

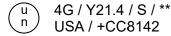
UNITED NATIONS / DOT PERFORMANCE CERTIFICATION



4G PERIODIC RETEST

4 x 9 Pint Beta Plastic Bottle Packaging with Vented Closure and Two Case Sealing Mechanisms

TEST REPORT #: 19-CA20091



**Insert the year packaging is manufactured

TESTING PERFORMED FOR:

PUREPAK TECHNOLOGY CORPORATION

324 South Bracken Lane, Suite 3 Chandler, AZ 85224

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

June 7, 2019



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4 x 9 Pint Beta Plastic Bottle Packaging with Vented Closure and the following Case Sealing Mechanism Variables:			
Option #	Option # Top Flaps Bottom Flaps		
1	2" 3M #34508 Scotch Tape	2" 3M #34508 Scotch Tape	
2	2" 3M #34508 Scotch Tape	Hot Melt Adhesive (Prepared by Client as for Transport) (Three Strips of Thermoset Adhesive – 1/2" x 4")	



SECTION I: CERTIFICATION

Periodic Retest of the PurePak Technology Corporation 4 x 9 Pint Beta Plastic Bottle Packaging with Vented Closure and 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 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	CFR REFERENCE	TEST LEVEL	TEST CONTENTS	TEST COMPLETED	TEST RESULTS
Drop	178.603	1.2 m	Methanol/Water Solution	May 13, 2019	PASS
Stacking (#1)	178.606	181.4 Kg – 24 Hours	Empty	May 17, 2019	PASS
Stacking (#2)	178.606	181.4 Kg – 24 Hours	Empty	May 20, 2019	PASS
Vibration	178.608	3.4 Hz – 1 Hour	Water	May 13, 2019	PASS
Cobb	178.516	30 Minutes		June 7, 2019	PASS
TEST REPORT	NUMBERS:		19-CA20091, 17-CA2008	5B	
UN MARKING: (CFR 49 – 178.	'	u 4G / Y21.4 / S / ** USA / +CC8142			
PACKAGING I	DENTIFICATION	ITIFICATION CODE: 4G - Fiberboard Box (178.516)			
PERFORMANO	PERFORMANCE STANDARD: Y (Packaging meets Packing Group II and III tests)		II tests)		
AUTHORIZED GROSS MASS:		21.4 Kg (47.1 Lbs.)			
"S" DESIGNATION:			Denotes Inner Packagings		
YEAR OF MANUFACTURE:		** Insert year the packaging is manufactured			
STATE AUTHO	ORIZING THE MA	ARK:	USA		
PACKAGING (ACKAGING CERTIFICATION AGENCY: (+CC) TEN-E Packaging Services, Inc. (Ontario, CA CAA #2006030021)				
THIRD PARTY	HIRD PARTY PACKAGING IDENTIFICATION: +CC8142				
PERIODIC RET	PERIODIC RETEST DATE: June 7, 2021				

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 324 South Bracken Lane Suite 3 Chandler, AZ 85224 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 9 Pint Beta Plastic Bottle Packaging with Vented Closure with Taped Top and Bottom Flaps **TEST LEVELS ASSEMBLY DRAWING** Certification Type: Periodic Retest Packaging Code Designation: 4G Packing Group: Ш Specific Gravity: 1.2 **TEST SAMPLE PREPARATION** (Refer to Section IV) Overall Packaging Tare Weight: 1,742.0 Grams Fill Capacity (98% Maximum Capacity): Methanol/Water Solution 4,004.2 Grams Water 4,123.9 Grams Package Test Weight: Methanol/Water Solution 17.7 Kg 39.0 Lbs. Water 18.2 Kg 40.1 Lbs. Authorized Package Gross Mass: 21.5 Kg 47.3 Lbs. **CLOSING METHODS - INNER PACKAGING** Application Torque: 50 In-Lbs. Kaps All Electronic Torque Tester Equipment: #W701 **CLOSING METHODS - SHIPPER** Top Flaps: Manufacturer: 3M, St. Paul, MN 3M #34508 Pressure Sensitive Tape Type: Width: 48 mm (2") 2" Minimum Overlap: Tape Pattern: Center Seam **Bottom Flaps:** 3M, St. Paul, MN Manufacturer: 3M #34508 Pressure Sensitive Tape Type: Width: 48 mm (2") 2" Minimum Overlap: 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.



4 x 9 Pint Beta Plastic Bottle Packaging with Vented Closure with **Taped Top and Hot Melt Glued Bottom Flaps TEST LEVELS ASSEMBLY DRAWING** Certification Type: Periodic Retest Packaging Code Designation: 4G Packing Group: Ш 1.2 Specific Gravity: **TEST SAMPLE PREPARATION** (Refer to Section IV) Overall Packaging Tare Weight: 1,742.0 Grams Fill Capacity (98% Maximum Capacity): Methanol/Water Solution 4,004.2 Grams Water 4,123.9 Grams Package Test Weight: Methanol/Water Solution 17.7 Kg 39.0 Lbs. Water 18.2 Kg 40.1 Lbs. Authorized Package Gross Mass: 21.5 Kg 47.3 Lbs. **CLOSING METHODS - INNER PACKAGING** Application Torque: 50 In-Lbs. Kapa All Electronic Torque Tester Equipment: #W701 **CLOSING METHODS - SHIPPER Top Flaps:** Manufacturer: 3M, St. Paul, MN 3M #34508 Pressure Sensitive Tape Type: 48 mm (2") Width: Overlap: 2" Minimum Tape Pattern: Center Seam **Bottom Flaps:** (Prepared by Client as for Transport) Hot Melt Adhesive (Three Strips of Type: Thermoset Adhesive – 1/2" x 4") (PHC-9256)

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

CLOS	URE (QIM-317-4937)	DRAWING
	stic Packaging, Evansville, IN	
Description:	38mm Threaded Vented Closure	
Quantity:	4	
Material:	Polypropylene	
Tare Weight:	10.40 Grams	
Overall Dimensions:	I	Marian
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):	10	
Liner:		m m m
Description:	Perforated Disc with a Non-Woven Teflon Surface Membrane	
Tare Weight:	0.50 Grams	(-2-2-2-)
Thickness:	0.041"	
Diameter:	1.377"	
PL	ASTIC BOTTLE	DRAWING
Manufacturer: PurePak T	echnology Corporation, Chandler, AZ	
Description:	9 Pint Beta Plastic Bottle with Oval Handle	
Quantity:	4	
Material:	High Density Polyethylene	
Method of Manufacture:	Blow Molded	
Tare Weight:	224.0 Grams	
Capacity:		
Rated	9 Pint	
Overflow	4,208.0 Grams (1.1 Gallons)	
Overall Dimensions:		
Height	12.694" ± 0.045"	
Diameter	6.231" ± 0.117"	
Thread Dimensions:		
• T	1.461" ± 0.041"	
• E	1.367" ± 0.056"	
Wall Thickness:		
Minimum	0030" PPT C95 SET2 6/19 3	
Markings (QC Audit):	PPT C95 SET2 6/19 3	



SHIPPER (507089, 507097, 507098 and 817308)				
Manufacturer: PCA, Phoeni	Manufacturer: PCA, Phoenix, AZ			
Description:	Regular Slotted Container			
Material/Flute (Inner to Outer):	51 ECT Double Wall Mottled White Corru	gated Fiberboard; B/C-Flute		
Basis Weight (Outer to Inne	er) Lbs./MSF:			
Specification	42 / 23 / 35 / 23 / 35			
Tare Weight:	811.0 Grams			
	DIMENSIONS			
	Specification Dimensions (Inside)	Measured Dimensions (Outside)		
• Length	12-3/4"	13-3/8"		
• Width	12-3/4"	13-3/8"		
Height	13"	14"		
Board Caliper (Nominal):	0.271"			
Manufacturer's Joint:	Inside Glued, 1-3/8" Lap			
Markings (QC Audit):	u 4G/X23.2/S/17 4G/Y33.8/S/17 4G/Y21.4/S/17 USA/+CC7640 USA/+CC7640 USA/+CC8142 BETA OPEN OTHER END NRC 507098 Artwork Date: 04/06/17 507098 12 ¾ X 12 ¾ X 13 ID 726866 HANDLE WITH CARE CORROSIVE 8 TOXIC 6			
	BOX CERTIFICATE			
(A) Corrugated Manufacturer:		A CERTIFICATE		
(B) Structure:	Double Wall	B		
(C) ECT:	51 Lbs. Per Sq. Inch	BOX MEETS ALL CONSTRUCTION REQUIREMENTS OF APPLICABLE FREIGHT CLASSIFICATION		
(D) Size Limit:	105"	EDGE CRUSH C TEST (ECT) LBS/IN		
(E) Gross Wt. Lt:	120 Lbs.	SIZE LIMIT D INCHES GROSS E LBS		
(F) Location:		F		



SECTION III: TEST PROCEDURES AND RESULTS

DROP TESTS Option #1: Taped Top and Bottom Flaps

TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Methanol/Water Solution (0.971 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.:	-19.9°C (-3.8°F)	within the outer packaging and there must be no leakage of the filling
DROP HEIGHT:	1.2 Meters (48.0") (Refer to Section IV)	 substance from the inner packaging. Any discharge from a closure is slight and ceases immediately after
TEST EQUIPMENT:	L.A.B. Accu Drop 160	impact with no further leakage. (§178.603)
	DROP ORIENTATIONS AND TEST RES	ULTS
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 Si	*Sample #5: Bottom Corner	**Sample #1: Top Corner
PASS: No leakage or damag	PASS: No leakage. Deformation to shipper on impact corner.	PASS: No leakage. Deformation to shipper on impact corner.

^{*}Side and corner drops were conducted to impact the manufacturer's joint.



DROP TESTS

Option #2: Taped Top and Glued Bottom Flaps

TEST	INFORMATION	TEST CRITERIA
TEST CONTENTS:	Methanol/Water Solution (0.971 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.:	-19.9°C (-3.8°F)	within the outer packaging and there must be no leakage of the filling
DROP HEIGHT:	1.2 Meters (48.0") (Refer to Section IV)	 substance from the inner packaging. Any discharge from a closure is slight and ceases immediately after
TEST EQUIPMENT:	L.A.B. Accu Drop 160	impact with no further leakage. (§178.603)
	DROP ORIENTATIONS AND TEST RES	ULTS
Sample #12: Flat on Botton	m Sample #13: Flat on Top	*Sample #14: Flat on Long Side
PASS: No leakage or damag		PASS: No leakage or damage.
*Sample #15: Flat on Short S	*Sample #16: Bottom Corner	**Sample #12: Top Corner
PASS: No leakage or damag	PASS: No leakage. Deformation to shipper on impact corner.	PASS: No leakage. Deformation to shipper on 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 Option #1: Taped Top and Bottom Flaps

TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Empty	
SAMPLE PREPARATION:	Refer to Section II	There can be no deterioration that could adversely affect transport safety or any
CONDITIONING:	Ambient	distortion liable to reduce the package's
TEST LOAD APPLIED:	181.4 Kg (400.0 Lbs.) (Refer to Section IV)	strength, cause instability in stacks of packages, or cause damage to inner packagings that is likely to reduce safety
TEST DURATION:	24 Hours	in transport. (§178.606)
TEST EQUIPMENT:	Dead Load Weights	

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

Option #2: Taped Top and Glued Bottom Flaps

TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Empty	
SAMPLE PREPARATION:	Refer to Section II	There can be no deterioration that could adversely affect transport safety or any
CONDITIONING:	Ambient	distortion liable to reduce the package's
TEST LOAD APPLIED:	181.4 Kg (400.0 Lbs.) (Refer to Section IV)	strength, cause instability in stacks of packages, or cause damage to inner packagings that is likely to reduce safety
TEST DURATION:	24 Hours	in transport. (§178.606)
TEST EQUIPMENT:	Dead Load Weights	

Sa

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.



VIBRATION TEST Option #1: Taped Top and Bottom Flaps

TEST	INFORMATION	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
CONDITIONING:	Ambient	for any evidence of leakage. • A packaging passes the vibration
TABLE DISPLACEMENT:	1"	test if there is no 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- E	9	PASS	
	10	PASS	No leakage or damage.
	11	PASS	



VIBRATION TEST Option #2: Taped Top and Bottom Flaps

TEST	INFORMATION	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
CONDITIONING:	Ambient	for any evidence of leakage. • A packaging passes the vibration
TABLE DISPLACEMENT:	1"	test if there is no 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					
-NSPERE LINE WITHERE LINE LINE	21	PASS	No leakage or damage.				
	22	PASS					



COBB WATER ABSORPTION TEST

TES	ST INFORMATION	TEST CRITERIA		
NUMBER OF SAMPLES:	5	An increase in mass greater than 155 g/m² over the 30 minute		
SAMPLE SIZE:	5" x 5" (Minimum)			
CONDITIONING:	73°F / 50% RH Quality Room #W202			
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 3.6.6)		

COBB WATER ABSOR	PTION TEST RESULTS
Sample #	Water Absorbed
1	136.0 g/m²
2	141.0 g/m²
3	131.0 g/m²
4	141.0 g/m²
5	129.0 g/m²
AVERAGE:	135.6 g/m²
RESULT	PASS



REGULATORY AND INDUSTRY STANDARD REFERENCES

REGULATORY REFERENCES								
	49 CFR①	UN@	IMDG3					
TEST	October 2018 Edition	20 th Edition	2018 Edition					
Drop:	178.603	6.1.5.3	6.1.5.3					
Stacking:	178.606	6.1.5.6	6.1.5.6					
Vibration:	178.608							
Cobb:	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					
	ASTM@ D5276:	Standard Test Method for Drop Test of Loaded Containers by Free Fall				
Drop: ASTM@ D7790		Standard Test Method for the Preparation of Plastic Packagings Containing Liquids for United Nations (UN) Drop Testing				
	ISO® 2248:	Packaging – Complete, Filled Transport Packages – Vertical Impact Test by Dropping				
Stookings	ASTM@ D4577:	Standard Test Method for Compression Resistance of a Container Under Constant Load				
Stacking:	ISO® 2234:	Packaging – Complete, Filled Transport Packages – Stacking Test using Static Load				
Vilonoti on	ASTM@ D999:	Standard Test Method for Vibration Testing of Shipping Containers				
Vibration:	ISO® 2247:	Packaging – Complete, Filled Transport Packages – Vibration Test at Fixed Low Frequency				
Cobb:	ISO© 535:	Paper and Board – Determination of Water Absorption – Cobb Method				

- 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

INFORMATION USED FOR CALCULATIONS						
Overall Packaging Tare Weight (PTW):	1,742.0 Grams					
Overflow Capacity (OFC):		Methanol/Water				
Methanol/Water	4,085.9 Grams	SG: 0.971				
Water	4,208.0 Grams					
Number of Inner Packagings (# IP):	4					
Packing Group	II					
Product Specific Gravity (PSG):	1.200					
Packing Group Multiplication Factor (MF):	1.00					
Overall Height of one Package (OH):	14.00 Inches					
Stack Test-# of Samples Tested Simultaneously:	1					

			98% OF OVERFL	OW	
			Overflow Capacity (OF	C) x 98%	
OFC	_ x _	98%	<u>-</u>		
4,085.9	X	98% =	4,004.2 Grams	Methanol/Water	
4,208.0	X	98% =	4,123.9 Grams	Water	

Inner Pkg (# IP)

	ı	AUTHORIZE	ED PACKAGE	GROSS MASS	CALCULATIO	N (APGM)
Overall P	kg Tare	Weight (PT	W) + (Product	SG (PSG) x 98%	6 Overflow (O	FC) x # of Inner Pkg (# IP))
PTW	+	(PSG	x	98% OFC	X	# IP)
1,742	_ + _	1.2	×	4,124	х	4
		21.5	Kg	47.3	Lbs.	



	DROP HEIGHT Calculation For Product Specific Gravities Exceeding 1.2 Product Specific Gravity (PSG) x Packing Group Multiplication Factor (MF)					
PSG	x	MF		Pac	king Group: II	
1.2	x	1.00		Required Drop Height	Actual Drop Height	
		1.20	Meter	47.2 Inches	48 Inches	

		STACKING	TEST MIN	IMUM LOAD	CALCULATIONS	
	Num	ber of Packages i	in a 3m Hig	h Stack (118	8 / Overall Pkg Height (OH) -1)	
		118 /	Overall He	ight of one	Pkg (OH) - 1	
(118	/ _	OH)	-1	=	# 3m HS	
118	1	14.00	-1	=	7.5	
		Stacking Te	est Load Ca	lculation (Ir	ndividual Package)	
	Autho	rized Pkg Gross I	Mass (APGI	M) x # of Pk	g in a 3m High Stack (# 3m HS)	
APGM	x	# 3m HS				
21.5	x	7.5				
		161.3 Kg		355	i.6 Lbs.	
	118	(118 / 118 / Author	Number of Packages 118 /	Number of Packages in a 3m High 118 / Overall He (118	Number of Packages in a 3m High Stack (11)	118