U.S. Department
of Transportation

**Research and
Special Programs
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

APR 23 1998

Mr. L.L. Kerstetter
Hercules Incorporated
Hercules Plaza
1313 North Market Street
Wilmington, DE 19894-0001

Dear Mr. Kerstetter:

This is in response to your January 12, 1998 letter and subsequent telephone conversations with Mr. Ryan Posten of my staff regarding the requirement, in 49 CFR § 178.814(b), that pressure relief devices and vented closures on metal intermediate bulk containers (IBC) be removed and their apertures plugged or rendered inoperative. Specifically, you stated if a closure (lid) on an IBC is designed to function as a non-reclosing pressure relief device with a burst pressure of 20 psig, then the 20 psig rupture disc may be replaced with a rupture disc that has a minimum burst pressure of 29 psig when conducting the hydrostatic pressure test.

Your understanding of this requirement is not correct. You may not replace the non-reclosing pressure relief device with another pressure relief device. Section 178.814(b) states all pressure relief devices (PRD) and vented closures must be removed and their apertures (openings) plugged or rendered inoperative during the hydrostatic pressure test on the IBC. The plug closing the aperture may be held in place by threading, bolting, welding, clamping or other suitable means. Additionally, you asked if the burst pressure of a pressure relief device is required to be marked on the container or on the closure of a (metal) IBC. The answer is no.

If you have any further questions, please do not hesitate to contact us.

Sincerely,

Edward T. Mazzullo

Edward T. Mazzullo
Director, Office of Hazardous
Materials Standards

Pooten
File: 178.814
SC: 322, 362

HERCULES

Hercules Incorporated
Hercules Plaza
1313 North Market Street
Wilmington, DE 19894-0001
(302) 594-5000

Mr. Edward Mazzullo
Director (DHM-10)
Office of Hazardous Materials Standards
Office of Hazardous Materials Safety
Research & Special Programs Administration
U.S. Department of Transportation
400 Seventh Street NW
Washington, D.C. 20590

January 12, 1998

Dear Mr. Mazzullo:

HYDROSTATIC PRESSURE TEST

Hercules' is requesting clarification of the qualification test required by 49 CFR 178.814 for 31A metal intermediate bulk containers.

49 CFR 178.814(d) requires a hydrostatic pressure test of 200 kPa (29 PSIG) for at least 10 minutes. 49 CFR 178.814(b) states that all pressure relief devices and vented closures must be removed and their apertures plugged or rendered inoperative.

If the closure (lid) on an IBC is designed to function as a non-reclosing pressure relief device with a burst pressure of 20 PSIG, then per 49 CFR 178.814(b) the 20 PSIG rupture disc may be replaced with a rupture disc that has a minimum burst pressure of 29 PSIG when conducting the hydrostatic pressure test.

Please advise if Hercules' interpretation of this regulation is correct. Also, must the 20 PSIG burst pressure be marked on the container and/or closure?

Thank you for your time and cooperation.

Very truly yours,

L. L. Kerstetter
Regulations
Purchasing & Transportation

LLK:ims
W:LLK:Ltrs

Pg. 1 of 11

FAX

abDuffy

SINCE 1951

ANDREW B. DUFFY, INC.
P.O. BOX #600
CROWN POINT ROAD
THOROFARE, NEW JERSEY

PH (609) 845-4900
FAX (609) 845-3921

DATE: 2/6/98

TO: Mr. Ron Postin

AT: D.O.T./STDS DIVISION

PHONE #: 202-366-8553

FAX #: 202 366 3753

FROM: Brian M. Duffy

NO. PAGES: 11

Mr. Postin:

As requested by Ed Reinsteter of Hercules Incorporated, I am enclosing the following:

- Information on emergency vent lid, clamp & bolt, Riene safety vent. Sketch "A" (1 pg)

- Sketch showing fixture used for hydrostatic testing (178.814(b)) (1 pg)

- Copies of our test reports from 1997 - IBC-J

I hope this information is helpful. Please feel free to call with questions.

Brian Duffy

Copy: E. Reinsteter - Hercules
FX 302 594 7304

Manuf. (Duffy) Drawings

ANDREW B. DUFFY, INC.
569 P.O. Box 6, Crown Point Road
Thorofare, NJ 08086
Custom Metal Fabrication
(609) 845-4900 (215) 922-4909
Fax: (609) 845-3921

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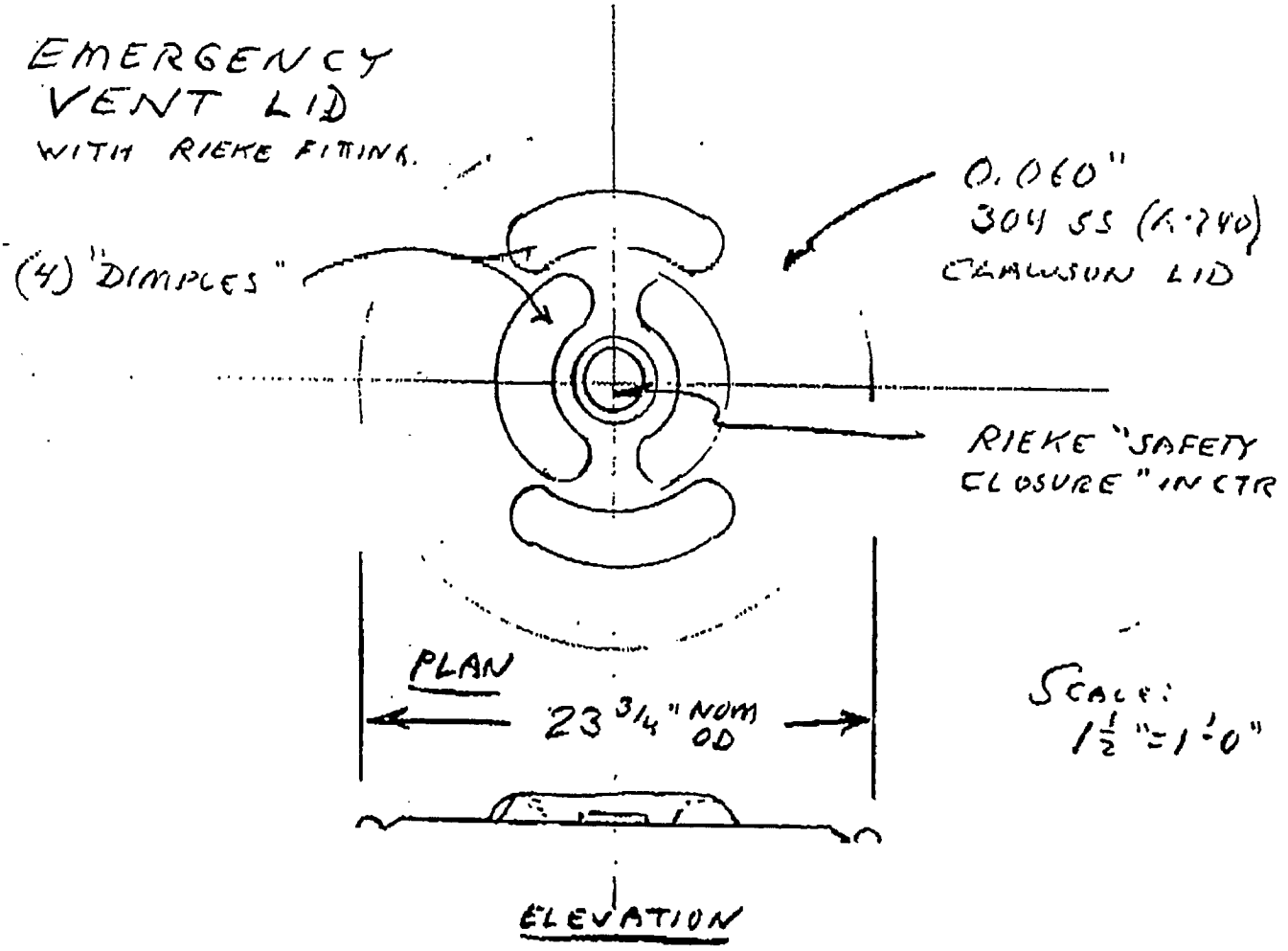
EMERGENCY VENT LID WITH RIEKE FITTING.



SCALE: 1½" = 1'-0"

CLAMP RING : ⅛" THK. 304 SS

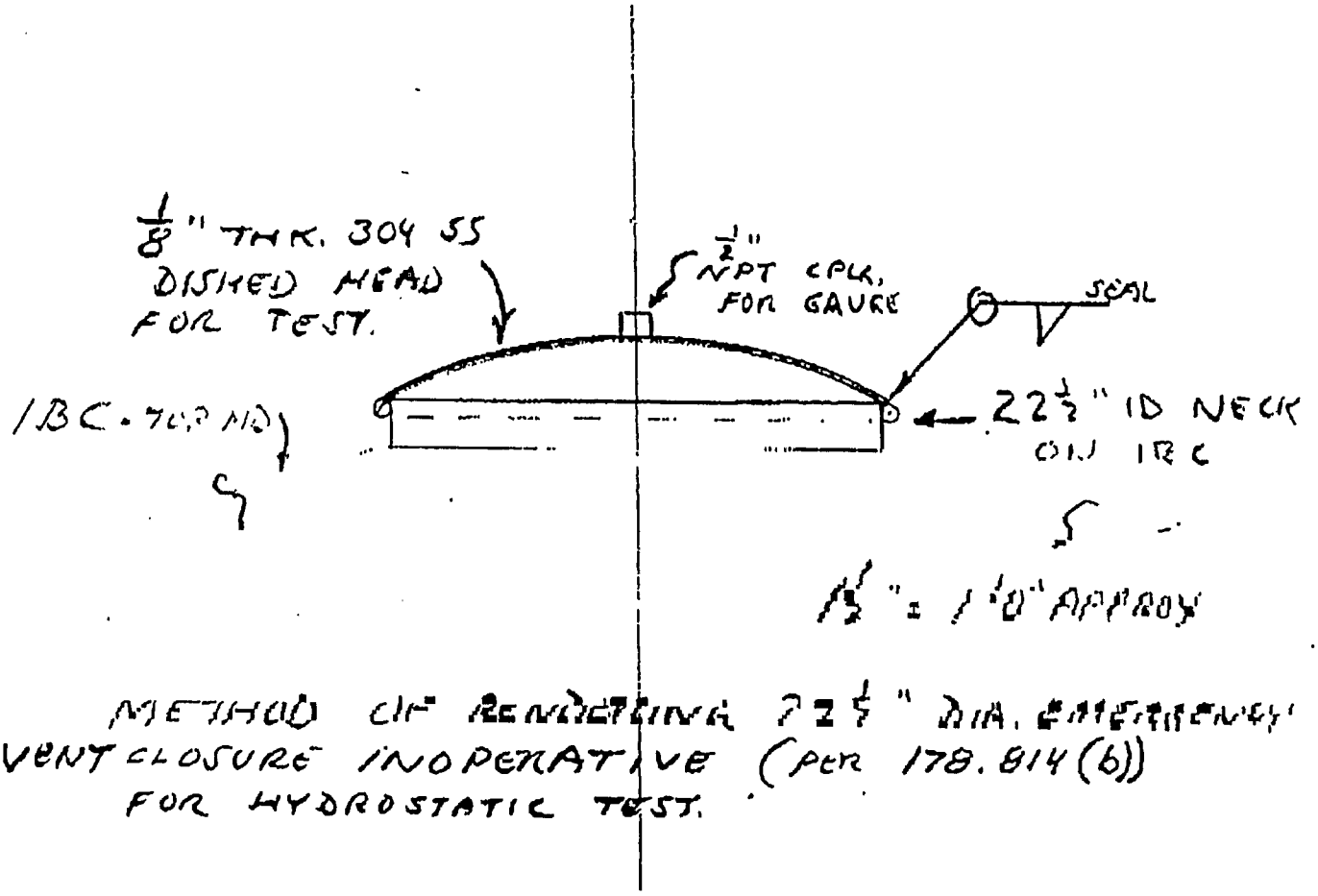
LUGS ON RING - 9/16" THK.
ONE LUG WITH 3/4" Ø HOLE
ONE LUG - TAPPED 9/16" UNC.

BOLT. - 304 S/S 9/16" UNC x 4" LG. HEX HD
WITH 9/16" UNC HEX NUT. S/S.

STA "A" RING - 2 REQ'D

ANDREW B. DUFFY, INC.
565 P.O. Box 8, Crown Point Road
Thorofare, NJ 08086
Custom Metal Fabrication
(609) 845-4900 (215) 922-4909
Fax: (609) 845-3921

BJ 3/11



METHOD OF RENDERING 22½" DIA. EMERGENCY VENT CLOSURE INOPERATIVE (PER 178.814(6)) FOR HYDROSTATIC TEST.

SK - "B"
BMD 2/6/98

Pa 4/11

PACKAGE RESEARCH LABORATORY
ROCKAWAY, NEW JERSEY 07866

Job No.: L-5038
Date Tested: 6/6/97

LABORATORY DOT VIBRATION TEST ON A 46" DIAMETER STEEL TANK/IBC

PERFORMED FOR:

Andrew B. Duffy, Inc.
Crown Point Road
P.O. Box #1
Thorofare, NJ 08086

MATERIAL TESTED:

One 46" diameter steel portable tank/IBC filled with sand is briefly described as follows:

Identification:	46" diameter steel portable tank/IBC
Outside Dimensions:	48-1/4" x 46" x 79-3/8"
Gross Weight:	5,747 lbs.
Manufactured by:	Andrew B. Duffy, Inc.
Contents:	Lead weight and 3,739 lbs. of water

Pg 5/11

MATERIAL TESTED: (Continued)

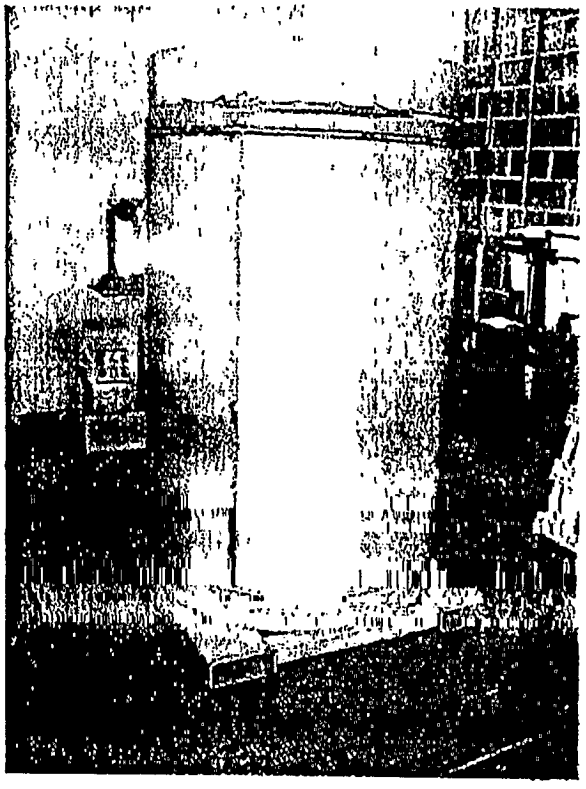


Photo No.: L-5038-A
Tank/IBC filled and ready for testing.

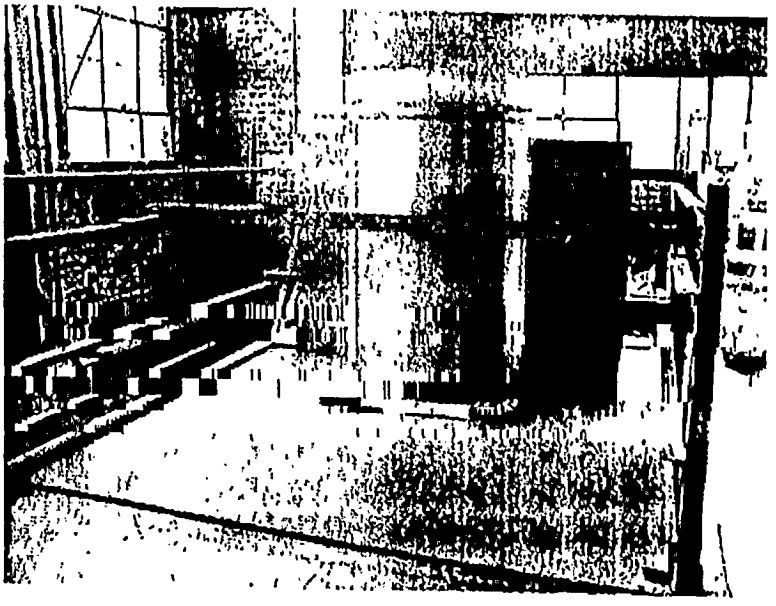


Photo No.: L-5038-B
Method of performing Vibration Test

TEST PROCEDURES:

The vibration test was performed on a filled Metal Portable Tank/IBC as specified in 49 Code of Federal Regulations 178.819 Paragraph 178.819 (b) (1), (2), (3), & (c).

Vibration Test

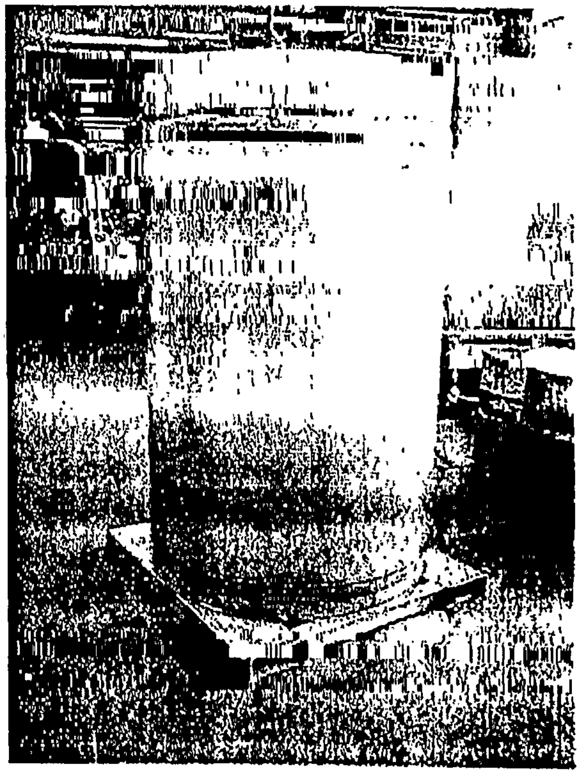
Equipment: A 10,000 lb. capacity variable speed drive synchronous motion L.A.B. vibration package tester with a circular motion at 1" double amplitude.

The metal portable tank/IBC, filled with sand was placed on the table of the vibration tester. A steel "I" beam was placed on the vibration table to prevent the tank/IBC from falling over, but the tank/IBC was allowed room to move vertically and bounce. The test was performed for one hour at 205 cpm. Vibration at this speed caused the tank/IBC to leave the testing table momentarily during each cycle. A flat metal shim was passed between the bottom of the tank/IBC and the table while at that vibration speed.

TEST RESULTS:

Vibration Test

No visible damage occurred to the tank/IBC. No leakage of contents was visible. The [illegible] during the test.



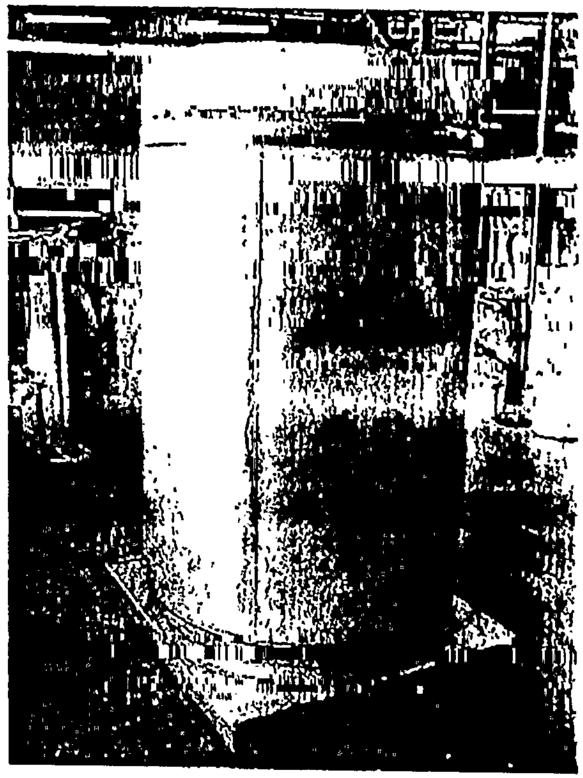


Photo No.: L-5038-C&D
Condition of the metal portable tank/IBC
after the Vibration Test

Bryan Berg
SENIOR PACKAGING TECHNICIAN

VIBRATION TEST

178.819

(b) *Test Method* (1) A sample IBC, selected at random, must be filled and closed as for shipment.
(2) The sample IBC must be placed on a vibrating platform that has a vertical double amplitude (peak to peak displacement) of 1 inch. The IBC must be constrained horizontally to prevent it from falling off the platform, but must be left free in all other directions, including vertically, bounce and rotate.
(3) The test must be performed for one hour at a frequency that causes the package to be raised from the vibrating platform to such a degree that a piece of material of approximately 1.6 mm (0.063 inch) thickness (such as steel strapping or paperboard) can be passed between the bottom of the IBC and the platform. Other methods at least equally effective may be used.
(c) *Criteria for passing the test.* An IBC passes the vibration test if there is no rupture or leakage.

SEE TEST REPORT OF PACKAGE RESEARCH LABORATORIES.

Performed By Above 6/5/97

Test Report Package Expected 1-2 wks After Test

BOTTOM LIFT TEST

178.811

(b) Special preparation for the bottom lift test. The intermediate bulk container must be loaded to 1.25 times its maximum permissible gross mass, the load being evenly distributed. (c) Test method. All intermediate bulk container design types must be raised and lowered twice by a lift truck with the forks centrally positioned and spaced at three quarters of the dimension of the side entry (unless the points of entry are fixed). The forks must penetrate to three quarters of the direction of entry.

RATED GROSS MASS:

WT. OF CONTAINER TESTED		
EMPTY IBC	1130 LB.	(PER P.R. LABS)
WT. OF WATER	3769 LB.	(PER P.R. LABS)
ADD FOR 1.1 S.G.	377 LB.	
TOTAL REQ'D GROSS	5276 LB.	

DESIRED RATED GROSS MASS	5300 LB.
REQUIRED TEST FACTOR 1.25	x 1.25
REQUIRED TEST WT.	6625 LB.

MAKEUP OF TEST WEIGHT

TARE	1130 LB.	←
LEAD WEIGHT	758 LB.	800 lbs
CONTENTS	3769 LB.	←
DISK #1 (2.5 X 32"D)	569 LB.	569 (2) 20-150" Ar. Fig. & Disk 2.5 x 32"D 425 lbs
DISK #2 (2.25 x 30"D)	450 LB.	
TOTAL TEST WT.	6676 LB.	6650 lbs

OUR TEST METHOD:

1. ADD LEAD WEIGHTS
2. FILL UNIT TO BOTTOM OF NECK WITH WATER
3. INSTALL COVER AND RING
4. PLACE DISKS ON TOP
5. MARK FORKS AT 36" FROM END (3/4 OF 48")
6. APPROACH UNIT, INSERT FORKS TO MARKS
7. LIFT 4 FEET FROM FLOOR
8. LOWER TO FLOOR AND REPEAT
9. REPEAT STEPS 6,7,8 ON OTHER SIDE

TEST COMPLETED DATE: 6/20/97 BY: [illegible signature]

DOCUMENTATION: VIDEO yes

PHOTO.

DESIGN TYPE: IBC 1

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LEAK PROOFNESS TEST

IBC, 178.813

(a) *General.* The leakproofness test must be conducted for the qualification of all IBC design types and on all production units intended to contain liquids or intended to contain solids that are loaded or discharged under pressure.

(b) *Special preparation for the leakproofness test.* Vented closures must either be replaced by similar non-vented closures or the vent must be sealed. For metal IBC design types, the initial test must carried out before the fitting of any thermal insulation equipment.

(c) *Test method and pressure applied.* The leakproofness test must be carried out for a suitable length of time using air at a gauge pressure of not less than 2.9 psig. Leakproofness of IBC design types must be determined by coating the seams and joints with a heavy oil, a soap solution and water, or other methods suitable for the purpose of detecting leaks. Other methods, if at least equally effective, may be used in accordance with appendix B of this part, or if approved by the Associate Administrator for Hazardous Materials Safety, as provided in 178.801(l).

(d) *Criteria for passing the test.* ....there may be no leakage of air from the IBC.

OUR TEST METHOD

1. Use same method as periodic air test.

TEST COMPLETED DATE: 6/21/99 BY: Mike Keegan
DESIGN TYPE: IBC 1

HYDROSTATIC PRESSURE TEST

IBC, 178.814

(a) General. The hydrostatic pressure test must be conducted for the qualification of all metal.... IBC design types intended to contain liquids or intended to contain solids loaded or discharged under pressure.

(b) Special preparation for the hydrostatic pressure test. For metal IBC's the test must be carried out before the fitting of any thermal insulation equipment. For all IBC's, pressure relief devices and vented closures must be removed and their apertures plugged or rendered inoperative.

(c) Test method. Hydrostatic gauge pressure must be measured at the top of the IBC. The test must be carried out for a period of at least 10 minutes applying a hydrostatic gauge pressure not less than that indicated in paragraph (d) of this section. The IBC may not be mechanically restrained during the test.

(d) Hydrostatic gauge pressure applied. (1) For metal IBC design type 31A,...9.4 psig.

(2) For metal IBC design type 31A...29 psig. For metal IBC design types ...31A, the tests in paragraphs (d)(1) and (d)(2) of this paragraph must be conducted consecutively.

(3) For metal IBC design types 21A..., for packing group I solids, 36 psig gauge pressure.

......

(e) Criteria for passing the test. (1) For metal IBC's, subjected to the 9.4 psig test pressure specified in paragraph (d)(1) of this section, there may be no leakage or permanent deformation that would make the IBC unsafe for transportation.

(2) For metal IBC's intended to contain liquids, when subjected to the 29 psig ..... test pressure, specified in paragraphs (d)(2) and (d)(3) of this section, respectively, there may be no leakage.

TEST TO 80 PSIG 6/20/97 PERFORMED By Mike Keyser

Video : YES

DROP TEST

IBC & DOT 57

DOT 57, 178.253-5 Testing

(a).....the tank must be filled with a liquid to not less than the rated gross weight.

(2) Drop Test. The tank must be capable of withstanding, without leakage of contents a 2-foot free drop onto a flat unyielding horizontal surface, striking the target surface in the position and attitude from which maximum damage to the tank (including piping and fittings) is expected.

IBC, 178.810 Drop Test

(a) General. The drop test must be conducted for the qualification of all IBC design types and performed periodically as specified in 178.801(e) of this subpart.

(b) Special preparation for the drop test. (1) Metal, ...IBC's intended to contain certain solids must be filled to not less than 95 percent of their capacity, or if intended to contain liquids, to not less than 98 percent of their capacity. Pressure relief devices must by removed and their apertures plugged or rendered inoperative.

(c) Test Method. Samples of all IBC design types must be dropped onto a rigid, non resilient, smooth, flat and horizontal surface. The point of impact must be the most vulnerable part of the base of the IBC being tested. Following the drop, the IBC must be restored to the upright position for observation.

(d) Drop height. (1) for all IBC's, drop heights are specified as follows:

(i) Packing Group I 5.9 Ft.

(ii) <u>Packing Group II 3.9 Ft.</u>

(2) Drop tests are to be performed with the solid or liquid to be transported or with a non-hazardous material having essentially the same physical characteristics.

(3) The specific gravity and viscosity of a substituted non-hazardous material used in the drop test for liquids must be similar to the hazardous material intended for transportation. Water may also be used for the drop test under the following conditions.

...

(c) Criteria for passing the test. For all IBC design types there may be no loss of contents. A slight discharge from a closure upon impact is not considered to be a failure of the IBC provided that no further leakage occurs. ....

Completed June 22, 1997 witnessed [illegible]

[illegible]

HER. 248 REV. 10-94

HERCULES

Hercules Incorporated
Hercules Plaza
1313 North Market Street
Wilmington, DE 19894-0001

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FIRST CLASS

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DIRECTOR (DHM-10)
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MATERIALS STANDARDS
OFFICE OF HAZARDOUS MATERIALS SAFETY
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