Testing and Technical Service Office

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February 13, 2019

UNITED NATIONS/IMO/DOT PERFORMANCE TEST

Report No:	S-1307-AL-011519	**Test Type:**	Annual Retest
Test Date:	1/15/2019	**Plant:**	Alsip, IL
Expiration Date:	1/15/2020		

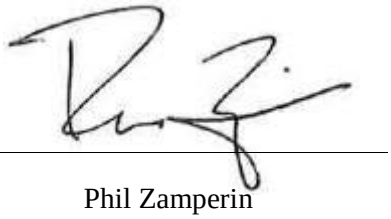
Mr. Dave Tomaszewski,

Attached are the laboratory test result sheets of the UN/DOT Performance Test on the steel drums that was conducted at the above stated plant.

These sample containers that were made with the proper components passed the required drop, leakproofness, hydrostatic and compression tests for the following UN Marking(s):

1A1/X1.8/300/YR 1A1/Y1.8/300/YR 1A1/Z1.8/300/YR

Thank you and best regards.



Phil Zamperin
Director, Quality Assurance and Regulatory Affairs

PZ:dt

TESTING and TECHNICAL SERVICE OFFICE

UNITED NATION/IMO/DOT
PERFORMANCE TEST

Date Tested: 1/15/2019
Report #: S-1307-AL-011519
Design Qualification Date: 12/1/2007
Closure Notification: See Attached

RETEST DESIGN TYPE RESULT SHEET

Drum Style: Steel Drum Tight Head — UN Code: 1A1 — Packing Group: I

GBC Code / Drum Type: THU 550 120090120 C20 / TIGHT HEAD

Dimensions: I.D.: 565.150 MM / 22.25 In. O.H.: 869.950 MM / 34.25 In.

UN Certified Markings: 1A1/X1.8/300/YR USA/GBC; 1A1/Y1.8/300/YR USA/GBC; 1A1/Z1.8/300/YR USA/GBC

Maximum Capacity:	215.6	Litres	/ 57.0	Gallons
Capacity Range:	208.2 - 208.2	Litres	/ 55 - 55	Gallons
Test Mass - Gross:	225.1	KG	/ 496.3	Lbs.
Tare:	17.1	KG	/ 37.6	Lbs.
Net:	208.0	KG	/ 458.7	Lbs.

Package Preparation: Drums filled with water to a minimum of 98%.

Conditioning: Not Applicable

Drop Tests (49 CFR 178.603)

Drop Height: 2.70 Metres / 106.30 Inches

Results Diagonal Top Drop: **3 Drums Passed**

Results Diagonal Bottom Drop: **3 Drums Passed**

Vibration Test (49 CFR 178.608)

Capable of withstanding, without rupture or leakage, the vibration test procedure in 49 CFR 178.608.

Leakproofness Test (49 CFR 178.604)

Air Pressure Applied: 4 psi

Results after 5 minutes: **3 Drums Passed**

Hydraulic (Hydrostatic) Test (49 CFR 178.605)

Internal (Hydraulic) Pressure: 300 kPa for a period of 5 minutes

Results: **3 Drums Passed**

Static Compression Test (49 CFR 178.606)

Total Mass: 992.56 KG (3.5 Drums x 397.0 KG each)

Duration: 24 Hours

Results: **3 Drums Passed**

TEST RESULTS CERTIFIED BY: GREIF
TESTING and TECHNICAL SERVICES

Phil Zamperin
Director, Quality Assurance and Regulatory Affairs

UN / IMO / DOT PERFORMANCE TEST
ADDITIONAL DRUM INFORMATION

Report # S-1307

Closing Ring:	N/A	**Necked-In:**	No
Chime Bands:	None	**Tapered:**	No
Cover Gasket:	N/A	**Agitator:**	No
Number of Hoops:	2 or more	**Other:**	None
Bottle / Liner:	None		

Fittings:

Brand:	Size:	Flange:	Plug:	Plug Gasket:	Location:
American Flange	2"	Steel	Steel	EPDM	Sidewall Btm
American Flange	2"	Steel	Steel	Poly Irradiated	Head
American Flange	3/4"	Steel	Steel	Poly Irradiated	Head
American Flange	2"	Steel	Steel	Poly Irradiated	Head
American Flange	2"	Steel	Nylon	Poly Irradiated	Head
American Flange	3/4"	Steel	Nylon	Poly Irradiated	Head

Notes:

1) This information reflects only the components of the sample drums tested and may not reflect all equivalent components of the drums covered under this test.
2) See attached closure notification for torque values for applicable rings and plugs on test drum.
3) If torque for components are not included on the closure attached, the components are customer supplied and were used for testing. Proper closing of the drum is the responsibility of the shipper.

S77 Greif Packaging LLC

********** CLOSURE NOTIFICATION **********

Pursuant to the requirements of the Department of Transportation in CFR 49 Part 178.2(c)(1), this is your notification of the closing method used for the the containers sold to you.

These instructions for closure are based upon the closure methods used to enable these containers to pass the United Nations test requirements as outlined by the UN marking on the package. This method of closure should be used to ensure that your containers have been closed in the same manner as when they were initially tested. To be UN certified, this drum must be closed with the same plugs used for certification. If the drum is purchased without these parts, contact the supplying Greif plant for the correct components.

Your product may adversely affect container materials, bung threads or closing devices. Product compatibility with the container is the shipper's responsibility.

The closure recommendations do not take into account any hazards present at your facility, or the handling, filling or shipping of your product.

Any container used for packaging hazardous materials should be inspected before filling and shipment. Containers with obvious damage or deterioration should not be filled or shipped.

Plug Closing Instructions:

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1) Place the plugs into the appropriate bung.
2) Turn the plug gently clockwise, making sure that the plug is entering the bung properly.
3) Using a torque wrench, tighten the plug according to the manufacturer's recommended torque below.

Drums with plugs closed in this manner have met the UN performance requirement as specified in the container markings.

August 22, 2018 - rev.0

For Item # DRST00192NA20003

Plugs

American Flange 2" Steel with EPDM	15 to 22	ft-lbs
American Flange 3/4" Steel with Poly Irradiated	11 to 18	ft-lbs
American Flange 2" Steel with Poly Irradiated	15 to 22	ft-lbs
American Flange 2" Steel with Poly Irradiated	15 to 22	ft-lbs
American Flange 2" Nylon with Poly Irradiated	15 to 22	ft-lbs
American Flange 3/4" Nylon with Poly Irradiated	8 to 11	ft-lbs