



**gh Package  
& Product  
Testing and  
Consulting of AZ, Inc.**

21609 N. 12th Ave.  
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Phoenix, AZ 85027

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14 June 2011

To: Mr. Michael Dodd  
PurePak Technology Corporation  
324 S. Bracken Lane, Suite # 3  
Chandler, AZ 85224

From: Michael Greer  
gh Package & Product Testing of AZ, Inc.

Subject: DOT/UN 49 CFR Design Qualification Testing of a 4G Combination Package for Liquids  
Specific Item: 4x1 Gallon 150g Containers in a Corrugated Box.

File Number: U-5136-11

Dear Mr. Dodd,

The attached report provides details of specific procedures, test conditions, and results of the UN/DOT tests required to certify subject packaging design. This certification is required prior to use of the design for transport of PG II, SG 1.4 compatible hazardous liquid materials. Samples of the packaging design were tested to Packing Group II Criteria per UN/DOT Test Specifications (Cobb Water Absorption Test, Drop Test, Stacking Test, Internal Pressure Test, and Vibration Test). In addition, the Mullen Burst Testing, basis weight, and caliper values were determined to further identify the fiberboard components of the package.

If gh Testing of Arizona can be of service in the future, please advise.

Sincerely,

A handwritten signature in blue ink, appearing to read 'M Greer', is written over the word 'Sincerely,'.

Mr. Michael Greer  
President  
gh Package & Product Testing  
and Consulting of Arizona, Inc.





# Laboratory Report

**Package & Product  
Testing and  
Consulting of AZ, Inc.**

**PurePak Technology, Corp  
324 S. Bracken Lane  
Suite #3  
Chandler, AZ 85224**

**21609 N. 12th Ave.  
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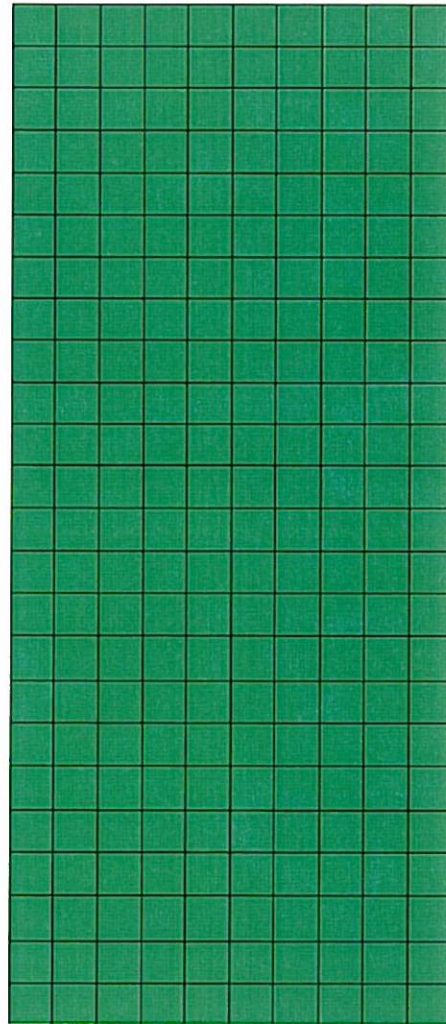
**File #: U-5136-11**



**4G/Y23.3/S/\*\*  
USA/+BV1468**

**This Report  
Prepared for:**

**Mr. Michael Dodd**



# Performance Oriented Package Test Report

File # U-5136-11 Report Date: 14 June 2011  
(Periodic Testing Required by June 2013)

*Tested by:*  
gh Package & Product Testing  
& Consulting of Arizona, Inc.  
21609 N. 12th Ave., Suite 300  
Phoenix, AZ 85027  
Phone: 623.869.8008

*Tested for:*  
PurePak Technology  
324 S. Bracken Lane Suite #: 3  
Chandler, AZ 85224  
Attn: Michael Dodd  
480.926.0022

## SECTION I CERTIFICATION

DESIGN QUALIFICATION TESTING  
4G Combination Package for Liquids  
Inner Packagings: Four 1 Gallon Plastic Bottles  
Testing Date(s): 5/24/2011 – 6/13/2011



4G/Y23.3/S/\*\*  
USA/+BV1468  
\*\*year of manufacture

### TRANSPORTATION MODES

*This packaging design was successfully tested as required by 49CFR and is suitable for use for shipments of compatible hazardous materials via surface and Cargo aircraft modes of transportation<sup>(1)</sup>. Use of packaging methods or package components other than those documented in this report may invalidate this certification. The shipper is required to insure this packaging design is used in accordance with all requirements of the national & international regulations applicable to the intended commodity and intended mode(s) of transport (49CFR, ICAO/IATA, IMO/IMDG, et. al.).*

*<sup>(1)</sup>49CFR (§172.101, §173.24(i) & §173.27(f)) & ICAO/IATA may limit the quantities allowed inner/outer packagings and/or prohibit shipments of specific commodities via aircraft.*

**Mr. Frank Reyes** (Certifying Official)  
gh Package & Product Testing  
and Consulting of Arizona, Inc.

**SECTION II**

**DESCRIPTION**

This 4G Combination Package design was tested at the PG II performance levels for surface and air shipments of compatible hazardous materials with a specific gravity of 1.4 or less. This design type consist one a corrugated (RSC) containing four one gallon polyethylene bottles placed in the container without a divider. Utilizing this package design for a commodity other than for which it was tested is at the discretion of the shipper. The following tables describe the components of the package design.

**Outer Packaging – UN 4G (Refer to Section V for drawings)**

Box Style	Corrugated White RSC
Manufacturer	Sound Packaging (Phoenix, AZ)
Drawing Number	811407
Number of Walls – Flute Type	Double Wall B/C Flutes
BMC: Mullen (Bottom Stamp)	275 lb
Dimension (OD) LxWxH	32.70 x 32.39 x 34.93 cm (12.875" x 12.75" x 13.75")
Dimension (ID) LxWxH	31.28 x 31.28 x 32.07 cm (12.313" x 12.313" x 12.625")
Weight	0.85 kg (1.87 lb)
Stacking Height	13.75"
Method of Joining Panels	Glued MFJ
Mfr's Joint - Flap Size	1"
Mfr's Joint - Location	2,5 vertical edge (ASTM box marking scheme)
Top Flap Inner Gap/Meet	0
Top Flap Outer Overlap/Meet	0
Bottom Flap Inner Gap/Meet	0
Bottom Flap Outer Overlap/Meet	0
Handles:	N/A
Closure Method/Material	<b>Top:</b> 48mm (2") clear poly self-adhesive tape (Scotch 3M) applied over the center strip long enough so that there is a 2" extension on each end. <b>Bottom:</b> H.B. Fuller Hot Melt Adhesive (PHC-9200) four 6 ¼" strips on each quarter inside flap panel.

**Material Analysis – Box**

Standards: • T.A.P.P.I. Method T- 410; "Grammage of Paper and Paperboard".  
 • T.A.P.P.I. Method T- 411; "Thickness of Paper and Paperboard".

Box	Basis Weight (lb/MSF)	Actual Combined Board Caliper	Mullen
Inside Facing	43.62	0.2675"	Bottom Stamp: 275 lb Actual: 280 lb
Middle Facing	43.62		
Outer Facing	43.62		
Flute: C	24.97		
Flute: B	28.99		

**gh Package & Product Testing and Consulting of AZ, Inc**  
**Test Report Number U-5136-11      Report Date: 14 June 2011**

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**Inner Packaging 4 required (Refer to Section V for drawings)**

Type, Grade, & Style	HDPE one gallon round bottle w/attached handle
Manufacturer	PurePak Technology Corp. (Chandler, AZ)
Material	HDPE
Part Number	Per Pure Pak – No Number assigned to this drawing
Method of Construction	Blow molding
Bottom Thickness – Min/Max/Avg	0.032"/0.073"/0.049"
Sides Thickness – Min/Max/Avg	0.031"/0.079"/0.046"
Neck Finish Size	38 - 439
Thread Type	Buttress
Thread Pitch	6 tpi
T's & E's	T: 1.4720" E: 1.3780"
Neck Opening	1.1515"
Dimensions	12.534" x 5.960" diameter
Capacity (Nominal)	1 Gallon
Capacity (Maximum/Overflow)	1.056 gal x 4 = 4.22 gallons
Weight	0.61 kg (1.34 lb)
Handle(s) Material Type, Number & Position	One HDPE integrated molded handle
Closure Equipment	Polypropylene (38-400) cap
Closure Methods (per PurePak)	(Using appropriate tool) 35 to 50 in/lb

**Inner Closure 4 required (Refer to Section V for drawing)**

Type, Grade, & Style	White, polypropylene
Manufacturer	Rexam Plastic Packaging (Brookville, PA)
Drawing Number	QIM-317-4937
Material	Polypropylene
Dimensions (Including skirt)	1.6930" diameter x 1.0130"
Thickness – Max/Min/Avg	1.116"/0.0985/0.1025
Neck Finish Size	38 - 439
Thread Type	Buttress
Thread Pitch	6 tpi
T's & E's	T's 1.483" E's 1.389"
Weight	0.04 kg (0.09 lb)
Liner Type	F422 Liner (0.0515" thick)
Liner Material	Extruded HDPE and LDPE center
Method of Closure (per PurePak)	(Using appropriate tool) 35 to 50 in/lb

**SECTION III: TEST DESCRIPTIONS AND RESULTS**

Laboratory Conditions: Ambient.

The samples were filled to a minimum of 98% full and prepared as for shipment prior to testing.

The following gh Package & Product Testing and Consulting of AZ, Inc. personnel were present during testing:

- Michael Greer – President (Reviewer – Testing Data)
- Jason Sager – Laboratory Technician
- Shane Dexter – Assistant Laboratory Technician
- Frank Reyes – Certifying Officer – Report Writer

The following tables describe testing/conditions/results

**Test Specimen Characteristics**

Specific Gravity:	1.6
State:	liquid
Dummy Load	Water/Glycol Mixture
Marked Weight	26.41 kg (58.22 lb)

**Drop Test –**

Test Method: 49 CFR 178.603

Number of Packages Tested – 5

The samples were conditioned in accordance with 49 CFR 178.603(c). The temperature was reduced to 0°F prior to tests. The contents consisted of Glycol slurry mixture.

Drop Height – 1.6 meters (See Section IV for calculations.)

**Results**

Box	Package Weight	Orientation	Result
1	17.69 kg (39.0 lb)	Top	Pass – No damage
2	17.69 kg (39.0 lb)	Short Side	Pass – No damage
3	17.69 kg (39.0 lb)	Bottom	Pass – No damage
4	17.69 kg (39.0 lb)	Long Side	Pass – No damage
5	17.69 kg (39.0 lb)	Top Corner	Pass – Corner deflection

**Pass/Fail Criteria -**

A package is considered to successfully pass the drop tests if for each sample tested: There is no damage to the outer packaging likely to adversely affect safety during transport, there is no leakage of the filling substance from the inner packaging and any discharge from a closure is slight and ceases immediately after impact.

**Stacking Test**

Test Method: 49 CFR 178.606

Number of Packages Tested – 3 full boxes

Lab weights were applied to the tops of the packages using platens (load spreaders) as specified by 178.606(c) (24-hour free standing). Refer to Section IV for calculations

**Results:**

Box	Required Load	Applied Load	Results
1	179.97 kg (396.84 lb)	235.87 kg (520 lb)	Passed
2	179.97 kg (396.84 lb)	235.87 kg (520 lb)	Passed
3	179.97 kg (396.84 lb)	235.87 kg (520 lb)	Passed

Note: Stacking stability was not assessed since a guided load test was not performed.

**Pass/Fail Criteria**

No test sample may leak. There must be no leakage of the filling substance from the inner receptacle, or inner packaging. No test sample may show any deterioration that could adversely affect transportation safety or any distortion likely to reduce its strength, cause instability in stacks of packages, or cause damage to inner packagings likely to reduce safety in transportation. The containers must maintain the load without significant deflection.

**Vibration Standard Test Method: 49 CFR 178.608**

Packages Tested – 3

The packages were placed on a rotary vibration table for one hour with an input of 1.1g @ 4Hertz. Package/vibration table separation was obtained at 184.1 CPM (RPM)

**Results**

Package 1	No damage
Package 2	No damage
Package 3	No damage

**Pass/Fail Criteria -**

A packaging passes the vibration test if there is no rupture or leakage from any of the packages. No test sample should show any deterioration that could adversely affect transportation safety or any distortion liable to reduce packaging strength.

**Water Resistance:**

Test Method): ISO Standard 535 as required by 49CFR 178.514 (b)(1)

Samples Tested: 5. The specimens were conditioned in accordance to 50% RH +/- 2% at 73°F for 24 hours prior to material analysis and Cobb testing.

**Results**

Sample	#1	#2	#3	#4	#5	Average	Passed
g/m <sup>2</sup>	140	140	150	150	130	142	Y

**Pass/Fail Criteria:**

An increase in mass of greater than 155 g/m<sup>2</sup> over the 30-minute duration of the test represents an unacceptable level of water absorption.

**gh Package & Product Testing and Consulting of AZ, Inc**  
**Test Report Number U-5136-11      Report Date: 14 June 2011**

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**Pressure Test:**

Test Method: 49 CFR 173.27(c)

Packages Tested – 3

The containers were subjected to hydraulic pressure for 30 minutes.

**Results:**

<b>Sample</b>	<b>Required Pressure</b>	<b>Applied Load</b>	<b>Results</b>
1	100 kPa (14.5 psi)	103 kPa (15 psi)	Passed
2	100 kPa (14.5 psi)	103 kPa (15 psi)	Passed
3	100 kPa (14.5 psi)	103 kPa (15 psi)	Passed

**Pass/Fail Criteria:**

No test sample may leak while undergoing the test.



**SECTION IV      CALCULATIONS**

**Package Gross Weight**

<b>Components</b>	<b>kg</b>	<b>lb</b>
Outer Packaging	0.85	1.87
Inner Packaging	0.61	1.34
Inner Closures	0.04	0.09
<b>Total Tare Weight</b>	<b>1.50</b>	<b>3.30</b>
Lading Weight	21.80	48.06
<b>Gross Weight</b>	<b>23.30</b>	<b>51.37</b>
<b>Marked Weight</b>	<b>23.3</b>	

Lading Weight = max vol x .98 x 8.3 x SG  
 4.22 x .98 x 8.3 x 1.4 = 48.06 lbs (21.80 kg)

**Drop Test Height**

Specific Gravity of Certification      1.4  
 Packing Group of Certification      II  
 Drop Test Height      1.4m

**Stack Test:**

<b>STACK TEST</b>			
<b>Report #</b>	<b>U-5136-11</b>	<b>Load=[(120/H)-1]*[W+(S*V*8.3*98%)]</b>	
		98% = Min fill factor 8.3 = Wt of 1 gal of	
<b>H =</b>	13.75	Height of Container (inches)	
<b>W =</b>	3.30	Tare Weight of Package (lbs)	
<b>S =</b>	1.40	Specific Gravity of Lading	
<b>V =</b>	4.22	Max Volume of Liquid (gals)	
<b>Applied</b>	520.00	Applied Weight (lbs)	
	<b>Required</b>	396.84 lbs	179.97 kgs
	<b>Applied</b>	520.00 lbs	235.83 kgs
	<b>Lading Wt</b>	48.06 lbs	21.79 kgs

**SECTION V DRAWINGS**

**The following drawings/information apply to this report:**

PurePak Technologies Corp. Closure Instructions  
Outer Packaging  
Inner Packaging  
Inner Packaging Closures



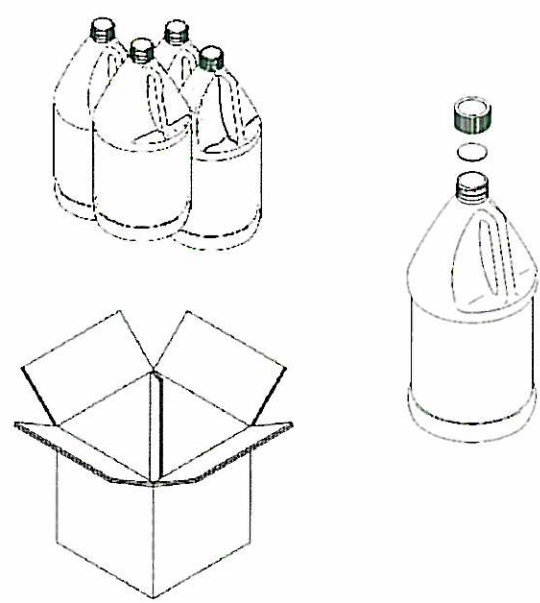
**Package: One Gallon 150 gram bottle Issue Date: June 1, 2009 Revision: 01 UN Cert #+CC6016  
4 x 150 gram Plastic Bottle Packaging**

NO. / CASE	LIST OF COMPONENTS	CONFIGURATION	SPEC / PART #
4	Rexam 38-439 A Stock Acid Closures with Foam Liner	A & B	20038485
4	150 gram Bottles with 38-439 neck and finish	A & B	812144
(1)	Regular Slotted Corrugated Container, Pre-assembled	A & B	731197
(1) Roll	2" Clear Pressure Sensitive Tape (Scotch 3M Packaging Tape)	A & B	
Adhesive	H.B. Fuller Hot Melt Adhesive PHC-9200	A	

PACKAGING CONFIGURATIONS:	Case Sealing Method
Configuration A: 4 X 150 gram Bottles	Top: 2" Clear Pressure Sensitive Tape Bottom: Glued
Configuration B: 4 X 150 gram Bottles	Top: 2" Clear Pressure Sensitive Tape Bottom: 2" Clear Pressure Sensitive Tape

ASSEMBLY INSTRUCTIONS:	Configuration
Note: Refer to component list above. Examine all parts for defects. Once you have determined that this packaging is free from defects then follow these instructions for package assembly.	A & B

1. Apply threaded closure to bottle with an application torque of 35 to 50 in/lbs using an appropriate closing tool.
2. For Configuration A, place four (4) bottles into a pre-assembled carton with the bottle closures facing upward.
3. Tape the tops closed with 2" pressure sensitive tape. Center the tape over the middle seam formed by the flaps being folded together. The length of the tape should be such that there is a 2" extension on each end.
4. For Configuration B, fold in two opposite bottoms flaps of carton. Then fold in the remaining two adjacent bottom flaps making sure that the exposed flaps display the Box Maker's Certificate or the Guarantee Stamp.
5. Tape the bottom flaps closed with 2" pressure sensitive tape. Center the tape over the middle seam formed by the flaps being folded together. The length of the tape should be such that there is a 2" extension on each end.
6. Then place four (4) bottles in the with the bottle closures facing upward.
7. Tape the top flaps closed with 2" clear pressure sensitive tape. Center the tape over the middle seam formed by the flaps being folded together. The length of the tape should be such that there is a 2" extension on each end.
8. Apply product labels and DOT hazard warning labels as required by work order instructions. Do not cover up any UN markings with labels or tape of any kind.

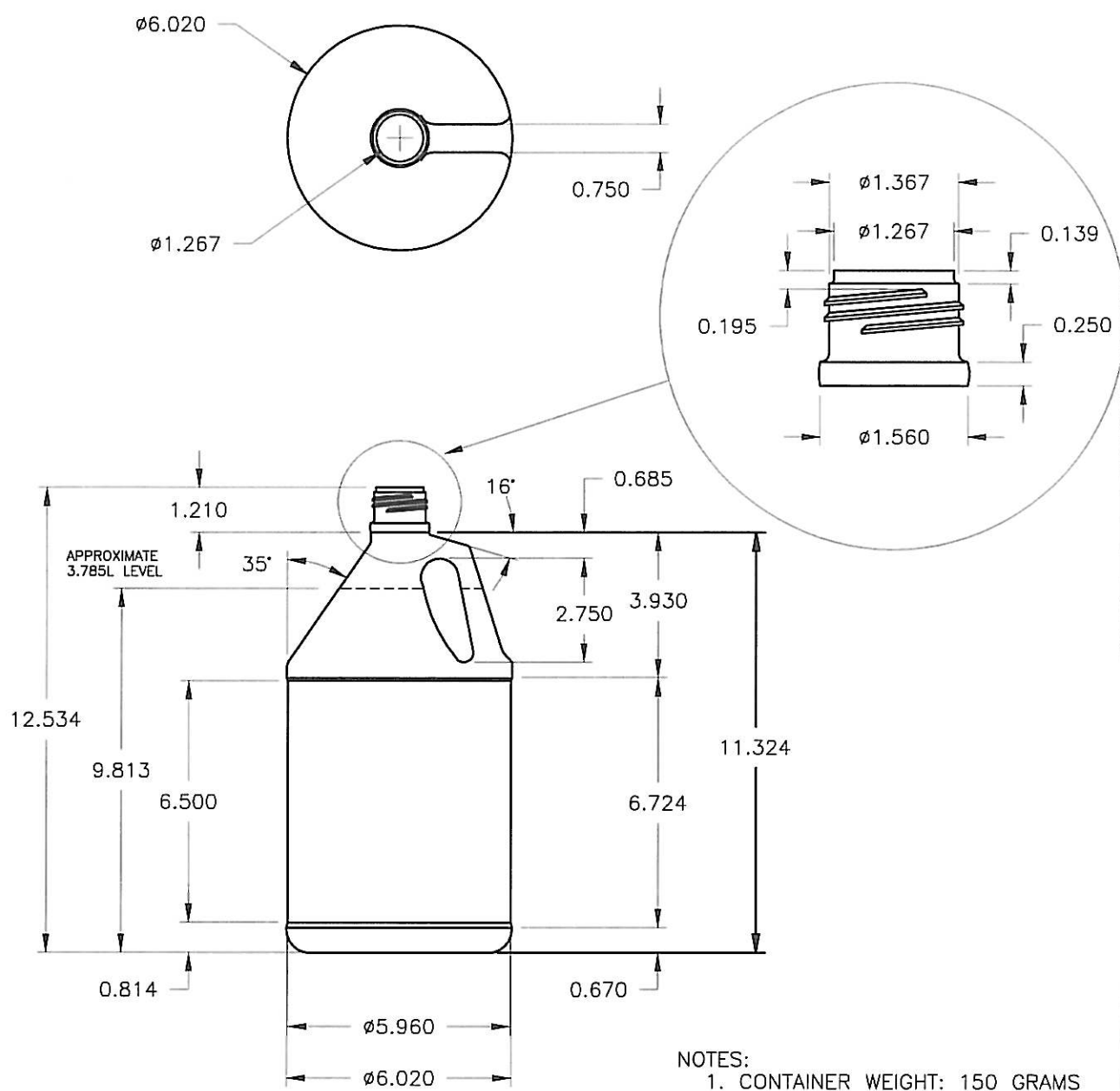


**UN** 4G/Y25.8/S/09  
USA/+CC6016

\*\* (Year of Manufacture)



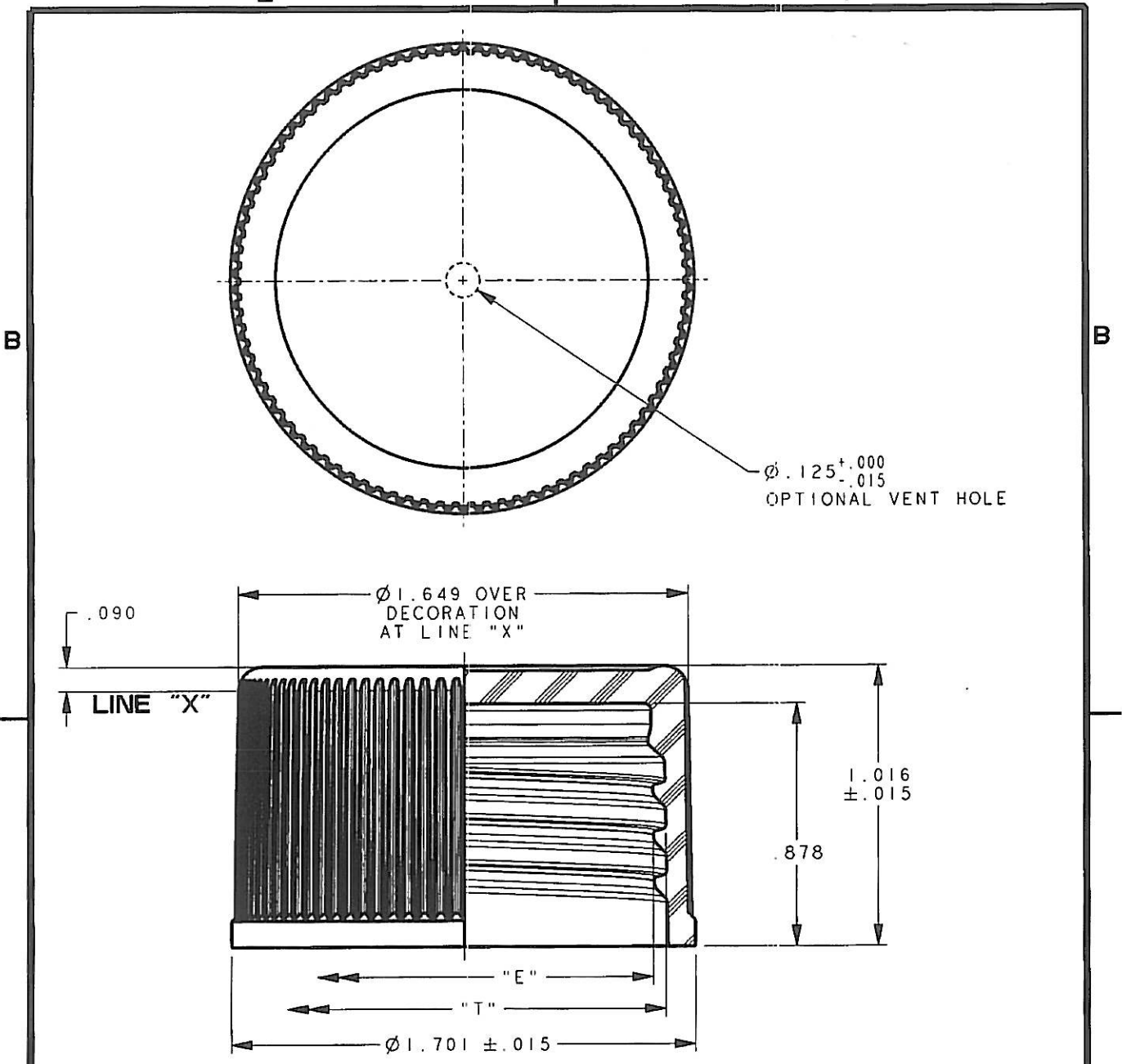
REV	DATE	DESCRIPTION
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- NOTES:
1. CONTAINER WEIGHT: 150 GRAMS
  2. MATERIAL: HDPE, NATURAL
  3. OVERFLOW CAPACITY: 3.903 L
  4. NECK FINISH: 38-439

THIS DRAWING AND THE INFORMATION CONTAINED THERE IN IS THE SOLE PROPERTY OF PUREPAK TECH. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF PUREPAK TECH. IS PROHIBITED.	REVISION	PurePak Technology Corporation	
	REV. _____	324 South Bracken Lane, Suite 3, Chandler, AZ 85224	
DATE: _____	ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED:	DESCRIPTION:	
APPRD. _____	DECIMALS: X.XX ±.010 X.XXX ±.005 X.XXXX ±.002	MOLDED HANDLE BOTTLE 38-439 NECK FINISH	
	ANGLES: X.X ±.500	APPRD. _____	
SHEET 1 OF 1	SCALE: 1:4	DRAWN BY: MSR	DATE: 7/2/07

2 | 1



A "REFERENCE PRODUCT CENTER FOR CURRENT DRAWING" A  
 UNSCREWING LUG IMPRESSIONS TO APPEAR IN BOTTOM SKIRT OF THE CLOSURE

DIMENSIONS ARE REPRESENTATIVE ONLY. FINAL SIZES TO BE DETERMINED AFTER PART IS MANUFACTURED

[F#] = FUNCTIONAL DIMENSION

NOTICE:  
 THIS DRAWING CONTAINS INFORMATION DEEMED PROPRIETARY TO REXAM PLASTIC PACKAGING. THE INFORMATION CONTAINED HEREIN SHALL NOT BE COPIED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION FIRST OBTAINED FROM REXAM PLASTIC PACKAGING.

MATERIAL POLYPRO	TOLERANCES UNLESS SPECIFIED DEC. ±.010 DEGREES ±1°	
GRAM WEIGHT 10.3 REF.	ONLY	CI#
Mold No.	PROD. MJ-410-1A	SAMPLE
SCALE 2:1	DRAWN E. F. HAFNER	
DATE 9/25/2000	CHECKED	
<b>REXAM PLASTIC PACKAGING</b>		

LINE "C" IS .367	DOWN FROM INSIDE TOP.	
"T" at "C"	1.483	±.007
"E" at "C"	1.389	±.007
TITLE <b>CUSTOMER DRAWING</b>		
<b>38-439 A STOCK</b>		
<b>ACID CLOSURE</b>		
FOR STOCK		
DRAWING NUMBER	REVISION	
<b>QIM-317-4937</b>		

## APPENDIX A – Test Equipment and Instrumentation

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**Caliper:** Mitutoyo Corp. Model: CD-6"B s/n: 0010699

**COBB Tester:** TMI

**Compression Machine:** 120,000 lb: Tinius Olsen s/n 89611; recorder: DC-12-SIC s/n M9410202

**Drop Testers:**

- 1) ASTM Electric Quick release (Large Item)
- 2) Gaynes m/n: 104 s/n 4585 (150 lb.)
- 3) Mrad Swing Arm pneumatic m/n 3636(200)DT s/n 564-75 (200 lb.)

**Environmental Chamber:**

- 1) Despatch Ecosphere Environmental Chamber m/n EC635 s/n 162695 with Watlow Ramping Controller m/n F4S/D
- 2) Master-Built Products s/n MBA10346-5 with Johnson Controls controller m/n A19ABC-24 s/n LR948 and Cooper Instrument Corp thermo-hygrometer m/n TM99A
- 3) General Electric Chest style freezer
- 4) Rain Spray Chamber (per ASTM D951 specification) with choke valves to control spray amount per hour. Custom designed and built

**HPT Tester:** WIKA (gauge) Press. +/- 60 PSI m/n: 9699117

**Impact Shock Tester:** MTS Dual Programmable m/n 846-361 s/n: 922-55 (1,000 lb.)

**Incline Impact Machine:** Custom built by Advanced Machinery asset number gh001

**Mullen Tester:** B.F. Perkin & Sons Burst Strength Tester w/Wika Gauge s/n: 15138

**Scales:**

- 1) AND brand electronic. Model: HL-2000 (2000 g)
- 2) Ohaus Triple Beam Balance m/n 700 (610 g)
- 3) Pelouze m/n 4040 s/n DC2804 (400 lb.)
- 4) Accuweigh m/n 25 (25 lb.)
- 5) GSE m/n 350 s/n 968537 (5,000 lb.)

**Shock Recorder:** Lansmont Test Partner II version 2.27

**Tensile/Compression/ECT Machine:** Chatillon ET-1100 s/n 03292

**Torque Meter:** Secure Bak m/n 50 s/n 503635MRA (0-50 in./lbs)

**Vacuum Chamber:** Fast Vac m/n DV-85. Reptech (gauge) Pressure/vacuum +/- 30 PSI

**Vibration Table:**

**Oscillatory:** Gaynes Engineering V250 s/n G17680-3 (250 lb.)  
LAB- 4000-SVML s/n 813024 ( 4,000 lb.)

**Random:** Zonic/Dactron System 306875 s/n: 794435 (4,000 lb.)

**Velocimeter:** GHI Systems m/n: VS200 s/n 082787-1

## APPENDIX B – Understanding and Disclaimer Notice

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This notice advises package manufacturers and package users regarding the use of United Nations Approved Certification Packs.

A "pack" as used herein, means the specific package or container submitted to gh Package & Product Testing and Consulting of Arizona, Inc. for testing and UN certification that the package or container meets the requirements of the Code of Federal Regulations, Title 49, §100 through §180. A pack, therefore, has specific components, including the package in which the containers are arranged for shipping, the containers, the contents of the containers, and all internal packaging elements designed to prevent the containers from moving and/or damage. Each component has unique specifications and characteristics, including, but not limited to, the material, shape, and weight of the package and containers and the internal packaging elements, and the material, specific gravity/density, shape, etc. of the contents of each container.

Herein, the use of singular means plural and the use of plural means singular.

Each pack type (complete individual specification pack) when successfully tested pursuant to the appropriate regulations (Code of Federal Regulations, Title 49, IATA/ICAO, IMDG) is assigned a certification number specifically for the submitted pack. This number represents the report that references the tested pack's specifications and the characteristics of the hazardous material (i.e. specific gravity, particle size) to be placed in the package. gh Testing disclaims any and all responsibility for any substitutions and/or changes in the package or each component thereof, and for any and all variations of use of the package and its contents made by any user/client/customer/other party from the package and its components and contents as tested by gh Testing. The regulations require that design type qualification testing be performed on "identical" and "virtually identical" packs. gh Testing shall not be responsible for any use of variations not tested by gh Testing.

The original tests are based on submitted pack/specifications of submitted packs. It is the shipper's responsibility to ensure that the packs have the same liner board combinations as the pack that was tested and that each pack shipped is capable of meeting the Cobb Test, Drop Test, Hydraulic Pressure Test, Leakproof Test, Stack Test and all other required criteria set forth in the regulations once the pack certification is being used. All inner packs must be the same as those specifications submitted and tested.

Only the materials originally certified are approved for use. If the shipper changes manufacturers, it must ensure that the pack is virtually identical to the pack previously tested. If changes or substitutions become necessary, it is at the discretion of the shipper if a variation applies – gh Testing does not endorse the use of untested variations.

Material Safety Data Sheets (MSDS), submitted pack descriptions, specifications and drawings will be retained by gh Testing. Alterations to the pack invalidate the certification.

It is the shipper's responsibility to ensure that any combination packs it ships are recertified every two years. Composite and Single packages must be recertified every year.

The responsibility of the container markings, compatibility testing between the hazard and packaging, shipping documentation, packing and closing of the packaging are that of the shipper.

Permitted and prohibited uses of the UN Marking assigned by gh Package & Product Testing and Consulting, Inc.



## APPENDIX B – Understanding and Disclaimer Notice

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The Certification Number(s) issued by gh Package/Product Testing & Consulting, Inc. ("gh Testing") shall be used only by gh Testing's customer on hazardous packages certified by gh Testing and shall remain applicable only so long as the certification remains current, through the re-certification at gh Testing, and has not expired, or only so long as gh Testing's customer prepares and uses packages prepared for shipment in virtually and substantially identical packages to those tested and listed by gh Testing in this test report and certification.

Any use of Certification Number(s) issued by gh Testing in this report by its customer which is inconsistent with such permitted use (such as, and including where any part of the package is changed according to CFR 49, subtitle B, Chapter 1, Subchapter C, Parts 171-180) or by persons or entities who are not gh Testing's customer for whom this report and certification were made, whether in a recertification or otherwise, is strictly prohibited, and gh Testing, for itself, its successors, officers, shareholders, directors, and all others acting on its behalf, hereby disclaims any and all liability for claims, causes of action, damages and demands of whatsoever nature arising directly or indirectly out of or in any way based upon any such prohibited use. The certification Number(s) issued by gh Testing in this report shall expire and terminate immediately whereas and if a prohibited use occurs.

All reasonable efforts will have been exercised to provide accurate data from resultant tests or consultation. Test methods utilized and followed in conducting various tests involve standards established by ASTM, TAPPI, DOT, IATA/ICAO, Federal Spec., Mil-Spec., ISTA, as well as private company test standards and procedures. gh Testing assumes no responsibility for nor does it guarantee or warrant any specifically expressed or implied performance and only assumes responsibility for the test data presented by it as derived from specifications, drawings, and information submitted to it for testing. Responsibilities involving alterations and/or changes to the packages and/or product beyond item(s) originally tested are those solely of the user/supplier/client, of which, gh testing assumes no responsibility.

gh Testing will hold submitted material for a period of one (1) week after testing is completed (unless otherwise instructed by the client). After this time, gh Testing may dispose of the material or equipment to its discretion or a storage charge at a rate of \$3.25 per square foot per month will be charged.

gh Testing shall not be liable for any incomplete, inaccurate, misrepresented, or inadequate specifications, drawings, details, or other information pertinent to the proper testing and description of the pack or contents. Should lack of such information supplied to gh Testing

give cause to penalty, gh Testing may seek financial reimbursement for any fines, legal fees, and lost billing and the undersigned shall indemnify gh Testing for all such fines and costs.

The completed testing above was in compliance with the customer requested test(s) and requirements. All reference and data logging materials used in the above testing are traceable to NIST. The testing performed above was performed at gh Package & Product Testing and Consulting of Arizona, Inc., in Phoenix Arizona. This test report cannot be reproduced, except in full, without written permission from gh Package & Product Testing and Consulting of Arizona, Inc. If the measurement uncertainty calculations are listed in the report, the measurement uncertainties represent an expanded uncertainties expressed at approximately 95% confidence level using a coverage factor of K=2.

### Test Criteria and Understanding

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