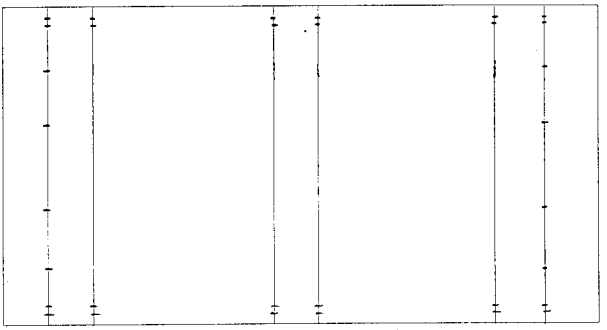
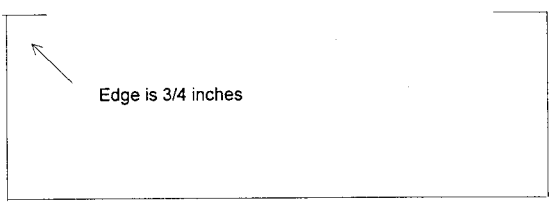
Revision 1 Riser Modification:



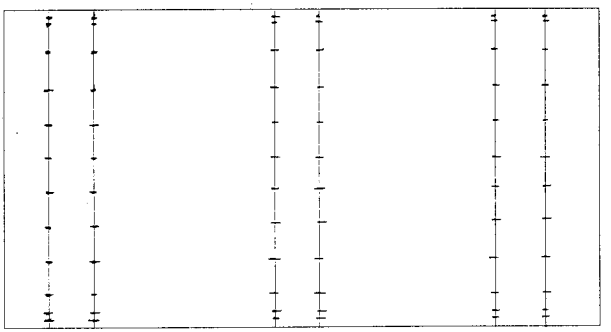
The original 4-inch by 4-inch riser design was modified. Revision 1 riser is 4 inches in height and ranges from 6 inches to 6 1/4 inches wide. The top of the riser that is welded onto the container has a 3/4 inch edge. The risers were then tack welded in two locations on each end of the container. Four tack welds, 10 inches on center hold the risers in place.

Height is 4 inches



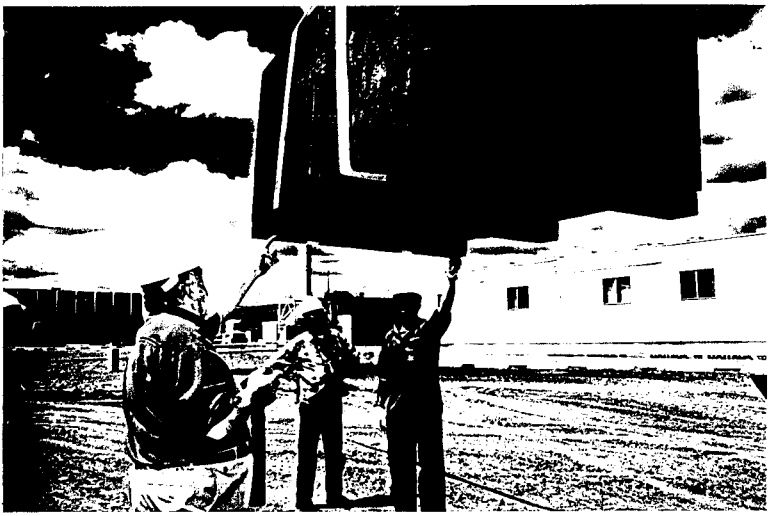
Distance ranges from 6 to 6 1/4 inches across

Revision 2 Riser Modification:

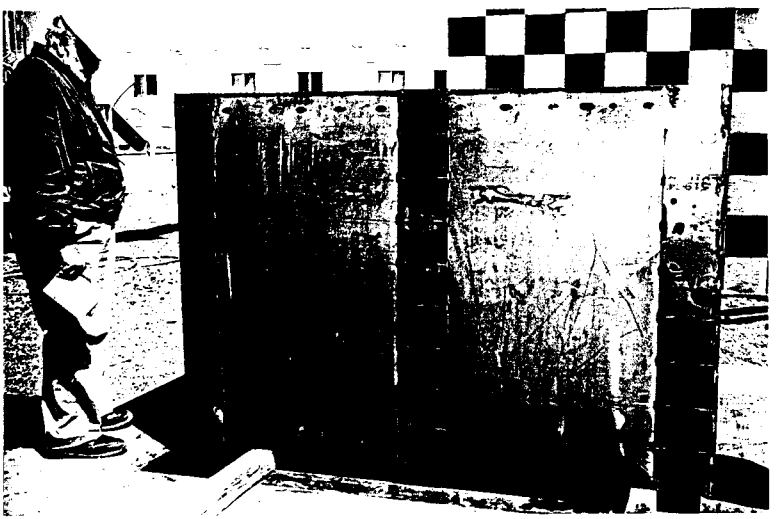


7-inch plate welded in three locations onto the bottom of the container.
The plate is securred by 2 tack welds at each end. A total of 8, 1 to 1 1/4 inch welds secure the plate onto the container base. These welds are every 6 inches, on center. The Revision 2 modification incorporates the riser design from the Revision 1 modification, plus the plate.

Revision 1 Riser Modification:



Revision 2 Riser Modification (Plate Only):



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APPENDIX B

OPENING, LOADING, AND CLOSURE PROCEDURE FOR TESTING

The containers will arrive with a system of temporary fasteners securing the cover in place. The temporary fastener system is configured to protect the gasket during shipment. The vent filter, seals, and the cover fasteners will be stowed within the container, arranged for easy retrieval. The container cover will arrive with the gasket cemented in place. Care must be taken not to damage the gasket while handling the cover.

B1.0 Container Handling

1. The containers are equipped with three (3) risers to facilitate forklift handling. An alternate system of removable risers is available to facilitate efficient storage at the repository.

2. The containers are equipped with a system of four (4) lifting lugs which permit the overhead lifting of the container by lifting frame or cable slings. Consult site lifting and rigging regulations before overhead lifting.

3. Care must be taken to tighten the lid fastening bolts before overhead lifting.

B2.0 Removal of the Cover

1. Remove the temporary fasteners using a 9/16-in. socket wrench.

2. Carefully remove the cover so as not to damage the gasket material. The cover may be lifted manually by four individuals.

3. Lay the cover horizontally onto a flat, even surface. If inspection of the gasket material is needed, ensure the cover lid is gasket-side up (flanges up).

B3.0 Inspection of Gasket Material

1. Inspect the gasket material to ensure it is smooth and continuous, and that no rips or tears exist.

2. If replacement of the gasket is needed, follow the steps in B4.0.

B4.0 Replacement of Gasket Material

1. Remove the old gasket material completely. Scrape away all adhesive to provide a clean, smooth surface.

2. Square cut the gasket material to exact lengths. Four (4) pieces are required.

3. Remove all loose materials from the bonding surface.

4. Clean the area of the cover where the gasket is to be applied with mineral spirits.

5. Coat the surfaces of the cover where the gasket is to be applied with Trubond contact cement, Federal Specification MMM-A-130B (or equivalent), according to the manufacturer's instructions.

6. Coat the surfaces of the gasket to be butt-joined.

7. Place the gasket in the cover. Care must be taken to position the gasket accurately the first time as bonding will occur upon contact. Any effort to reposition or remove the gasket will result in tearing of the gasket material.

8. As the gasket is laid within the cover, do not pull or stretch the material. Such actions will thin the gasket material and will cause an excess of material beyond the original cut length. Thinning of the gasketing material may have a negative effect upon the performance of the packaging to contain material contents.

9. Assure that the butt-joints are properly positioned and bonded.

B5.0 Installation of NucFil 013 Filter

1. Clean surface around the threaded filter hole, and assure it is free of dirt.

2. Thread the filter, with its gasket, into the recessed filter fitting located on one end of the container.

3. Tighten the filter to 11 ft-lb (+2.0/-0.0) with a calibrated wrench.

B6.0 Loading the Simulated Contents

NOTE: One filtered packaging will be provided for testing. The balance of the containers will be fitted with a typical drum plug which is identical to the filter in material and external geometry. Prior to any loading of simulated contents, check the torque level of the plugs that will be in six of the test units. During transportation to the Hanford site, possible loosening may occur. With a calibrated wrench, ensure that the torque level is 11.0 ft-lb (+2.0/-0.0).

NOTE: Prior to any loading of simulated contents, cover/protect the bolt holes of the container body so that materials do not drop into this space.

NOTE: A mixture of flour and fluorescein will be added to simulate Form No. 1 materials and for leak detection. Care is to be taken so that clumping of the flour and fluorescein mixture will not occur due to the natural moisture that is found in sand/soil. This mixture will be added as follows:

43-TU-07: This test unit has risers welded to the underside of the container body. This test unit will contain a plug, not a filter. This test unit will be an empty packaging, and no simulated contents will be added for testing purposes.

43-TU-01, 43-TU-02, 43-TU-03, 43-TU-04, 43-TU-05, 43-TU-07: Test unit 43-TU-01 has removable risers that are located under the container body. The other test units have risers welded to the underside of the container body. For testing purposes, these test units will contain plugs, not a filter. **These test units will be dropped onto the bottom portion of the container.** Add the flour and fluorescein mixture around the bottom of the container at the location where the sidewalls and base intersect. Lay a piece of thin, plastic sheeting loosely on top of this mixture. Continue loading the remaining simulated contents of sand/soil mixture and six drums according to B6.1 below.

43-TU-04: This test unit was first used for a drop onto the top portion of the container. The sponsor requested this container be used for a drop onto the bottom portion of the container. This test unit did not have the flour and fluorescein mixture added around the base of the container.

43-TU-07: This test unit was used for the stack test. After the stack test, the risers on this test unit underwent modification. This test unit was then used for drop testing onto the bottom portion of the container; therefore, the flour and fluorescein mixture was added around the bottom of the container at the location where the sidewalls and base intersect. A piece of thin, plastic sheeting was placed loosely on top of this mixture. The remaining simulated contents of sand/soil and six drums were then added.

43-TU-04, ~~43-TU-02~~, ~~43-TU-05~~: These test units have risers welded to the underside of the container body. For testing purposes, these test units will contain plugs, not a filter. **These test units will be dropped onto the top portion of the container.** Load the six drums into the container and fill the void space surrounding the drums with sand/soil mixture according to B6.1 below. Lay a piece of thin, plastic sheeting on top of the sand/soil. Add the flour and fluorescein mixture near the top edges of the container prior to closure.

43-TU-02: After being dropped onto the bottom portion of the container, this test unit underwent a drop onto the top portion of the container. Prior to the top drop, the container was opened, the flour and fluorescein mixture was added around the edges of the container, and the container was closed.

43-TU-06: This test unit has risers welded to the underside of the container body. For testing purposes, this will be a filtered packaging. This test unit will be dropped on its side at the filter location. Load the six drums into the container and fill some of the void space surrounding the drums with sand/soil mixture according to B6.1 below. Be sure to leave the area around the filter free. Place the flour and fluorescein mixture around the filter area. ~~Place a piece of cheesecloth (or other suitable material that will allow air flow around the filter) around the area where the trace material has been added.~~ Continue loading of simulated contents. Lay a piece of thin, plastic sheeting on top of the sand/soil. Add more flour and fluorescein mixture near the top edges of the container prior to closure. Note: Due to the design of the container, it was not necessary to add the cheesecloth around the filter area. The filter is protected by a channel.

B6.1 Loading Six (6) Drums

1. Place six (6), 55-gal drums into the container using a drum grapple.

2. Either by the use of a front-end loader or by hand, fill the void space between the container and drums with dirt/sand mixture to the container's rated weight.

B7.0 Closure

1. Inspect the gasket material per B3.0.

2. Ensure that the gasket surface is free from loose dirt. Care must be taken not to damage the gasket surface.

3. Place the cover onto the container, gasket-side down. The cover may be lifted manually by four (4) individuals. Care must be taken so as to not damage the gasket surface.

4. The container cover is secured with a system of conventional, high-strength bolts and washers. Two (2) of the bolts are painted red and drilled to receive the stranded wire of the tamper-proof seal. These bolts are to be placed at diagonal corners of the container, in a hole adjacent to the lifting lug. These bolts were not supplied for testing.

5. Place a lock washer, then flat washer onto a bolt. Thread the bolt into a tapped hole in the container body until finger tight. Repeat the process at each bolt hole.

6. Starting at a corner, alternate holes (every-other-one) until all bolts are in place. Remember to place the red-painted bolts at diagonal corners of the container, in a hole adjacent to the lifting lug.

   The following pattern will be used during testing:

1	14	2	15	3	16	4
26						17
13						5
25						18
12						6
24						19
11						7
23	10	22	9	21	8	20

7. Torque the bolts to 450 in-lb (±10%), (38 ft-lb [±10%]) using a calibrated wrench.

8. The tamper-proof wire will not be added during testing.

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Brainard Associates, Inc.
Low-level Waste Container Specialists
5381 Brainard Road, Solon, Ohio 44139
Voice: (216) 498-9199 FAX: (216) 498-9141 e-mail: ba@en.com

CONTAINER OPERATING INSTRUCTIONS
M-101/7A/12/90
ISSUE 4 Rev. 1

LOADING - (6) DRUM payload

- Place six (6) 55 gallon drums in the container using a drum grapple.
- Care must be taken not to exceed the container's rated weight.
- Clean the gasketing surface until it is free from loose dirt.
- Care must be taken not to damage the gasketing surface.

LOADING - LOOSE MATERIALS, ANY PARTICULATE SIZE

- Either by the use of a front end loader or by hand, load the container with materials to the container's rated weight.
- Clean the gasketing surface until it is free from loose dirt.
- Care must be taken not to damage the gasketing surface.
- The container will arrive with a system of temporary fasteners securing the cover in place. The temporary fastener system is configured to protect the gasket during shipment. The vent filter (as required), the seals, and the cover fasteners will be stowed within the container, arranged for easy retrieval. The container cover will arrive with the gasket cemented in place. Care must be taken not to damage the gasket while handling the cover. In the event the gasket must be replaced in the field, the following instructions should be followed.
- Lay the cover horizontally, flanges up.
- Remove the old gasket material completely. Scrape away all adhesive to provide a clean smooth surface.
- Square cut the gasket material to exact lengths, four (4) pieces are required.
- Remove all loose materials from the bonding surface
- Clean the cover gasket area with mineral spirits.
- Coat the surfaces to be bonded according to the manufacturers instructions.
- Coat the surfaces of the gasket to be butt-joined.
- Place the gasket in the cover. Care must be taken to position the gasket
- accurately the first time. It will bond immediately upon contact. Any effort to reposition or remove the gasket will result in tearing the gasket material.
- Assure that the butt joints are properly positioned and bonded
- As the gasket is laid within the cover do not pull or stretch the material. Such actions will thin the material and will cause an excess of material beyond the original cut length.

CONTAINER HANDLING

- The M-100 containers are equipped with three (3) fixed risers to facilitate fork lift handling, and a system of four (4) lifting lugs which permit the overhead lifting of the container by lifting frame or cable slings. Care must be taken to tighten the lid fastening bolts before overhead lifting. Consult site lifting and rigging regulations before overhead lifting.

- An alternate system of removable risers is available to facilitate efficient storage at the repository.

CLOSURE

- The container cover is secured with a system of conventional high strength bolts and washers. Two (2) of the bolts are painted red and drilled to receive the stranded wire of the tamper proof seal. These bolts are to be placed at diagonal corners of the container, in a hole adjacent to the lifting lug.
- Place the cover upon the container, taking care not to disturb the gasket.

- Thread a bolt with its washer and lock washer in place into each of the holes. Starting at the corner, alternate holes(every other one) until all bolts are in place.
- Torque the bolts to 450 (+/- 10%) in.lb.
- Thread the stranded wire through the drilled bolt head and the cover lifting lug and secure the lead seal. Repeat the process at the diagonal corner

SUBMITTED May 9, 1997

JAMES D. GREAVES
VP ENGINEERING
m1hnts5.doc

APPENDIX C

TEST DATA SHEETS

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Westinghouse Hanford Company

NDE ULTRASONIC MEASUREMENT PROCEDURE AND TEST REPORT

NONDESTRUCTIVE EXAMINATION
306 BLDG., 300 AREA - TEL. 376-5401

Job No. 97-14

Requester (client)	Company	MSIN	Bldg.	Area
DONNA KELLY	RFSNW	HI-15	N/A	1100

Project/System/Work Package/Traveler No.
PERFORM ULTRASONIC MEASURMENTS ON 7EA. METAL BOXES TO ENSURE MATERIAL IS 12 GA. C/S

Acceptance Std.	Section	Para.	Date	
				[X] NA

PART INFORMATION

Material	CARBON STEEL	
Wall Thickness	.0946 TO .1046	[ ] NA
Diameter		[X] NA
Schedule		[X] NA
Size	12 GA.	[ ] NA

Dwg. No. [X] NA

NCR [X] NA

WHC PROCEDURE NO.
NDT-UT-9000, Revision No. 3
Appendix A Revision No. 3

Special Technique No. [X] NA

COVERAGE
[X] 100% of Area Requested
[ ] Other

INSTRUMENTATION
Mfg. STAVELEY Model SONIC 124D
Standards Lab No. 584-31-50-024
Expiration Date 4/98

CALIBRATION STANDARD(S)
Standards Lab No. 584-99-30-125
Expiration Date 12/98
Standards Lab No.
Expiration Date

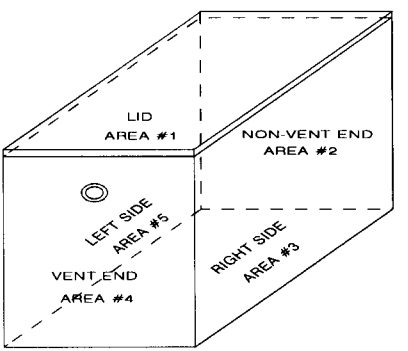
TRANSDUCER
Diameter 1/4"
Frequency 5 MHZ
Mfg. NORTEC
Serial No. 931888
Stand Off NONE

Couplant ULTRAGELL II
Batch No. 8336

RESULTS

BOX# 43-TU-01	BOX# 43-TU-02	BOX# 43-TU-03
AREA	AREA	AREA
#1 .105"	#1 .105"	#1 .104"
#2 .105"	#2 .108"	#2 .107"
#3 .115"	#3 .107"	#3 .105"
#4 .113"	#4 .107"	#4 .108"
#5 .108"	#5 .105"	#5 .110"

BOX# 43-TU-04	BOX# 43-TU-05	BOX# 43-TU-06	BOX# 43-TU-07
AREA	AREA	AREA	AREA
#1 .107"	#1 .105"	#1 .106"	#1 .105"
#2 .107"	#2 .111"	#2 .108"	#2 .108"
#3 .105"	#3 .113"	#3 .109"	#3 .109"
#4 .108"	#4 .106"	#4 .109"	#4 .109"
#5 .102"	#5 .110"	#5 .109"	#5 .109"



Technician	UT Level	Interpreted by	UT Level	Reviewed by
BILL PURDY	I	JAMES N FURTH	II	
Date of examination		Date of examination		Date
28 MAY 1997		C-3 28 MAY 1997		5-28-97

7-24-97

WESTINGHOUSE STANDARDS LABORATORY PHYSICAL AND ELECTRICAL REPORT

CUSTODIAN/ADDRESS: ANDERSON AA L6-36	STANDARDS CODE NUMBER: 584-99-30-125				NEW		REFERENCE NUMBER: 396041
					MODIFY		
					ORGANIZATION CODE: W8A300		WORK ORDER: M8A30
INSTRUMENT: C-S STEP WEDGE MFGR. UNKNOWN 6 INCH LG X 1 INCH WD	SERIAL NUMBER: N/A	PROPERTY NUMBER: N/A	RECALL STATUS: 1 ACTIVE, 2 NONRECALL, 3 SUSPENDED, 4 DELETED, 5 PM, 6 NONDATA M&TE: 1		RECALL CYCLE: 1080		TOLERANCE HISTORY: NN
	ROOM: 165	BUILDING: 306-E	SERVICE DEPARTMENT: 6		DATE RECEIVED: 951213		TOLERANCE AS RECEIVED: 1 IN, 2 OUT, 3 NA, 4 FAILED: 1
SENDER: W)AARON 2-0719	COMMENTS: 6 STEPS				SHIPPING DAY: WE		

INSTRUMENT SPECIFICATIONS: See below

STANDARD(S) USED IN CALIBRATION TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY OR NATIONALLY RECOGNIZED STANDARDS — 4:1 RATIO Y ☒ N ☐

	EXPIRATION DATE		EXPIRATION DATE
002-50-02-001	06-13-96	- -	- -
- -	- -	- -	- -
- -	- -	- -	- -

REMARKS: Removed rust + burrs

PROCEDURE NUMBER: WHC-99-30-THICKNESS(4-87)

TRAINING HOURS	
CALIBRATION HOURS	1.0
REPAIR HOURS	1.0
OTHER HOURS	
MATERIALS	
TOTAL CHARGE = ($120 x SUM OF HOURS) + MATERIALS	
DATE CALIBRATED	DATE DUE
121595	121598
AMBIENT TEMPERATURE	68°F

TEST POINTS	AS FOUND	FINAL	TOLERANCE
.950"	.9507"	same	±.001"
.750"	.7505"	"	"
.500"	.5004"	"	"
.250"	.2504"	"	"
.100"	.1003"	"	"
.050"	.0499"	"	"

APPROVED BY: D.J. Nelson 12-18-95

CALIBRATED BY: MEC

WHC STD LAB 50

Hanford Operations and Engineering Contractor for the United States Department of Energy

Westinghouse Hanford Company Subsidiary of Westinghouse Electric Corporation Box 1970, Richland, WA 99352

PAGE 1 OF 1

WESTINGHOUSE STANDARDS LABORATORY PHYSICAL AND ELECTRICAL REPORT

CUSTODIAN/ADDRESS: ANDERSON AA L6-36

STANDARDS CODE NUMBER: 584-31-50-024

NEW / MODIFY: MODIFY

REFERENCE NUMBER: 405507

ORGANIZATION CODE: W8A300

WORK ORDER: M8A30

INSTRUMENT: THICKNESS GAUGE SONIC NDT-124D DIGITAL U.T.

SERIAL NUMBER: 902-D

PROPERTY NUMBER: N/A

RECALL STATUS: 1 ACTIVE, 2 NONRECALL, 3 SUSPENDED, 4 DELETED, 5 PM, 6 NONDATA M&TE — 1

RECALL CYCLE: 360

TOLERANCE HISTORY: IIII

ROOM: 165

BUILDING: 306E

SERVICE DEPARTMENT: 3

DATE RECEIVED: 961122

TOLERANCE AS RECEIVED: 1 IN, 2 OUT, 3 NA, 4 FAILED

SENDER: AARON 2-0719

COMMENTS

CO ID: B

SD: WE

INSTRUMENT SPECIFICATIONS: SEE MANUAL AND BELOW

TRAINING HOURS:

CALIBRATION HOURS: 3.0

REPAIR HOURS:

OTHER HOURS:

ENG/ADMIN HOURS:

MATERIALS:

TOTAL CHARGE = ($125 x SUM OF HOURS) + MATERIAL

STANDARD(S) USED IN CALIBRATION TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY OR NATIONALLY RECOGNIZED STANDARDS — 4:1 RATIO Y [X] N [ ]

	EXPIRATION DATE		EXPIRATION DATE
002-10-01-005	7-25-97		
002-79-01-038	3-7-98		
001-84-01-004 (1000 4-7-97)	1-29-98		

REMARKS: CHARGER NG - USED MY ESTD SMH2 *821808 - RAN OUT W/AS

*ADDS NOT VALID - COULD NOT GET OUT TO SWITCH RANGES @ 2"

DATE CALIBRATED: 4-9-97

DATE DUE: 4-9-98

PROCEDURE NUMBER: WHC-NTC-124D(1979)

AMBIENT TEMPERATURE = 22°C

XTAL	RANGE	GAGE BLOCK	AS FOUND	FINAL	TOLERANCE
NORTEC	0.2 INCHES	0.050	.050	SAME	+/-0.003 INCH
E-STD 5 MHZ	0.2 INCHES	0.100	.099		+/-0.003 INCH
E-STD 5 MHZ	0.2 INCHES	0.200	.200		+/-0.003 INCH
E-STD 5 MHZ	2.0 INCHES	0.2	.200		+/-0.003 INCH
E-STD 5 MHZ	2.0 INCHES	1.0	1.000		+/-0.003 INCH
E-STD 5 MHZ	2.0 INCHES	2.0	1.999		+/-0.030 INCH
E-STD 5 MHZ	10 INCHES	2.0	1.999		+/-0.030 INCH
E-STD 5 MHZ	10 INCHES	5.0	5.05*		+/-0.030 INCH
E-STD 5 MHZ	10 INCHES	8.0	8.00		+/-0.030 INCH
		3.0	3.00		± .030
		5.0	5.02		
		8.0	8.00		

APPROVED BY: [signature] 4/14/97

CALIBRATED BY: SHOLAR 30 — 4-9-97

Hanford Operations and Engineering Contractor for the United States Department of Energy

Westinghouse Hanford Company Subsidiary of Westinghouse Electric Corporation Box 1970, Richland, WA 99352

PAGE 1 OF 1

Mark Wrench ~~HNF-SD-OTP-004~~ Rev. 1 CW

WESTINGHOUSE STANDARDS LABORATORY PHYSICAL AND ELECTRICAL REPORT

CUSTODIAN/ADDRESS: CASTO ML L6-38	STANDARDS CODE NUMBER: 678-88-01-004			NEW / MODIFY	REFERENCE NUMBER: 406558
				ORGANIZATION CODE: W8A200	WORK ORDER: N4HDF
INSTRUMENT: TORQUE WRENCH PROTO 6062-5 10-200 IN-LBS.	SERIAL NUMBER: 73223	PROPERTY NUMBER: N/A	RECALL STATUS: 1	RECALL CYCLE: 360	TOLERANCE HISTORY: IIII
	ROOM: N/A / BUILDING: 306E	SERVICE DEPARTMENT: 8		DATE RECEIVED: 970120	TOLERANCE AS RECEIVED: 1
SENDER: F BOLSON 3-0094	COMMENTS			CO ID: J / SD: WE	

RECALL STATUS: 1 ACTIVE, 2 NONRECALL, 3 SUSPENDED, 4 DELETED, 5 PM, 6 NONDATA M&TE

TOLERANCE AS RECEIVED: 1 IN, 2 OUT, 3 NA, 4 FAILED

INSTRUMENT SPECIFICATIONS: +/-4% RDG; NO ACCURACY REQUIREMENT FROM 0% THRU 20% OF FULL SCALE

STANDARD(S) USED IN CALIBRATION TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY OR NATIONALLY RECOGNIZED STANDARDS — 4:1 RATIO Y ☐ N ☒ (not available)

EXPIRATION DATE	EXPIRATION DATE
002-29-03-011	05-20-97

TRAINING HOURS	
CALIBRATION HOURS	1.0
REPAIR HOURS	
OTHER HOURS	
ENG/ADMIN HOURS	
MATERIALS	
TOTAL CHARGE = ($150 x SUM OF HOURS) + MATERIALS	

REMARKS: CLOCKWISE ONLY

DATE CALIBRATED	DATE DUE
01/21/97	01/21/98

PROCEDURE NUMBER: WHC-8-TORQUE-WRENCH REV.0

AMBIENT TEMPERATURE = 68°F

TEST POINT	AS FOUND CW	FINAL CW	TOLERANCE
20% OF FULL SCALE 40 IN/LBS.	39	same	SEE ABOVE
40% OF FULL SCALE 80 "	81	"	SEE ABOVE
60% OF FULL SCALE 120 "	122	"	SEE ABOVE
80% OF FULL SCALE 160 "	165	"	SEE ABOVE
100% OF FULL SCALE 200 "	206	"	SEE ABOVE

APPROVED BY	CALIBRATED BY	WHC STD LAB	Hanford Operations and Engineering Contractor for the United States Department of Energy	Westinghouse Hanford Company Subsidiary of Westinghouse Electric Corporation Box 1970, Richland, WA 99352	PAGE
MM Mercado 1/22/97	MEC	50			1 OF 1

HANFORD STANDARDS LABORATORY PHYSICAL AND ELECTRICAL REPORT

CUSTODIAN/ADDRESS	LEECH NJ L6-13
STANDARDS CODE NUMBER	750-88-01-006
NEW / MODIFY	X
REFERENCE NUMBER	409042
ORGANIZATION CODE	W80000
WORK ORDER	TG71C
INSTRUMENT	TORQUE WRENCH PROTO 6008-4 5-80 FT/LBS.
SERIAL NUMBER	120582
PROPERTY NUMBER	N/A
RECALL STATUS (1 ACTIVE, 2 NONRECALL, 3 SUSPENDED, 4 DELETED, 5 PM, 6 NONDATA M&TE)	2
RECALL CYCLE	270 ~~360~~ 5/30/97
TOLERANCE HISTORY	OI
ROOM	N/A
BUILDING	305
SERVICE DEPARTMENT	8
DATE RECEIVED	970513
TOLERANCE AS RECEIVED (1 IN, 2 OUT, 3 NA, 4 FAILED)	2*
SENDER	D SQUIER 6-4346
COMMENTS	
CO ID	8
SD	WE

INSTRUMENT SPECIFICATIONS
+/-4% RDG; NO ACCURACY REQUIREMENT FROM 0% THRU 20% OF FULL SCALE

STANDARD(S) USED IN CALIBRATION TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY OR NATIONALLY RECOGNIZED STANDARDS 4:1 RATIO Y [X] N [ ]

STANDARD	EXPIRATION DATE
002-29-03-011	05-06-98

TRAINING HOURS (NO CHARGE)	
CALIBRATION HOURS	0.8
REPAIR HOURS	0.8
OTHER HOURS	
ENG/ADMIN HOURS	.4X
MATERIALS	
TOTAL CHARGE = ($150 x SUM OF HOURS) + MATERIAL	
DATE CALIBRATED	052897
DATE DUE	052898

REMARKS
CLOCKWISE ONLY
* = Out of spec.

PROCEDURE NUMBER WHC-8-TORQUE-WRENCH REV.0 80 FT/LBS.

AMBIENT TEMPERATURE = 68°F

TEST POINT	AS FOUND	FINAL	TOLERANCE FT/LBS.
20% OF FULL SCALE 16 FT/LBS.	15.33	14.50	SEE ABOVE N/A
40% OF FULL SCALE 32 "	32.83	31.08	SEE ABOVE ±1.3
60% OF FULL SCALE 48 "	* 50.92	48.00	SEE ABOVE ±1.9
80% OF FULL SCALE 64 "	* 69.16	64.92	SEE ABOVE ±2.6
100% OF FULL SCALE 80 "	* 86.66	79.75	SEE ABOVE ±3.2

note: recall cycle change to 270 days because of poor tolerance history
Mercado 5/30/97

APPROVED BY	CALIBRATED BY	WHC STD LAB		PAGE
Mercado 5/30/97	MEC	50	Project Hanford Management Contractor for the United States Department of Energy — DynCorp Tri-Cities Services, Inc, P.O. Box 1400 Richland, WA 99352	1 OF 1

RUSH

Physical and Electrical Standards Laboratory
NOTICE OF DISCREPANCY MEASURING AND TEST EQUIPMENT

To: N.J. Leech
L6-13

Instrument Name Torque wrench
Standards Code No. 750-88-01-006
Property No. S/N. 120582
Date 5/28/97

While performing "as found" calibration on the above M&TE, out-of-tolerance readings were noted as seen on the attached report. The disposition of the item is as follows:

[X] Repaired and calibrated to original manufacturer specifications

[ ] * Conditionally accept item "as is".

[ ] * Repaired to acceptable conditions within the following limits:

REJECT:

[ ] – Beyond economical repair at Standards Laboratory

[ ] – No parts available at Standards Laboratory

[ ] – No manual, prints, etc., available at Standards Laboratory

*Attach Limited Calibration Label

If your investigations into situations where material inspected or data collected by the discrepant item since last calibrated may have been erroneously accepted; notify Quality Assurance of actions initiated to control such material or data.

Stds Lab: Mercado 5/30/97

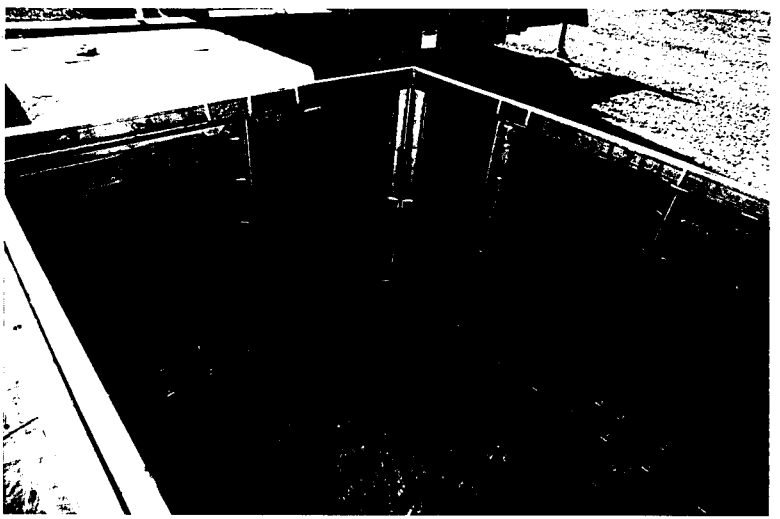
Distribution: Custodian
Quality Assurance
File

Hanford Operations and
Engineering Contractor
for the U.S. Department of Energy

Westinghouse Hanford Co.
Subsidiary of Westinghouse
Electrical Corpration
Box 1970
Richland, WA 99352

Interior of M-100:

Interior of M-100:

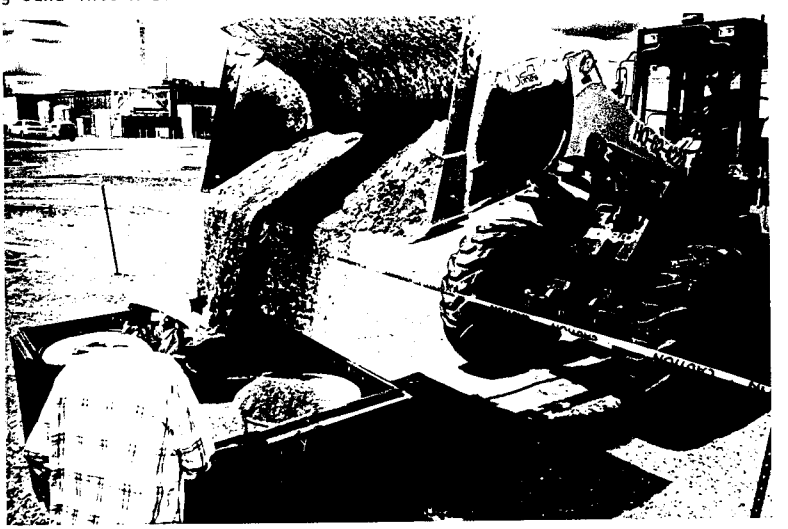


Adding Fluorescein and Flour Mixture into M-100:

Placement of Thin Plastic Sheeting (Moisture Barrier) and Drum into M-100:

Loading Drums into M-100:

Adding Sand into M-100:



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DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-01

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/2/97

Component: Container body and cover	Accept [X] Reject [ ]
Remarks: Verify 12 gauge (0.1046 in. to 0.0946 in.). (Refer to NDE Ultrasonic Measurement Procedure and Test Report, Job No. 97-14, dated May 28, 1997).	
Ensure no dents affecting closure or performance.	
Welds to be continuous--no sharp edges.	

Component: Gasket sealing surface	Accept [X] Reject [ ]
Remarks: Ensure clean and smooth surface.	

Component: Gasket	Accept [X] Reject [ ]
Remarks: Ensure clean, smooth, continuous.	
Ensure no rips or tears.	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-01

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/2/97

Component: Bolts and Bolt holes	Accept [X] Reject [ ]
Remarks: Ensure clean and no fouled threads exist.	

Component: Plug (this is a non-filtered test unit)	Accept [X] Reject [ ]
Remarks: Ensure no visible cracks.	
Ensure installation is to the proper torque (11.0 ft-lb +2.0/-0.0).	

Component: Lift Lugs	Accept [X] Reject [ ]
Remarks: Ensure there are no visible cracks.	
Note: This is a painted container and incorporates a removable riser configuration.	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-02

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/5/97

Component: Container body and cover	Accept [X] Reject [ ]
Remarks: Verify 12 gauge (0.1046 in. to 0.0946 in.). (Refer to NDE Ultrasonic Measurement Procedure and Test Report, Job No. 97-14, dated May 28, 1997).	
Ensure no dents affecting closure or performance.	
Welds to be continuous--no sharp edges.	
Note: The top of this lid appears slightly warped outward. When measured from the center of the lid, the distance is 17 inches on each side, for a total distance of 34 inches. The shape is convex.	
Note: The original riser configuration on this test unit was revised on 6/4/97 (Rev. 1).	
Component: Gasket sealing surface	Accept [X] Reject [ ]
Remarks: Ensure clean and smooth surface.	
Component: Gasket	Accept [X] Reject [ ]
Remarks: Ensure clean, smooth, continuous.	
Ensure no rips or tears.	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-02

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/5/97

Component: Bolts and Bolt holes	Accept [X] Reject [ ]
Remarks: Ensure clean and no fouled threads exist.	

Component: Plug (this is a non-filtered test unit)	Accept [X] Reject [ ]
Remarks: Ensure no visible cracks.	
Ensure installation is to the proper torque (11.0 ft-lb +2.0/-0.0).	

Component: Lift Lugs	Accept [X] Reject [ ]
Remarks: Ensure there are no visible cracks.	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-03

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/9/97

Component: Container body and cover	Accept [X] Reject [ ]
Remarks: Verify 12 gauge (0.1046 in. to 0.0946 in.). (Refer to NDE Ultrasonic Measurement Procedure and Test Report, Job No. 97-14, dated May 28, 1997).	
Ensure no dents affecting closure or performance.	
Welds to be continuous--no sharp edges.	
Note: The original riser configuration on this test unit was revised on 6/4/97 (Rev. 1), and then again on 6/5/97 (Rev. 2).	
Component: Gasket sealing surface	Accept [X] Reject [ ]
Remarks: Ensure clean and smooth surface.	
Component: Gasket	Accept [X] Reject [ ]
Remarks: Ensure clean, smooth, continuous.	
Ensure no rips or tears.	
Note: One section is pieced in and a slight gap exists.	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-03

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

Component: Bolts and Bolt holes	Accept [X] Reject [ ]
Remarks: Ensure clean and no fouled threads exist.	

Component: Plug (this is a non-filtered test unit)	Accept [X] Reject [ ]
Remarks: Ensure no visible cracks.	
Ensure installation is to the proper torque (11.0 ft-lb +2.0/-0.0).	

Component: Lift Lugs	Accept [X] Reject [ ]
Remarks: Ensure there are no visible cracks.	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-04

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/2/97

Component: Container body and cover	Accept [X] Reject [ ]
Remarks: Verify 12 gauge (0.1046 in. to 0.0946 in.). (Refer to NDE Ultrasonic Measurement Procedure and Test Report, Job No. 97-14, dated May 28, 1997).	
Ensure no dents affecting closure or performance.	
Welds to be continuous--no sharp edges.	

Component: Gasket sealing surface	Accept [X] Reject [ ]
Remarks: Ensure clean and smooth surface.	

Component: Gasket	Accept [X] Reject [ ]
Remarks: Ensure clean, smooth, continuous.	
Ensure no rips or tears.	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-04

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6-2-97

Component: Bolts and Bolt holes	Accept [X] Reject [ ]
Remarks: Ensure clean and no fouled threads exist.	

Component: Plug (this is a non-filtered test unit)	Accept [X] Reject [ ]
Remarks: Ensure no visible cracks.	
Ensure installation is to the proper torque (11.0 ft-lb +2.0/-0.0).	

Component: Lift Lugs	Accept [X] Reject [ ]
Remarks: Ensure there are no visible cracks.	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-05

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

Component: Container body and cover	Accept [X] Reject [ ]
Remarks: Verify 12 gauge (0.1046 in. to 0.0946 in.). (Refer to NDE Ultrasonic Measurement Procedure and Test Report, Job No. 97-14, dated May 28, 1997).	
Ensure no dents affecting closure or performance.	
Welds to be continuous--no sharp edges.	
Note: The original riser configuration on this test unit was revised on 6/4/97 (Rev. 1), and then again on 6/5/97 (Rev. 2).	
Component: Gasket sealing surface	Accept [X] Reject [ ]
Remarks: Ensure clean and smooth surface.	
Component: Gasket	Accept [X] Reject [ ]
Remarks: Ensure clean, smooth, continuous.	
Ensure no rips or tears.	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-05

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

Component: Bolts and Bolt holes	Accept [X] Reject [ ]
Remarks: Ensure clean and no fouled threads exist.	

Component: Plug (this is a non-filtered test unit)	Accept [X] Reject [ ]
Remarks: Ensure no visible cracks.	
Ensure installation is to the proper torque (11.0 ft-lb +2.0/-0.0).	

Component: Lift Lugs	Accept [X] Reject [ ]
Remarks: Ensure there are no visible cracks.	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-06

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/6/97

Component: Container body and cover	Accept [X] Reject [ ]
Remarks: Verify 12 gauge (0.1046 in. to 0.0946 in.). (Refer to NDE Ultrasonic Measurement Procedure and Test Report, Job No. 97-14, dated May 28, 1997).	
Ensure no dents affecting closure or performance.	
Welds to be continuous--no sharp edges.	
Note: The original riser configuration on this test unit was revised on 6/4/97 (Rev. 1).	
Component: Gasket sealing surface	Accept [X] Reject [ ]
Remarks: Ensure clean and smooth surface.	
Component: Gasket	Accept [X] Reject [ ]
Remarks: Ensure clean, smooth, continuous.	
Ensure no rips or tears.	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-06

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/6/97

Component: Bolts and Bolt holes	Accept [X] Reject [ ]
Remarks: Ensure clean and no fouled threads exist.	

Component: NucFil Filter (NucFil-013, PAT - 4500328)	Accept [X] Reject [ ]
Remarks: Ensure no visible cracks.	
Ensure installation is to the proper torque (11.0 ft-lb +2.0/-0.0).	

Component: Lift Lugs	Accept [X] Reject [ ]
Remarks: Ensure there are no visible cracks.	

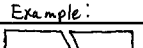
DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-07

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/2/97

Component: Container body and cover	Accept [X] Reject [ ]
Remarks: Verify 12 gauge (0.1046 in. to 0.0946 in.). (Refer to NDE Ultrasonic Measurement Procedure and Test Report, Job No. 97-14, dated May 28, 1997).	
Ensure no dents affecting closure or performance.	
Welds to be continuous--no sharp edges.	
Note: The top of this lid appears slightly warped outward. When measured from the center of the lid, the distance is 18.5 inches on each side, for a total distance of 37 inches. The shape is convex.	
Component: Gasket sealing surface	Accept [X] Reject [ ]
Remarks: Ensure clean and smooth surface.	
Component: Gasket	Accept [X] Reject [ ]
Remarks: Ensure clean, smooth, continuous.	
Ensure no rips or tears.	
Note: The gasket has a diagonal gap where the cut does not match. This is located along one lengthwise side. Per sponsor's agreement, this was acceptable for use in the stack test. Example: 	
Note: Because of the failure of the first drop that was performed on 43-TU-02, the lid from 43-TU-07 was used in conjunction with the second drop test on 43-TU-02. Prior to completing the second drop test on 43-TU-02, the gasket from 43-TU-07 was not replaced per the sponsor's agreement. Although this gasket had compressed during the compression test, the lid had been removed and set into place. Therefore, there was no visible signs of compression on this gasket.	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.1
PACKAGING VISUAL INSPECTIONS

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-07

Perform inspections per procedure Section 6.4.1.

Test Engineer: Donna L. Kelly/ Donna L Kelly

Date: 6/2/97

Component: Bolts and Bolt holes	Accept [X] Reject [ ]
Remarks: Ensure clean and no fouled threads exist.	
Hole #19 had to be tapped out prior to insertion of screw.	

Component: Plug (this is a non-filtered test unit)	Accept [X] Reject [ ]
Remarks: Ensure no visible cracks.	
Ensure installation is to the proper torque (11.0 ft-lb +2.0/-0.0).	

Component: Lift Lugs	Accept [X] Reject [ ]
Remarks: Ensure there are no visible cracks.	
Note: The original riser configuration on this test unit was revised on 6/4/97 (Rev. 1) (and after the stack test). and then again on 6/5/97 (Rev. 2).	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.2
PACKAGING COMPONENT WEIGHTS

DOCKET: 96-43-7A

4 dlk

Measure major component weights and record per procedure Section 6.4.2.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/9/97

TEST UNIT NUMBER	COMPONENT	WEIGHT
43-TU-01		
	Container Body	800 lb
	Cover	160 lb
	(Without Simulated Payload) NET (TARE) WEIGHT:	960 lb
	(With Simulated Payload) GROSS WEIGHT:	10,900 lb
TEST UNIT NUMBER	COMPONENT	WEIGHT
43-TU-02		
	Container Body	800 lb
	Cover	180 lb
	(Modified riser config - Rev. 1)	
	(Without Simulated Payload) NET (TARE) WEIGHT:	980 lb
	(With Simulated Payload) GROSS WEIGHT:	9,340 lb
TEST UNIT NUMBER	COMPONENT	WEIGHT
43-TU-03		
	Container Body	820 lb
	Cover	160 lb
	(Modified riser config - Rev. 2)	
	(Without Simulated Payload) NET (TARE) WEIGHT:	980 lb
	(With Simulated Payload) GROSS WEIGHT:	9,260 lb

DOT-7A PROGRAM
TEST DATA SHEET 6.4.2
PACKAGING COMPONENT WEIGHTS

DOCKET: 96-43-7A
Page ~~1 of 2~~ 2 of 4 dlk

Measure major component weights and record per procedure Section 6.4.2.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

TEST UNIT NUMBER	COMPONENT	WEIGHT
43-TU-04		
	Container Body	800 lb
	Cover	160 lb
	(Without Simulated Payload) NET (TARE) WEIGHT:	960 lb
	(With Simulated Payload) GROSS WEIGHT:	9,140 lb
TEST UNIT NUMBER	COMPONENT	WEIGHT
43-TU-05		
	Container Body	840 lb
	Cover	180 lb
	(Modified riser config - Rev. 2)	
	(Without Simulated Payload) NET (TARE) WEIGHT:	1,020 lb
	(With Simulated Payload) GROSS WEIGHT:	9,280 lb
TEST UNIT NUMBER	COMPONENT	WEIGHT
43-TU-06		
	Container Body	800 lb
	Cover	180 lb
	(Modified riser config - Rev. 1)	
	(Without Simulated Payload) NET (TARE) WEIGHT:	980 lb
	(With Simulated Payload) GROSS WEIGHT:	9,540 lb

DOT-7A PROGRAM
TEST DATA SHEET 6.4.2
PACKAGING COMPONENT WEIGHTS

DOCKET: 96-43-7A
Page ~~1 of 2~~ 3 of 4 dlw

Measure major component weights and record per procedure Section 6.4.2.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

TEST UNIT NUMBER	COMPONENT	WEIGHT
43-TU-07 - stack test	Container Body	800 lb
	Cover	160 lb
	This is an empty test unit used for the stack test	
	(Without Simulated Payload) NET (TARE) WEIGHT:	960 lb
	(With Simulated Payload) GROSS WEIGHT:	

TEST UNIT NUMBER	COMPONENT	WEIGHT
43-TU-07 - drop test	Container Body (43-TU-07)	820 lb
	Cover (from 43-TU-02)	180 lb
	(Modified riser config - Rev. 2)	
	(Without Simulated Payload) NET (TARE) WEIGHT:	1,000 lb
	(With Simulated Payload) GROSS WEIGHT:	9,240 lb

TEST UNIT NUMBER	COMPONENT	WEIGHT
	Container Body	
	Cover	
	(Without Simulated Payload) NET (TARE) WEIGHT:	
	(With Simulated Payload) GROSS WEIGHT:	

DOT-7A PROGRAM
TEST DATA SHEET 6.4.2
PACKAGING COMPONENT WEIGHTS

DOCKET: 96-43-7A
Page ~~2 of 2~~ 4 of 4

Measure major component weights and record per procedure Section 6.4.2

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/2/97

EQUIPMENT NOTES:
Description: Trifor
Serial No.:
Calibration No.: 815-29-06-025
Calibration Expiration: 5/5/98
Accuracy: ±0.04 tons
EQUIPMENT NOTES:
Description:
Serial No.:
Calibration No.:
Calibration Expiration:
Accuracy:
REMARKS:

DOT-7A PROGRAM
TEST DATA SHEET 6.4.3
PACKAGING COMPONENT WALL THICKNESS

DOCKET: 96-43-7A
Page 1 of 2 8 each

Measure component wall thickness and any significant dimensions identified per the Test Plan. Record information per procedure Section 6.4.3.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/2/97

TEST UNIT NUMBER	COMPONENT		
43-TU-01	Exterior Dimensions		
FEATURE OR LOCATION:	Overall		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	42 inches (with 4-in riser)	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	without 4-in riser, height = 38 inches (includes securred lid)		

TEST UNIT NUMBER	COMPONENT		
43-TU-01	Exterior Dimensions		
FEATURE OR LOCATION:	Container Body - Exterior		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	36 1/8 inches at edge w/o interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Exterior: 77 in x 52 in x 2 in (has 1 in edge on all sides for bolt slots)		

TEST UNIT NUMBER	COMPONENT		
43-TU-01	Interior Dimensions		
FEATURE OR LOCATION:	Container Body - Interior Measured at Sidewall Channels		
LENGTH	WIDTH	HEIGHT	
76 inches	51 inches	37 ½ inches with interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Interior: 76 1/4 in x 51 1/4 in (due to gasket, no height taken)		

DOT-7A PROGRAM
TEST DATA SHEET 6.4.3
PACKAGING COMPONENT WALL THICKNESS

DOCKET: 96-43-7A
Page ~~1 of 2~~ 2 of 8 ack

Measure component wall thickness and any significant dimensions identified per the Test Plan. Record information per procedure Section 6.4.3.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/5/97

TEST UNIT NUMBER	COMPONENT		
43-TU-02	Exterior Dimensions		
FEATURE OR LOCATION:	Overall		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	42 inches (with 4-in riser)	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	without 4-in riser, height = 38 inches (includes securred lid)		

TEST UNIT NUMBER	COMPONENT		
43-TU-02	Exterior Dimensions		
FEATURE OR LOCATION:	Container Body - Exterior		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	36 1/8 inches at edge w/o interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Exterior: 77 in x 52 in x 2 in (has 1 in edge on all sides for bolt slots)		

TEST UNIT NUMBER	COMPONENT		
43-TU-02	Interior Dimensions		
FEATURE OR LOCATION:	Container Body - Interior Measured at Sidewall Channels		
LENGTH	WIDTH	HEIGHT	
76 inches	51 inches	37 ½ inches with interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Interior: 76 1/4 in x 51 1/4 in (due to gasket, no height taken)		

DOT-7A PROGRAM
TEST DATA SHEET 6.4.3
PACKAGING COMPONENT WALL THICKNESS

DOCKET: 96-43-7A
Page ~~1 of 2~~ 3 of 8 dlh

Measure component wall thickness and any significant dimensions identified per the Test Plan. Record information per procedure Section 6.4.3.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

TEST UNIT NUMBER	COMPONENT		
43-TU-03	Exterior Dimensions		
FEATURE OR LOCATION:	Overall		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	42 inches (with 4-in riser)	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	without 4-in riser, height = 38 inches (includes securred lid)		

TEST UNIT NUMBER	COMPONENT		
43-TU-03	Exterior Dimensions		
FEATURE OR LOCATION:	Container Body - Exterior		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	36 1/8 inches at edge w/o interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Exterior: 77 in x 52 in x 2 in (has 1 in edge on all sides for bolt slots)		

TEST UNIT NUMBER	COMPONENT		
43-TU-03	Interior Dimensions		
FEATURE OR LOCATION:	Container Body - Interior Measured at Sidewall Channels		
LENGTH	WIDTH	HEIGHT	
76 inches	51 inches	37 ½ inches with interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Interior: 76 1/4 in x 51 1/4 in (due to gasket, no height taken)		

DOT-7A PROGRAM
TEST DATA SHEET 6.4.3
PACKAGING COMPONENT WALL THICKNESS

DOCKET: 96-43-7A
Page ~~1 of 2~~ 4 of 8 dck

Measure component wall thickness and any significant dimensions identified per the Test Plan. Record information per procedure Section 6.4.3.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/3/97

TEST UNIT NUMBER	COMPONENT		
43-TU-04	Exterior Dimensions		
FEATURE OR LOCATION:	Overall		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	42 inches (with 4-in riser)	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	without 4-in riser, height = 38 inches (includes securred lid)		

TEST UNIT NUMBER	COMPONENT		
43-TU-04	Exterior Dimensions		
FEATURE OR LOCATION:	Container Body - Exterior		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	36 1/8 inches at edge w/o interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Exterior: 77 in x 52 in x 2 in (has 1 in edge on all sides for bolt slots)		

TEST UNIT NUMBER	COMPONENT		
43-TU-04	Interior Dimensions		
FEATURE OR LOCATION:	Container Body - Interior Measured at Sidewall Channels		
LENGTH	WIDTH	HEIGHT	
76 inches	51 inches	37 ½ inches with interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Interior: 76 1/4 in x 51 1/4 in (due to gasket, no height taken)		

DOT-7A PROGRAM
TEST DATA SHEET 6.4.3
PACKAGING COMPONENT WALL THICKNESS

DOCKET: 96-43-7A
Page ~~1 of 2~~ 5 of 8 alt

Measure component wall thickness and any significant dimensions identified per the Test Plan. Record information per procedure Section 6.4.3.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

TEST UNIT NUMBER	COMPONENT		
43-TU-05	Exterior Dimensions		
FEATURE OR LOCATION:	Overall		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	42 inches (with 4-in riser)	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	without 4-in riser, height = 38 inches (includes securred lid)		

TEST UNIT NUMBER	COMPONENT		
43-TU-05	Exterior Dimensions		
FEATURE OR LOCATION:	Container Body - Exterior		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	36 1/8 inches at edge w/o interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Exterior: 77 in x 52 in x 2 in (has 1 in edge on all sides for bolt slots)		

TEST UNIT NUMBER	COMPONENT		
43-TU-05	Interior Dimensions		
FEATURE OR LOCATION:	Container Body - Interior Measured at Sidewall Channels		
LENGTH	WIDTH	HEIGHT	
76 inches	51 inches	37 ½ inches with interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Interior: 76 1/4 in x 51 1/4 in (due to gasket, no height taken)		

DOT-7A PROGRAM
TEST DATA SHEET 6.4.3
PACKAGING COMPONENT WALL THICKNESS

DOCKET: 96-43-7A

Measure component wall thickness and any significant dimensions identified per the Test Plan. Record information per procedure Section 6.4.3.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/6/97

TEST UNIT NUMBER	COMPONENT		
43-TU-06	Exterior Dimensions		
FEATURE OR LOCATION:	Overall		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	42 inches (with 4-in riser)	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	without 4-in riser, height = 38 inches (includes securred lid)		

TEST UNIT NUMBER	COMPONENT		
43-TU-06	Exterior Dimensions		
FEATURE OR LOCATION:	Container Body - Exterior		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	36 1/8 inches at edge w/o interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Exterior: 77 in x 52 in x 2 in (has 1 in edge on all sides for bolt slots)		

TEST UNIT NUMBER	COMPONENT		
43-TU-06	Interior Dimensions		
FEATURE OR LOCATION:	Container Body - Interior Measured at Sidewall Channels		
LENGTH	WIDTH	HEIGHT	
76 inches	51 inches	37 ½ inches with interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Interior: 76 1/4 in x 51 1/4 in (due to gasket, no height taken)		

DOT-7A PROGRAM
TEST DATA SHEET 6.4.3
PACKAGING COMPONENT WALL THICKNESS

DOCKET: 96-43-7A
Page ~~1 of 2~~ 7 & alt

Measure component wall thickness and any significant dimensions identified per the Test Plan. Record information per procedure Section 6.4.3.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

TEST UNIT NUMBER	COMPONENT		
43-TU-07	Exterior Dimensions		
FEATURE OR LOCATION:	Overall		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	42 inches (with 4-in riser)	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	without 4-in riser, height = 38 inches (includes securred lid)		

TEST UNIT NUMBER	COMPONENT		
43-TU-07	Exterior Dimensions		
FEATURE OR LOCATION:	Container Body - Exterior		
LENGTH	WIDTH	HEIGHT	
79 inches	54 inches	36 1/8 inches at edge w/o interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Exterior: 77 in x 52 in x 2 in (has 1 in edge on all sides for bolt slots)		

TEST UNIT NUMBER	COMPONENT		
43-TU-07	Interior Dimensions		
FEATURE OR LOCATION:	Container Body - Interior Measured at Sidewall Channels		
LENGTH	WIDTH	HEIGHT	
76 inches	51 inches	37 ½ inches with interior ledge	
THICKNESS:	12 gauge	DIAMETER:	N/A
OTHER:	Lid - Interior: 76 1/4 in x 51 1/4 in (due to gasket, no height taken)		

DOT-7A PROGRAM
TEST DATA SHEET 6.4.3
PACKAGING COMPONENT WALL THICKNESS

DOCKET: 96-43-7A
Page ~~2 of 2~~ 8 of 8 alk

Measure component wall thickness and any significant dimensions identified per the Test Plan. Record information per procedure Section 6.4.3.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

EQUIPMENT NOTES:
Description: Tape Measure - IRWIN - 100 ft.
Serial No.: N/A
Calibration No.: N/A
Calibration Expiration: N/A
Accuracy: 1/8-in. increments
EQUIPMENT NOTES:
Description:
Serial No.:
Calibration No.:
Calibration Expiration:
Accuracy:
REMARKS:

DOT-7A PROGRAM
TEST DATA SHEET 7.4
STACKING TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-07

Perform the stack test and record data per Section 7.4.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/3/97

	ACTIVITY	VERIFICATION [✓]
1.	Initial conditions established.	✓
2.	Set up test assembly according to test plan.	✓
	Test load (kg/lb): 46,260 lb	
3.	Load package; record time.	✓
	Record time (military): 09:30 (9:30 a.m.)	
4.	Hold (24 hours); observe; ~~photograph.~~ c dlk 6/3/97	✓
5.	Unload weights from package; record time.	✓
	Record time (military): 14:00 (2:00 p.m.)	
6.	~~Photograph results.~~ c dlk 6/3/97	see below
7.	Evaluate performance. Pass [X] Fail [ ]	✓

REMARKS:

Weights applied:	17,250	This is the original, fixed riser
	17,450	configuration. This is an empty package.
	11,010	
	550	
Total:	46,260	

Note: Photos after 24-hour hold period were not taken due to the extra costs associated with maintaining the photographer over a designated time period (from the drop test failure of 43-TU-01 and 43-TU-04 (second drop)), until the weights could be removed by Crane & Rigging.

The height of the container was measured for any compression, and no change was observed.

There was no indication of buckling.

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DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-01

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/2/97

	ACTIVITY	VERIFICATION [✓]
1.	Initial conditions established.	✓
2.	Set up test assembly according to test plan.	✓

Drop height: 49 inches (124.46 cm) (cm/in)

Impact angle: approx. 45 degree angle (degrees)

Orientation: Drop onto bottom of container body, along the short edge of package, center of gravity

3. Sketch drop orientation:

DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-01

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly Donna L. Kelly Date: 6/2/97

ACTIVITY		VERIFICATION [✓]
4.	Rig package.	✓
5.	Photograph set-up; ~~start video coverage~~ dlk	✓
6.	Drop package; ~~secure video~~ dlk	✓
7.	Clear drop area for approach.	✓
8.	Examine; photograph; ~~videotape package damage.~~ dlk	✓
9.	Evaluate performance. Pass [ ] Fail [X]	Fail

REMARKS:

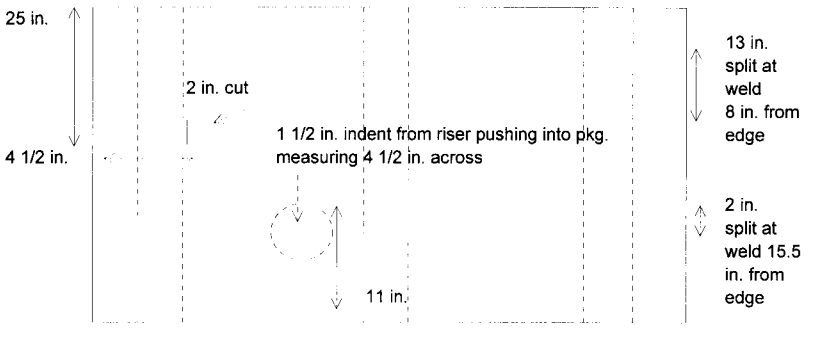
This is the first drop test with this test unit. This test unit incorporates the original removable risers. During rigging, the center clip and riser broke off at the tack weld location, and the center riser was not attached to the package for this drop test.

At the point of impact, the end riser broke off and flew to the opposite end of the package, removing both risers. At the point of impact, the container wall pushed outward between the wall channels (approx. 3 inches outward). The bottom of the package separated at the weld (left of the Y axis) 8 inches from the edge of the package and across 13 inches. The package also split open at a weld at a second location, 15 1/2-inches from the edge of the package and across 2 inches. There is also a 1 1/4-inch split (at weld) along the Y axis end of the package, 1 inch up from the base of the container. The underside of the container body indented and buckled inward 1 1/2-inches where the edge of an end riser pushed into the container. This area measures 4 1/2-inches across, 25 1/2-inches from one side, and 11 inches inward from one side. The riser cut into the underside of the container body approximately 2 inches across (4 1/2-inches inward and 25 inches from edge).

Fluoresceine and sand were detected at all weld splits and cut on underside.

43-TU-01

Underside of Container

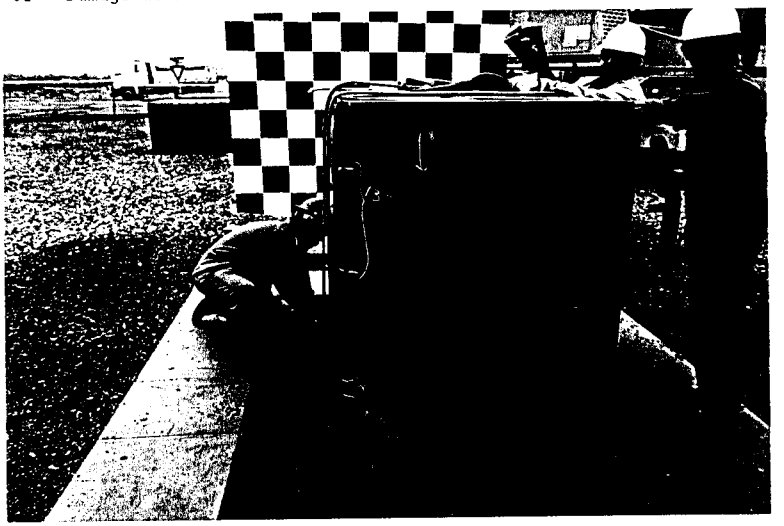


The center removable riser fell off during rigging, prior to drop testing.

Y Axis End of Container

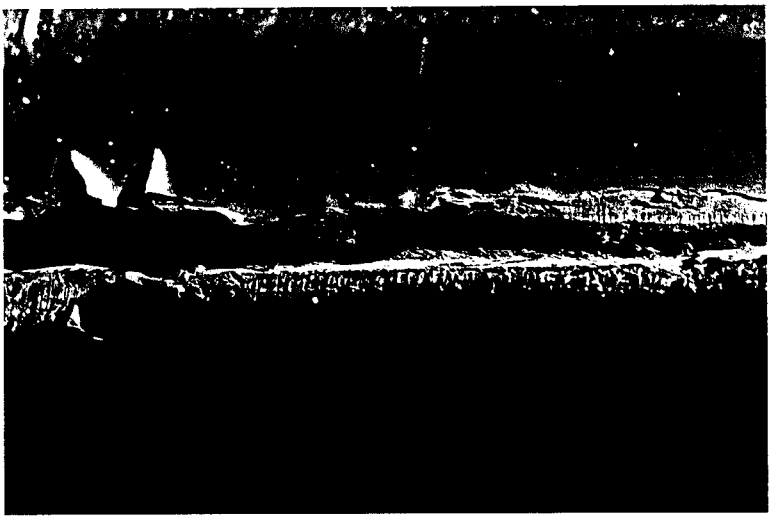
Container bowed outward 3 inches across entire sidewall and between the channels

43-TU-01 - Damage at Base of Container and Y Axis End:

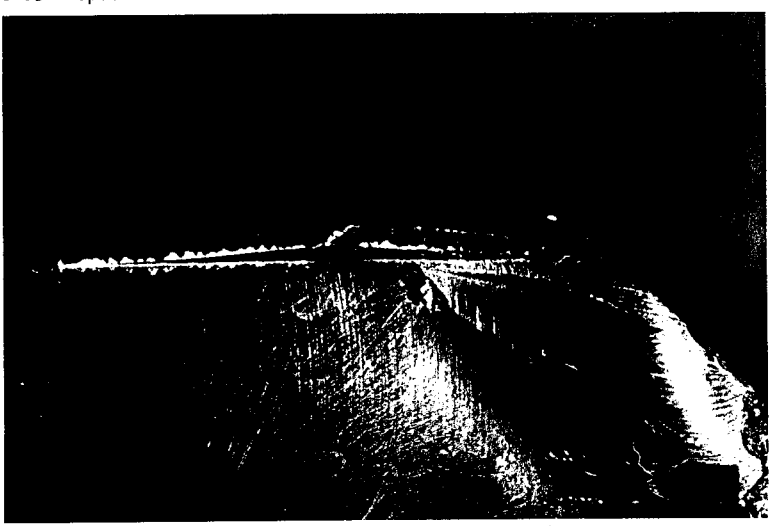


43-TU-01 - Damage at Base of Container and Y Axis End:

43-TU-01 - Split of Weld at Base of Container and Y Axis End:



43-TU-01 - Split of Weld at Base of Container and Y Axis End:



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DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-01

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L Kelly

Date: 6/2/97

	ACTIVITY	VERIFICATION [✓]
1.	Initial conditions established.	
2.	Set up test assembly according to test plan.	

Drop height: 49 inches (124.46 cm) (cm/in)

Impact angle: _____ (degrees)

Orientation: Drop onto bottom corner, opposite side as first drop center of gravity

3. Sketch drop orientation:

Note: This test unit was originally scheduled to undergo two drop tests. Because of the failure during the first drop test. This test unit could not be used for additional tests.

DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-01

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Date:

	ACTIVITY	VERIFICATION [✓]
4.	Rig package.	
5.	Photograph set-up; start video coverage.	
6.	Drop package; secure video.	
7.	Clear drop area for approach.	
8.	Examine; photograph; videotape package damage.	
9.	Evaluate performance. Pass [ ] Fail [ ]	

REMARKS:

DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-02

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/5/97

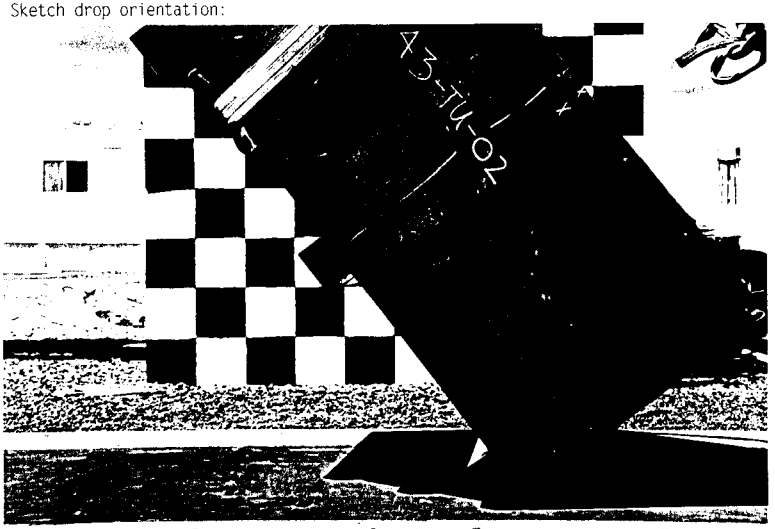
	ACTIVITY	VERIFICATION [✓]
1.	Initial conditions established.	✓
2.	Set up test assembly according to test plan.	✓

Drop height: 49 inches (124.46 cm) (cm/in)

Impact angle: approx. 45 degree angle (degrees)

Orientation: Drop onto bottom, short edge, center of gravity

3. Sketch drop orientation:



DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-02

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/5/97

ACTIVITY		VERIFICATION [✓]
4.	Rig package.	✓
5.	Photograph set-up; ~~start video coverage.~~ dlk	✓
6.	Drop package; ~~secure video.~~ c dlk	✓
7.	Clear drop area for approach.	✓
8.	Examine; photograph; vid~~eotape package damage.~~ e dlk	✓
9.	Evaluate performance. Pass [ ] Fail [X]	Fail

REMARKS:

This test unit incorporated the modified riser configuration (Rev. 1 Riser Mod.)

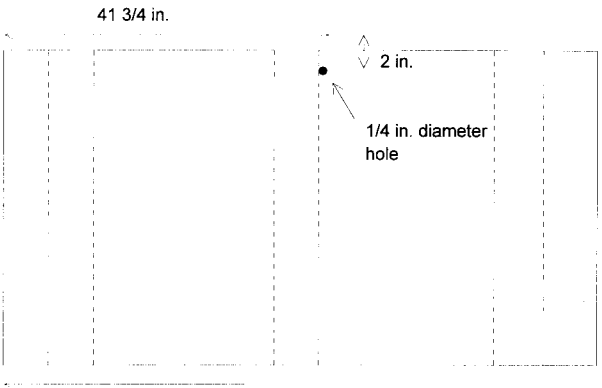
Placement of the drums was such that the bolts were turned toward the outer wall of the container. All three risers were knocked off due to impact, and all crushed.

The bottom of the container buckled along the edge of impact. The bottom was pushed outward 1 inch on one end, 1 1/2-inched in the center, and 2 inches on the other end.

The side wall of the container bowed outward across the base of the container a maximum of 3 inches. The middle riser tore out from a tack weld and a 1/4-inch diameter hole occurred.

The hole is located 41 3/4-inches from the short end of the container and 2 inches inward from the lengthwise end. Fluoresceine was detected at this hole.

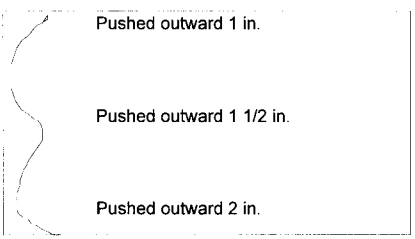
Underside of Container



Container bowed outward 2 in. across distance of center and outer riser

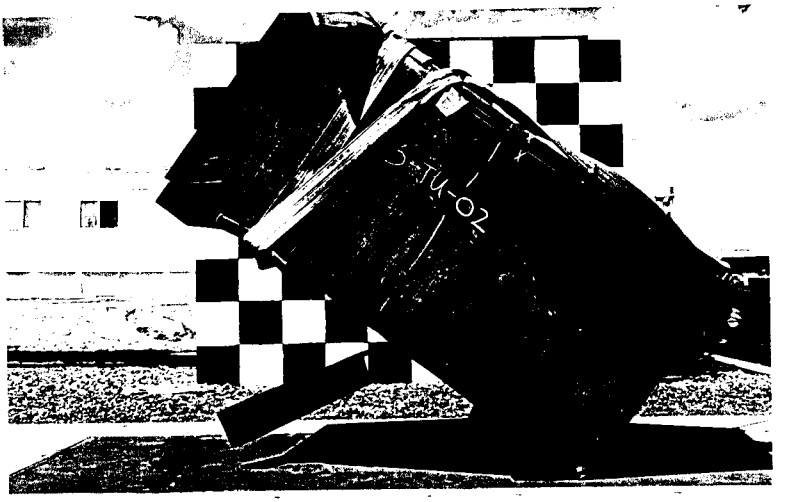
Y Axis End of Container

indent and buckling at point of impact

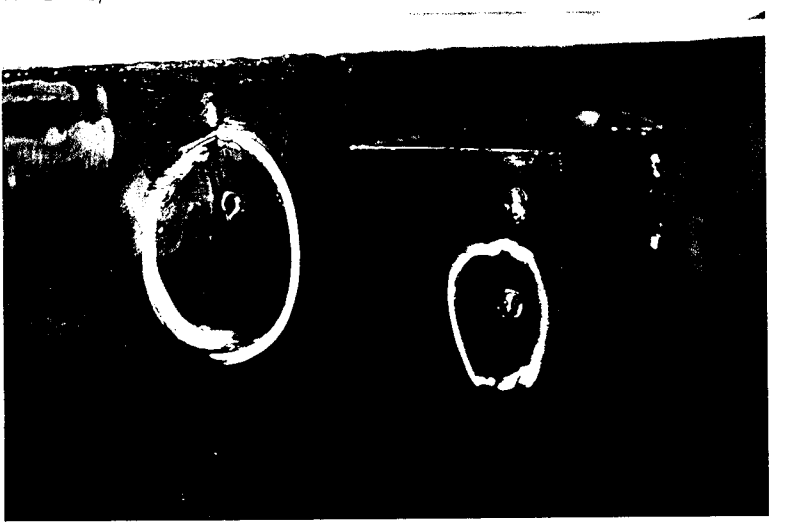


Container bowed outward a maximum of 3 inches across entire base of container

43-TU-02 - Impact Along Short Edge at Base of Container, CG:



43-TU-02 - 1/4-inch Diameter Hole at Middle Riser Location:



DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-02

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L Kelly

Date: 6/6/97

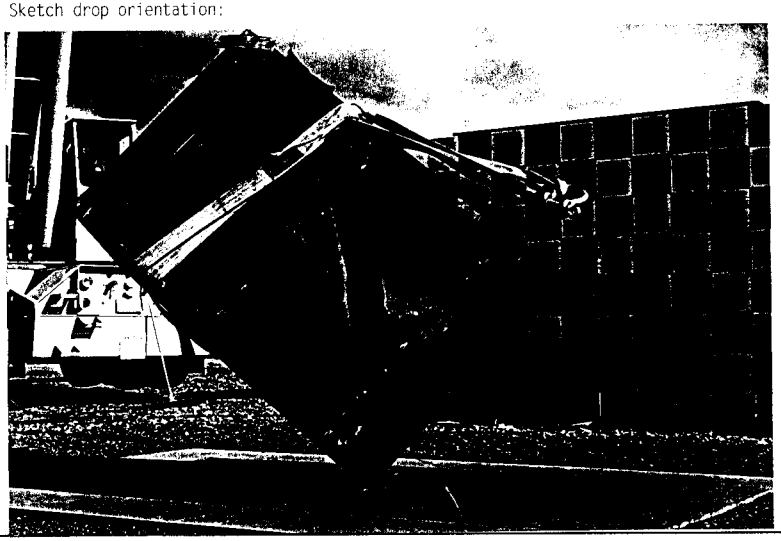
	ACTIVITY	VERIFICATION [✓]
1.	Initial conditions established.	✓
2.	Set up test assembly according to test plan.	✓

Drop height: 49 inches (124.46 cm) (cm/in)

Impact angle: approx. 45 degree angle (degrees)

Orientation: Drop onto top corner at lifting ring, center of gravity

3. Sketch drop orientation:



DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-02

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/6/97

ACTIVITY		VERIFICATION [✓]
4.	Rig package.	✓
5.	Photograph set-up; ~~start video coverage~~ c dlk	✓
6.	Drop package; ~~secure video.~~ c dlk	✓
7.	Clear drop area for approach.	✓
8.	Examine; photograph; vi~~deotape package damage.~~ c dlk	✓
9.	Evaluate performance. Pass [X] Fail [ ]	Pass

REMARKS:

This is the second drop with this test unit. The lid to 43-TU-02 was not used for this test due to the gasket being compressed because of the previous test. Instead of replacing the gasket material, the lid from test unit 43-TU-07 was used. Although 43-TU-07 had been used for the compression test prior to this drop test, the lid was removed from the container such that the gasket was allowed to return to its original shape. New screws, lock nuts, and washers were used.

Placement of the drums was such that the bolts were turned toward the outer wall of the container.

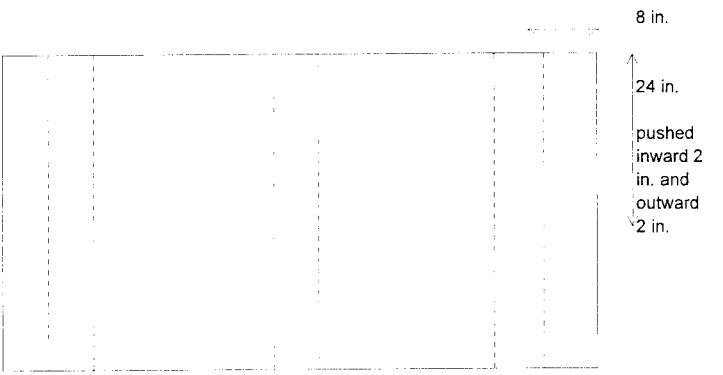
The lift lug completely mashed into the lid. A ripple effect occurred at the corner of impact 2 ½ inches down from the lid area and 3 ½ inches from the sidewall. Very slight lifting between the following screws occurred: #16, #3, #15, #2, and #14. Slight lifting between the following screws occurred at the W axis end of the container at impact: #7 & #19 (1/4 inch); #19 & #6 (1/2 inch); #6 & #18 (1/4 inch to 1/8 inch); #18 & #5 (1/8 inch).

The bottom of the container pushed inward approximately 2 inches and outward approximately 2 inches 8 inches from the lenghwise edge and 24 inches from the short side edge.

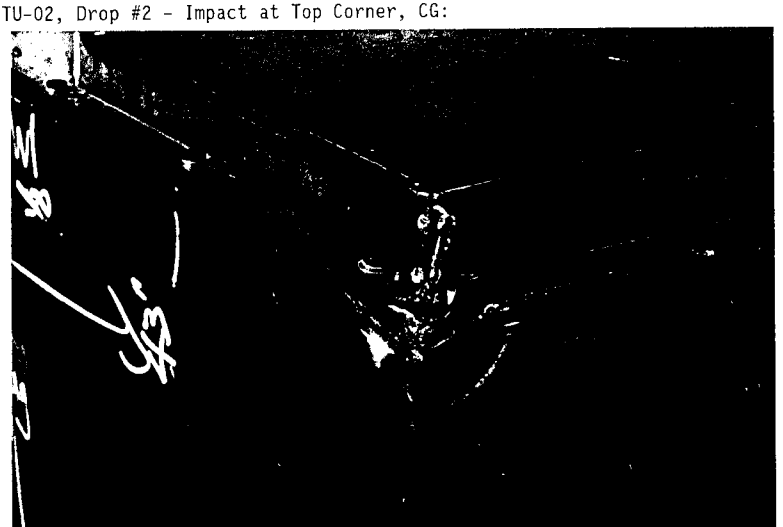
No release of contents.

43-TU-02
Drop #2

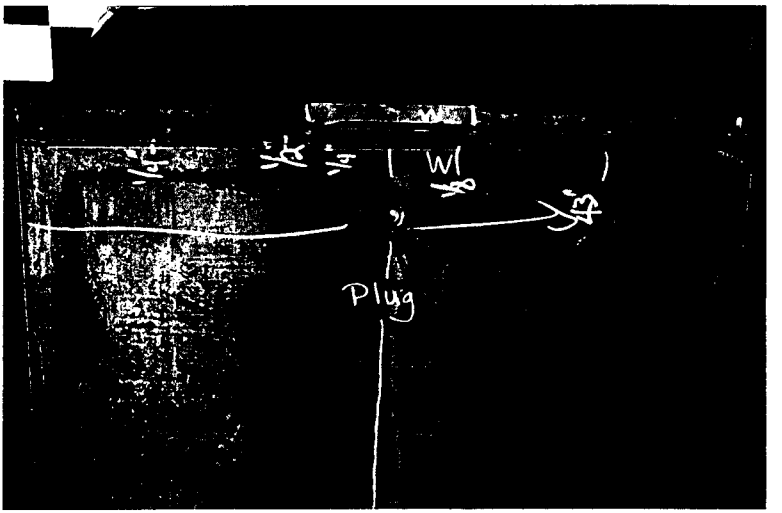
Underside of Container



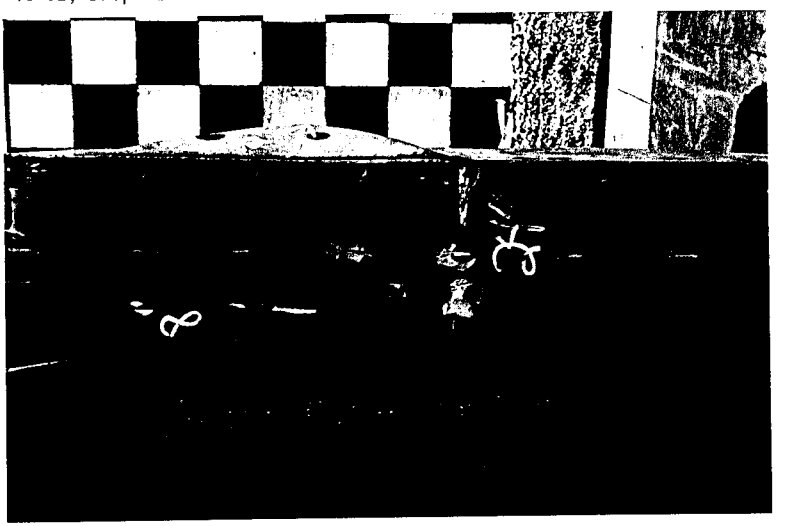
43-TU-02, Drop #2 - Impact at Top Corner, CG:



43-TU-02, Drop #2 - Lifting Between Screws:



43-TU-02, Drop #2 - Base of Container Pushed Outward 2 inches:



DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-03

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

ACTIVITY	VERIFICATION [✓]
1. Initial conditions established.	✓
2. Set up test assembly according to test plan.	✓

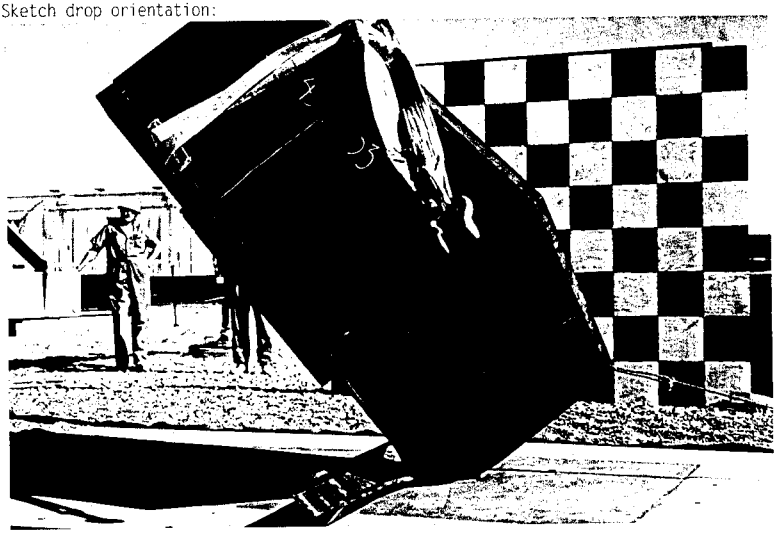
Drop height: 49 inches (124.46 cm) (cm/in)

Impact angle: approx. 45 degree angle (degrees)

Orientation: Drop onto bottom corner

center of gravity

3. Sketch drop orientation:



DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-03

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

ACTIVITY		VERIFICATION [✓]
4.	Rig package.	✓
5.	Photograph set-up: ~~start video coverage~~ c dlk	✓
6.	Drop package: ~~secure video.~~ c dlk	✓
7.	Clear drop area for approach.	✓
8.	Examine; photograph; ~~videotape package damage.~~ c dlk	✓
9.	Evaluate performance. Pass [X] Fail [ ]	Pass

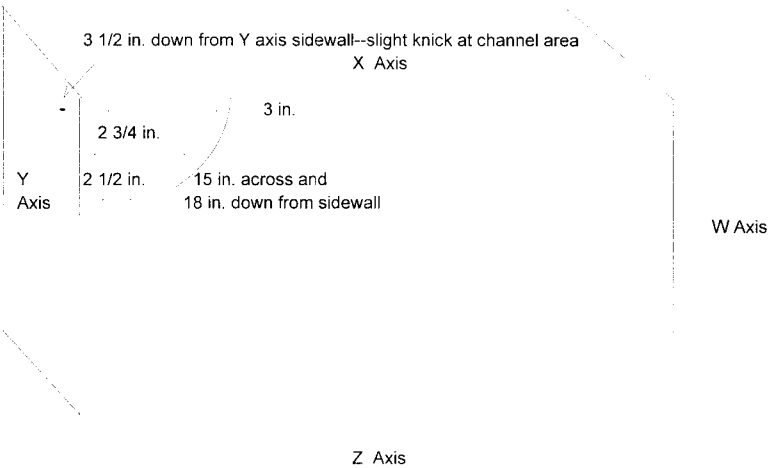
REMARKS:

This test unit incorporates the Rev. 2 riser modification.

Placement of the drums was such that the bolts were turned toward the outer wall of the container. Prior to this drop test, while rigging the packaging, the riser plate tack welds broke loose at the Y axis side of the package. The riser at the Y axis (impact point) broke loose upon impact of the drop. The center and other end riser squashed completely, and the center riser broke loose. The corner of impact crushed across an area measuring 15 inches. The crush area indented from 2 ½ inches to 3 inches. A slight knick of the metal occurred at a welded area of an internal channel. This knick is located 3 ½ inches up from the base of the package, and 18 inches from the edge. This knick was checked for release of contents, and no release was detected. The riser plate pulled away from the X axis end of the container approximately 1 1/8-inches for a distance of 2 inches along the plate.

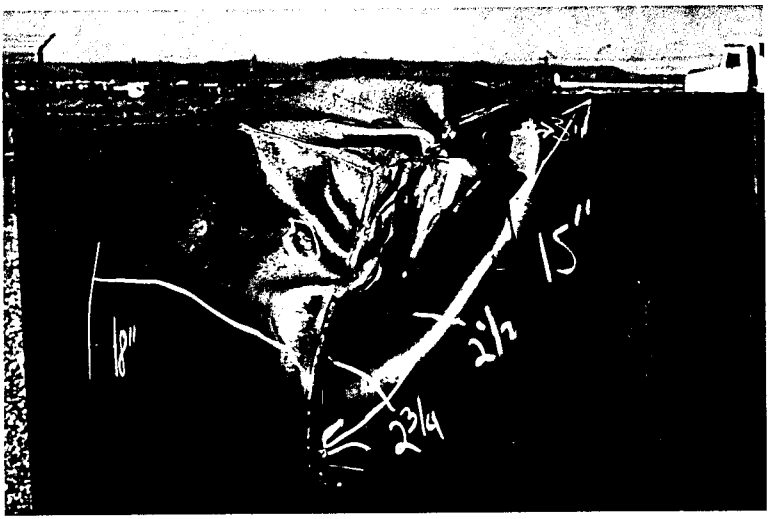
No release of contents.

43-TU-03

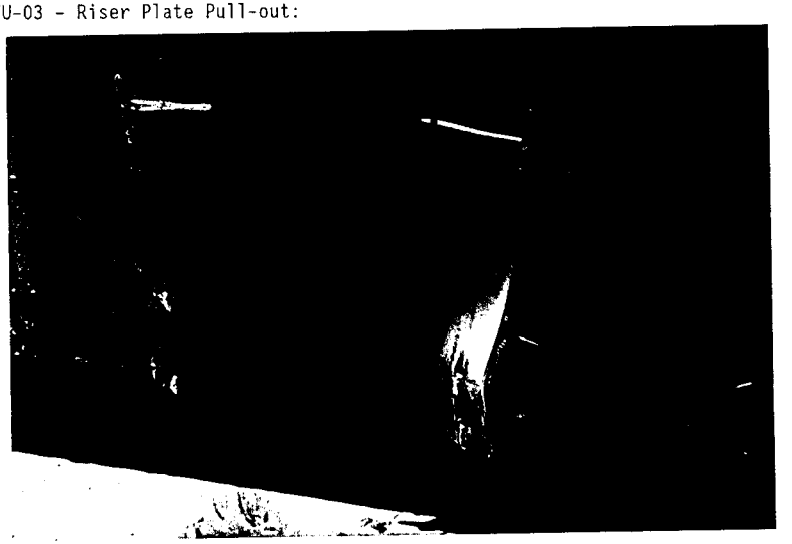


Z Axis

43-TU-03 - Bottom Corner Impact Area:



43-TU-03 - Riser Plate Pull-out:



DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-04

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/3/97

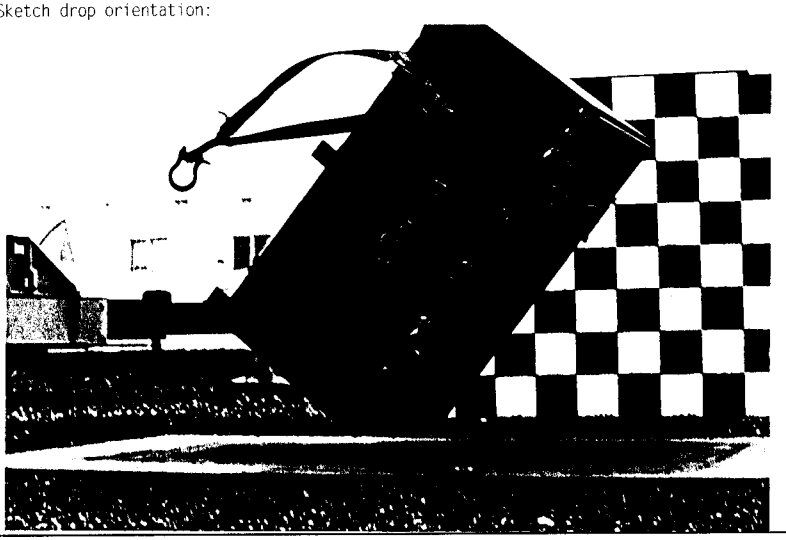
	ACTIVITY	VERIFICATION [✓]
1.	Initial conditions established.	✓
2.	Set up test assembly according to test plan.	✓

Drop height: 49 inches (124.46 cm) (cm/in)

Impact angle: approx. 45 degree angle (degrees)

Orientation: Drop onto top short edge center of gravity

3. Sketch drop orientation:



DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-04

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/3/97

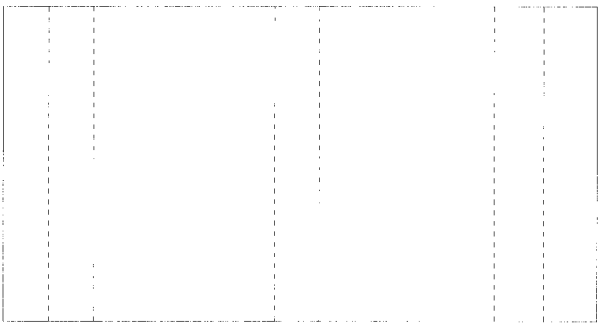
	ACTIVITY	VERIFICATION [✓]
4.	Rig package.	✓
5.	Photograph set-up; ~~start video coverage~~.c dlk	✓
6.	Drop package; ~~secure video.~~c dlk	✓
7.	Clear drop area for approach.	✓
8.	Examine; photograph; ~~videotape package damage.~~c dlk	✓
9.	Evaluate performance. Pass [X] Fail [ ]	Pass

REMARKS:

This test unit incorporates the origingal fixed riser configuration. Placement of the drums was such that the bolts were turned toward the outer wall of the container. Screw #26 sheared off at its head. The lid shifted slightly at the impact point (approximately 1/4 inch). The top of the lid bowed outward slightly. There was very slight lifting of the lid at the point of impact along the lid/body interface between the screws. From screw #6 through #17, the lid flange lifted upward about 1/8 inch between each of the noted screws. Slight cracking along the lid flange at the welds occurred as noted: From screw #7, #19, and #6 the distance of the crack measured 11 1/4 inches. Between screw #6 and #18, the distance of the crack measured 1 ½ inches. Between screw #18 and #5, the distance of the crack measured 2 3/4 inches. There was no release of contents. The wall of the package at the Y axis bowed outward between the channels slightly. The bottom of the container bowed outward between the center riser and the Y axis riser approximately 2 inches. There was no release of contents.

Underside of Container

X Axis



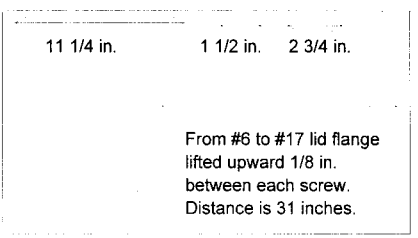
Y Axis

Bowed outward approximately 2 in.
between the center and end riser

Y Axis End of Container

#7 #19 #6 #18 #5 #17

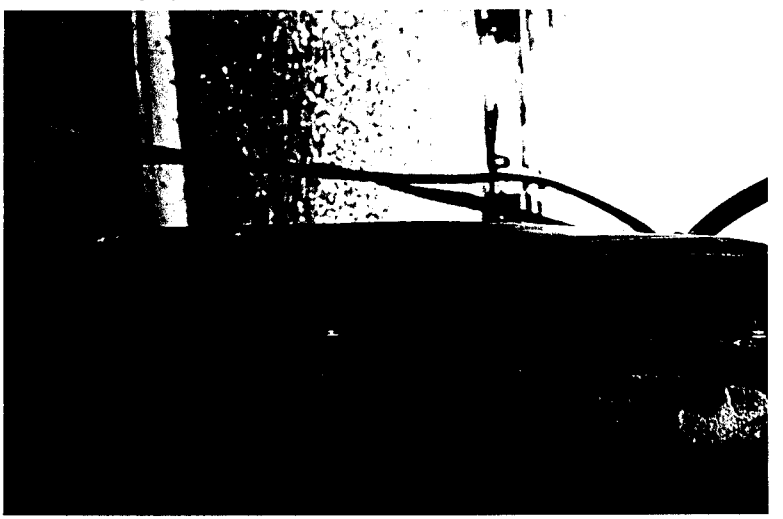
Weld separation at lid flange as indicated.



Y Axis sidewall bowed outward slightly across entire sidewall

43-TU-04 - Head Sheared Off of Screw #26:

43-TU-04 - Bulging of Lid and Lifting Between Closure Screws:



DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-04

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/3/97

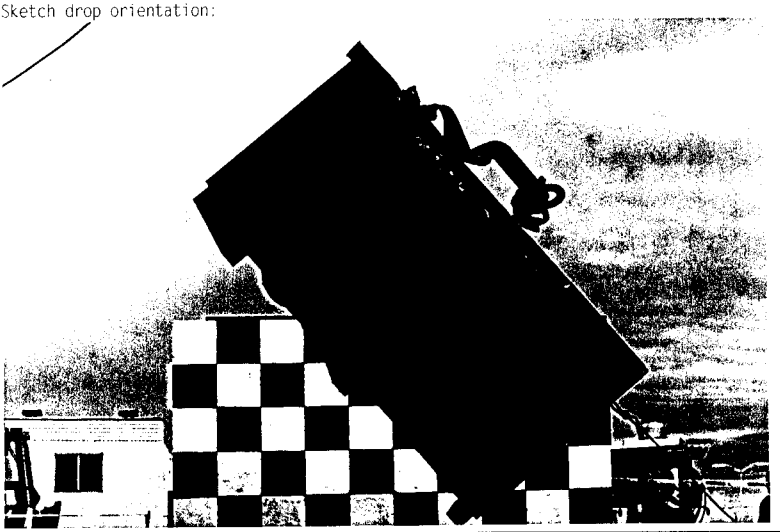
	ACTIVITY	VERIFICATION [✓]
1.	Initial conditions established.	✓
2.	Set up test assembly according to test plan.	✓

Drop height: 49 inches (124.46 cm) (cm/in)

Impact angle: approx. 45 degree angle (degrees)

Orientation: Drop onto bottom short edge center of gravity

3. Sketch drop orientation:



DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-04

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/3/97

	ACTIVITY	VERIFICATION [✓]
4.	Rig package.	✓
5.	Photograph set-up; ~~start video coverage~~ dlk	✓
6.	Drop package; ~~secure video.~~ dlk	✓
7.	Clear drop area for approach.	✓
8.	Examine; photograph; ~~videotape package damage~~ dlk	✓
9.	Evaluate performance. Pass [ ] Fail [X]	Fail

REMARKS:

This test unit incorporates the origingal fixed riser configuration.

This was the second drop test with this package, with the sponsor's concurrence.

A 2 inch split at a welded seam, 2 inches in from the sidewall at the intersection of the W axis and Y axis occured where the riser tore away from the container. Sand and soil released from this split.

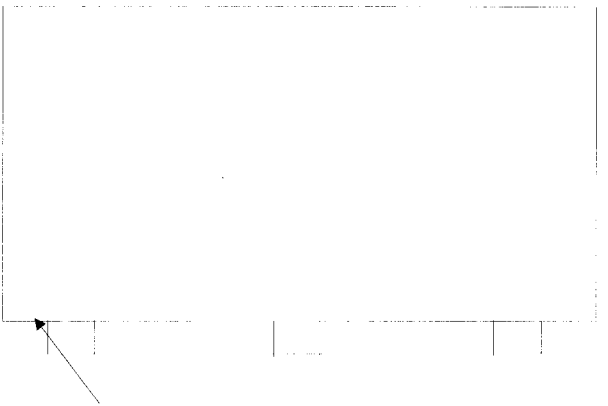
A riser flattened slightly and pushed up into the base of the container.

The base of the container bowed outward approximately 2 inches at the area of impact.

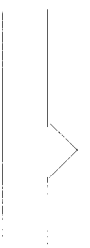
43-TU-04
Drop #2

Y Axis

W Axis



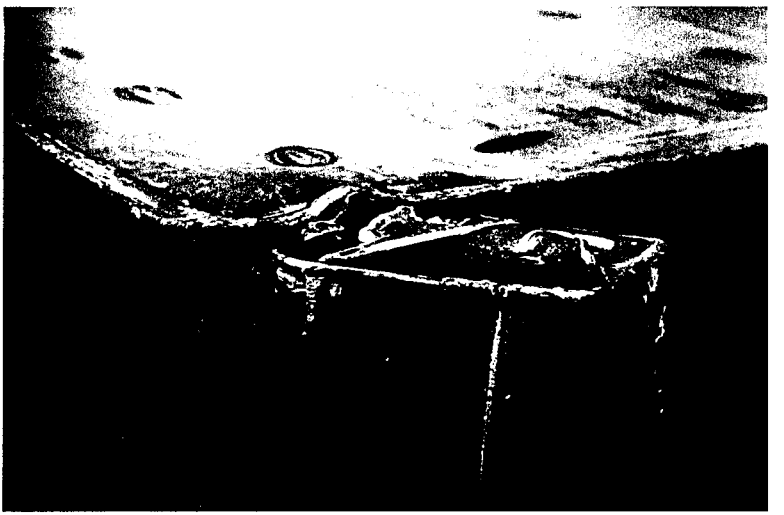
2 in. split at welded seam, 2 in. in from W Axis sidewall.
Riser tore out from base of container.



Riser pushed inward considerably into base of container
No ruptures at this location.

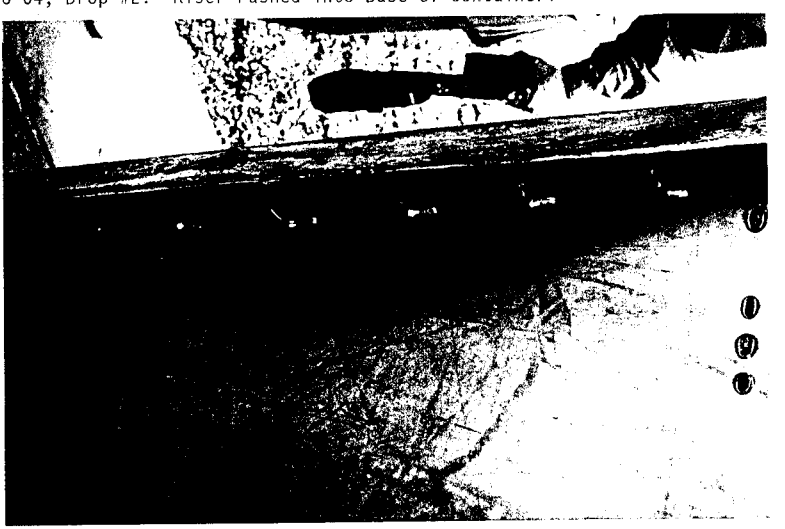
43-TU-04, Drop #2 - Riser Tear-Out at Base of Container. Release of Sand.

43-TU-04, Drop #2: Riser Tear-Out at Base of Container:



43-TU-04, Drop #2 - Impact of Inner Drums at Base of Container.

43-TU-04, Drop #2: Riser Pushed into Base of Container:



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DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-05

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/9/97

	ACTIVITY	VERIFICATION [✓]
1.	Initial conditions established.	✓
2.	Set up test assembly according to test plan.	✓

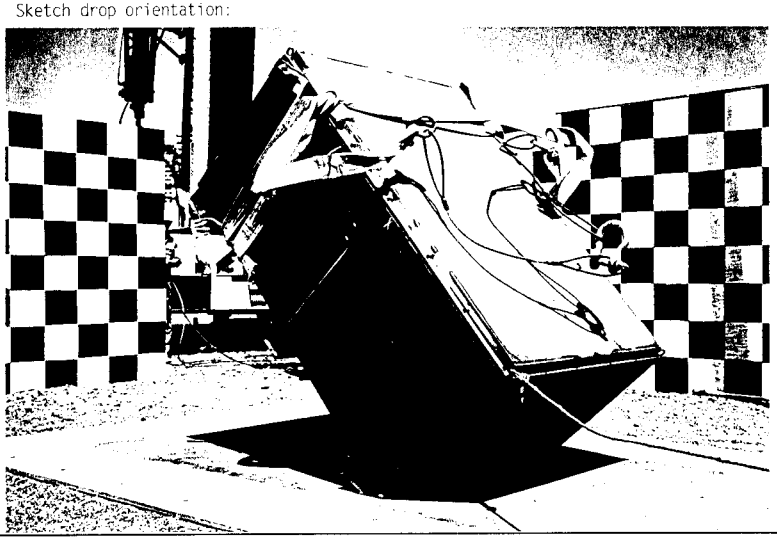
Drop height: 48 inches (124.46 cm) (cm/in)

Impact angle: approx. 45 degree angle (degrees)

Orientation: Drop onto bottom short edge

center of gravity

3. Sketch drop orientation:



DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-05

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

	ACTIVITY	VERIFICATION [✓]
4.	Rig package.	✓
5.	Photograph set-up; ~~start video coverage.~~ c dlk	✓
6.	Drop package; ~~secure video.~~ c dlk	✓
7.	Clear drop area for approach.	✓
8.	Examine; photograph; ~~videotape package damage.~~ c dlk	✓
9.	Evaluate performance. Pass [X] Fail [ ]	Pass

REMARKS:

This test unit incorporates the Rev. 2 modified riser configuration.

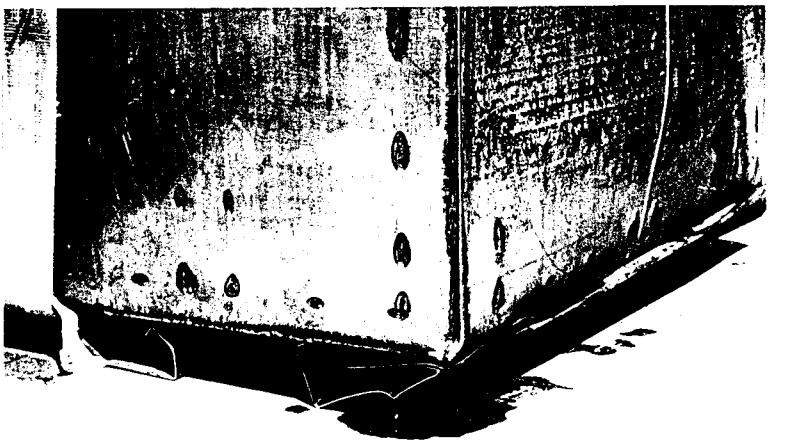
Placement of the drums was such that the bolts were turned toward the outer wall of the container.

The tack welds from the center riser and one end released when the packaging was lifted for rigging. Upon impact, the Y axis sidewall and bottom of the container pushed outward slightly.

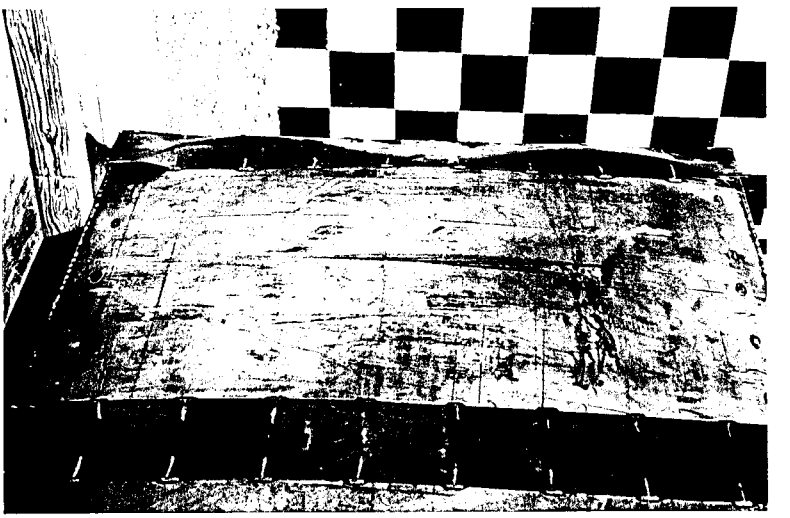
The riser plate along the bottom edge of impact pulled away from the container approximately 1 ½ inches on one end, and 1 1/4 inches on the opposite end.

There was no release of contents.

43-TU-05 - Crushing of Bottom Riser (Rev. 2 Riser Modification):



43-TU-05: Drum Impact and Damage to Riser Plate (Rev. 2 Riser Modification):



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DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-06

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/6/97

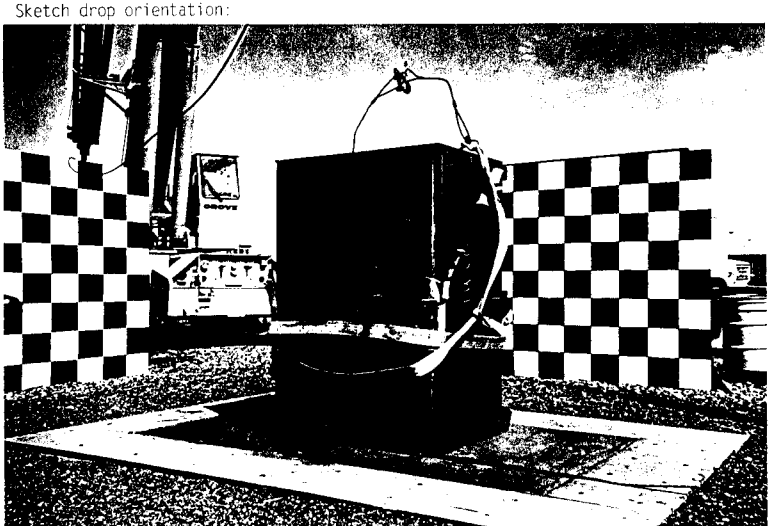
	ACTIVITY	VERIFICATION [✓]
1.	Initial conditions established.	✓
2.	Set up test assembly according to test plan.	✓

Drop height: 48 inches (124.46 cm) (cm/in)

Impact angle: none (degrees)

Orientation: Drop flat onto end with
NucFil filter

3. Sketch drop orientation:



DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-06

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/6/97

	ACTIVITY	VERIFICATION [✓]
4.	Rig package.	✓
5.	Photograph set-up; ~~start video coverage.~~ c dlk	✓
6.	Drop package; ~~secure video.~~ c dlk	✓
7.	Clear drop area for approach.	✓
8.	Examine; photograph; ~~videotape package damage.~~ c dlk	✓
9.	Evaluate performance. Pass [X] Fail [ ]	Pass

REMARKS:

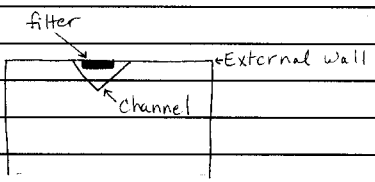
This test unit incorporates the Rev. 1 modified riser configuration.

Placement of the drums was such that the bolts were turned toward the outer wall of the container.

The riser at the end of impact broke off. No further damage to the packaging.

There was no release of contents.

Note: Due to the design of the package interior, no cheesecloth was placed around the filter area to keep possible moisture from the sand/soil mixture separated from the flour and fluoresceine mixture. The interior channel design protects the filter.



DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-07

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L Kelly Date: 6/9/97

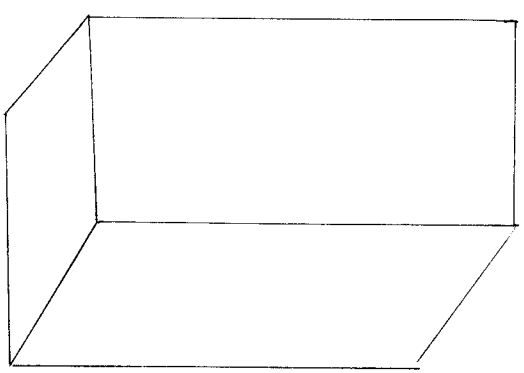
	ACTIVITY	VERIFICATION [✓]
1.	Initial conditions established.	✓
2.	Set up test assembly according to test plan.	✓

Drop height: 49 inches (124.46 cm) (cm/in)

Impact angle: Approximately 45 degrees (degrees)

Orientation: Drop onto bottom
Lengthwise edge
Center of gravity

3. Sketch drop orientation:



NO PHOTOGRAPH AVAILABLE.

DOT-7A PROGRAM
TEST DATA SHEET 7.6
FREE DROP TEST

DOCKET: 96-43-7A

TEST UNIT NO: 43-TU-07

Perform the free drop test and record data per Section 7.6.

Test Engineer: Donna L. Kelly/ Donna L. Kelly Date: 6/9/97

	ACTIVITY	VERIFICATION [✓]
4.	Rig package.	✓
5.	Photograph set-up: ~~start video coverage.~~ c dea	✓
6.	Drop package: ~~secure video.~~ c dea	✓
7.	Clear drop area for approach.	✓
8.	Examine; photograph; ~~videotape package damage.~~ c dea	✓
9.	Evaluate performance. Pass [ ] Fail [X]	Fail

REMARKS:

This test unit incorporates the Rev. 2 modified riser configuration.

Placement of the drums was such that the bolts were turned toward the outer wall of the container.

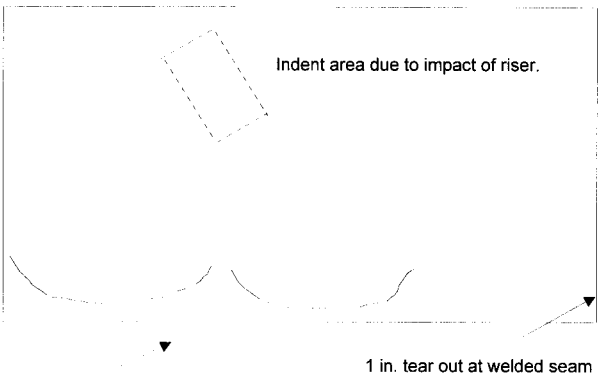
The lid from 43-TU-07 had been used for the second drop test with test unit 43-TU-02. The lid used during this drop test was from 43-TU-02, and the gasket was not replaced on this lid prior to this drop since it was a bottom drop.

Note: The tap used to rethread the hole at location #24 stuck and broke off at that location. Hence, no screw could be inserted into hole #24 prior to this drop.

Upon impact, a 1-inch tear at the welded seam occurred, and there was release of contents at that location.

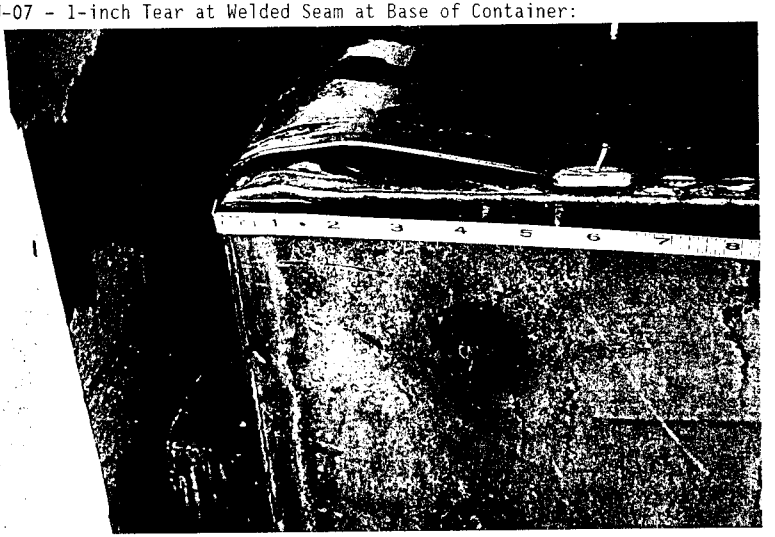
An end riser plate pushed outward approximatly 3/4 inch, and the bottom of the container pushed outward at two locations from the impact of the drums. An indent occurred near the center of the container where a riser broke loose and impacted.

Bottom View of Container



Area where drums pushed outward upon impact.

43-TU-07 - 1-inch Tear at Welded Seam at Base of Container:



43-TU-07: Drum Impact at Bottom and Riser Plate (Rev. 2 Riser Modification):