

Quality Assurance and Regulatory Affairs
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June 10, 2021

UN/DOT Design Type Certification

Report No:	S-1319-AL-210609	Test Type:	Periodic Retest
Test Date:	June 9, 2021	Expiration Date:	June 9, 2022
Test Facility:	Greif Packaging LLC 4300 West 130th St. Alsip, IL 60803	Manufacturing Plant:	Alsip Sd

Attached are our laboratory test result sheets of the UN/DOT Performance Test on the steel drums that were conducted at the above test facility location.

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

1A2/Y2.4/150 1A2/Z2.4/150

Thank you and best regards.

A handwritten signature in black ink, appearing to read "P. Zamperin", written over a horizontal line.

Phil Zamperin
Director, Quality Assurance and Regulatory Affairs

This test report is the property of Greif. The know-how, methods and techniques disclosed in this report are confidential information which can only be used by those persons with specific written authorization from Greif.

**Quality Assurance and Regulatory Affairs
United Nations/IMO/DOT
Performance Test**



DESIGN TYPE Details

Report No: S-1319-AL-210609
Date Tested: June 9, 2021
Qualification Date: September 20, 2007
Drum Style: OHBR
Drum Type: Steel Open Head Bolt Ring
UN Certified Marking(s):



1A2/Y2.4/150



1A2/Z2.4/150

Diameter: 18.25 inches
Overall Height: 29.13 inches
Tare Weight: 33.2 lbs
Gallon Capacity: 20 - 30 gal
Steel (T/B/B): 1.4 / 1.1 / 1.1
Hoops / Corrugations: 3 Hoops
Necked-In Top: No
Necked-In Bottom: No
Tapered: No
Bag/Tubing/Liner Mil: None
Seal Top: None
Composite Bottle: None
Agitator: No
Chime Bands: No
Cover Gasket: EPDM Solid

Additional components - see next page

Drum Construction:

Shell body is formed with longitudinally welded side seam, bottom end is mechanically seamed as indicated to lock bottom and shell together. Top end is mechanically seamed as indicated, or rolled outward to form a curl that allows for the attachment of a cover and locking ring. When top is removable, the cover has a sealing gasket inserted in the channel around the periphery of the cover. The cover is fixed with a locking band. Body or cover may contain fittings that are mechanically inserted as described in this report.

**Quality Assurance and Regulatory Affairs
United Nations/IMO/DOT
Performance Test**




DESIGN TYPE Details - Additional Components

Report No: S-1319-AL-210609

Date Tested: June 9, 2021

UN Certified Marking(s):  1A2/Y2.4/150

 1A2/Z2.4/150

The following components have undergone DOT qualification testing as described in the Original Design Type Result Sheet using the same conditions and procedures, and meet the requirements of §178.601(g)(5):

CLOSING RINGS

<u>Material</u>	<u>Style / Thickness</u>	<u>Bolt Size</u>
Steel	BR 12ga	5/8"

FITTINGS

<u>Size</u>	<u>Flange Material</u>	<u>Plug Material</u>	<u>Plug Gasket</u>	<u>Location</u>
2"	Steel	Steel	Buna Gasket	Side Btm
2"	Steel	Nylon	Poly Gsk	Cover
2"	Steel	Steel	Buna Gasket	Cover
3/4"	Steel	Poly MPV	EPDM Gasket	Cover
3/4"	Steel	Steel	Buna Gasket	Cover

Notes:


1. Elastomer gaskets include EPDM, BUNA and Viton. All other gasket materials should be denoted in the tested design. For specific plug gasket and torque instructions, please refer to your product specific closure instruction on the packing slip.
2. See attached closure notification for torque values for applicable rings on test drum.
3. If torques for components are not included on the attached closure, the components were supplied by the customer for testing. Proper closure of the unit is the responsibility of the shipper.
4. Closures supplied by Greif for this design have been fully qualified throughout the packaging design history, and the closures on this report may not include all qualified closures for this design. Please consult Greif Quality Assurance and Regulatory Affairs for specific question regarding closure qualification. In the event a closure that is not qualified by Greif is substituted by the customer, the certified mark should be voided and removed from the package. It is the responsibility of the customer to ensure that any substituted closures meet the requirement of CFR 49 178.601 and this report cannot be used as evidence of compliance to the certified marking.

**Quality Assurance and Regulatory Affairs
United Nations/IMO/DOT
Performance Test**



RETEST DESIGN TYPE RESULT SHEET

Report No: S-1319-AL-210609
Date Test: June 9, 2021
Qualification Date: September 20, 2007
Drum Style: Steel Open Head Bolt Ring
UN Certified Marking(s):  1A2/Y2.4/150

 1A2/Z2.4/150

Maximum Capacity:	117.2 Litres	30.9 Gallons
Capacity Range:	75.8 - 113.7 Litres	20 - 30 Gallons
Test Mass - Gross with water:	129.9 KG	286.3 Lbs
Tare:	15.2 KG	33.5 Lbs
Net:	114.7 KG	252.8 Lbs

Static Compression Test (49 CFR 178.606)

Package Preparation: Fill to 98% minimum capacity with water
Conditioning: Ambient

Total Mass: 929 KG (3.2 Units x KG each)
Duration: 24 Hours
Results: 3 Units Passed

Drop Test (49 CFR 178.603)

Package Preparation: Fill to 98% capacity minimum with water
Conditioning: Ambient

Drop Height: 2.4 Metres / 94.5 Inches
Diagonal Top, At ring juncture
& largest fitting, opposite weld
seam: 3 Units Passed
Diagonal Bottom, On bottom
chime at weld seam: 3 Units 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)

Package Preparation: Drum are to be empty for the duration of the test
Conditioning: Ambient

Air Pressure Applied: 20 kPa / 3 psi
Duration: 5 Minutes
Results: 3 Units Passed

Hydraulic (Hydrostatic) Test (49 CFR 178.605)

Package Preparation: Brim full and purged of air
Conditioning: Ambient

Internal (Hydraulic) Pressure: 150 kPa
Duration: 5 Minutes
Results: 3 Units Passed

TEST RESULTS CERTIFIED BY:

Quality Assurance and Regulatory Affairs

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Phil Zamperin

***** BOLT RING 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 cover, closing ring, gasket and plugs (if applicable) 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.

Ring Closing Instructions:

- 1) Place cover on the drum, making sure that the gasket is in place.
- 2) Snap the closing ring over the cover and top lip of the drum. Make sure that the ring's lugs point down below the ring. Also, make sure the bottom edge of the closing ring engages under the lip of the drum.
- 3) Insert the bolt completely through the lug without threads. Next, screw on the jam nut if included. Finally screw the bolt into the threaded lug.
- 4) While tightening the bolt, tap along the entire perimeter of the ring with a mallet, starting directly across from the bolt.
- 5) Tighten the bolt according to the manufacturer's recommended torque and gap listed below. The cover and ring should not spin, and the free ends of the ring should not touch.
- 6) If used, tighten the jam nut or locking nut against the lug without threads. This prevents the bolt from backing out of the closing ring.

Plug Closing Instructions:

- 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 rings and plugs closed in this manner have met the UN performance requirement as specified in the container markings.

August 9, 2018 - rev.0

For Item # DRST01778NA20001

Closing Ring		Torque	Gap
12ga Bolt Ring with EPDM Gasket		60 ft-lbs	1/8" to 5/8"
Plugs			
Tri-Sure 2" Steel with Buna	15 to 22	ft-lbs	
Tri-Sure 2" Steel with Buna	15 to 22	ft-lbs	
Tri-Sure 2" Nylon with Poly Irradiated	15 to 22	ft-lbs	
Tri-Sure 3/4" Steel with Buna	8 to 15	ft-lbs	

Tri-Sure 3/4" Plastic w/MPV with EPDM

8 to 11

ft-lbs