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

21609 N. 12th Ave.
Suite 300
Phoenix, AZ 85027

Phone (623) 869-8008
Fax (623) 869-8003

November 3, 2010

To: Mr. Michael Dodd
PurePak Technology Corporation
324 S. Bracken Lane Ste. # 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.

Inner Containers: Six 2.6 Liter Plastic Bottles (2 Closure Types)

Outer Container Closure Schemes: Tape Bottom –Tape Top
Glued Bottom-Tape Top

File Number: U-5012-10

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 1.9 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,

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

Laboratory Report

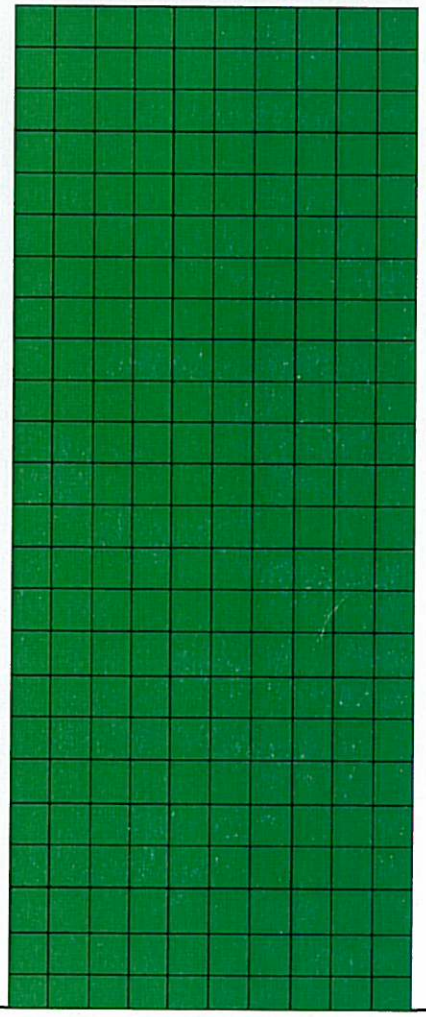
Package & Product Testing and Consulting of AZ, Inc.

21609 N. 12th Ave.
Suite 300
Phoenix, AZ 85027
Phone (623) 869-8008
Fax (623) 869-8003

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

File #: U-5012-10

4G/Y31.5/S/**
USA/+BV1425



This Report Prepared for:

Mr. Michael Dodd

U. S. DEPARTMENT OF TRANSPORTATION

Performance Oriented Package Test Report

File # U-5012-10 Report Date: November 3, 2010
Periodic Testing Required by November 2012

Tested by:
gh Package & Product Testing
& Consulting of Arizona, Inc.
21609 N. 12th Ave., Suite #300
Phoenix, AZ 85027
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 Test
4G Combination Package for Liquids (4 Schemes)
Inner Packagings: Six 2.6 Liter Plastic Bottles
Testing Date(s): 10/14/2010 to 11/2/2010

un

4G/Y31.5/S/**
USA/+BV1425
*****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 air modes of transportation[(1)]. Use of packaging methods or package components other than those documented in this report may invalidate this certification Shippers must insure this packaging design is used in accordance with all national & international regulations applicable to the intended commodity and intended mode(s) of transport (49CFR, ICAO/IATA, IMO/IMDG, et. al.).

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

Frank Reyes

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

SECTION II PACKAGE DESCRIPTION

The 4G Combination Package Designs were tested specifically for surface and air shipments of six 2.6 liter plastic bottles containing a compatible PG II, SG1.9, Corrosive Liquid, Class 8 material. Use of these packaging designs for a commodity other than that for which it was tested will be at the discretion of the shipper. The bottles are placed into a fiberboard box. The four schemes (designs) consist of one common outer package with two different closure schemes and containing two different inner containers.
Scheme A consists of six 38/439 bottles in a common outer package with the top and bottom of the package taped. **Scheme B** consists of six 38/439 bottles in a common outer package with the top of package taped and the bottom glued. **Scheme C** consists of six 45mm bottles with a PTFE plug in a common outer package with the top and bottom of the package taped. **Scheme D** consists of six 45mm bottles with a PTFE plug in a common outer package with the top of package taped and the bottom glued. The following tables describe the components of the package design.

Exterior Container – 4G (See section V for drawings)

Box Style	White RSC FEFCO Style:201
Manufacturer	PCA, Phoenix, AZ
Project Number	P369-1311-1 (CAD #3690177289-1)
Material of Construction	White Corrugated
Number of Walls – Flute Type	Double Wall C/B Flute
BMC: ECT/Mullen	61 ECT Per Drawing
Dimension (OD) LxWxH	38.74 x 24.13 x 34.77 cm (15.25" x 9.5" x 13.69")
Dimension (ID) LxWxH	34.93 x 22.86 x 31.43 cm (13.75" x 9.0" x 12.38")
Mass	0.68 kg (1.50 lb)
Stacking Height	13.69"
Method of Joining Panels	Inside Lapped and Glued
Mfr's Joint - Flap Size	1.50"
Mfr's Joint - Location	5-2 corner (ASTM numbering scheme)
Top Flap Inner Gap/Meet	$4^{7}/_{8}$"
Top Flap Outer Overlap/Meet	0
Bottom Flap Inner Gap/Meet	$4^{7}/_{8}$"
Bottom Flap Outer Overlap/Meet	0
Closure Method/Material **Scheme A** (38/439 Closure) **Scheme C** (45mm Closure)	**Top & Bottom**: 2" clear poly self-adhesive tape (Scotch 3M) extended 3" beyond the long center seam of the box to the short sides 2 and 4 (ASTM numbering format)
Closure Method/Material **Scheme B** (38/439 Closure) **Scheme D** (45mm Closure)	**Top**: 2" clear poly self-adhesive tape (Scotch 3M) extended 3" beyond the long center seam of the box to the short sides. **Bottom**: SETCO Waterproof thermoset adhesive system. Four 6" x 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	
Inside Facing	35.40	0.2845	Per drawing: 61 ECT
Middle Facing	34.95		
Outer Facing	35.50		
C Flute	34.25		
B Flute	34.15		

Inner Packaging Schemes A & B – 6 required (See section V for drawings)

Type, Grade, & Style	2.6 Liter Handleware w/attached handle
Manufacturer	PurePak Technology Corp, Chandler, AZ
Project Drawing	38mm Neck
Material	PPQ Resin (a proprietary HDPE)
Method of Construction	Extrusion – blow molding
Minimum Thickness (bottom)	0.058"
Minimum Thickness (sides)	0.066"
Average Thickness (bottom)	0.071"
Average Thickness (sides)	0.069"
Neck Finish Size	38mm
Thread Type	Buttress
Thread Style	M
Thread Pitch	6 tpi
T's & E's	T's 1.4695" E's 1.3785" (+/- 0.010")
Neck Opening	1.345"
Dimensions	12.124" x 5.30" x 5.30"
Capacity (nominal)	2.6 Liter
Capacity (maximum/overflow)	2.64 Liter = 0.70 gal x 6 = 4.22 gal
Mass	208.2g x 6 = 1.25 kg (2.75 lb)
Handle Number & Position	One integrated solid pinched handle in upper part of bottle
Closure Methods	Hand applied with a torque meter to 50 inch pounds per PurePak Corporation Instructions

Inner Closure Schemes A & B – 6 required (See section V for drawing)

Type, Grade, & Style	38-439 A stock acid closure
Manufacturer	REXAM Plastic Packaging, Brookville, PA
Part Number	QIM-317-4937 (solid inner liner)
Method of Manufacture	Injection Molding
Material	White Polypropylene
Dimensions Including the Skirt	1.016" x 1.701" diameter
Thickness – Maximum	0.0990"
Thickness – Minimum	0.0900"
Thread Style	38/439 "M" Style Modified Buttress
Thread Type	Buttress
Thread Pitch	6tpi
T's & E's	T's 1.4830" E's 1.3890" (+/- 0.010")
Mass	0.06 kg (0.14 lb)
Liner Type	F-422 Tri-layer full seal
Liner Material	Co-extruded HDPE, LDPE, HDPE

Inner Packaging Schemes C & D – 6 required (See section V for drawings)

Type, Grade, & Style	2.6 Liter Handleware w/attached handle
Manufacturer	Pure Pak Technology Corporation, Chandler, AZ
Project Drawing	45mm Neck
Material	PPQ Resin (a proprietary HDPE)
Method of Construction	Extrusion blow molding
Minimum Thickness (bottom)	0.058"
Minimum Thickness (sides)	0.066"
Average Thickness (bottom)	0.071"
Average Thickness (sides)	0.069"
Neck Finish Size	45mm
Thread Type	Butress
Thread Style	M
Thread Pitch	1.575"
T's & E's	T's 1.772" E's 1.644" (+/- 0.010")
Neck Opening	1.266"
Dimensions	12.124" x 5.30" x 5.30"
Capacity (nominal)	2.6 Liter
Capacity (maximum/overflow)	2.65 Liter = 0.70 gal x 6 = 4.22 gal
Mass	208.2g x 6 = 1.25 kg (2.75 lb)
Handle Number & Position	One integrated solid pinched handle in upper part of bottle.
Closure Methods	Hand applied with a torque meter to 50 inch pounds per PurePak Corporation Instructions.

Inner Closure Schemes C & D – 6 required (See section V for drawing)

Type, Grade, & Style	Tamper evident screw cap S45x4 w/KER45 PFTE plug
Manufacturer	Menshen, Germany
Specification or Part Nbr	2.145199.2
Material	HDPE/PFTE
Dimensions Including the Skirt	1.1795" x 2.0190" diameter
Thickness – Maximum	0.1005"
Thickness- Minimum	0.0455"
Thread Type	Butress
Thread Style	M
Thread Pitch	1.1575"
T's & E's	T's 1.8125" E's 1.6730" (+/- 0.010")
Mass	0.07 kg (0.15 lb)
Liner Type	PTFE full liner over the built in plug on the closure
Liner Material	0.0115" PTFE full liner

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 – Package Testing - Test Reviewer
- Jason Sager - Laboratory Technician
- Frank Reyes – Certifying Officer – Report Writer

The following tables describe testing/conditions/results

Test Specimen Characteristics

SCHEME	A & B	C & D
State:	Liquid	Liquid
Dummy Load	Glycol water mixture	Glycol water mixture
Gross Weight (Calculated @ SG = 1.9)	31.57 kg (69.61 lb)	31.58 kg (69.62 lb)
Gross Weight (Tested @ SG = 1.05)	17.69 kg (39.00 lb)	17.69 kg (39.00 lb)

Drop Test –
Test Method: 49 CFR 178.603
Number of Packages Tested – 20 (5 per Scheme)
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 water mixture.
Drop Height –1.9 meters (75") (See Section IV for calculations.)
Results

Box	Tested Weight	Orientation	Result
1A, 1B	17.69 kg (39.00 lb)	Flat on Top	Pass – No damage
2A, 2B	17.69 kg (39.00 lb)	Flat on Short Side	Pass – No damage
3A, 3B	17.69 kg (39.00 lb)	Flat on Bottom	Pass – No damage
4A, 4B	17.69 kg (39.00 lb)	Flat on Long Side	Pass – No damage
5A, 5B	17.69 kg (39.00 lb)	Top Corner	Pass – Corner deflection
1C, 1D	17.69 kg (39.00 lb)	Flat on Top	Pass – No damage
2C, 2D	17.69 kg (39.00 lb)	Flat on Short Side	Pass – No damage
3C, 3D	17.69 kg (39.00 lb)	Flat on Bottom	Pass – No damage
4C, 4D	17.69 kg (39.00 lb)	Flat on Long Side	Pass – No damage
5C, 5D	17.69 kg (39.00 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 – 12 (3 per Scheme)
Lab weights were applied to the tops of the packages using platens (load spreaders) as specified by 178.606© (24-hour free standing).
See Section IV for calculations.
Results:

Box	Required Load	Applied Load	Results
1A, 1B	245.18 kg (540.62 lb)	281.23 kg (620.00 lb)	Passed
2A, 2B	245.18 kg (540.62 lb)	281.23 kg (620.00 lb)	Passed
3A, 3B	245.18 kg (540.62 lb)	281.23 kg (620.00 lb)	Passed
1C, 1D	245.15 kg (540.55 lb)	281.23 kg (620.00 lb)	Passed
2C, 2D	245.15 kg (540.55 lb)	281.23 kg (620.00 lb)	Passed
3C, 3D	245.15 kg (540.55 lb)	281.23 kg (620.00 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 – 12 (3 per Scheme)
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 (see table).
Results

Sample	CPM	Results
1A, 1B	169.4	No damage
2A, 2B	169.4	No damage
3A, 3B,	169.4	No damage
1C, 1D	164.3	No damage
2C, 2D	164.3	No damage
3C, 3D	164.3	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^2	120	130	140	120	140	130	Yes

Pass/Fail Criteria:
An increase in mass of greater than 155 g/m2 over the 30-minute duration of the test represents an unacceptable level of water absorption.

Hydrostatic Pressure (Internal Pressure Test)

Test Method: 49 CFR 173.27(c)(i)
Six inner packagings (3 of each type x = Scheme A & B and y = Scheme C & D) were subjected to hydraulic pressure for 30 minutes.
See section IV for calculations.
Results:

Sample	Applied Load	Results
1x, 2x, 3x	300 kPa (43.5 psi.)	Passed
1y, 2y, 3y	300 kPa (43.5 psi.)	Passed

Pass/Fail Criteria:
No test sample may leak while undergoing the test.

SECTION IV CALCULATIONS

Package Gross Weight

	Schemes A & B		Schemes C & D	
Components	**kg**	**lb**	**kg**	**lb**
Box	0.68	1.50	0.68	1.50
Inner Receptacles	1.25	2.75	1.25	2.75
Inner Closures	0.06	0.14	0.07	0.15
Total Tare Weight	**1.99**	**4.39**	**2.00**	**4.40**
Lading Weight	29.58	65.22	29.58	65.22
Gross Weight	**31.57**	**69.61**	**31.58**	**69.62**
Marked Weight	**31.5 kg**			

Lading Weight = max vol x .98 x 8.3 x SG
4.22 x .98 x 8.3 x 1.9 = 29.58 kg (65.22 lb)

Drop Test Height:
Specific Gravity of Certification: 1.9
Packing Group of Certification: II
Drop Test Height (performed by height): 1.9 x 1.0m = 1.9m (75")
Dummy Load: Glycol Water Mixture

Stack Test:

STACK TEST FORMULA		
REPORT #	**U-5012-10**	**Load=[(120/H)-1]*[W+(S*V*8.3*98%)] 98% = in fill factor 8.3 = wt of 1 gal of**
H =	13.69	Height of Container (inches)
W =	4.40	Tare Weight of Package (lbs)
S =	1.90	Specific Gravity of Lading
V =	4.22	Max Volume of Liquid (gals)
Applied	620.00	Applied Weight (lbs)

Required	540.62 lbs	245.18 kgs
Applied	620.00 lbs	281.18 kgs
Lading Wt	65.22 lbs	29.58 kgs

STACK TEST FORMULA		
REPORT #	**U-5012-10**	**Load=[(120/H)-1]*[W+(S*V*8.3*98%)] 98% = in fill factor 8.3 = wt of 1 gal of**
H =	13.69	Height of Container (inches)
W =	4.39	Tare Weight of Package (lbs)
S =	1.90	Specific Gravity of Lading
V =	4.22	Max Volume of Liquid (gals)
Applied	620.00	Applied Weight (lbs)

Required	540.55 lbs	245.15 kgs
Applied	620.00 lbs	281.18 kgs
Lading Wt	65.22 lbs	29.58 kgs

SECTION V DRAWINGS

The following drawings and sketches apply to this report:
Exterior Container
Inner Receptacles
Inner Receptacle Closures

CAD SPEC

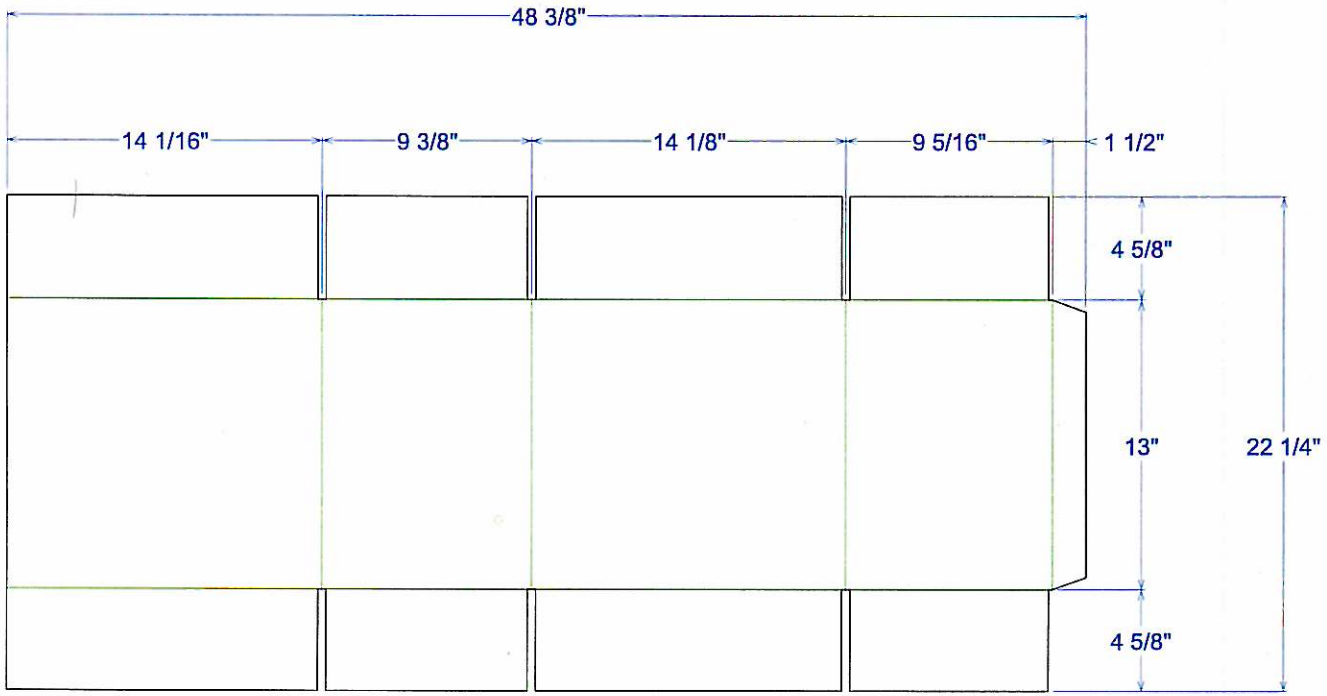
Validation Reviewed

Verification Reviewed

HAZ MAT Packaging

Proprietary and Confidential

Hazmat Item - Do not vary from Spec!!!



Corrugation Direction: Vertical **-INSIDE VIEW-**

NOTES: 8-324-600

Designer: Tony Alvaro

Salesperson:

Customer:
Berry Plastics/Phoenix - 5305

Project Description:
6-1 Gal

Customer Ident:
One-Up

Creation Date: **10/1/2010** | Revision Date: **10/1/2010**

Dimensions (Inside):
13 3/4" x 9" x 12 3/8"

Style: **RSC**

Joint: **Glue Inside**

Board Grade/Flute/Combo:
CB-35MW-33M-35-33M-35
61 ECT CB Flute

Blank Size: **22 1/4" x 48 3/8"**

Sq Ft: **7.47 sq ft** Waste %: **2.49**

Total Rule: **338.98"**

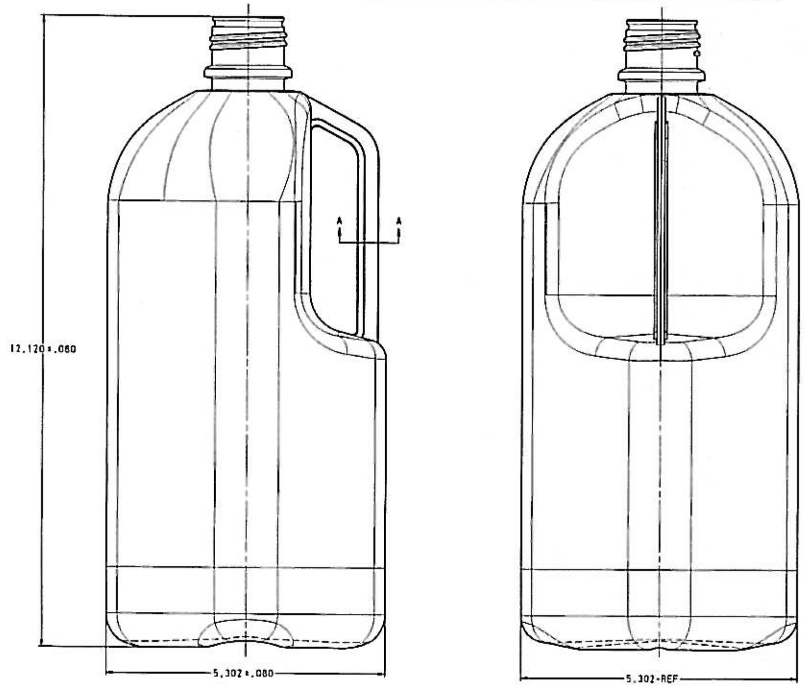
Master set #: **of**

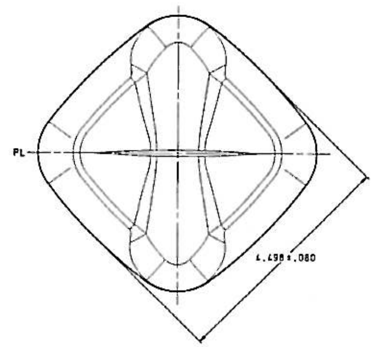
Count Needed:

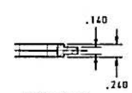
Project Number/Rev
P369-1311-1

CAD Number/Rev
3690177289-1

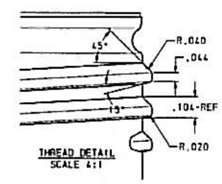
441 South 53rd Avenue
Phoenix, AZ, 85043
(602) 455-6302



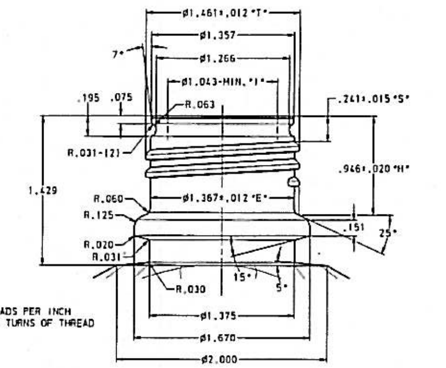




SECTION A-A



THREAD DETAIL
SCALE 4:1



6 THREADS PER INCH
2 FULL TURNS OF THREAD

38mm NECK FINISH DETAIL
SCALE 2:1

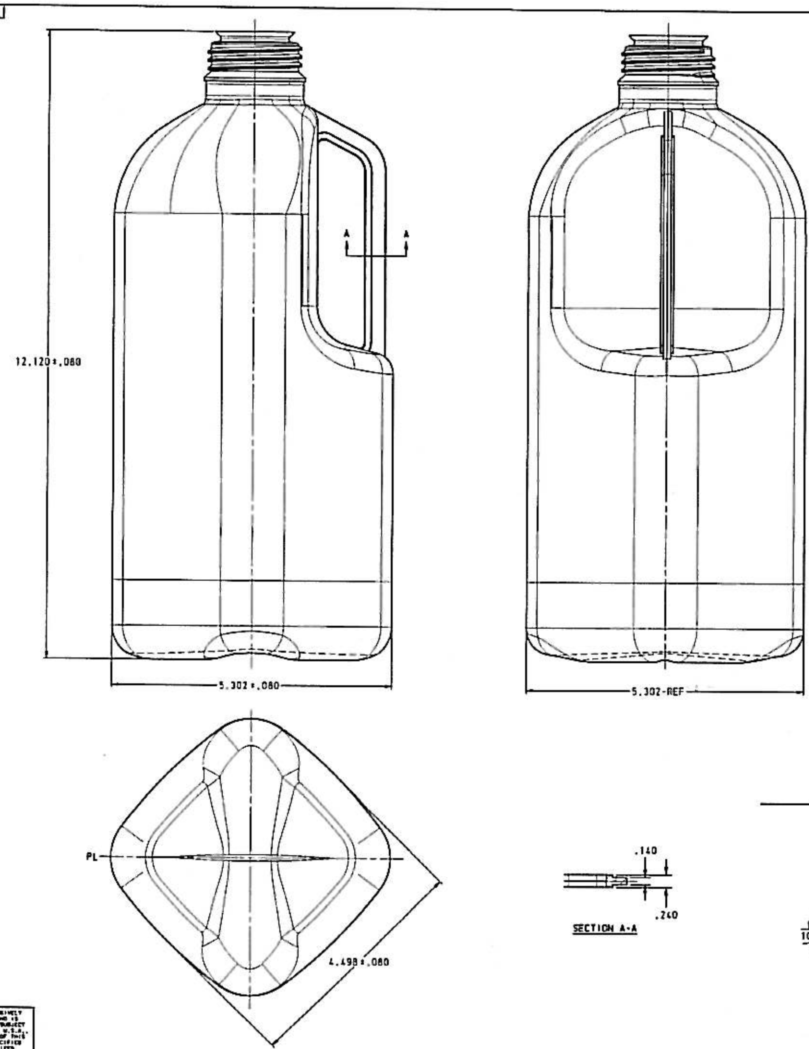
NOTES:
1) MATERIAL- PPO RESIN, NATURAL
2) WEIGHT- 208±8 GRAMS
3) OVERFLOW CAPACITY 2600 ±30ml (A)

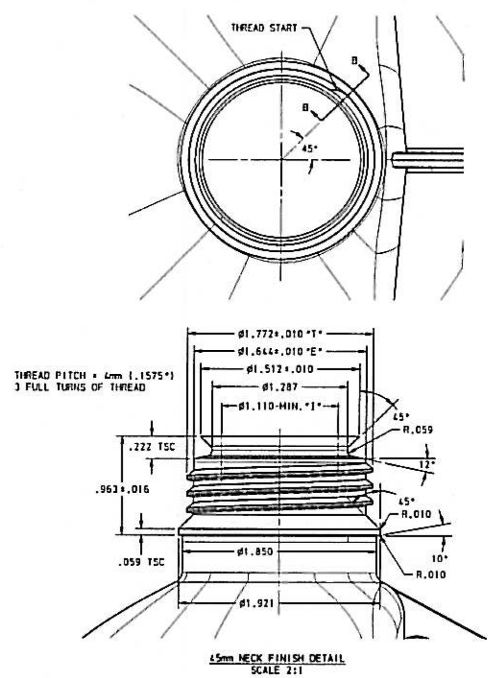
NOTE: THIS IS A PRELIMINARY PRODUCT DRAWING. SPECIFICATIONS ARE SUBJECT TO CHANGE.

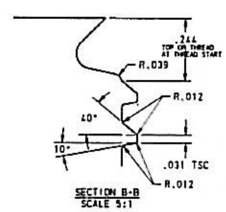
ALL NECK FINISH DIAMETER DIMENSIONS ARE THE AVERAGE OF TWO MEASUREMENTS TAKEN ACROSS THE MAJOR AND MINOR AXIS. THE LIMITS OF OVALITY ARE (.036)

V031AS	1:1	---	HEISE INDUSTRIES INC	2.6 LITER HANDLEWARE		
JOB No.	SET	CAVITY No.		PRODUCT DRAWING 38mm NECK		A
CAD FILE INFORMATION:						REVISIONS
PROJECT: V031AD				DRW'N. BY: J.A. DATE: 10-14-10	SCALE FULL	SHEET 1 OF 1
DRAWING: V031ASPD_38				CHK'D. BY: J.A. DATE: 10-14-10		DWG.# D-45945-A
MODEL FILE: V031AD_DESIGN						
LIBRARY: ------LIBRARY-						

DWG.# D-45945-A







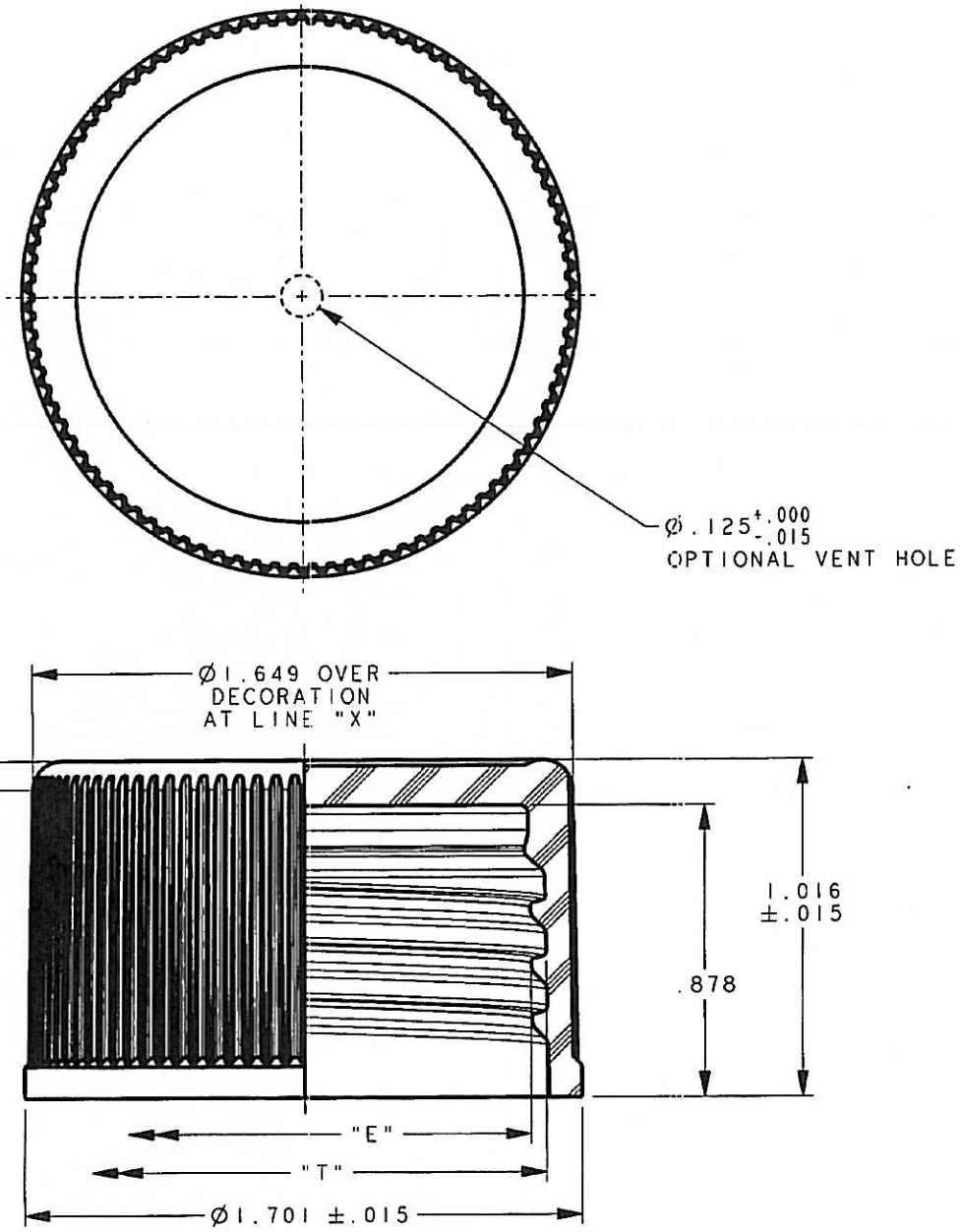
NOTES:
1) MATERIAL- PPD RESIN, NATURAL
2) WEIGHT- 208±8 GRAMS
3) OVERFLOW CAPACITY 2614 ±30ml (A)

NOTE: THIS IS A PRELIMINARY PRODUCT DRAWING. SPECIFICATIONS ARE SUBJECT TO CHANGE.

ALL NECK FINISH DIAMETER DIMENSIONS ARE THE AVERAGE OF TWO MEASUREMENTS TAKEN ACROSS THE MAJOR AND MINOR AXIS. THE LIMITS OF OVALITY ARE (.036)

HEISE INDUSTRIES INC	2.6 LITER HANDLEWARE	
	PRODUCT DRAWING 45mm NECK	REVISIONS
	DRW'N. BY: J.A. DATE: 10-14-10	SCALE FULL · SHEET 1 OF 1
	CHK'D. BY: J.A. DATE: 10-14-10	DWG. # D-45946-A

DWG. # D-45946-A



"REFERENCE PRODUCT CENTER FOR CURRENT DRAWING"

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

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. HAFFNER
DATE	9/25/2000
CHECKED	

LINE "C" IS .367 DOWN FROM INSIDE TOP.		
"T" at "C"	1.483	±.007
"E" at "C"	1.389	±.007

TITLE **CUSTOMER DRAWING**

38-439 A STOCK ACID CLOSURE

FOR STOCK

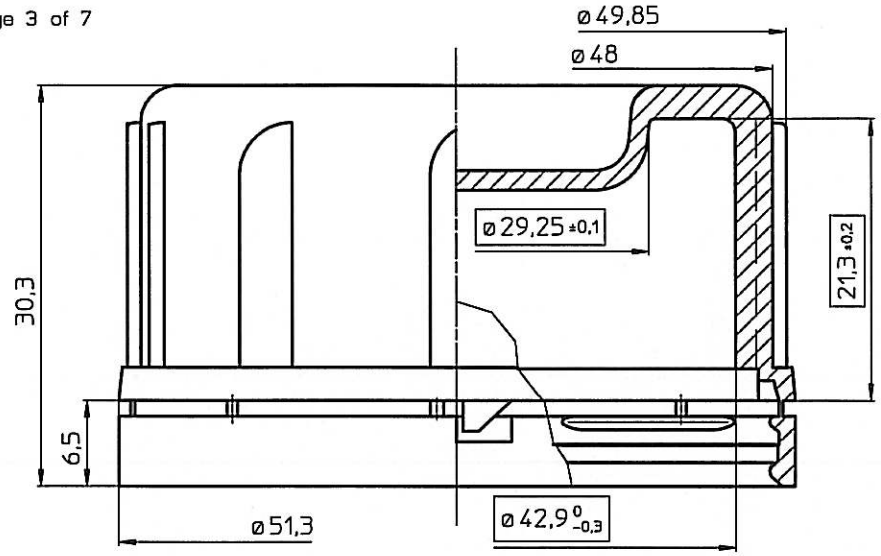
REXAM PLASTIC PACKAGING

DRAWING NUMBER **QIM-317-4937**

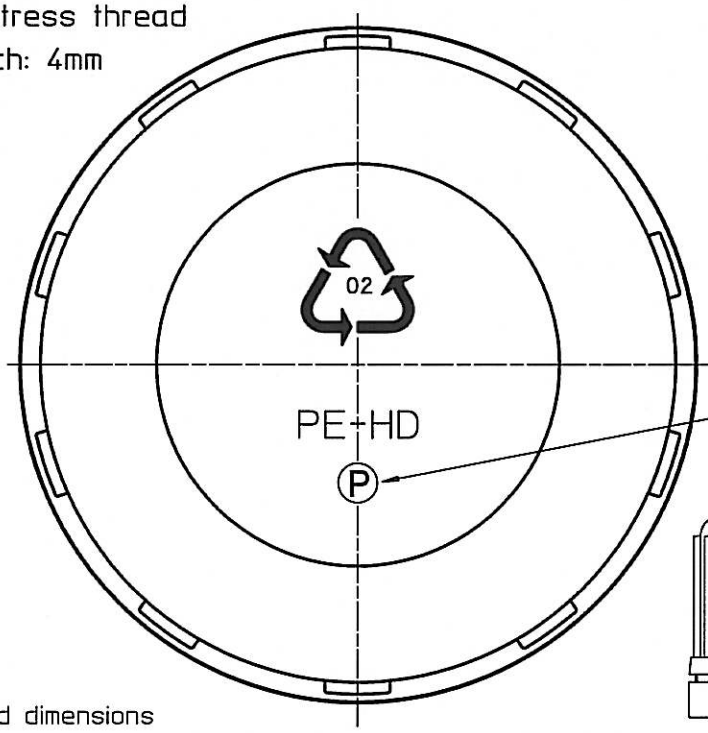
REVISION

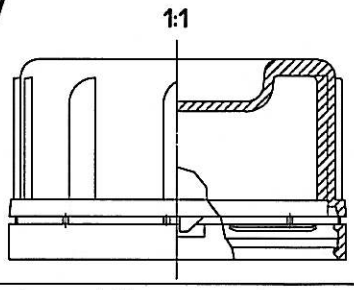
MODEL NAME: im-317-4937 | DIRECTORY: stock/prod

Stock



buttress thread
pitch: 4mm





▭ =tested dimensions

This information is valid for 6 month from date of this dispatch, new information available on request.

				Datum: *date* 10.03.2010	Freimasstoleranzen: *general tolerances* DIN 16901-150	Material: *material* HDPE	
				Gezeichnet: *drawn by* Mertens	Massstab: *scale* 2:1 / 5:1	Gewicht: *weight* -	
				Geprueft: *checked*	Bezeichnung: *description* tamper evident screw cap S 45x4		
				MENSHEN GEORG MENSHEN GmbH + CO.KG. Kunststoffverarbeitung 57413 Finnentrop Tel: +49 (0)2721-518-0 Fax: +49 (0)2721-518-198 Web: http://www.menshen.com	Artikel-Nr.: *article no.* 4.1451.99.2	Blatt: *sheet* .	
					Entwicklung Nr.: *development no.*	von: *of* .	
					Datei: *file* u:\me10\az\1451		
Index	Aenderung *modification*	Datum *date*	Name *name*		Ersatz fuer: *supersedes* 1451_1 (neu) vom 20.07.1994	Ersetzt durch: *superseded by* -	

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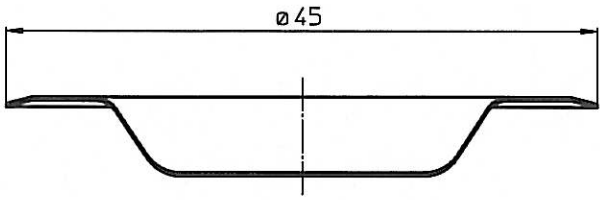
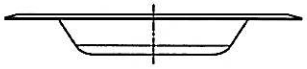


1:1



This information is valid for 6 month from date of this dispatch, new information available on request.

				Datum: *date* 10.03.2010	Freimassloleranzen: *general tolerances* DIN 16901-150		Material: *material* -
				Gezeichnet: *drawn by* Mertens	Massstab: *scale* 2:1 / 1:1		Gewicht: *weight* -
				Geprueft: *checked*	Bezeichnung: *description*		
				MENSHEN GEORG MENSHEN GmbH + CO.KG. Kunststoffverarbeitung 57413 Finnentrop Tel: +49 (0)2721-518-0 Fax: +49 (0)2721-518-198 Web: http://www.menshen.com	PTFE - plug		
					Artikel-Nr.: *article no.* KER 45		Blatt: *sheet* .
					Entwicklung Nr.: *development no.*		von: *of* .
				This drawing may not be copied partially or complete nor handed out to third persons or competitors for use or copying without our approval ©	Datei: *file*		
Index	Aenderung *modification*	Datum *date*	Name *name*		Ersatz fuer: *supersedes* -	Ersetzt durch: *superseded by* -	

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APPENDIX A – Test Equipment and Instrumentation

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

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

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
All reasonable efforts 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 A.S.T.M., T.A.P.P.I., D.O.T., Federal Spec. and Mil-Spec., I.S.T.A. as well as private company test standards and procedures. gh Testing assumes no responsibility or guarantees/warranties regarding (specifically stated or implied) performance and only assumes responsibility for the test data presented by it. Responsibilities involving alterations and/or changes to the packages and/or product beyond item(s) originally tested are those of the user/supplier/client, of which, gh testing assumes no responsibility.