

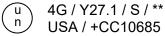
# UNITED NATIONS / DOT PERFORMANCE CERTIFICATION



### **4G PERIODIC RETEST**

4 x 4 Liter Plastic 160 Gram Bottle Packaging with Two Case Sealing Mechanisms

**TEST REPORT #: 23-CA20142** 



\*\*Insert the year packaging is manufactured

### **TESTING PERFORMED FOR:**

### PUREPAK TECHNOLOGY CORPORATION

75 West Baseline Road Suite D44 Gilbert, AZ 85233

**ATTN: Michael Dodd** 

### **TESTING PERFORMED BY:**

### TEN-E PACKAGING SERVICES, INC.

326 North Corona Avenue Ontario, CA 91764 Phone: 909-937-1260

Fax: 909-937-1262

September 14, 2023



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### **NOTES AND COMMENTS**

- 4 x 4 Liter Plastic 160 Gram Bottle Packaging with Two Case Sealing Mechanisms:
- #1) Taped Top and Bottom Flaps
- #2) Taped Top and Hot Melt Glued Bottom Flaps



### **SECTION I: CERTIFICATION**

## Periodic Retest of the PurePak Technology Corporation 4 x 4 Liter Plastic 160 Gram Bottle Packaging with Two Case Sealing Mechanisms

**TEN-E Packaging Services, Inc.** is a current DOT UN Third-Party Certification Agency under §107.403 and certifies that the **PurePak Technology 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, ICAO/IATA Regulations 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.

nay render this certification invalid.					
SUMMARY OF PERFORMANCE TESTS					
UN / DOT	49 CFR	TEST	TEST	TEST	TEST
TEST	REFERENCE	LEVEL	CONTENTS	COMPLETED	RESULTS
Drop	178.603	1.5 m	Methanol/Water Solution	August 2, 2023	PASS
Stacking (#1)	178.606	204.1 Kg – 24 Hours	Empty	August 11, 2023	PASS
Stacking (#2)	178.606	204.1 Kg – 24 Hours	Empty	August 14, 2023	PASS
Pressure	173.27	100 kPa - 30 Minutes	Water	August 2, 2023	PASS
Vibration	178.608	3.4 Hz – 1 Hour	Water	July 31, 2023	PASS
Cobb	178.516	30 Minutes		September 14, 2023	PASS
TEST REPO	TEST REPORT NUMBERS: 23-CA20142, 21-20099				
_	UN MARKING: (CFR 49 – 178.503) u 4G / Y27.1 / S / ** USA / +CC10685				
PACKAGING IDENTIFICATION CODE: 4G - Fiberboard Box (178.516)					
PERFORMANCE STANDARD: Y (Packaging meets Packing Group II and III tests)			ts)		
AUTHORIZED GROSS MASS: 27.1 Kg (59.7 Lbs.)					
"S" DESIGNATION: Denotes Inne		Denotes Inner Packagin	gs		
YEAR OF MANUFACTURE:			** Insert year the packaging is manufactured		
STATE AUTHORIZING THE MARK:		USA			
PACKAGING CERTIFICATION AGENCY:		(+CC) TEN-E Packaging Services, Inc. (Ontario, CA CAA #2006030021)			
THIRD PARTY PACKAGING IDENTIFICATION: +CC10685		+CC10685			
PERIODIC RETEST DATE: September 14, 2025					

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 **PurePak Technology Corporation** for services rendered. In the event of future changes to the above referenced test standards, it is the responsibility of **PurePak Technology 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:

**PurePak Technology Corporation** 75 West Baseline Road, Suite D44 Gilbert, AZ 85233 Matthew C. Anderson Project Manager TEN-E Packaging Services, Inc. 326 North Corona Avenue Ontario, CA 91764



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

4 x 4 Liter Plastic 160 Gram Bottle	Packaging with Taped Top ar	d Bottom Flaps	
ASSEMBLY DRAWING	TEST LEVELS		
	Certification Type:	Periodic Retest	
	Packaging Code Designation:	4G	
	Packing Group:	II	
	Specific Gravity:	1.5	
	Internal Pressure:	100 kPa	
	TEST SAMPLE P (Refer to Se		
	Overall Packaging Tare Weight:		
	Fill Capacity (98% Maximum Ca		
	Methanol/Water Solution	4,093.5 Grams	
	Water	4,279.7 Grams	
	Package Test Weight:	47.01/- 20.01.5-	
	Methanol/Water Solution Water	17.8 Kg 39.2 Lbs.	
	Authorized Package Gross Mas	18.5 Kg 40.7 Lbs. s: 27.1 Kg 59.7 Lbs.	
	CLOSING METHODS – INNER PACKAGING		
	Application Torque: 50 In		
	Equipment: Snar	o-On Torque Wrench	
	CLOSING METHODS – SHIPPER		
	Top Flaps:		
	Manufacturer: 3M, St. Paul, N		
	Sensitive Tape	er MMM115994 Pressure	
_	Width: 48 mm (2")		
	Overlap: 2" Minimum		
	Tape Pattern: Center Seam		
	Bottom Flaps:		
	Manufacturer: 3M, St. Paul, N		
	Type: 3M Part Numb Sensitive Tape	er MMM115994 Pressure	
<b>*</b>	Width: 48 mm (2")		
	Overlap: 2" Minimum		
	Tape Pattern: Center Seam		



4 x 4 Liter Plastic 160 Gram Bottle Packaging with Taped Top and Bottom Flaps				
ASSEMBLY DRAWING	TEST LEVELS			
	Certification Ty		Periodic R	etest
	Packaging Cod		4G	
	Packing Group			
	Specific Gravity		1.5	
	Internal Pressu		100 kPa	
	Т	EST SAMPLE PRE (Refer to Secti		
		ing Tare Weight:	1,443.0 Gı	rams
		8% Maximum Capa		
		ater Solution	4,093.5 Gi	
	Water	A/ = : = l= 4:	4,279.7 Gı	rams
	Package Test Weight:  Methanol/Water Solution		17.8 Kg	39.2 Lbs.
	Water	ater Solution	17.6 Kg 18.5 Kg	40.7 Lbs.
		kage Gross Mass:	27.1 Kg	59.7 Lbs.
	CLOSING METHODS – INNER PACKAGING			
	Application Torque: 50 In-Lbs.			
	Equipment:	Snap-Oı	n Torque Wre	ench
	CLOSING METHODS – SHIPPER			
		Top Flaps	s:	
	Manufacturer:	3M, St. Paul, MN		
	Туре:	3M Part Number Sensitive Tape	MMM11599	4 Pressure
	Width:	48 mm (2")		
	Overlap:	2" Minimum		
	Tape Pattern:	Center Seam		
		Bottom Fla	•	
	Type:	(Prepared by Clie Hot Melt Adhesiv Thermoset Adhe	e (Three Stri	ips of
		(PHC-9256)		



### **COMPONENT INFORMATION**

CLOSURE	(QIM-317-4937) (500093)	DRAWING
Manufacturer: Berry Plast	ics, Evansville, IN	
Description:	38mm Threaded Closure	
Quantity:	4	
Material:	Polypropylene	
Tare Weight:	10.65 Grams	
Overall Dimensions:		Mean
Height	1.016" ± 0.015"	
Diameter	1.701" ± 0.015"	
Thread Dimensions:		
• T	1.481" ± 0.007"	
• E	1.389" ± 0.007"	
Markings (QC Audit):	4	
LINER:		
Description:	Polyethylene Foam	
Tare Weight:	0.68 Grams	
Thickness:	0.061"	
Diameter:	1.370"	
PLASTIC B	OTTLE (8086 0600 0678)	DRAWING
		DRAWING
	OTTLE (8086 0600 0678) echnology Corporation, Gilbert, AZ 4 Liter Plastic 160 Gram Bottle	DRAWING
Manufacturer: PurePak Te Description: Quantity:	4 Liter Plastic 160 Gram Bottle	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material:	4 Liter Plastic 160 Gram Bottle High Density Polyethylene	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material: Method of Manufacture:	4 Liter Plastic 160 Gram Bottle High Density Polyethylene Blow Molded	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material: Method of Manufacture: Tare Weight:	4 Liter Plastic 160 Gram Bottle High Density Polyethylene	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material: Method of Manufacture: Tare Weight: Capacity:	4 Liter Plastic 160 Gram Bottle High Density Polyethylene Blow Molded 160.0 Grams	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material: Method of Manufacture: Tare Weight: Capacity:	4 Liter Plastic 160 Gram Bottle High Density Polyethylene Blow Molded 160.0 Grams	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material: Method of Manufacture: Tare Weight: Capacity: Rated Overflow	4 Liter Plastic 160 Gram Bottle High Density Polyethylene Blow Molded 160.0 Grams	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material: Method of Manufacture: Tare Weight: Capacity: • Rated • Overflow Overall Dimensions:	4 Liter Plastic 160 Gram Bottle High Density Polyethylene Blow Molded 160.0 Grams  4 Liter 4,367.0 Grams	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material: Method of Manufacture: Tare Weight: Capacity: • Rated • Overflow Overall Dimensions: • Height	4 Liter Plastic 160 Gram Bottle High Density Polyethylene Blow Molded 160.0 Grams  4 Liter 4,367.0 Grams	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material: Method of Manufacture: Tare Weight: Capacity: • Rated • Overflow Overall Dimensions: • Height • Diameter	4 Liter Plastic 160 Gram Bottle High Density Polyethylene Blow Molded 160.0 Grams  4 Liter 4,367.0 Grams	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material: Method of Manufacture: Tare Weight: Capacity: • Rated • Overflow Overall Dimensions: • Height • Diameter Thread Dimensions:	4 Liter High Density Polyethylene Blow Molded 160.0 Grams  4 Liter 4,367.0 Grams  13.610" 6.093"	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material: Method of Manufacture: Tare Weight: Capacity: • Rated • Overflow Overall Dimensions: • Height • Diameter Thread Dimensions:	4 Liter Plastic 160 Gram Bottle High Density Polyethylene Blow Molded 160.0 Grams  4 Liter 4,367.0 Grams  13.610" 6.093"	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material: Method of Manufacture: Tare Weight: Capacity: • Rated • Overflow Overall Dimensions: • Height • Diameter Thread Dimensions: • T	4 Liter High Density Polyethylene Blow Molded 160.0 Grams  4 Liter 4,367.0 Grams  13.610" 6.093"	DRAWING
Manufacturer: PurePak Te Description: Quantity: Material: Method of Manufacture: Tare Weight: Capacity: • Rated • Overflow Overall Dimensions: • Height • Diameter Thread Dimensions:	4 Liter Plastic 160 Gram Bottle High Density Polyethylene Blow Molded 160.0 Grams  4 Liter 4,367.0 Grams  13.610" 6.093"	DRAWING



	SHIPPER (P369-14406-1)				
Manufacturer: Pratt Industri	Manufacturer: Pratt Industries Inc., Dallas, TX				
Description:	Regular Slotted Container	Regular Slotted Container			
Material/Flute:	Option #1) 51 ECT Double Wall Mottled V Option #2) 51 ECT Double Wall Natural K	•			
Basis Weight (Outer to Inner	Basis Weight (Outer to Inner) Lbs./MSF:				
Specification	35 / 23 / 35 / 23 / 35				
Tare Weight:	741.0 Grams				
	DIMENSIONS				
	Specification Dimensions (Inside)	Measured Dimensions (Outside)			
• Length	12-5/16"	13"			
• Width	12-5/16"	12-7/8"			
Height	13-7/8"	15"			
Board Caliper (Nominal):	0.248"				
Manufacturer's Joint:	Inside Glued, 1-1/2" Lap				
Markings (QC Audit):	4180-01 143584 ARTWORK DATE 05/18/22 12.3125x12.3125x13.875 ID C804071				
	BOX CERTIFICATE				
(A) Corrugated Manufacturer:	PRATT INDUSTRIES, INC	A CERTIFICATE THIS			
(B) Structure:	Double Wall	BOX MEETS ALL CONSTRUCTION			
(C) ECT:	51 Lbs. Per Inch	REQUIREMENTS OF APPLICABLE FREIGHT CLASSIFICATION  EDGE CRUSH			
(D) Size Limit:	105"	TEST (ECT) LBS/IN SIZE LIMIT D INCHES			
(E) Gross Wt. Lt:	120 Lbs.	GROSS E LBS			
(F) Location:	DALLAS, TEXAS	F			



### **SECTION III: TEST PROCEDURES AND RESULTS**

DROP TESTS Design #1

TEST	INFORMATION	TEST CRITERIA
TEST CONTENTS:	Methanol/Water Solution (0.960 SG)	For packaging containing liquid, each packaging does not leak.
SAMPLE PREPARATION:	Refer to Section II	There can be no damage to the outer packaging likely to adversely
CONDITIONING:	-18°C (0°F) Freezer #W201	affect safety during transport. Inner receptacles, inner packagings or articles must remain completely
CONTENTS TEMP.:	-18.2°C (-0.7°F)	within the outer packaging and there must be no leakage of the filling
DROP HEIGHT:	1.5 Meters (60.0") (Refer to Section IV)	<ul><li>substance from the inner packaging.</li><li>Any discharge from a closure is slight and ceases immediately after</li></ul>
TEST EQUIPMENT:	L.A.B. Accu Drop 160	impact with no further leakage. (§178.603)
	DROP ORIENTATIONS AND TEST RE	SULTS
Sample #1: Flat on Botton	n Sample #2: Flat on Top	*Sample #3: Flat on Long Side
PASS: No leakage or damag		PASS: No leakage or damage.
*Sample #4: Flat on Short S	ide *Sample #5: Bottom Corner	**Sample #1: Top Corner
PASS: No leakage or damag	PASS: No leakage. Slight deformation at impact corner.	PASS: No leakage. Slight deformation at impact corner.

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

<sup>\*\*</sup>Flat on bottom drop sample was also used for the top corner drop.



### DROP TESTS Design #2

TEST	INFORMATION	TEST CRITERIA
TEST CONTENTS:	Methanol/Water Solution (0.960 SG)	For packaging containing liquid, each packaging does not leak.
SAMPLE PREPARATION:	Refer to Section II	There can be no damage to the outer packaging likely to adversely
CONDITIONING:	-18°C (0°F) Freezer #W201	affect safety during transport. Inner receptacles, inner packagings or articles must remain completely
CONTENTS TEMP.:	-18.2°C (-0.7°F)	within the outer packaging and there must be no leakage of the filling
DROP HEIGHT:	1.5 Meters (60.0") (Refer to Section IV)	<ul><li>substance from the inner packaging.</li><li>Any discharge from a closure is slight and ceases immediately after</li></ul>
TEST EQUIPMENT:	L.A.B. Accu Drop 160	impact with no further leakage. (§178.603)
	DROP ORIENTATIONS AND TEST RE	ESULTS
Sample #12: Flat on Botton	m Sample #13: Flat on Top	*Sample #14: Flat on Long Side
	T	
PASS: No leakage or damag		PASS: No leakage or damage.
*Sample #15: Flat on Short S	side *Sample #16: Bottom Corner	**Sample #12: Top Corner
PASS: No leakage or damag	PASS: 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.

<sup>\*\*</sup>Flat on bottom drop sample was also used for the top corner drop.



STACKING TEST	Design #1
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TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Empty	
SAMPLE PREPARATION:	Refer to Section II	There can be no deterioration that could adversely affect transport safety
CONDITIONING:	Ambient	or any distortion liable to reduce the
TEST LOAD APPLIED:	204.1 Kg (450.00 Lbs.) (Refer to Section IV)	package's strength, cause instability in stacks of packages, or cause damage to inner packagings that is likely to
TEST DURATION:	24 Hours	reduce safety in transport. (§178.606)
TEST EQUIPMENT:	Dead Load Weights	

# STACKING TEST SET-UP & RESULTS Sample # Maximum Deflection 24 Hours



Sample #	Maximum Deflection After 24 Hours	Results
6	0"	PASS
7	1/16"	PASS
8	0"	PASS

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

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



STACKING TEST Design #2

TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Empty	
SAMPLE PREPARATION:	Refer to Section II	There can be no deterioration that could adversely affect transport safety
CONDITIONING:	Ambient	or any distortion liable to reduce the
TEST LOAD APPLIED:	204.1 Kg (450.00 Lbs.) (Refer to Section IV)	package's strength, cause instability in stacks of packages, or cause damage to inner packagings that is likely to
TEST DURATION:	24 Hours	reduce safety in transport. (§178.606)
TEST EQUIPMENT:	Dead Load Weights	

STACKING TEST SET-UP & RESULTS							
	Sample #	Maximum Deflection After 24 Hours	Results				
	17	1/16"	PASS				
	18	1/16"	PASS				
19 0" PASS							
<b>Comments/Observations:</b> Following the 24-hour stack test, there was no damage likely to affect the performance of the packaging.							

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



### PRESSURE DIFFERENTIAL TEST

TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Water	
WATER TEMPERATURE:	(75.7°F)	
FILL CAPACITY:	Maximum Capacity	
CLOSURE APPLICATION:	Refer to Section II	Packaging for which retention of
CONDITIONING:	Ambient	liquid is a basic function must be capable of withstanding the
TEST PRESSURE:	100 kPa	pressure requirements without leakage.
TEST DURATION:	30 Minutes	(§173.27(c))
AREA OF PRESSURIZATION:	Through the Bottom	
TEST EQUIPMENT:	Regulated Water Source Digital Pressure Gauge #: 605	

# HYDROSTATIC PRESSURE TEST SET-UP AND RESULTS



Sample #	Results
1	PASS
2	PASS
3	PASS

### **Comments/Observations**

All three samples maintained the 100 kPa test pressure for 30 minutes without leakage.



VIBRATION TEST Design #1

TEST	TEST CRITERIA	
TEST CONTENTS:	Water	Immediately following the period
SAMPLE PREPARATION:	Refer to Section II	of vibration, each package must be removed from the platform, turned on its side and observed for any evidence of leakage.
CONDITIONING:	Ambient	A packaging passes the vibration test if there is no
TABLE DISPLACEMENT:	1"	rupture or leakage from any of the packages.
TEST FREQUENCY:	3.4 Hz	No test sample should show any deterioration which could
TEST DURATION:	1 Hour	adversely affect transportation safety or any distortion liable to
TEST EQUIPMENT:	Vertical motion using L.A.B. Palletizer Vibration System	reduce packaging strength. (§178.608)

VIBRATION TEST SET-UP AND RESULTS				
	Sample #	Results	Comments/Observations	
	9	PASS		
	10	PASS	No leakage or damage.	
	11	PASS		



VIBRATION TEST Design #2

TEST	TEST CRITERIA	
TEST CONTENTS:	Water	Immediately following the period
SAMPLE PREPARATION:	Refer to Section II	of vibration, each package must be removed from the platform, turned on its side and observed for any evidence of leakage.
CONDITIONING:	Ambient	A packaging passes the vibration test if there is no
TABLE DISPLACEMENT:	1"	rupture or leakage from any of the packages.
TEST FREQUENCY:	3.4 Hz	No test sample should show any deterioration which could
TEST DURATION:	1 Hour	adversely affect transportation safety or any distortion liable to
TEST EQUIPMENT:	Vertical motion using L.A.B. Palletizer Vibration System	reduce packaging strength. (§178.608)

VIBRATION TEST SET-UP AND RESULTS				
	Sample #	Results	Comments/Observations	
	20	PASS		
и и и	21	PASS	No leakage or damage.	
	22	PASS		



### **COBB WATER ABSORPTION TEST**

TES	TEST CRITERIA	
NUMBER OF SAMPLES:	5	
SAMPLE SIZE:	5" x 5" (Minimum)	An increase in wasse greater then
CONDITIONING:	73°F / 50% RH Quality Room #W202	An increase in mass greater than 155 g/m² over the 30 minute
WATER APPLIED:	100 mL / Sample	duration represents an unacceptable level of water
TEST DURATION:	30 Minutes / Sample	resistance. (§178.516)
TEST EQUIPMENT:	UWE Analytical Balance Gurley Cobb Water Absorption Fixtures	(3.11.216.16)

COBB WATER ABSORPTION TEST RESULTS					
REPRESENTATIVE SET-UP PHOTO Sample # Water Absorbe					
	1	108.0 g/m²			
TEN-E Setting the Standard	2	114.0 g/m²			
	3	106.0 g/m²			
	4	104.0 g/m²			
	5	110.0 g/m²			
	AVERAGE:	108.4 g/m²			
	RESULT	PASS			



### **REGULATORY AND INDUSTRY STANDARD REFERENCES**

REGULATORY REFERENCES					
	49 CFR①	UN@	IMDG3	ICAO@	IATA®
TEST	October 2022 Edition	22 <sup>nd</sup> Edition	2022 Edition	2023-2024 Edition	64 <sup>th</sup> Edition
Drop:	178.603	6.1.5.3	6.1.5.3	6;4.3	6.3.3
Stacking:	178.606	6.1.5.6	6.1.5.6	6;4.6	6.3.6
Pressure:	173.27(c)	4.1.1.4.1		4;1.1.6	5.0.2.9
Vibration:	178.608			4;1.1.1 & 4;1.1.4	5.0.2.7
Cobb:	178.516(b)(1)	6.1.4.12.1	6.1.4.12.1	6;3.1.11.1	6.2.12.2

- 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)
- 4 Technical Instructions for the Safe Transport of Dangerous Good by Air (ICAO)
- ⑤ International Air Transport Association (IATA) Dangerous Goods Regulations

INDUSTRY STANDARD REFERENCES			
ASTM® D5276:  Drop: ASTM® D7790:		Standard Test Method for Drop Test of Loaded Containers by Free Fall	
		Standard Test Method for the Preparation of Plastic Packagings Containing Liquids for United Nations (UN) Drop Testing	
	ISO⑦ 2248:	Packaging – Complete, Filled Transport Packages – Vertical Impact Test by Dropping	
	ASTM® D8409:	Standard Guide for Conducting Stacking Tests on UN Packagings Using Guided or Unguided Loads	
Constant Load		Standard Test Method for Compression Resistance of a Container Under Constant Load	
		Packaging – Complete, Filled Transport Packages – Stacking Test using Static Load	
Hydrostatic Pressure:	ASTM® D7660:	Standard Guide for Conducting Internal Pressure Tests on United Nations (UN) Packagings	
		Standard Test Method for Vibration Testing of Shipping Containers	
Vibration:	ISO⑦ 2247:	Packaging – Complete, Filled Transport Packages – Vibration Test at Fixed Low Frequency	
Cobb:	ISO⑦ 535:	Paper and Board – Determination of Water Absorption – Cobb Method	

<sup>©</sup> American Society for Testing and Materials (ASTM)

### **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.

⑦ International Organization for Standardization (ISO)



### **SECTION IV: MATHEMATICAL CALCULATIONS**

INFORMATION USED FOR CALCULATIONS				
Overall Packaging Tare Weight (PTW):	1,433.0 Grams			
Overflow Capacity (OFC):		Methanol/Water		
Methanol/Water	4,177.0 Grams	SG: 0.960		
Water	4,367.0 Grams			
Number of Inner Packagings (# IP):	4			
Packing Group	II			
Product Specific Gravity (PSG):	1.500			
Packing Group Multiplication Factor (MF):	1.00			
Overall Height of one Package (OH):	15.00 Inches			
Stack Test-# of Samples Tested Simultaneously:	1			

98% OF OVERFLOW									
Overflow Capacity (OFC) x 98%									
OFC	_ x _	98%	<u>-</u>						
4,177.0	x	98% =	4,093.5 Grams	Methanol/Water					
4,367.0	X	98% =	4,279.7 Grams	Water					

	PACKAGE TEST WEIGHTS										
Overa	Overall Pkg Tare Weight (PTW) + (98% Overflow Capacity (OFC) x # of Inner Pkg (# IP)										
PTW	PTW + (98% OFC x #IP)										
1,433.0	+	4,093.5		X	4	Methanol/Water					
1,433.0	+	4,279.7		X	4	Water					
Methanol/Water:		17.8	kg		39.2	lb					
Water:		18.5	kg		40.7	lb					

AUTHORIZED PACKAGE GROSS MASS CALCULATION (APGM)										
Overall Pkg Tare Weight (PTW) + (Product SG (PSG) x 98% Overflow (OFC) x # of Inner Pkg (# IP))										
 PTW	+	(PSG		X	98% OFC	:	X	# IP)		
1,433.0	- + -	1.5		X	4,279.7		X	4		
		27.1	kg		59.7	lb				



DROP HEIGHT  Calculation For Product Specific Gravities Exceeding 1.2  Product Specific Gravity (PSG) x Packing Group Multiplication Factor (MF)								
PSG	x	MF		Packing Group: II				
1.5 x 1.00		1.00		Required Drop Height	Actual Drop Height			
		1.50	Meter	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										
(118.2	(118.2 / OH) -1 = #3m HS										
118.2	1	15.00	-1	=	6.9						
	Stacking Test Load Calculation (Individual Package)										
	Authorized Pkg Gross Mass (APGM) x # of Pkg in a 3m High Stack (# 3m HS)										
APGM	x _	# 3m HS									
27.1	x	6.9									
		187.0 kg	I	412	2.3 lb						