

**UNITED NATIONS / DOT  
PERFORMANCE CERTIFICATION**




**LEECONTAINER**

**4G PERIODIC RETEST**

**2 x 2.5 Gallon F-Style Plastic Bottle Packaging**

**TEST REPORT #: 22-NC20131**

 4G / Y32.1 / S / \*\*  
USA / +CQ9565

\*\*Insert the year packaging is manufactured

**TESTING PERFORMED FOR:**

**LEE CONTAINER CORPORATION**

100 Chambers Boulevard  
Homerville, GA 31634

**ATTN: Allen Jones**

**TESTING PERFORMED BY:**

**TEN-E PACKAGING SERVICES, INC.**

2101 Shore Street  
High Point, NC 27263  
Phone: 336-803-4878  
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August 23, 2022

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**NOTES AND COMMENTS**

The 2 x 2.5 Gallon F-style Plastic Bottle Packaging was tested with the following bottle, closure, and case sealing variables:


- **Variable #1:** 2 x 2.5 Gallon F-Style Plastic Bottle / Rexam 63 mm Cap / Glued Case Sealing
- **Variable #2:** 2 x 2.5 Gallon F-Style Plastic Bottle / Phoenix 63 mm Vented Cap / Taped Case Sealing

Providing the provisions of Selective Testing Variation 1 have been met (178.601(g)(1)), alternate bottle and closure combinations may be used.

**SECTION I: CERTIFICATION**

**Periodic Retest of the Lee Container Corporation  
 2 x 2.5 Gallon F-Style Plastic Bottle Packaging**

TEN-E Packaging Services, Inc. is a current DOT UN Third-Party Certification Agency under §107.403 and certifies that the **Lee Container Corporation** packaging referenced above has passed the standards of the DEPARTMENT OF TRANSPORTATION'S TITLE 49 CFR; Performance Oriented Packaging Standards, Section 178. This package is also certified under IMDG and the UN Recommendations on the Transport of Dangerous Goods. It is the responsibility of the end user to determine authorization for use under these regulations. The use of other packaging methods or components other than those documented in this report may render this certification invalid.

SUMMARY OF PERFORMANCE TESTS					
UN / DOT TEST	49 CFR REFERENCE	TEST LEVEL	TEST CONTENTS	TEST COMPLETED	TEST RESULTS
Drop	178.603	1.5 m	PPG/Water Solution	August 22, 2022	PASS
Stacking	178.606	226.8 Kg – 24 Hours	Water	August 23, 2022	PASS
Pressure	173.27	--	---	---	---
Vibration	178.608	4.3 Hz – 1 Hour	Water	August 22, 2022	PASS
Cobb	178.516	30 Minutes	---	August 23, 2022	PASS
<b>TEST REPORT NUMBERS:</b>			22-NC20131, 18-NC20010		
<b>UN MARKING: (CFR 49 – 178.503)</b>			 4G / Y32.1 / S / ** USA / +CQ9565		
<b>PACKAGING IDENTIFICATION CODE:</b>			4G - Fiberboard Box (178.516)		
<b>PERFORMANCE STANDARD:</b>			Y (Packaging meets Packing Group II and III tests)		
<b>AUTHORIZED GROSS MASS:</b>			32.1 Kg (70.7 Lbs.)		
<b>"S" DESIGNATION:</b>			Denotes Inner Packagings		
<b>YEAR OF MANUFACTURE:</b>			** Insert year the packaging is manufactured		
<b>STATE AUTHORIZING THE MARK:</b>			USA		
<b>PACKAGING CERTIFICATION AGENCY:</b>			(+CQ) TEN-E Packaging Services, Inc. (High Point, NC CAA #2015050020)		
<b>THIRD PARTY PACKAGING IDENTIFICATION:</b>			+CQ9565		
<b>PERIODIC RETEST DATE:</b>			August 23, 2024		

ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY THAT THE PACKAGING TESTED IS MERCHANTABLE OR FIT FOR A PARTICULAR PURPOSE, ARE DISCLAIMED. In no event shall TEN-E Packaging Services, Inc. liability exceed the total amount paid by **Lee Container Corporation** for services rendered. In the event of future changes to the above referenced test standards, it is the responsibility of **Lee Container Corporation** to determine whether additional testing or updating of past testing is necessary to verify that the packaging we have tested remains in compliance with those standards.

**MANUFACTURER:**

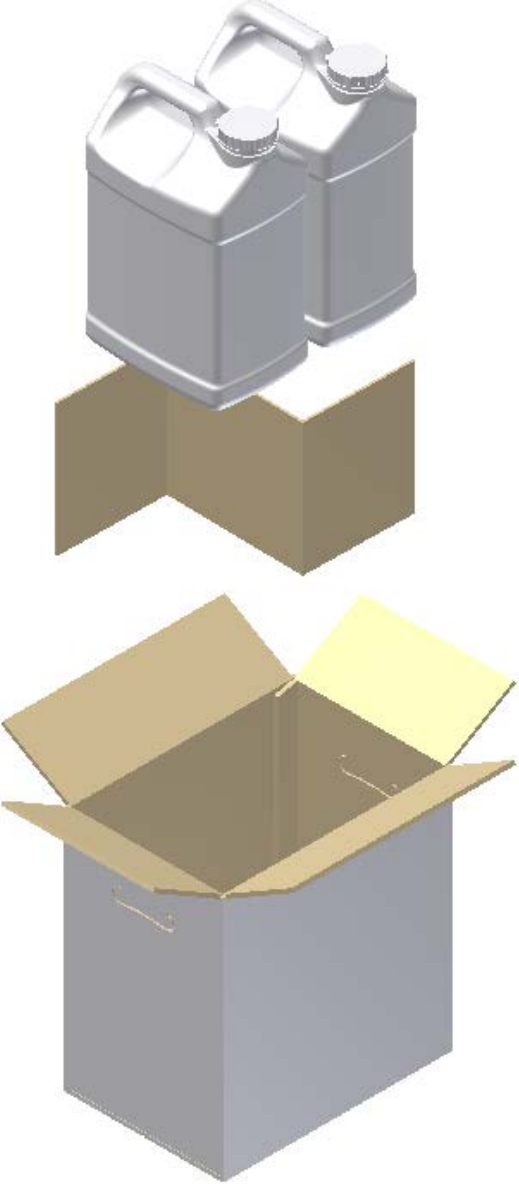
**Lee Container Corporation**  
 100 Chambers Boulevard  
 Homerville, GA 31634-0575



Brent Weber  
 Project Manager  
 TEN-E Packaging Services, Inc.  
 2101 Shore Street  
 High Point, NC 27263

**SECTIONS II & V: PACKAGING DESCRIPTIONS / COMPONENT DRAWINGS**

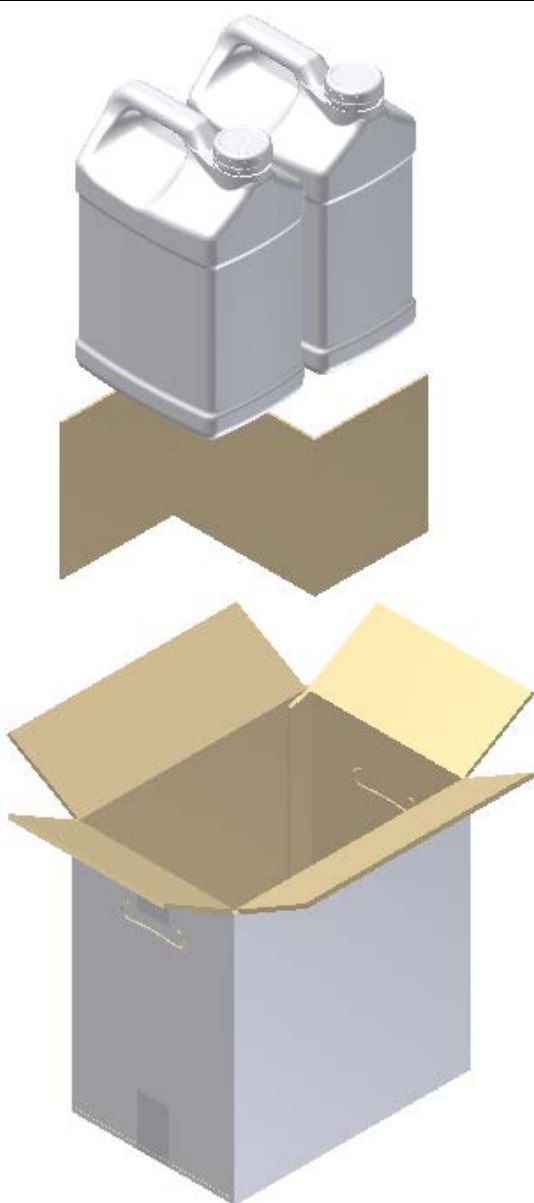
**2 x 2.5 Gallon F-Style Plastic Bottle Packaging - Var. #1: Rexam 63mm Cap / Glued**

ASSEMBLY DRAWING	TEST LEVELS		
	Certification Type:	Periodic Retest	
	Packaging Code Designation:	4G	
	Packing Group:	II	
	Specific Gravity:	1.5	
	<b>TEST SAMPLE PREPARATION</b> (Refer to Section IV)		
	Overall Packaging Tare Weight:	1,600 Grams	
	Fill Capacity (98% Maximum Capacity):		
	PPG/Water Solution	11,076.7 Grams	
	Water	10,650.7 Grams	
	Package Test Weight:		
	PPG/Water Solution	23.7 Kg	52.2 Lbs.
	Water	22.9 Kg	50.4 Lbs.
	Authorized Package Gross Mass:	33.5 Kg	73.8 Lbs.
	<b>CLOSING METHODS – INNER PACKAGING</b>		
	63 mm Threaded Closure:		
Application Torque:	55 In-Lbs.		
Equipment:	Torque Wrench #E705		
<b>CLOSING METHODS – SHIPPER</b>			
<b>Top Flaps:</b>			
Manufacturer:	3M, St. Paul		
Type:	3M #373 Pressure Sensitive Tape		
Width:	3"		
Overlap:	2-1/2" Minimum		
Tape Pattern:	Center Seam		
<b>Bottom Flaps:</b>			
Manufacturer:	3M, St. Paul		
Type:	3M #373 Pressure Sensitive Tape		
Width:	3"		
Overlap:	2-1/2" Minimum		
Tape Pattern:	Center Seam		

**For Packagings with an Established Gross Mass:**

If the gross mass calculation in this report exceeds the previously established gross mass, the manufacturer may elect to maintain the current gross mass marking (e.g. the gross mass rating of the UN marking on the packaging may be less than the calculated gross mass indicated in this report) or use the newly established gross mass. In no event shall the gross mass marking on the packaging exceed the gross mass to which the packaging was tested.

**2 x 2.5 Gallon F-Style Plastic Bottle Packaging - Var. #2: Phoenix 63mm Vented Cap / Taped**


ASSEMBLY DRAWING	TEST LEVELS		
	Certification Type:	Design Qualification	
	Packaging Code Designation:	4G	
	Packing Group:	II	
	Specific Gravity:	1.5	
	<b>TEST SAMPLE PREPARATION</b> (Refer to Section IV)		
	Overall Packaging Tare Weight:	1,592 Grams	
	Fill Capacity (98% Maximum Capacity):		
	PPG/Water Solution	11,125.6 Grams	
	Water	10,697.7 Grams	
	Package Test Weight:		
	PPG/Water Solution	23.8 Kg	52.4 Lbs.
	Water	22.9 Kg	50.4 Lbs.
	Authorized Package Gross Mass:	33.6 Kg	74.0 Lbs.
	<b>CLOSING METHODS – INNER PACKAGING</b>		
63 mm Threaded Closure:			
Application Torque:	55 In-Lbs.		
Equipment:	Torque Wrench #E705		
<b>CLOSING METHODS – SHIPPER</b>			
<b>Top Flaps:</b>			
Manufacturer:	Specialty Adhesives, Grand Prairie, TX		
Type:	Glued, Hot Melt Adhesive		
Pattern:	Three (3) strips of glue to both sides of each minor flap		
<b>Bottom Flaps:</b>			
Manufacturer:	Specialty Adhesives, Grand Prairie, TX		
Type:	Glued, Hot Melt Adhesive		
Pattern:	Three (3) strips of glue to both sides of each minor flap		

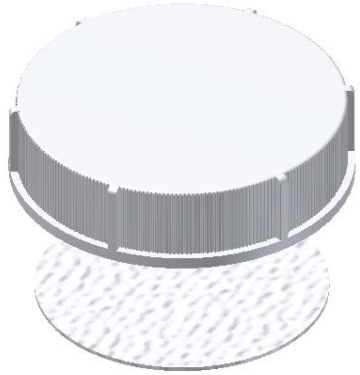
**For Packagings with an Established Gross Mass:**

If the gross mass calculation in this report exceeds the previously established gross mass, the manufacturer may elect to maintain the current gross mass marking (e.g. the gross mass rating of the UN marking on the packaging may be less than the calculated gross mass indicated in this report) or use the newly established gross mass. In no event shall the gross mass marking on the packaging exceed the gross mass to which the packaging was tested.


**COMPONENT INFORMATION**

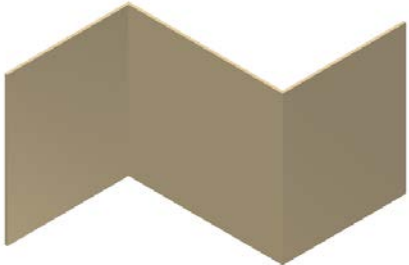
CLOSURE (63-S01-9102U) VAR. #1		DRAWING
<b>Manufacturer: Phoenix Closures, Inc., Naperville, IL</b>		
<b>Description:</b>	63-S01 63 mm Vented Closure	
<b>Quantity:</b>	2	
<b>Material:</b>	Polypropylene, White	
<b>Tare Weight:</b>	11.770 Grams	
<b>Overall Dimensions:</b>		
• <b>Height</b>	0.846" ± 0.010"	
• <b>Diameter</b>	2.772" ± 0.010"	
<b>Thread Dimensions:</b>		
• <b>T</b>	2.554" ± 0.010"	
• <b>E</b>	2.392" ± 0.010"	
<b>Markings (QC Audit):</b>	PHOENIX CLOSURES Phoenix Logo 5A	
<b>LINER</b>		
<b>Description:</b>	AirFoil® YN4 PE Vented Liner	
<b>Tare Weight:</b>	1.161 Grams	
<b>Thickness:</b>	0.013"	
<b>Diameter:</b>	2.5"	

BOTTLE WITH 63 TE/ABO FINISH (10TRO-036) VAR. #1		DRAWING
<b>Manufacturer: Lee Container, Homerville, GA</b>		
<b>Description:</b>	10-Quart Trimline F-Style Plastic Bottle	
<b>Quantity:</b>	2	
<b>Material:</b>	High Density Polyethylene	
<b>Method of Manufacture:</b>	Blow Molded	
<b>Tare Weight:</b>	350 Grams ± 5 Grams	
<b>Capacity:</b>		
• <b>Rated</b>	2.5 Gallons	
• <b>Overflow</b>	2.87 Gallons (10,868 mL)	
<b>Overall Dimensions:</b>		
• <b>Height</b>	14.381" ± 0.090"	
• <b>Width</b>	6.670" ± 0.090"	
• <b>Depth</b>	9.120" ± 0.110"	
<b>Thread Dimensions:</b>		
• <b>T</b>	2.495" ± 0.020"	
• <b>E</b>	2.350" ± 0.020"	
<b>Wall Thickness:</b>		
• <b>Minimum</b>	0.022"	
<b>Markings (QC Audit):</b>	M4462 LEE Q 33 12/22 ACRC MEMBER SPI "2" HDPE Recycling Symbol	

CLOSURE (63 DOT) VAR. #2		DRAWING
<b>Manufacturer: Rexam Closures, Evansville, IN</b>		
<b>Description:</b>	63 DOT Threaded Closure	
<b>Quantity:</b>	2	
<b>Material:</b>	Copolymer Polypropylene, White	
<b>Tare Weight:</b>	12.150 Grams	
<b>Overall Dimensions:</b>		
• <b>Height</b>	0.718" ± 0.015"	
• <b>Diameter</b>	2.796" ± 0.15"	
<b>Thread Dimensions:</b>		
• <b>T</b>	2.541" ± 0.007"	
• <b>E</b>	2.391" ± 0.007"	
• <b>Thread Pitch</b>	0.167"	
<b>Markings (QC Audit):</b>	2	
<b>LINER</b>		
<b>Description:</b>	F217 Foamed PE Liner, Glued-In	
<b>Tare Weight:</b>	1.270 Grams	
<b>Thickness:</b>	0.039"	
<b>Diameter:</b>	2.383"	



BOTTLE WITH REXAM FINISH (10TRO-005)VAR. #2		DRAWING
<b>Manufacturer: Lee Container, Homerville, GA</b>		
<b>Description:</b>	10-Quart Trimline F-Style Plastic Bottle	
<b>Quantity:</b>	2	
<b>Material:</b>	High Density Polyethylene, White (3943) or Natural Exxon AA45-004	
<b>Method of Manufacture:</b>	Blow Molded	
<b>Tare Weight:</b>	350 Grams ± 5 Grams	
<b>Capacity:</b>		
• <b>Rated</b>	2.5 Gallons	
• <b>Overflow</b>	2.88 Gallons (10,916 mL)	
<b>Overall Dimensions:</b>		
• <b>Height</b>	14.381" ± 0.090"	
• <b>Width</b>	6.670" ± 0.090"	
• <b>Depth</b>	9.120" ± 0.110"	
<b>Thread Dimensions:</b>		
• <b>T</b>	2.505" + 0.017/- 0.018"	
• <b>E</b>	2.357" + 0.017/- 0.018"	
<b>Wall Thickness:</b>		
• <b>Minimum</b>	0.022"	
<b>Markings (QC Audit):</b>	M4462 LEE Q 18 4/22 SPI "2" HDPE Recycling Symbol	

INSERT ( 01742100034_3)		DRAWING
<b>Manufacturer: International Paper, Forest Park, GA</b>		
<b>Description:</b>	Z-Divider	
<b>Quantity:</b>	1	
<b>Material/Flute:</b>	Single Wall Natural Kraft Corrugated Fiberboard, C-Flute	
<b>Basis Weight (Outer to Inner) Lbs./MSF:</b>		
• <b>Specification</b>	56 / 26 / 56	
<b>Board Caliper (Nom.):</b>	0.171"	
<b>Tare Weight:</b>	170 Grams	
<b>Blank Size:</b>	24-1/8" x 14-1/2"	
<b>Markings (QC Audit):</b>	None	

SHIPPER (AB210874-01_B)		
<b>Manufacturer: Pratt Industries, Inc, Albany, GA</b>		
<b>Description:</b>	Regular Slotted Container (RSC) with Die-Cut Hinged Hand Holes	
<b>Die-Cut Hand Holes:</b>		
• <b>Dimensions (L x W)</b>	3-1/2" x 1"	
• <b>Location</b>	Centered on Minor Panels 1-1/4" From Top Score	
<b>Material/Flute (Outer to Inner):</b>	Double Wall Mottled White Corrugated Fiberboard, C/B Flute	
<b>Basis Weight (Outer to Inner) Lbs./MSF:</b>		
• <b>Specification</b>	33 / 23 / 35 / 23 / 35	
<b>Tare Weight:</b>	684 Grams	
DIMENSIONS		
	Specification Dimensions (Inside)	Measured Dimensions (Outside)
• <b>Length</b>	14-5/16"	14-7/8"
• <b>Width</b>	9-7/8"	10-3/8"
• <b>Height</b>	14-5/8"	15-3/4"
<b>Board Caliper (Nominal):</b>	0.259"	
<b>Manufacturer's Joint:</b>	Inside Glued, 1-7/8" Lap	
<b>Markings (QC Audit):</b>	None	

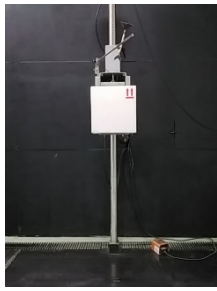
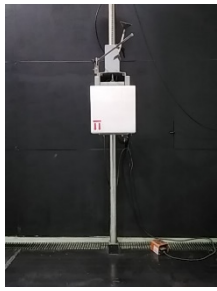
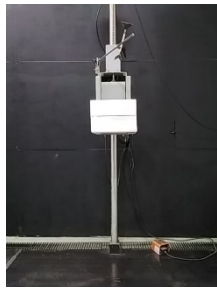

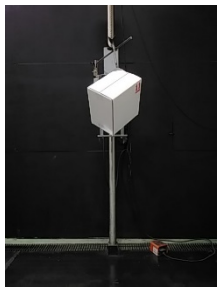
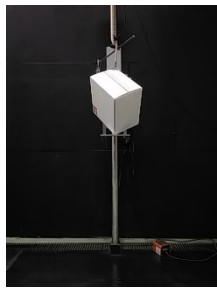
**SECTION III: TEST PROCEDURES AND RESULTS**

**DROP TESTS**

**Variable #1**

TEST INFORMATION		TEST CRITERIA
<b>TEST CONTENTS:</b>	PPG/Water Solution (1.04 SG)	<ul style="list-style-type: none"> <li>For packaging containing liquid, each packaging does not leak.</li> <li>There can be no damage to the outer packaging likely to adversely affect safety during transport. Inner receptacles, inner packagings or articles must remain completely within the outer packaging and there must be no leakage of the filling substance from the inner packaging.</li> <li>Any discharge from a closure is slight and ceases immediately after impact with no further leakage. (\$178.603)</li> </ul>
<b>SAMPLE PREPARATION:</b>	Refer to Section II	
<b>CONDITIONING:</b>	-18°C (0°F) Chamber #E201	
<b>CONTENTS TEMP.:</b>	-19.4°C (-2.92°F)	
<b>DROP HEIGHT:</b>	1.5 Meters (60.0") (Refer to Section IV)	
<b>TEST EQUIPMENT:</b>	L.A.B. Accu Drop 160 #E301	

**DROP ORIENTATIONS AND TEST RESULTS**

Sample #1: Flat on Bottom	Sample #2: Flat on Top	*Sample #3: Flat on Long Side
		
<b>PASS:</b> No leakage or damage.	<b>PASS:</b> No leakage or damage.	<b>PASS:</b> No leakage or damage.
*Sample #4: Flat on Short Side	*Sample #5: Bottom Corner	**Sample #1: Top Corner
		
<b>PASS:</b> No leakage or damage.	<b>PASS:</b> No leakage. Slight deformation at impact corner.	<b>PASS:</b> No leakage. Slight deformation at impact corner.

\*Side and corner drops were conducted to impact the manufacturer's joint.

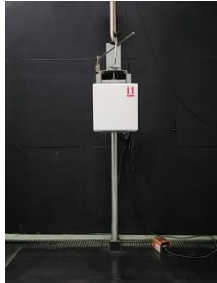
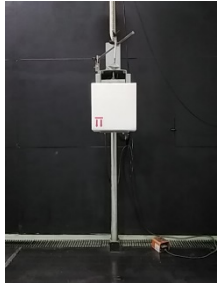
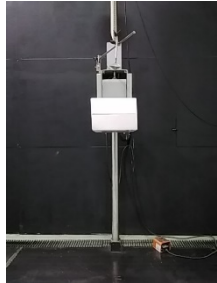
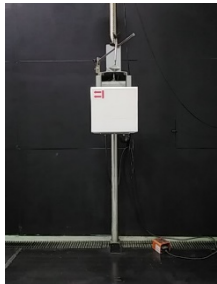
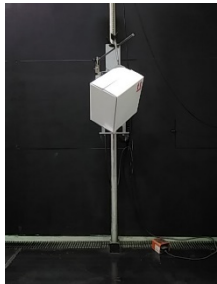

\*\*Flat on bottom drop sample was also used for the top corner drop.

**DROP TESTS**

**Variable #1**

TEST INFORMATION		TEST CRITERIA
<b>TEST CONTENTS:</b>	PPG/Water Solution (1.04 SG)	<ul style="list-style-type: none"> <li>For packaging containing liquid, each packaging does not leak.</li> <li>There can be no damage to the outer packaging likely to adversely affect safety during transport. Inner receptacles, inner packagings or articles must remain completely within the outer packaging and there must be no leakage of the filling substance from the inner packaging.</li> <li>Any discharge from a closure is slight and ceases immediately after impact with no further leakage. (§178.603)</li> </ul>
<b>SAMPLE PREPARATION:</b>	Refer to Section II	
<b>CONDITIONING:</b>	-18°C (0°F) Chamber #E201	
<b>CONTENTS TEMP.:</b>	-19.4°C (-2.92°F)	
<b>DROP HEIGHT:</b>	1.5 Meters (60.0") (Refer to Section IV)	
<b>TEST EQUIPMENT:</b>	L.A.B. Accu Drop 160 #E301	

**DROP ORIENTATIONS AND TEST RESULTS**

Sample #6: Flat on Bottom	Sample #7: Flat on Top	*Sample #8: Flat on Long Side
		
<b>PASS:</b> No leakage or damage.	<b>PASS:</b> No leakage or damage.	<b>PASS:</b> No leakage or damage.
*Sample #9: Flat on Short Side	*Sample #10: Bottom Corner	**Sample #6: Top Corner
		
<b>PASS:</b> No leakage or damage.	<b>PASS:</b> No leakage. Slight deformation at impact corner.	<b>PASS:</b> No leakage. Slight deformation at impact corner.

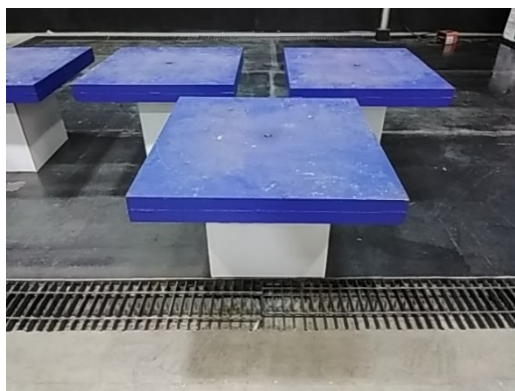
\*Side and corner drops were conducted to impact the manufacturer's joint.

\*\*Flat on bottom drop sample was also used for the top corner drop.

**STACKING TEST**

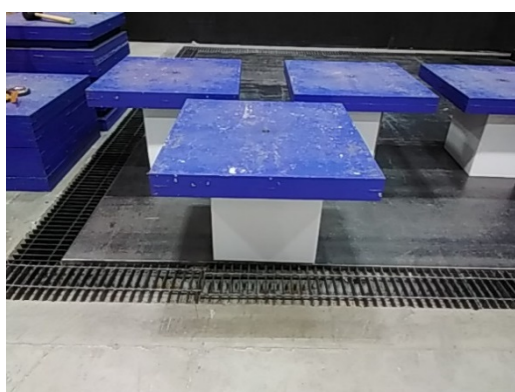
TEST INFORMATION		TEST CRITERIA
<b>TEST CONTENTS:</b>	Water	<ul style="list-style-type: none"> <li>• There must be no leakage of the filling substance from the inner receptacle, or inner packaging.</li> <li>• There can be no deterioration that could adversely affect transport safety or any distortion liable to reduce the package's strength, cause instability in stacks of packages, or cause damage to inner packagings that is likely to reduce safety in transport.</li> </ul> (\$178.606)
<b>SAMPLE PREPARATION:</b>	Refer to Section II	
<b>CONDITIONING:</b>	Ambient	
<b>TEST LOAD APPLIED:</b>	226.8 Kg (500.0 Lbs.) (Refer to Section IV)	
<b>TEST DURATION:</b>	24 Hours	
<b>TEST EQUIPMENT:</b>	Dead Load Weights	

**STACKING TEST SET-UP & RESULTS – Variable #1**



Sample #	Maximum Deflection After 24 Hours	Results
11	0"	PASS
12	0"	PASS
13	0"	PASS

**STACKING TEST SET-UP & RESULTS – Variable #2**



Sample #	Maximum Deflection After 24 Hours	Results
14	0"	PASS
15	0"	PASS
16	0"	PASS


**Comments/Observations:** Following the 24-hour stack test, there was no leakage of contents from the test samples and no damage likely to affect the performance of the packaging.

**Stacking Stability:** Not conducted; required only for guided load tests.

**VIBRATION TEST**

TEST INFORMATION		TEST CRITERIA
<b>TEST CONTENTS:</b>	Water	<ul style="list-style-type: none"> <li>• Immediately following the period of vibration, each package must be removed from the platform, turned on its side and observed for any evidence of leakage.</li> <li>• A packaging passes the vibration test if there is no rupture or leakage from any of the packages.</li> <li>• No test sample should show any deterioration which could adversely affect transportation safety or any distortion liable to reduce packaging strength. (§178.608)</li> </ul>
<b>SAMPLE PREPARATION:</b>	Refer to Section II	
<b>CONDITIONING:</b>	Ambient	
<b>TABLE DISPLACEMENT:</b>	1"	
<b>TEST FREQUENCY:</b>	4.3 Hz	
<b>TEST DURATION:</b>	1 Hour	
<b>TEST EQUIPMENT:</b>	Vertical motion using L.A.B. V4000 Vibration System #E503	

**VIBRATION TEST SET-UP AND RESULTS**

	Sample & Variable #		Results	Comments / Observations
	V1 – 11	V2 – 14	PASS	No leakage or damage.
	V1 – 12	V2 - 15	PASS	
	V1 – 13	V2 - 16	PASS	



**COBB WATER ABSORPTION TEST**

TEST INFORMATION	TEST CRITERIA
<p><b>NUMBER OF SAMPLES:</b> 5</p> <p><b>SAMPLE SIZE:</b> 5" x 5" (Minimum)</p> <p><b>CONDITIONING:</b> 73°F / 50% RH Chamber #215</p> <p><b>WATER APPLIED:</b> 100 mL / Sample</p> <p><b>TEST DURATION:</b> 30 Minutes / Sample</p> <p><b>TEST EQUIPMENT:</b> AD Precision Balance #E101 Gurley Cobb Water Absorption Fixtures</p>	<ul style="list-style-type: none"> <li>An increase in mass greater than 155 g/m<sup>2</sup> over the 30 minute duration represents an unacceptable level of water resistance. (§178.516)</li> </ul>

**COBB WATER ABSORPTION TEST RESULTS**

REPRESENTATIVE SET-UP PHOTO	Sample #	Water Absorbed
	1	161.7 g/m <sup>2</sup>
	2	156.0 g/m <sup>2</sup>
	3	153.0 g/m <sup>2</sup>
	4	153.6 g/m <sup>2</sup>
	5	146.0 g/m <sup>2</sup>
	<b>AVERAGE:</b>	<b>154.1 g/m<sup>2</sup></b>
	<b>RESULT</b>	<b>PASS</b>



## REGULATORY AND INDUSTRY STANDARD REFERENCES

### REGULATORY REFERENCES

TEST	49 CFR <sup>①</sup>	UN <sup>②</sup>	IMDG <sup>③</sup>
	October 2021 Edition	22 <sup>nd</sup> Edition	2020 Edition
<b>Drop:</b>	178.603	6.1.5.3	6.1.5.3
<b>Stacking:</b>	178.606	6.1.5.6	6.1.5.6
<b>Vibration:</b>	178.608	---	---
<b>Cobb:</b>	178.516(b)(1)	6.1.4.12.1	6.1.4.12.1

① United States Department of Transportation Code of Federal Regulations (CFR) Title 49, Transportation, Parts 100-185

② The United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations (UN – Orange Book)

③ International Maritime Dangerous Goods Code (IMDG)

### INDUSTRY STANDARD REFERENCES

<b>Drop:</b>	ASTM <sup>④</sup> D5276:	Standard Test Method for Drop Test of Loaded Containers by Free Fall
	ASTM <sup>④</sup> D7790	Standard Test Method for the Preparation of Plastic Packagings Containing Liquids for United Nations (UN) Drop Testing
	ISO <sup>⑤</sup> 2248:	Packaging – Complete, Filled Transport Packages – Vertical Impact Test by Dropping
<b>Stacking:</b>	ASTM <sup>⑥</sup> D8409	Standard Guide for Conducting Stacking Tests on UN Packagings Using Guided or Unguided Loads
	ASTM <sup>④</sup> D4577:	Standard Test Method for Compression Resistance of a Container Under Constant Load
	ISO <sup>⑤</sup> 2234:	Packaging – Complete, Filled Transport Packages – Stacking Test using Static Load
<b>Vibration:</b>	ASTM <sup>④</sup> D999:	Standard Test Method for Vibration Testing of Shipping Containers
	ISO <sup>⑤</sup> 2247:	Packaging – Complete, Filled Transport Packages – Vibration Test at Fixed Low Frequency
<b>Cobb:</b>	ISO <sup>⑤</sup> 535:	Paper and Board – Determination of Water Absorption – Cobb Method

④ American Society for Testing and Materials (ASTM)

⑤ International Organization for Standardization (ISO)

### EQUIPMENT

All inspection, measuring and test equipment that can affect product quality is calibrated and adjusted at prescribed intervals, or prior to use, and is traceable to NIST, using ANSI Z540 as an overall guide for calibration certification.

**SECTION IV: MATHEMATICAL CALCULATIONS**

**VARIABLE #1 (Rexam 63mm Cap / Glued)**

**INFORMATION USED FOR CALCULATIONS**

Overall Packaging Tare Weight (PTW):	1,600.0 Grams	
Overflow Capacity (OFC):		<u>Propylene/Glycol</u>
Propylene/Glycol	11,302.7 Grams	SG: 1.040
Water	10,868.0 Grams	
Number of Inner Packagings (# IP):	2	
Packing Group	II	
Product Specific Gravity (PSG):	1.500	
Packing Group Multiplication Factor (MF):	1.00	
Overall Height of one Package (OH):	15.75 Inches	
Stack Test-# of Samples Tested Simultaneously:	0	

**98% OF OVERFLOW**

Overflow Capacity (OFC) x 98%

<u>OFC</u>	x	<u>98%</u>		
11,302.7	x	98% =	11,076.7 Grams	Propylene/Glycol
10,868.0	x	98% =	10,650.7 Grams	Water

**PACKAGE TEST WEIGHTS**

Overall Pkg Tare Weight (PTW) + (98% Overflow Capacity (OFC) x # of Inner Pkg (# IP))

<u>PTW</u>	+	<u>(98% OFC)</u>	x	<u># IP)</u>	
1,600.0	+	11,076.7	x	2	Propylene/Glycol
1,600.0	+	10,650.7	x	2	Water
Propylene/Glycol:		23.7	Kg	52.2	Lbs.
Water:		22.9	Kg	50.4	Lbs.

**AUTHORIZED PACKAGE GROSS MASS CALCULATION (APGM)**

Overall Pkg Tare Weight (PTW) + (Product SG (PSG) x 98% Overflow (OFC) x # of Inner Pkg (# IP))

<u>PTW</u>	+	<u>(PSG)</u>	x	<u>98% OFC</u>	x	<u># IP)</u>
1,600.0	+	1.5	x	10,650.7	x	2
		33.5	Kg	73.8	Lbs.	

**DROP HEIGHT**

Calculation For Product Specific Gravities Exceeding 1.2  
Product Specific Gravity (PSG) x Packing Group Multiplication Factor (MF)

<u>PSG</u>	x	<u>MF</u>		<b>Packing Group: II</b>
1.5	x	1.00		
		1.50	Meter	
			<u>Required Drop Height</u>	<u>Actual Drop Height</u>
			59.1 Inches	60 Inches

**STACKING TEST MINIMUM LOAD CALCULATIONS**

Number of Packages in a 3m High Stack (118.2 / Overall Pkg Height (OH) -1)

118.2 / Overall Height of one Pkg (OH) - 1

<u>(118.2</u>	/	<u>OH)</u>	-1	=	<u># 3m HS</u>
118.2	/	15.75	-1	=	6.6

Stacking Test Load Calculation (Individual Package)

Authorized Pkg Gross Mass (APGM) x # of Pkg in a 3m High Stack (# 3m HS)

<u>APGM</u>	x	<u># 3m HS</u>	
33.5	x	6.6	
			221.1 Kg                  487.4 Lbs.

**VARIABLE #2 (Phoenix 63mm Vented Cap / Taped)**

**INFORMATION USED FOR CALCULATIONS**

Overall Packaging Tare Weight (PTW):	1,592.0 Grams	
Overflow Capacity (OFC):		<u>Propylene/Glycol</u>
Propylene/Glycol	11,352.6 Grams	SG: 1.040
Water	10,916.0 Grams	
Number of Inner Packagings (# IP):	2	
Packing Group	II	
Product Specific Gravity (PSG):	1.500	
Packing Group Multiplication Factor (MF):	1.00	
Overall Height of one Package (OH):	15.75 Inches	
Stack Test-# of Samples Tested Simultaneously:	0	

**98% OF OVERFLOW**

Overflow Capacity (OFC) x 98%

<u>OFC</u>	x	<u>98%</u>		
11,352.6	x	98% =	11,125.6 Grams	Propylene/Glycol
10,916.0	x	98% =	10,697.7 Grams	Water

**PACKAGE TEST WEIGHTS**

Overall Pkg Tare Weight (PTW) + (98% Overflow Capacity (OFC) x # of Inner Pkg (# IP))

<u>PTW</u>	+	<u>(98% OFC)</u>	x	<u># IP)</u>	
1,592.0	+	11,125.6	x	2	Propylene/Glycol
1,592.0	+	10,697.7	x	2	Water
Propylene/Glycol:		23.8	Kg	52.4	Lbs.
Water:		22.9	Kg	50.4	Lbs.

**AUTHORIZED PACKAGE GROSS MASS CALCULATION (APGM)**

Overall Pkg Tare Weight (PTW) + (Product SG (PSG) x 98% Overflow (OFC) x # of Inner Pkg (# IP))

<u>PTW</u>	+	<u>(PSG</u>	x	<u>98% OFC</u>	x	<u># IP)</u>
1,592.0	+	1.5	x	10,697.7	x	2
		33.6	Kg	74.0	Lbs.	

<b>DROP HEIGHT</b>				
Calculation For Product Specific Gravities Exceeding 1.2				
Product Specific Gravity (PSG) x Packing Group Multiplication Factor (MF)				
<u>PSG</u>	x	<u>MF</u>		Packing Group: II
1.5	x	1.00		
		1.50	Meter	
				Required Drop Height
				Actual Drop Height
				59.1 Inches
				60 Inches

<b>STACKING TEST MINIMUM LOAD CALCULATIONS</b>				
Number of Packages in a 3m High Stack (118.2 / Overall Pkg Height (OH) -1)				
118.2 / Overall Height of one Pkg (OH) - 1				
<u>(118.2</u>	/	<u>OH)</u>	-1	= # 3m HS
118.2	/	15.75	-1	= 6.6
<b>Stacking Test Load Calculation (Individual Package)</b>				
Authorized Pkg Gross Mass (APGM) x # of Pkg in a 3m High Stack (# 3m HS)				
<u>APGM</u>	x	<u># 3m HS</u>		
33.6	x	6.6		
			221.8 Kg	489.0 Lbs.

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