T-MAK LABS, INC.

♦T-MAK Labs, Inc., 1205 Karl Ct., Suite 108, Wauconda, IL 60084 ♦ Phone: 847-469-8630 ♦ Fax: 847-469-8918 ♦ www.t-maklabs.com♦

Section 1: Basic Information

Re: S-18024 (S-18025)

Date of Report: November 7, 2015
Report No. 15-1108

Tests Performed By:

T-MAK LABS, Inc.
1205 Karl Ct, Suite 108
Wauconda, IL 60084

Tests Conducted For:

Uline
12575 Uline Drive
Pleasant Prairie, WI 53158

Attn: Uline Product Management

Items Tested: Two (2) sets of combination packages intended for the transport of hazardous liquids.

Package: 275# RSC Style, C-flute, corrugated box
Approximate Size: 11.0625" x 5.625" x 7.125"
Inner Packaging: Two (2) 1 Quart, Round open head steel cans with friction lids and Two (2) locking ring options.
Nominal Tare Weight: 1.155 lbs.
Nominal Gross Weight: 11.7 lbs.

Object of Test: Initial design qualification testing to determine compliance with applicable sections of 49 CFR pertaining to the transport of hazardous materials. PG II.

Findings: As submitted and tested, this package design was considered to comply with noted requirements.

4G/Y5.3/S/**
USA/+CO1387

** Indicates the last two digits of the year of manufacture as per §178.503(a) (6).

Expiration: This package certificate expires 2 years from the date of this test report.

Tim Phelan
President

T-MAK LABS, Inc. is a current DOT UN Third-Party Certification Agency under § 107.403.

Section 1: BASIC INFORMATION (continued)

Report No: **15-1108** **Date of Report: 11-07-2015**

Prepared For:

Contact Name:	Uline Product Management
Company Name:	Uline
Address:	12575 Uline Drive
	Pleasant Prairie, WI 53158
Phone:	1-800-295-5510
E-mail:	customer.service@uline.com

Prepared By:

Contact Name:	Tim Phelan
Company Name:	T-MAK Labs, Inc.
Address:	1205 Karl Ct. Suite #108
	Wauconda, IL 60084
Phone:	1-847-469-8630
E-mail:	tphelan@t-maklabs.com

Project Details:

Test Report Number:	15-1108
Lab Technician	Tim Phelan
Test Dates:	10-22-2015 to 11-04-2015
Report Date:	11-07-2015
Laboratory symbol:	+CO
Package ID:	UN 4G

Note: Any changes to this package that are not specified in 178.601 (G) (1) or 178.601 (G) (4) will VOID this certification.

Section 2: PACKAGING DESCRIPTION

Outer Packaging (Fiberboard Box): See Section 5.1 for Design Drawings

OUTER PACKAGING						
	Design Standard	UN 4G				
	Manufacturer	Mfg. by StandFast, Addison, IL for Uline				
	Part Number	S-18025				
	Style	Regular Slotted Container (RSC) International Box Code (0201)				
MATERIAL						
	Type	Fiberboard (Kraft)				
	Grade	275# Mullen				
	Flutes	C - Vertical Fluting				
	Number of plys	One (1)				
	Caliper (thickness)	0.172	inches	4.3688	mm	
	Basis weight (indicated)	69 - 26 - 69				
	Basis weight (measured)	70.4 - 24.8C - 71.2				
	Combined board weight	141.6 lbs./1,000 ft²				
SIZE						
	O.D. Length	11.0625	inches	280.9875	mm	
	O.D. Width	5.625	inches	142.875	mm	
	O.D. Height	7.125	inches	180.975	mm	
	I.D. Length	10.75	inches	273.05	mm	
	I.D. Width	5.375	inches	136.525	mm	
	I.D. Height	6.375	inches	161.925	mm	
MANUFACTURERS JOINT						
	Description	Inside Glued, Vertical edge				
	Length	5.625	inches	142.875	mm	
	Width	1.375	inches	34.925	mm	
FLAP GAPS						
	Inner Top	5.25	inches	133.35	mm	
	Outer Top	0	inches	0	mm	
	Inner Bottom	5.125	inches	130.175	mm	
	Outer Bottom	0	inches	0	mm	
GRAM WEIGHT		225.7	grams			
QUANTITY/PKG		One (1)				
METHOD OF CONSTRUCTION		MRA Starch				
UNIQUE FEATURES		None				

Section 2: PACKAGING DESCRIPTION (continued)

Section 2: PACKAGING DESCRIPTION (continued)

Outer Packaging (Foam Inserts): See Section 5.2 Design Drawings

INNER PACKAGING								
	Manufacturer		Mfg by Cellox, Reedsburg, WI for Uline					
	Part Number		S-7340					
	Style		Custom molded top and bottom inserts					
MATERIAL								
	Type		Expanded Polystyrene					
LID DIMENSIONS								
	Length		5.140	inches	130.556	mm		
	Width		5.140	inches	130.556	mm		
	Height		1.110	inches	28.194	mm		
LID GRAM WEIGHT			5.3	Grams				
QUANTITY/PKG			Four (4)					

Section 2: PACKAGING DESCRIPTION (continued)

Inner Packaging (Cans): See Section 5.3 for Design Drawings

INNER PACKAGING									
	Manufacturer			Unican, Fremont, OH					
	Part Number			Unican Spec# 9520 E 751 02 414 01					
	Part Number			Uline Part No. S-7343					
	Style			One quart round open head can					
MATERIAL									
	Type			Steel Gauge: 65/75/85 ETP STEEL					
CAPACITY									
	Indicated			0.2500	Gallons	0.94625	Liters		
	Overflow			0.2536	Gallons	0.959876	Liters		
	98% full			0.2485	Gallons	0.940573	Liters		
DIMENSIONS									
	Diameter			4.23	inches	107.442	mm		
	Height without cap			4.85	inches	123.19	mm		
THICKNESS RANGE									
		From	To		From	To			
	Bottom	0.008	0.011	inches	0.2032	0.2794	mm		
	Sides	0.009	0.011	inches	0.2286	0.2794	mm		
GRAM WEIGHT				98.3	Grams				
QUANTITY/PKG				Two (2)					
METHOD OF CONSTRUCTION				Crimped top and bottom with welded side seam					
ORIENTATION				See Closure Instructions					

Note: All of the cans were filled with water for testing.

Section 2: PACKAGING DESCRIPTION (continued)

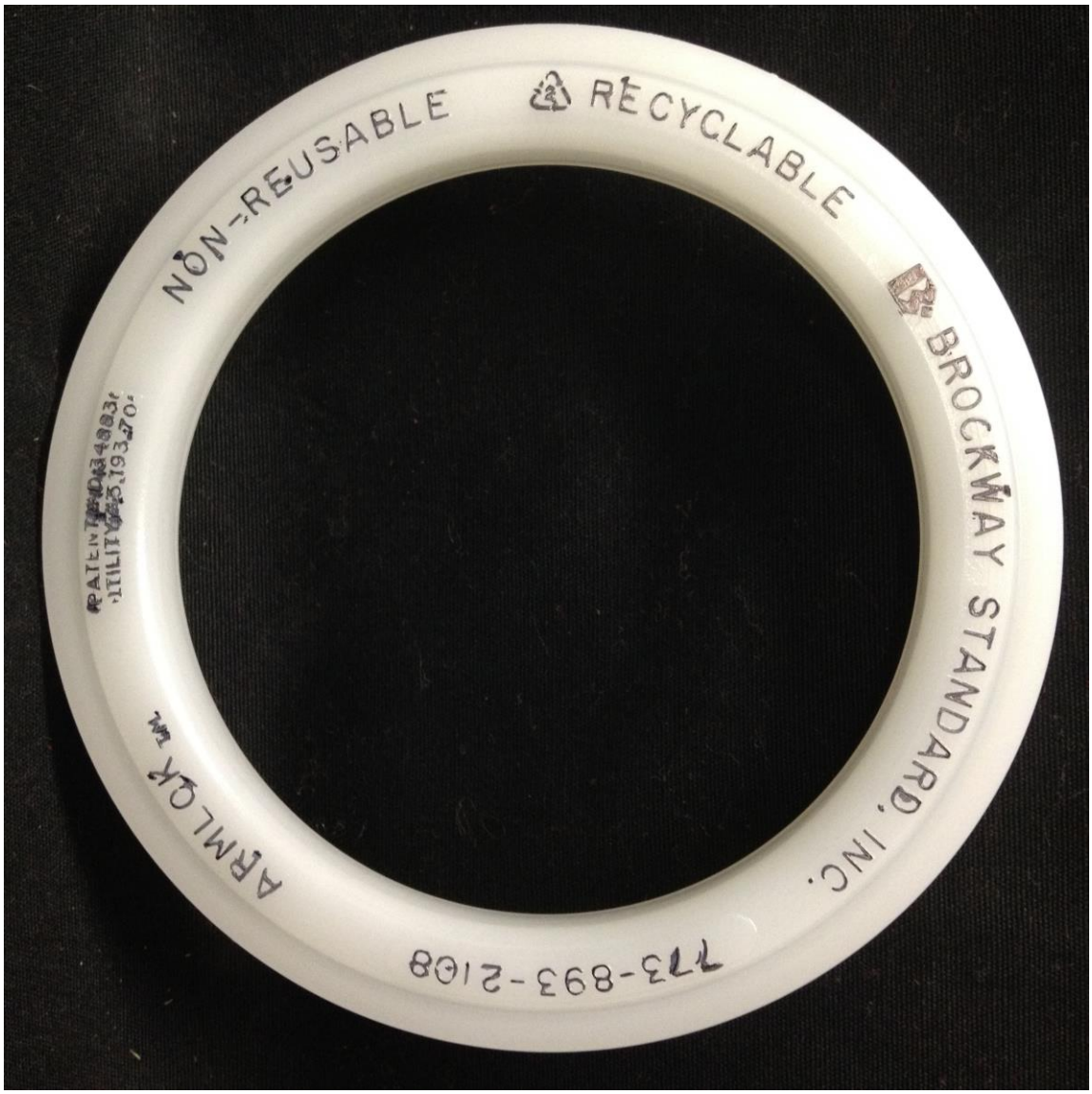
Inner Packaging (Lid): See Section 5.4 for Design Drawings

INNER PACKAGING								
	Manufacturer		Unican, Fremont, OH					
	Part Number		Unican Spec# 9520E 751 05 404					
	Style		Friction fit steel lid					
MATERIAL								
	Type		Steel Gauge: 85 ETP STEEL					
LID DIMENSIONS								
	Diameter		3.880	inches	98.552	mm		
	Height		0.320	inches	8.128	mm		
	Thickness		0.009	inches	0.2286	mm		
LID GRAM WEIGHT			23.6	Grams				
QUANTITY/PKG			Two (2)					

Section 2: PACKAGING DESCRIPTION (continued)

Inner Packaging (Locking Ring Option #1): See Section 5.5 for Design Drawings

INNER PACKAGING								
	Manufacturer		B-Way Packaging Corp. Atlanta GA 30350					
	Part Number		ARMLOK RING ALL SIZE (404)					
	Part Number		Uline Part No. S-7345					
	Style		Poly ring that secures lid to can					
MATERIAL								
	Type		Natural "Opaque" HDPE					
LOCKING RING DIMENSIONS								
	Diameter		4.440	inches	112.776	mm		
	Thickness		0.041	inches	1.0414	mm		
LOCKING RING WEIGHT			15.8	Grams				
QUANTITY/PKG			Two (2)					



Section 2: PACKAGING DESCRIPTION (continued)

Inner Packaging (Locking Ring Option #2): See Section 5.6 for Design Drawings

INNER PACKAGING								
	Manufacturer		Norman International, Chicago, IL					
	Part Number		Normlok II Ring Quart					
	Style		Poly ring that secures lid to can					
MATERIAL								
	Type		Natural "Opaque" HDPE					
LOCKING RING DIMENSIONS								
	Diameter		4.400	inches	111.76	mm		
	Thickness		0.067	inches	1.7018	mm		
LOCKING RING WEIGHT			13.7	Grams				
QUANTITY/PKG			Two (2)					

Section 2: PACKAGING DESCRIPTION (continued)

Outer Packaging (Box Tape): See Section 5.7 for Design Drawings

CLOSURE					
Manufacturer	Mfg. by Achem Technology Corp, Tiawan for Uline				
Part Number	S-472				
Style	2" wide PS Poly Tape				
MATERIAL					
Type	polypropylene film backing with solvent acrylic adhesive				
DIMENSIONS					
Length	17.0625	inches	433.3875	mm	
Width	1.90	inches	48.26	mm	
Thickness	0.002	inches	0.0508	mm	
ORIENTATION	See Closure Instructions				
GRAM WEIGHT	1	Grams			
QUANTITY/PKG	Two (2)				

Equipment used to set up and prepare the packages for testing:

- Tape Dispenser: Uline, Model Number H-150 (2” wide side load)
- Lid/Ring Applicator: Freund Model No. #7855
- Calibration data can be found on page 33.

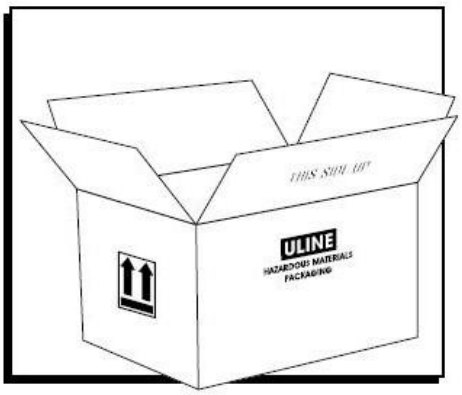
Assembly and Closure Instructions

T-MAK LABS Inc. followed the assembly and closure instructions provided by Uline to prepare the packages for testing.

ULINE S-18024, S-18025

2-1 QUART PAINT CAN FOAM SHIPPER KIT

1-800-295-5510
uline.com

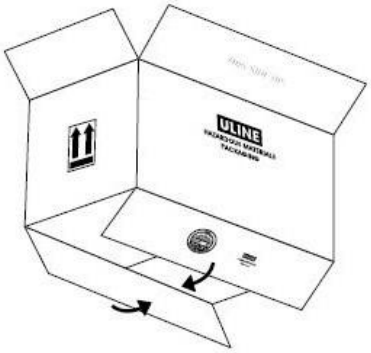


COMPONENTS

1 Corrugated Carton (Uline Model # S-18025)
2 - 1 Quart Can With Lid (Uline Model # S-7343)
2 - 1 Quart Locking Ring (Uline Model # S-7345)
4 - 1 Quart Foam Insert (Uline Model # S-7340)
2" Wide (2 mil) Polypropylene Tape (Uline Model # S-472*)
*Sold Separately

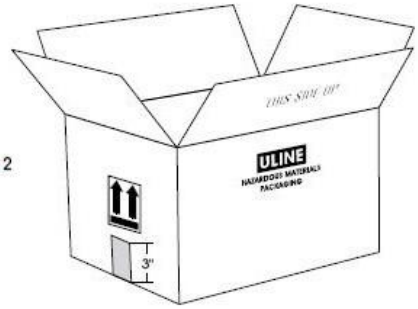
ASSEMBLY INSTRUCTIONS

Figure 1



1. Fold flaps on bottom of carton so that they meet. Manufacturer's certification must be visible on the outside of the carton. (See Figure 1)

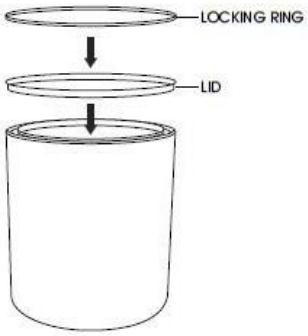
Figure 2



2. Seal bottom of carton down the center seam with one strip of 2" wide (2 mil) polypropylene tape (Uline Model # S-472). The tape must extend 3" over each end of the carton. (See Figure 2)

3. Fill cans. Do not overfill.

Figure 3



4. Secure lids completely on cans by applying even pressure with a paint can closer until lids are fully nested. (See Figure 3)

5. Align locking rings evenly over can lids and secure by applying even pressure with a paint can closer. Make sure rings snap into place. (See Figure 3)

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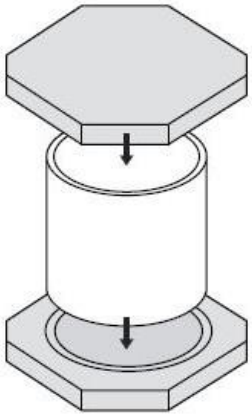
Assembly and Closure Instructions - Continued

ASSEMBLY INSTRUCTIONS CONTINUED

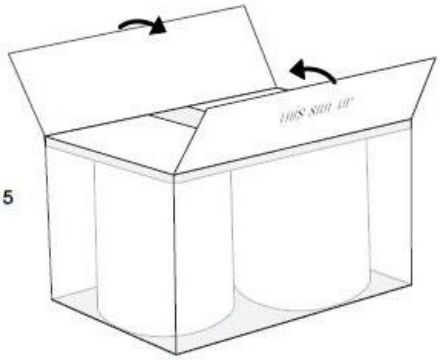
Figure 4



6. Apply one foam insert to both top and bottom of each can. (See Figure 4)

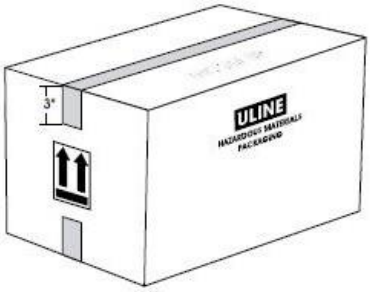
7. Place cans into carton – bottom first.

Figure 5



8. Fold flaps on top of carton so that they meet. "THIS SIDE UP" must be visible on the outside of the carton. (See Figure 5)

Figure 6



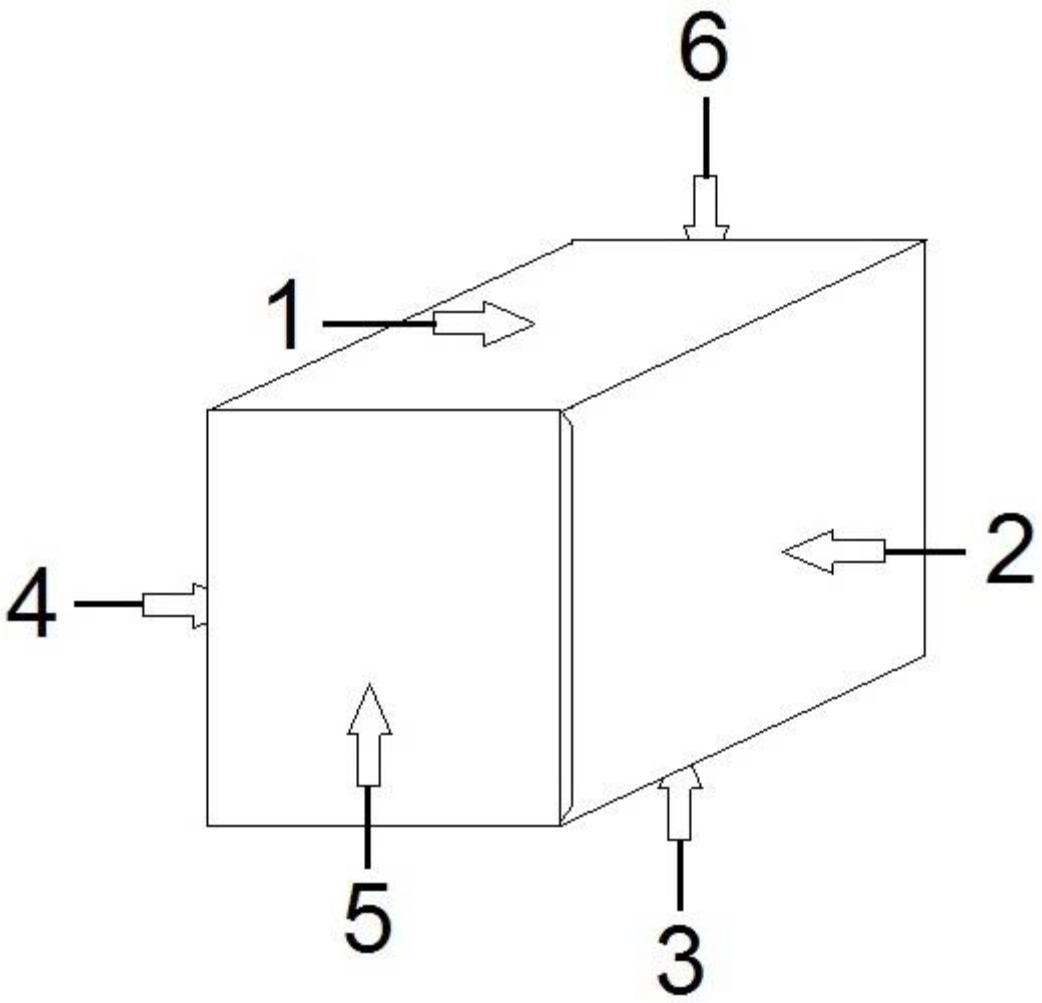
9. Seal top of carton down the center seam with one strip of 2" wide (2 mil) polypropylene tape (Uline Model # S-472). The tape must extend 3" over each end of the carton. (See Figure 6)

Section 3: TEST DESCRIPTION AND RESULTS

Package Preparation:

The inner packages were filled to a minimum of 98% full. The caps were applied as specified in the closure instructions. The inner packages were placed into the outer packaging as specified in the closure instructions and secured closed.

Box Panel Orientation



Section 3: TEST DESCRIPTION AND RESULTS - (continued)

Drop Test: 49CFR § 178.603

Conditioning: 24 hours minimum conditioning to 23° C and 50% RH. The drop testing occurred within 2 minutes of removal from the environmental chamber. The temperature of the test solution was checked after the completion of the drop tests during the inspection process. An extra package was set up with thermocouples to monitor the temperature and confirm the packages were at the correct temperature before removal from the environmental chamber.

Test Method: § 178.603 (a) General. The drop test must be conducted for the qualification of all packaging design types and performed periodically as specified in § 178.601(e). For other than flat drops, the center of gravity of the test packaging must be vertically over the point of impact. Where more than one orientation is possible for a given drop test, the orientation most likely to result in failure of the packaging must be used. (d) Target. The target must be a rigid, non-resilient, flat and horizontal surface. (e) Drop height. Drop heights, measured as the vertical distance from the target to the lowest point on the package, must be equal to or greater than the drop height determined as follows

Actual time the packages were in the conditioning chamber: 46 Hours.

Cans with Brockway Standard Rings

Package Number	Package Weight	Drop Orientation	Drop Height	Result
1a	5.306 lbs.	Flat on Bottom (Face 3)	2.6 m	Pass
1b		Flat on Top (Face 1)	2.6 m	Pass
1c		Flat on Long side (Face 2)	2.6 m	Pass
1d		Flat on Short Side (Face 5)	2.6 m	Pass
1e		Mfg. Corner (Corner 1,5,2)	2.6 m	Pass

Cans with Norman International Rings

Package Number	Package Weight	Drop Orientation	Drop Height	Result
2a	5.297 lbs.	Flat on Bottom (Face 3)	2.6 m	Pass
2b		Flat on Top (Face 1)	2.6 m	Pass
2c		Flat on Long side (Face 2)	2.6 m	Pass
2d		Flat on Short Side (Face 5)	2.6 m	Pass
2e		Mfg. Corner (Corner 1,5,2)	2.6 m	Pass

Section 3: TEST DESCRIPTION AND RESULTS - (continued)

Drop Test: 49CFR § 178.603

Pass/Fail Criteria: For each Package 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 ceased immediately after impact. After the drop testing was complete, the samples were placed horizontal for a period of 15 minutes to check for any leaks, spillage or loss of contents.

Cans with Brockway Standard Rings

Package Number	Drop Orientation	Condition of Packages after drop sequence
1a	Flat on Bottom (Face 3)	Can bottom bulged out, No leakage detected.
1b	Flat on Top (Face 1)	Can lid bulged out, No leakage detected.
1c	Flat on Long side (Face 2)	Can sides flat sided, top and bottom bulged out, No leakage detected.
1d	Flat on Short Side (Face 5)	Can sides flat sided, top and bottom bulged out, No leakage detected.
1e	Mfg. Corner (Corner 1,5,2)	.625" crush on top corner, Can dented, No leakage

Cans with Norman International Rings

Package Number	Drop Orientation	Condition of Packages after drop sequence
2a	Flat on Bottom (Face 3)	Can bottom bulged out, No leakage detected.
2b	Flat on Top (Face 1)	Can lid bulged out, No leakage detected.
2c	Flat on Long side (Face 2)	Can sides flat sided, top and bottom bulged out and water was trapped inside ring. No leakage detected.
2d	Flat on Short Side (Face 5)	Can sides flat sided, top and bottom bulged out, No leakage detected.
2e	Mfg. Corner (Corner 1,5,2)	.625" crush on top corner, Can dented, No leakage

Section 3: TEST DESCRIPTION AND RESULTS - (continued)

Hydrostatic Pressure Test: 49CFR § 178.605 & § 173.27

Test Method: ASTM Method D7660-10. A valve was installed on the side of the container (clear of seams or closures) on three inner packages. A hydraulic pressure regulator and gauges are used to apply pressure and monitor the pressures. The containers were filled with water just below the container opening. The valves and gauges are checked for leaks and the cap is secured closed as specified in the closure instructions. The inner packages are oriented in a 45° upright angle for the duration of the test. The time to reach the indicated pressure was recorded from 1 stop watch, and at the exact time the pressure in the inner packages was reached, a 2nd timer was started to measure the specified test duration. The water temperature at the time of the test was 62°F.

Cans with Brockway Standard Rings

Inner Pkg. Number	Applied Pressure	Duration	Time to Pressure	Pressure Rate (kpa/Second)	Pass/Fail
1	95 kpa	5 Min	20 Seconds	4.75 kpa/sec	Pass
2	95 kpa	5 Min	25 Seconds	3.8 kpa/sec	Pass
3	95 kpa	5 Min	30 Seconds	3.16 kpa/sec	Pass

Cans with Norman International Rings

Inner Pkg. Number	Applied Pressure	Duration	Time to Pressure	Pressure Rate (kpa/Second)	Pass/Fail
4	95 kpa	5 Min	20 Seconds	4.75 kpa/sec	Pass
5	95 kpa	5 Min	25 Seconds	3.8 kpa/sec	Pass
6	95 kpa	5 Min	20 Seconds	4.75 kpa/sec	Pass

Pass/Fail Criteria: A package passes the hydrostatic test if, for each test sample, there is no leakage of liquid from the package.

Cans with Brockway Standard Rings

Inner Pkg. Number	Condition of Inner Packagings after Hydrostatic test
1	Can lid and bottom bulged out, small amount of water trapped under locking ring, No leakage detected.
2	Can lid and bottom bulged out, No leakage detected.
3	Can lid and bottom bulged out, No leakage detected.

Cans with Norman International Rings

Inner Pkg. Number	Condition of Inner Packagings after Hydrostatic test
1	Can lid and bottom bulged out, No leakage detected.
2	Can lid and bottom bulged out, No leakage detected.
3	Can lid and bottom bulged out, No leakage detected.

Section 3: TEST DESCRIPTION AND RESULTS - (continued)

Stacking Test: 49CFR § 178.606

Test Method: Design qualification testing. The test sample must be subjected to a force applied to the top surface of the test sample equivalent to the total weight of identical packages which might be stacked on it during transport; where the contents of the test sample are non-hazardous liquids with specific gravities different from that of the liquid to be transported, the force must be calculated based on the specific gravity that will be marked on the packaging. The minimum height of the stack, including the test sample, must be 3.0 m (10 feet). The duration of the test must be 24 hours. Each test sample was subjected to conditioning for 24 hours @ 23° C and 50% RH prior to the start of the test. The test samples were prepared as they would be for actual shipment. Each individual sample uses a top platen with weights placed on top (This is a free standing stacking test, so stacking stability is not required at the conclusion of the test).

Calculations: See section 4 for stack weight calculations

Cans with Brockway Standard Rings

Package Number	Required Weight	Actual Weight (Rounded up from the Required Weight)	Duration of Test	Result
1f	182.28 lbs.	202.6 lbs.	24 Hours	Pass
1g	182.28 lbs.	202.6 lbs.	24 Hours	Pass
1h	182.28 lbs.	202.6 lbs.	24 Hours	Pass

Cans with Norman International Rings

Package Number	Required Weight	Actual Weight (Rounded up from the Required Weight)	Duration of Test	Result
2f	182.28 lbs.	202.6 lbs.	24 Hours	Pass
2g	182.28 lbs.	202.6 lbs.	24 Hours	Pass
2h	182.28 lbs.	202.6 lbs.	24 Hours	Pass

Section 3: TEST DESCRIPTION AND RESULTS - (continued)

Stacking Test: 49CFR § 178.606

Pass/Fail Criteria: For each Package Sample tested: The packages must remain standing and 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. After the stacking testing was complete, the samples were place horizontal for a period of 15 minutes to check for any leaks, spillage or loss of contents.

Cans with Brockway Standard Rings

Package Number	Condition of Package at the conclusion of the test
1f	No sidewall buckling, No visible damage, No leakage detected.
1g	No sidewall buckling, No visible damage, No leakage detected.
1h	No sidewall buckling, No visible damage, No leakage detected.

Cans with Norman International Rings

Package Number	Condition of Package at the conclusion of the test
2f	No sidewall buckling, No visible damage, No leakage detected.
2g	No sidewall buckling, No visible damage, No leakage detected.
2h	No sidewall buckling, No visible damage, No leakage detected.

Section 3: TEST DESCRIPTION AND RESULTS - (continued)

Vibration Standard: 49CFR § 178.608

Test Method: ASTM 999-08. Each packaging must be capable of withstanding, without rupture or leakage, the vibration test procedure outlined in this section. Three sample packagings, selected at random, must be filled and closed as for shipment. The three samples must be placed on a vibrating platform that has a vertical or rotary double-amplitude (peak-to-peak displacement) of one inch. The packages should be constrained horizontally to prevent them from falling off the platform, but must be left free to move vertically, bounce and rotate. The test must be performed for one hour at a frequency that causes the package to be raised from the vibrating platform to such a degree that a piece of material of approximately 1.6 mm (0.063 inch) thickness can be passed between the bottom of any package and the platform. In this case a 10" x 2" x .063" steel shim was used.

Cans with Brockway Standard Rings

Package Number	Speed (RPM)	Speed (Hz)	Duration (Minutes)
1i	229	3.817	60
1j	229	3.817	60
1k	229	3.817	60

Cans with Norman International Rings

Package Number	Speed (RPM)	Speed (Hz)	Duration (Minutes)
2i	229	3.817	60
2j	229	3.817	60
2k	229	3.817	60

Section 3: TEST DESCRIPTION AND RESULTS - (continued)

Vibration Standard: 49CFR § 178.608

Pass/Fail Criteria: For each Package Sample tested: The packages must remain standing for the duration of the test. 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 which could adversely affect transportation safety or any distortion liable to reduce packaging strength. After the vibration testing was complete, the samples were place horizontal for a period of 15 minutes to check for any leaks, spillage or loss of contents.

Cans with Brockway Standard Rings

Package Number	Condition of the packages at the conclusion of the test.
1i	Slight scuffing on bottom, No visible damage, and No leakage detected.
1j	Slight scuffing on bottom, No visible damage, and No leakage detected.
1k	Slight scuffing on bottom, No visible damage, and No leakage detected.

Cans with Norman International Rings

Package Number	Condition of the packages at the conclusion of the test.
2i	Slight scuffing on bottom, No visible damage, and No leakage detected.
2j	Slight scuffing on bottom, No visible damage, and No leakage detected.
2k	Slight scuffing on bottom, No visible damage, and No leakage detected.

Section 3: TEST DESCRIPTION AND RESULTS - (continued)

Water Absorption Test: 49CFR § 178.516 (b) (1)

Test Method: ISO Standard 535. The water resistance of the outer surface must be such that the increase in mass, as determined in a test carried out over a period of 30 minutes by the Cobb method of determining water absorption, is not greater than 155 g/m² (0.0316 pounds per square foot).

Conditioning: Each test sample was subjected to conditioning for 24 hours @ 23° C and 50% RH prior to the start of the test.

Test Contents: 100ml of distilled water is used for each sample.

Sample	Weights in grams		Water Absorbed	Result
Number	Initial weight	Final weight	(g/m²)	
1	17.24	18.33	109	Pass
2	17.29	18.39	110	Pass
3	17.3	18.43	113	Pass
4	17.25	18.37	112	Pass
5	17.22	18.32	110	Pass
6	17.31	18.38	107	Pass
7	17.26	18.33	107	Pass
8	17.2	18.29	109	Pass
9	17.2	18.3	110	Pass
10	17.28	18.39	111	Pass

Pass/Fail Criteria: For each test sample, the increase in mass does not exceed 155 g/m².

Section 4: Mathematical Calculations (B-way, Ring Option #1)

Overflow Volume Calculation:					
The overflow volume of each inner packaging is calculated from the following data:					
	Weight of inner packaging filled with solution	2.3785	lbs.	1.079	kg.
	Weight of each empty inner packaging	0.3036	lbs.	0.138	kg.
	1.0 Specific Gravity (weight of water)	8.3500	lbs./gallon	3.787	kg.
	Weight of solution to fill inner packaging	2.0750	lbs.	0.941	kg.
	Overflow volume based on water weight	0.2536	gallons	0.960	liters
Minimum Fill Limits:					
The minimum volume of each inner packaging is calculated from the following data:					
	Overflow volume	0.2536	gallons	0.960	liters
	Minimum Fill Limit (98% Full)	0.2485	gallons	0.941	liters
And the minimum weight of each inner packaging is calculated from the following data:					
	Weight of each empty inner packaging	0.3036	lbs.	0.138	kg.
	Minimum Fill Limit	0.2485	gallons	0.941	liters
	Specific gravity of water	8.3500	lbs./gallon	3.787	kg.
	Minimum weight of each inner packaging	2.3785	lbs.	1.079	kg.
Drop Height Calculation:					
This calculation is only used when substituting actual product for water and the specific gravity exceeds 1.2. Use the factors from §178.603(e)(2)(ii)to calculate the drop height.					
	Maximum specific gravity of product	2.53			
	Packing Group	II			
	Factor based on Packing Group	1			
	Drop Height in Meters	2.6			
	Drop Height in Inches	102.36			
Maximum Gross Weight Calculations: for Liquids					
The maximum gross weight for the package is calculated using the following data:					
	Tare weight of complete package	1.155	lbs.		
	Weight of package as tested	5.306	lbs.		
	Number of inner packagings	2			
	Overflow volume	0.2536	gal.		
	Maximum product specific gravity	2.53			
	Test media specific gravity	1			
	Maximum permissable gross weight	11.7	lbs.		
	Indicated volume of each inner packagings	0.25	gal.		

Section 4: Mathematical Calculations (B-way, Ring Option #1)

Stack Weight Calculations:					
The stacking weight for the package is calculated using the following data:					
	Height of Outer Packaging	7.125	inches	0.18	meters
	3 meter stack height	118.11	inches	3.00	meters
	Number of containers to reach 3m	16.58	boxes		
	Containers -1 (test packaging)	15.58	boxes		
	Maximum permissable gross weight	11.70	lbs.	5.31	kg.
	Calculated stack weight (minimum)	182.28	lbs.	82.67	kg.
	Actual stack weight (rounded up)	202.60	lbs.	91.88	kg.

Marked Weight to Accommodate Actual Product					
	Weight of Product	10.562	lbs.	4.79	kg.
	Weight of Outer Packaging	0.548	lbs.	0.25	kg.
	Weight of Inner Packaging	0.607	lbs.	0.28	kg.
	Marked Weight rounded down	11.7	lbs.	5.31	kg.

Section 4: Mathematical Calculations (Norman, Ring Option #2)

Overflow Volume Calculation:					
The overflow volume of each inner packaging is calculated from the following data:					
	Weight of inner packaging filled with solution	2.3739	lbs.	1.077	kg.
	Weight of each empty inner packaging	0.2989	lbs.	0.136	kg.
	1.0 Specific Gravity (weight of water)	8.3500	lbs./gallon	3.787	kg.
	Weight of solution to fill inner packaging	2.0750	lbs.	0.941	kg.
	Overflow volume based on water weight	0.2536	gallons	0.960	liters
Minimum Fill Limits:					
The minimum volume of each inner packaging is calculated from the following data:					
	Overflow volume	0.2536	gallons	0.960	liters
	Minimum Fill Limit (98% Full)	0.2485	gallons	0.941	liters
And the minimum weight of each inner packaging is calculated from the following data:					
	Weight of each empty inner packaging	0.2989	lbs.	0.136	kg.
	Minimum Fill Limit	0.2485	gallons	0.941	liters
	Specific gravity of water	8.3500	lbs./gallon	3.787	kg.
	Minimum weight of each inner packaging	2.3739	lbs.	1.077	kg.
Drop Height Calculation:					
This calculation is only used when substituting actual product for water and the specific gravity exceeds 1.2. Use the factors from §178.603(e)(2)(ii)to calculate the drop height.					
	Maximum specific gravity of product	2.53			
	Packing Group	II			
	Factor based on Packing Group	1			
	Drop Height in Meters	2.6			
	Drop Height in Inches	102.36			
Maximum Gross Weight Calculations: for Liquids					
The maximum gross weight for the package is calculated using the following data:					
	Tare weight of complete package	1.146	lbs.		
	Weight of package as tested	5.297	lbs.		
	Number of inner packagings	2			
	Overflow volume	0.2536	gal.		
	Maximum product specific gravity	2.53			
	Test media specific gravity	1			
	Maximum permissable gross weight	11.7	lbs.		
	Indicated volume of each inner packagings	0.25	gal.		

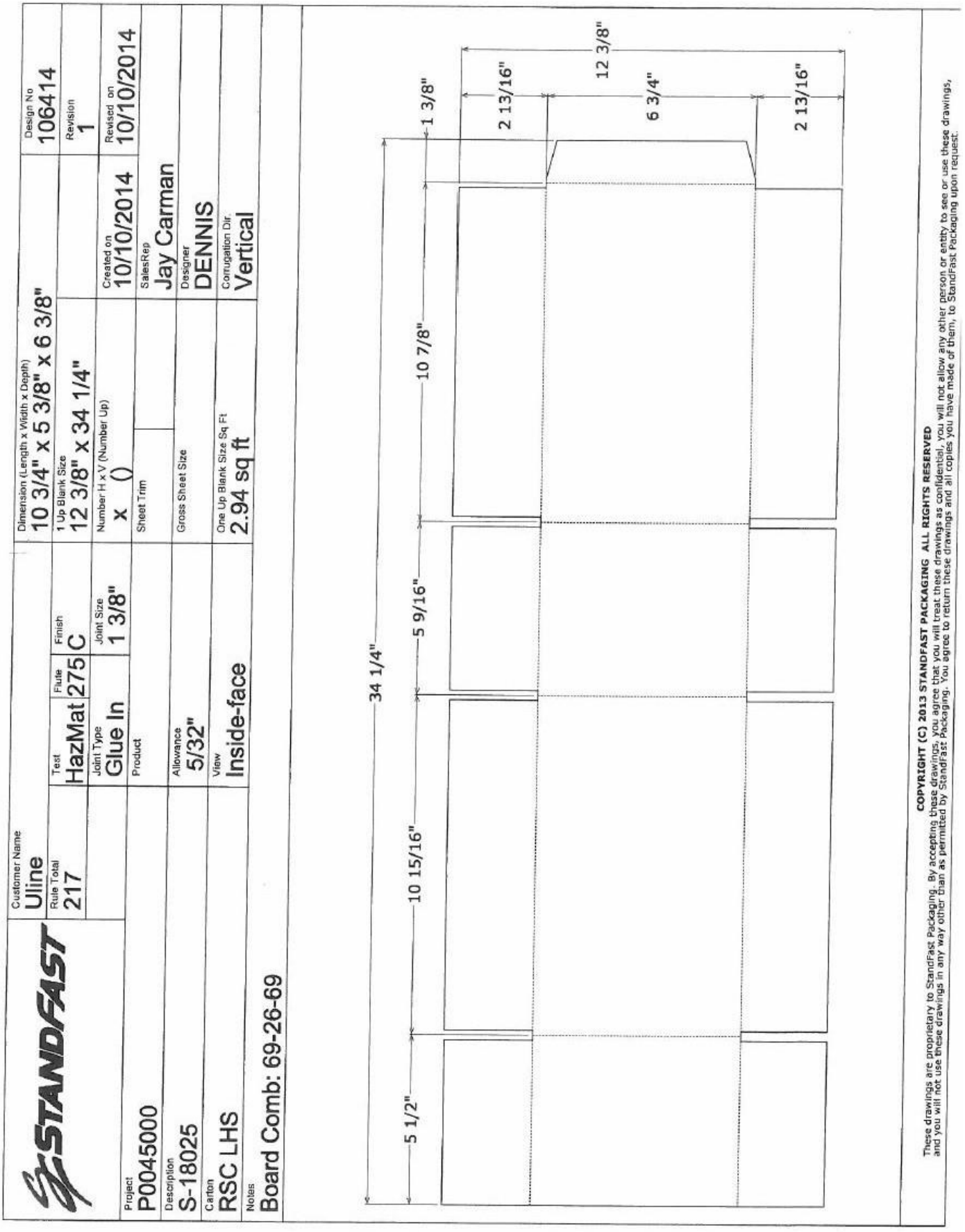
Section 4: Mathematical Calculations (Norman, Ring Option #2)

Stack Weight Calculations:					
The stacking weight for the package is calculated using the following data:					
	Height of Outer Packaging	7.125	inches	0.18	meters
	3 meter stack height	118.11	inches	3.00	meters
	Number of containers to reach 3m	16.58	boxes		
	Containers -1 (test packaging)	15.58	boxes		
	Maximum permissable gross weight	11.70	lbs.	5.31	kg.
	Calculated stack weight (minimum)	182.28	lbs.	82.67	kg.
	Actual stack weight (rounded up)	202.60	lbs.	91.88	kg.

Marked Weight to Accommodate Actual Product					
	Weight of Product	10.562	lbs.	4.79	kg.
	Weight of Outer Packaging	0.548	lbs.	0.25	kg.
	Weight of Inner Packaging	0.597	lbs.	0.27	kg.
	Marked Weight rounded down	11.7	lbs.	5.31	kg.

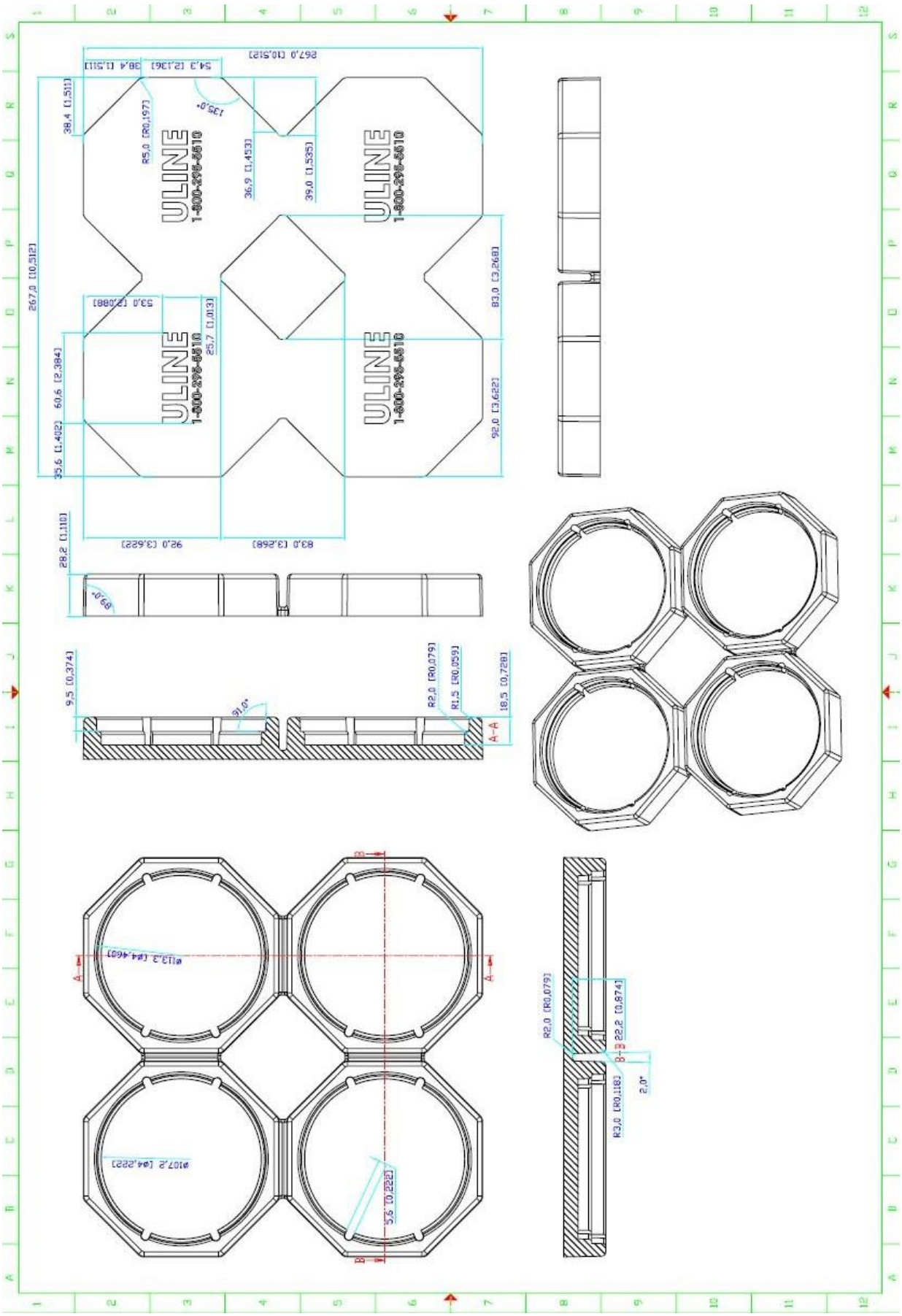
Section 5: Design Drawings of Packaging Components

5.1 Outer Packaging (Fiberboard Box)



Section 5: Design Drawings of Packaging Components

5.2 Outer Packaging (Foam Inserts)

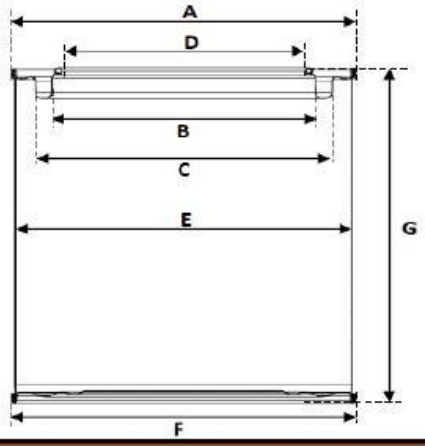


5.3 Inner Packaging (Can)

UNICAN	PACKAGING COMPONENT SPECIFICATION	REF. SPECIFICATION:	ISSUE DATE:
		9520E 751 02 414 01	2014-05-19
		PAGE:	REV. DATE:
		1/1	2015-01-26

1/4 GALLON		STEEL GAUGE: 65 / 75 / 85 ETP STEEL

PRODUCT IMAGE



Beaded end

DIMENTIONS TABLE

	Inches		mm	
FEATURE	NOMINAL	RANGE	NOMINAL	RANGE
A) UPPER SEAM Ø	4.245	0.010	107.82	0.25
B) EXT. CHANNEL Ø	3.745	0.010	95.12	0.25
C) INT. CHANNEL Ø	3.390	0.010	86.11	0.25
D) INT. RING Ø	3.157	0.010	80.19	0.25
E) INTERNAL Ø	4.139	0.010	105.13	0.25
F) LOWER SEAM Ø	4.234	0.010	107.54	0.25
G) TOTAL HEIGHT	4.855	0.020	123.32	0.51
BODY THICKNESS	0.0072	0.0007	0.18	0.018
END RHICKNESS	0.0083	0.0008	0.21	0.021
RING THICKNESS	0.0094	0.0009	0.24	0.024

Product code	Lining	Gel

ELABORATE:	REVIEWED:	APPROVED:	CUSTOMER:
ARTURO FERNANDEZ	PLANT MANAGEMENT	TECHNICAL DIRECTOR	

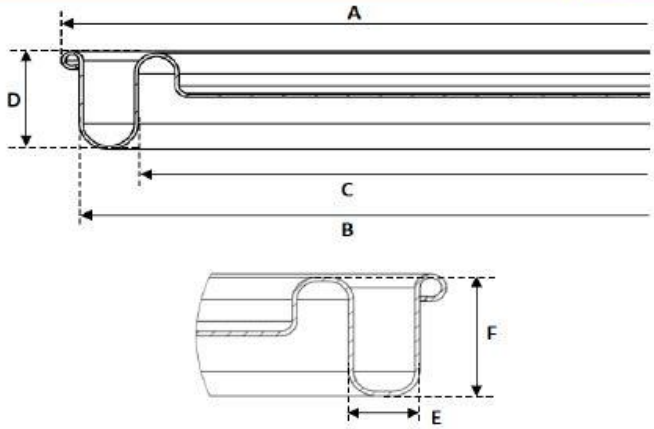
1000F 423 3101, Rev. 03

5.4 Inner Packaging (Lid)

UNICAN	PACKAGING COMPONENT SPECIFICATION	REF. SPECIFICATION: 9520E 751 05 404	ISSUE DATE: 2014-06-06
		PAGE: 1/1	REV. DATE: 2015-01-26

1/4 GALLON		STEEL GAUGE: 85 ETP STEEL

PRODUCT IMAGE



DIMENTIONS TABLE

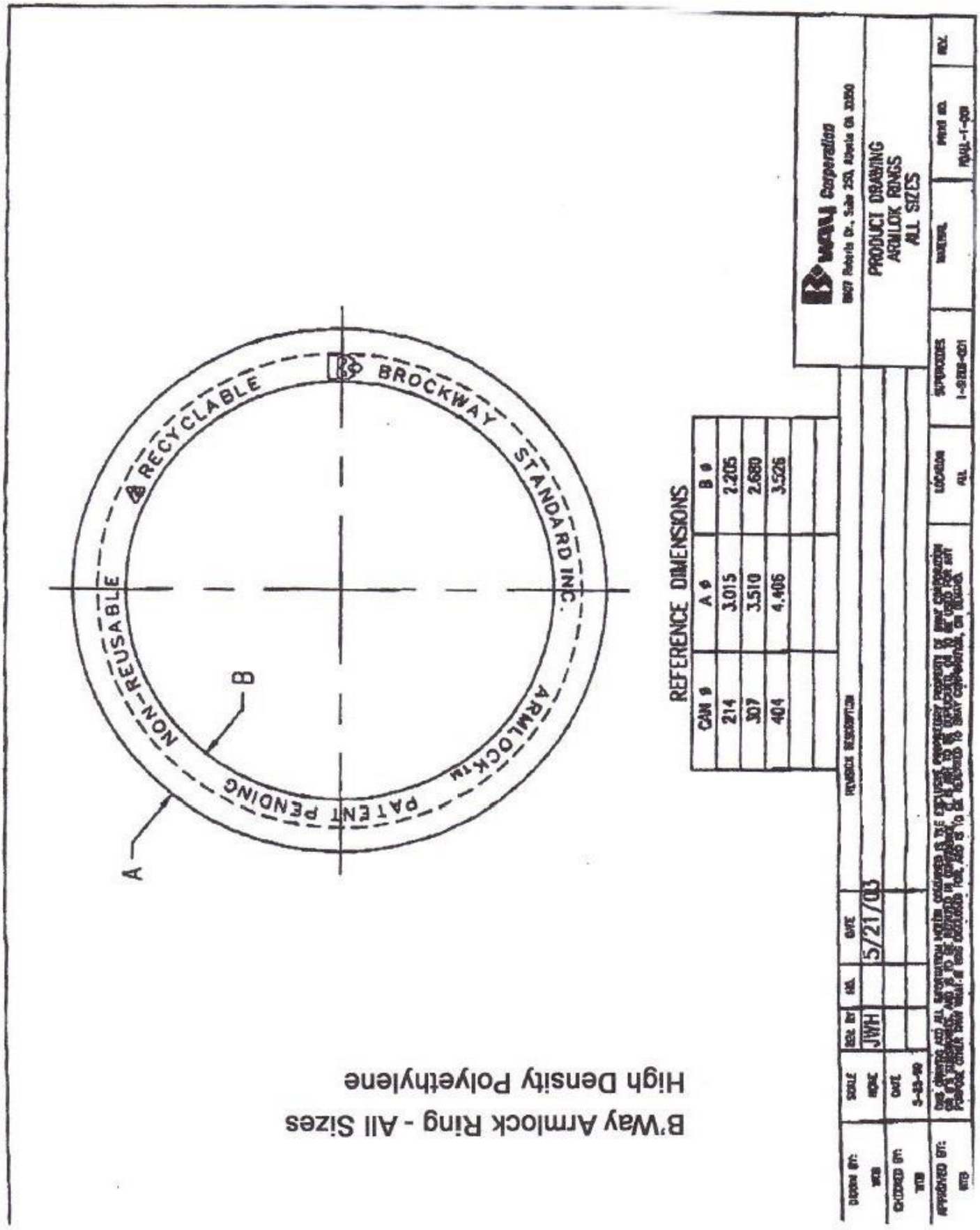
	Inches		mm	
FEATURE	NOMINAL	RANGE	NOMINAL	RANGE
A) EXTERNAL Ø	3.880	0.020	98.55	0.51
B) INFERIOR Ø	3.755	0.020	95.38	0.51
C) INTERNAL Ø	3.389	0.020	86.08	0.51
D) PLUG HEIGHT	0.324	0.015	8.23	0.38
E) CHANNEL LENGHT	0.183	0.020	4.65	0.51
F) CURL'S HEIGHT	0.304	0.020	7.72	0.51
PLUG THICKNESS	0.0094	0.001	0.24	0.024

Product code	Lining	Gel

ELABORATE:	REVIEWED:	APPROVED:	CUSTOMER:
ARTURO FERNANDEZ	XOLOTL ESPINOZA	ALBERTO ALVAREZ	

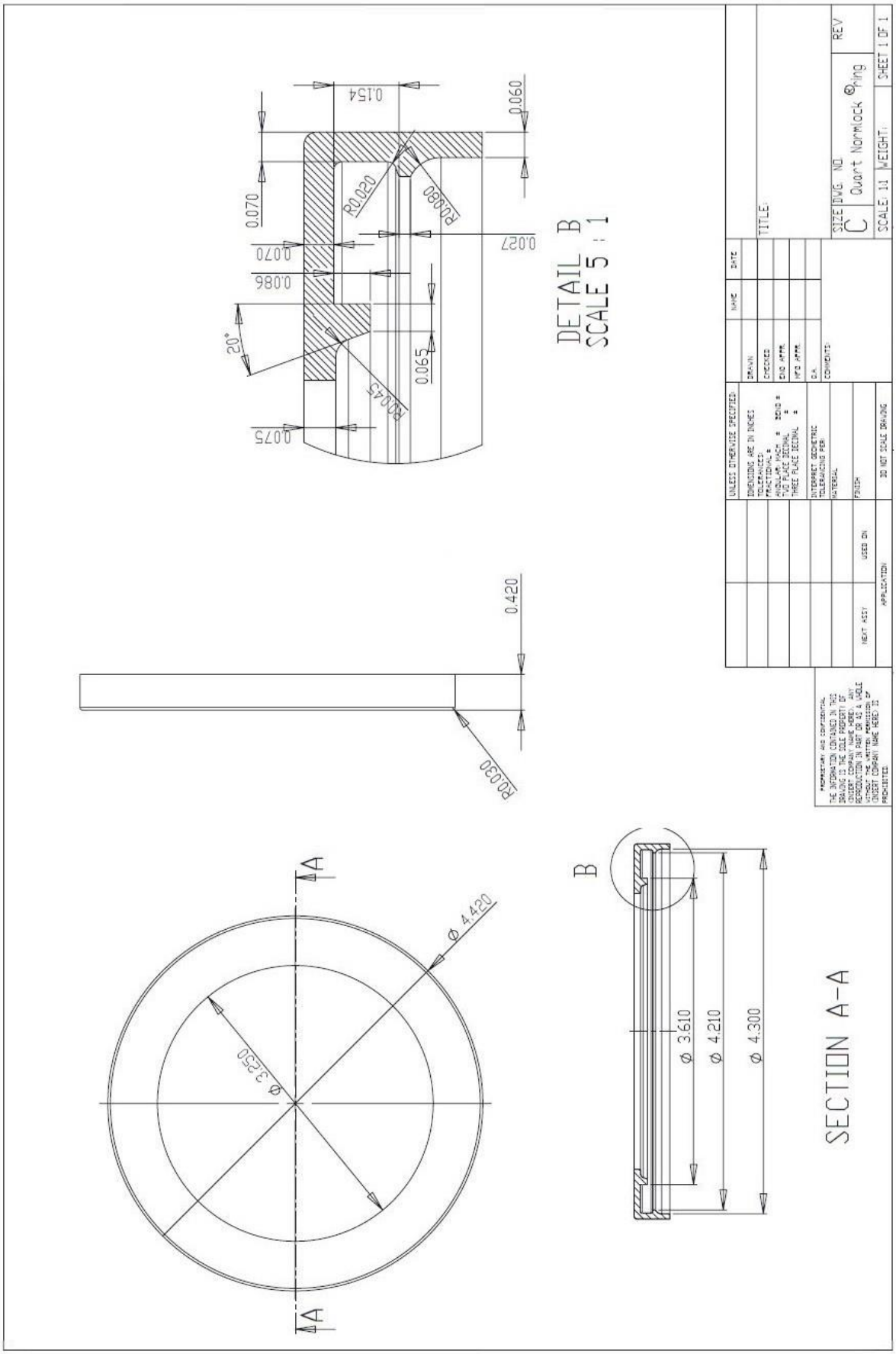
1000F 423 3101, Rev. 03

5.5 Inner Packaging (Locking Ring Option #1)



Section 5: Design Drawings of Packaging Components

5.6 Inner Packaging (Locking Ring Option #2)



5.7 Outer Packaging (Box Tape)

ULINE® SHIPPING SUPPLY SPECIALISTS 1-800-958-5463

2" x 220 yards Clear 2 Mil Big Daddy Industrial Tape

MODEL NO.	COLOR	MIL	SIZE
S-472	Clear	2.0	2" x 220 yds.

DURABLE: Industrial Tape stands up to heat, humidity and cold. Application range 0°F to 140°F.

APPEARANCE: Crystal clear - Won't yellow. Makes packages look their best.

- Big Daddy - Seals four times as much as 55-yd. rolls. Reduces downtime caused by changing rolls.
- Solvent acrylic adhesive.

DIMENSIONS:
* Core: 3"
* Roll diameter: 5 5/8"

COMPATIBILITY:
* Can be used with H-150, H-157, or H-958 dispensers.
* Not recommended for use with the H-464.

MATERIAL:
* Backing: Polypropylene film
* Latex free

SHELF LIFE: 1 year

TEMPERATURE RANGE:
* Performance: -60 to 140 F

Equipment and Calibration Data

Instrument	Manufacturer	Model # / Serial #	Calibration Due Date
Tape Measure	Starrett	TX12-12-N / 15184509	04-30-2017
12” Caliper	Fowler	54-100-112-2 / 130864040	11-03-2017
Micrometer	Fowler	52-229-201 / 140861329	11-03-2017
Micrometer	Fowler	52-224-001 / 121005537	11-03-2017
Gram Scale	Tree	HRB Series / HR08110432	06-30-2017
Floor Scale	TCS	TC-TC02 / 35042	06-30-2017
Floor Scale	Prime Scales Inc.	PS-1N108 / 83584514010006	08-08-2016
Conditioning Chamber	Fisher Scientific	13-986-274f / 008N0005	07-30-2016
Conditioning Chamber	Fisher Scientific	13-986-274f / 012N0009	07-30-2016
Thermometer	Control Company	4148 / 150283339	04-08-2017
Temp/Humidity Gauge	Lascar	EL-USB-2-LCD / 010082275	04-09-2016
Torque Tester	Owens Illinois	Spring Tester / 25-84	10-17-2016
Torque Wrench	Craftsman	913918 / CP159221	06-19-2017
Pressure Gauge	Noshok	25-500-5 psi / N65342	02-24-2016
Timer	SPER Scientific LTD.	810045C / 066213	01-21-2016
Pressure Gauge	Noshok	25-500-60-psi / N71317	04-08-2017
Cobb Weight	Menge’s Roller Co.	4.27 x 5.49	07-02-2017
Vibration Table	LAB	400V / G241008	07-21-2016
Drop Tester	LAB	AD-100 / 4410914	07-21-2016