UNITED NATIONS / DOT
PERFORMANCE CERTIFICATION

4G DESIGN QUALIFICATION

6 x 2.6 Liter Plastic Bottles Packaging
(Tested with 38 and 45mm closures)

TEST REPORT #: 12-7065

u
n

4G / Y30.6 / S / **
USA / +CC7198

** Insert year the packaging is manufactured

TESTING PERFORMED FOR:

PUREPAK TECHNOLOGY CORPORATION
324 South Braken Lane Suite 3
Chandler, AZ 85224

ATTN: Mike Dodd

TESTING PERFORMED BY:

TEN-E Packaging Services, Inc.
1666 County Road 74
Newport, MN 55055
Phone: (651) 459-0671
Fax: (651) 459-1430

TEN-E Packaging Services, Inc.
326 N. Corona Avenue
Ontario, CA 91764
Phone: (909) 937-1260
Fax: (909) 937-1262

April 27, 2012

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NOTES AND COMMENTS

PurePak Technology may use Certification Number +CC7198 for a 4 x 2.6 Liter Plastic Bottle Variable Packaging & a 1 x 2.6 Liter Plastic Bottle Variable Packaging provided they meet 49 CFR; 178.601 (g)(1) Selective Testing Variation 1 and 49 CFR; 178.601 (g)(4) Selective Testing Variation 4.

6 x 2.6 Liter Plastic Bottle Variables Tested:
Variable #1: 6 x 2.6 Liter Plastic Bottle with 45mm Opening -Taped Top and Bottom Flaps
Variable #2: 6 x 2.6 Liter Plastic Bottle with 45mm Opening - Taped Top and Hot Melt Glued Bottom Flaps
Variable #3: 6 x 2.6 Liter Plastic Bottle with 38mm-439 Opening - Taped Top and Bottom Flaps
Variable #4: 6 x 2.6 Liter Plastic Bottle with 38mm-439 Opening - Taped Top and Hot Melt Glued Bottom Flaps

SECTION I: CERTIFICATION

Design Qualification of the PurePak Technology Corporation
6 x 2.6 Liter Plastic Bottle Variables Packaging

TEN-E PACKAGING SERVICES, INC. certifies that the **PurePak Technology Corporation** packaging referenced above has passed the standards of the DEPARTMENT OF TRANSPORTATION'S TITLE 49 CFR; Performance Oriented Packaging Standards, Section 178. This package is also certified under IMDG, ICAO/IATA Regulations and the UN Recommendations on the Transport of Dangerous Goods. It is the responsibility of the end user to determine authorization for use under these regulations. The use of other packaging methods or components other than those documented in this report may render this certification invalid.

SUMMARY OF PERFORMANCE TESTS

UN /DOT TEST	CFR REFERENCE	TEST LEVEL	TEST CONTENTS	TEST COMPLETED	TEST RESULTS
Drop	178.603	1.9m	Methanol / Water	April 27, 2012	PASS
Stacking #1 & #3	178.606	272.1 Kg – 24 Hrs.	Empty	April 25, 2012	PASS
Stacking #2 & #4	178.606	272.1 Kg – 24 Hrs.	Empty	April 26, 2012	PASS
Pressure	173.27	300kPa –30 Min.	Water	April 27, 2012	PASS
Vibration	178.608	4.0 Hz – 1 Hr.	Water	April 27, 2012	PASS
Cobb	178.516	30 minutes	---	April 20, 2012	PASS

TEST REPORT NUMBER:	**12-7065**
UN MARKING: (CFR 49 - 178.503)	(un) 4G / Y30.6 / S / ** USA / +CC7198
PACKAGING IDENTIFICATION CODE:	4G - Fiberboard Box (178.516)
PERFORMANCE STANDARD:	Y (Packaging meets Packing Group II and III tests)
AUTHORIZED GROSS MASS:	30.6 Kg (67.4 Lbs.)
"S" DESIGNATION:	Denotes Inner Packagings
YEAR OF MANUFACTURE:	**Insert year the packaging is manufactured
STATE AUTHORIZING THE MARK:	USA
PACKAGING CERTIFICATION AGENCY:	(+CC) TEN-E Packaging Services, Inc. (Ontario, CA)
THIRD PARTY PACKAGE IDENTIFICATION:	+CC7198
PERIODIC RETEST DATE:	April 27, 2014

ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY THAT THE PACKAGING TESTED IS MERCHANTABLE OR FIT FOR A PARTICULAR PURPOSE, ARE DISCLAIMED. In no event shall TEN-E Packaging Services, Inc. liability exceed the total amount paid by **PurePak Technology Corporation** for services rendered. In the event of future changes to the above referenced test standard, it is the responsibility of **PurePak Technology Corporation** to determine whether additional testing or updating of past testing is necessary to verify that the packaging we have tested remains in compliance with those standards.

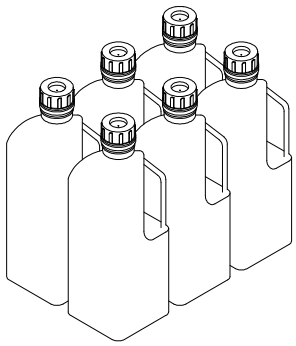
MANUFACTURER:
PurePak Technology Corporation
324 South Braken Lane Suite 3
Chandler, AZ 85224

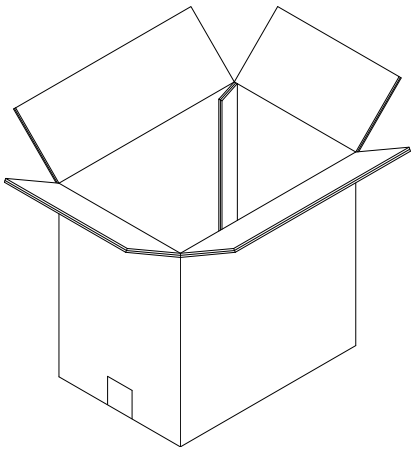
Matthew Anderson
Packaging Engineer
TEN-E Packaging Services, Inc.
326 North Corona Avenue
Ontario, CA 91764

SECTIONS II & V: PACKAGING DESCRIPTION / COMPONENT DRAWINGS

6 x 2.6 Liter Plastic Bottle with 45mm Opening (Variable #1)

ASSEMBLY DRAWING





TEST LEVELS

Certification Type:	Design Qualification
Packaging Code Designation:	4G
Packing Group:	II
Specific Gravity:	1.9
Internal Pressure:	300kPa

TEST SAMPLE PREPARATION
(Refer to Section IV)

Overall Packaging Tare Weight:	1,993.0 Grams	
Inner Packaging Fill Capacity (98% Maximum Capacity):		
Methanol/Water	2,439.3 Grams	
Water	2,514.7 Grams	
Package Test Weight:		
Methanol/Water	16.6 Kg	(36.5 Lbs.)
Water	17.0 Kg	(37.4 Lbs.)
Authorized Package Gross Mass:	30.6 Kg	(67.4 Lbs.)

CLOSING METHODS – INNER PACKAGING

Application Torque	25 In-Lbs
Equipment:	Kaps-All Electronic Torque Tester #701

CLOSING METHODS – SHIPPER

Top Flaps:

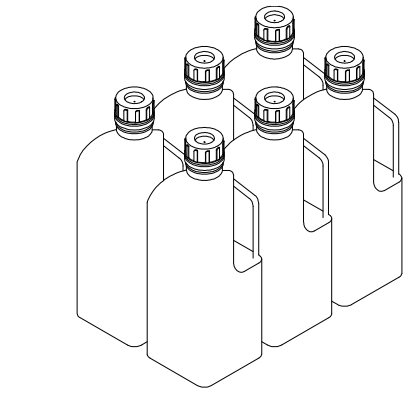
Type:	(3M) Pressure Sensitive Tape; Supplied by PurePak
Width:	48mm (2")
Overlap:	2" Minimum
Tape Pattern:	Center Seam
Inner Flaps:	4-3/4” Width Gap
Outer Flaps:	Meet

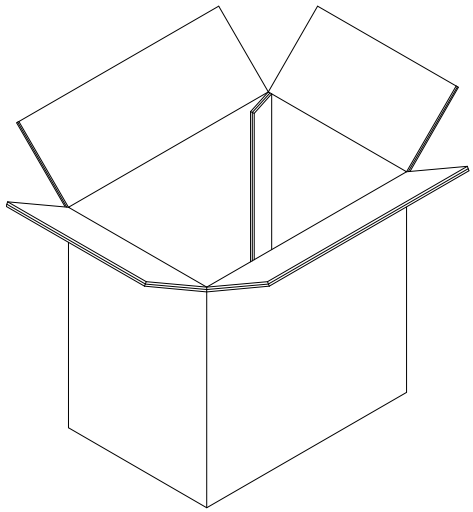
Bottom Flaps:

Type:	(3M) Pressure Sensitive Tape; Supplied by PurePak
Width:	48mm (2")
Overlap:	2" Minimum
Tape Pattern:	Center Seam
Inner Flaps:	4-3/4” Width Gap
Outer Flaps:	Meet

6 x 2.6 Liter Plastic Bottle with 45mm Opening (Vairable #2)

ASSEMBLY DRAWING





TEST LEVELS

Certification Type:	Design Qualification
Packaging Code Designation:	4G
Packing Group:	II
Specific Gravity:	1.9
Internal Pressure:	300kPa

TEST SAMPLE PREPARATION
(Refer to Section IV)

Overall Packaging Tare Weight:	2,004.0 Grams	
Inner Packaging Fill Capacity (98% Maximum Capacity):		
Methanol/Water	2,439.3 Grams	
Water	2,514.7 Grams	
Package Test Weight:		
Methanol/Water	16.6 Kg	(36.5 Lbs.)
Water	17.0 Kg	(37.4 Lbs.)
Authorized Package Gross Mass:	30.6 Kg	(67.4 Lbs.)

CLOSING METHODS – INNER PACKAGING

Application Torque	25 In-Lbs
Equipment:	Kaps-All Electronic Torque Tester #701

CLOSING METHODS – SHIPPER

Top Flaps:

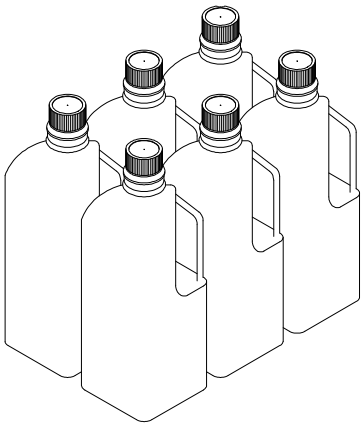
Type:	(3M) Pressure Sensitive Tape; Supplied by PurePak
Width:	48mm (2")
Overlap:	2" Minimum
Tape Pattern:	Center Seam
Inner Flaps:	4-3/4” Width Gap
Outer Flaps:	Meet

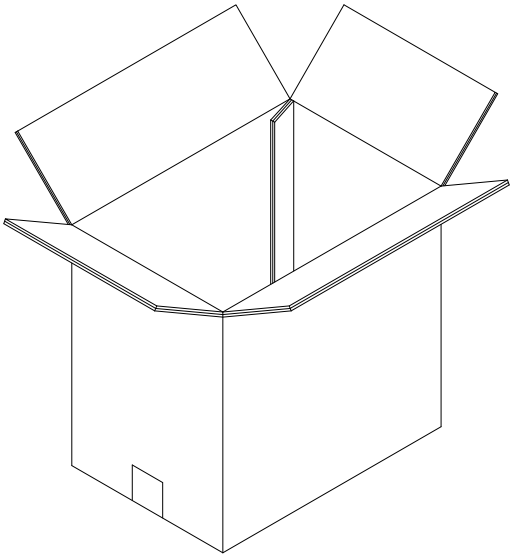
Bottom Flaps:

Type:	Hot Melt Glued; Prepared By PurePak
Inner Flaps:	4-3/4” Width Gap
Outer Flaps:	Meet

6 x 2.6 Liter Plastic Bottle with 38mm-439 Opening (Variable #3)

ASSEMBLY DRAWING





TEST LEVELS

Certification Type:	Design Qualification
Packaging Code Designation:	4G
Packing Group:	II
Specific Gravity:	1.9
Internal Pressure:	300kPa

TEST SAMPLE PREPARATION
(Refer to Section IV)

Overall Packaging Tare Weight:	1,986.0 Grams	
Inner Packaging Fill Capacity (98% Maximum Capacity):		
Methanol/Water	2,631.3 Grams	
Water	2,712.7 Grams	
Package Test Weight:		
Methanol/Water	17.7 Kg	(39.0 Lbs.)
Water	18.2 Kg	(40.1 Lbs.)
Authorized Package Gross Mass:	32.9 Kg	(72.5 Lbs.)

CLOSING METHODS – INNER PACKAGING

Application Torque	50 In-Lbs
Equipment:	Kaps-All Electronic Torque Tester #701

CLOSING METHODS – SHIPPER

Top Flaps:

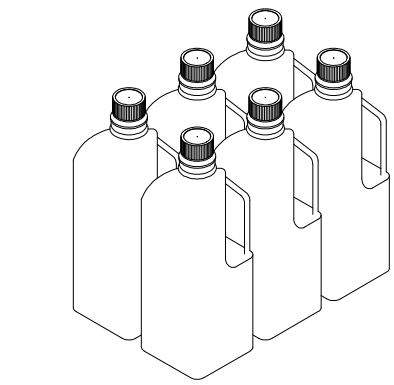
Type:	(3M) Pressure Sensitive Tape; Supplied by PurePak
Width:	48mm (2")
Overlap:	2" Minimum
Tape Pattern:	Center Seam
Inner Flaps:	4-3/4” Width Gap
Outer Flaps:	Meet

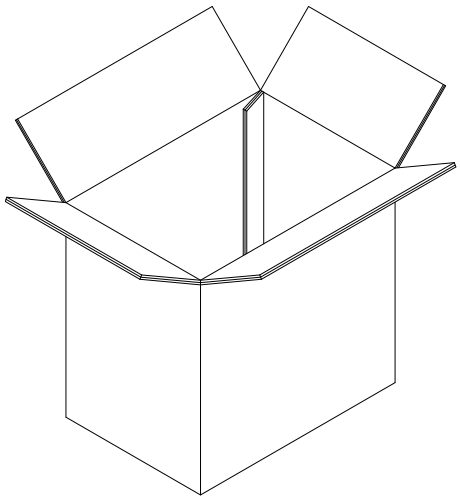
Bottom Flaps:

Type:	(3M) Pressure Sensitive Tape; Supplied by PurePak
Width:	48mm (2")
Overlap:	2" Minimum
Tape Pattern:	Center Seam
Inner Flaps:	4-3/4” Width Gap
Outer Flaps:	Meet

6 x 2.6 Liter Plastic Bottle with 38mm-439 Opening (Variable #4)

ASSEMBLY DRAWING





TEST LEVELS

Certification Type:	Design Qualification
Packaging Code Designation:	4G
Packing Group:	II
Specific Gravity:	1.9
Internal Pressure:	300kPa

TEST SAMPLE PREPARATION
(Refer to Section IV)

Overall Packaging Tare Weight:	1,997.0 Grams	
Inner Packaging Fill Capacity (98% Maximum Capacity):		
Methanol/Water	2,631.3 Grams	
Water	2,712.7 Grams	
Package Test Weight:		
Methanol/Water	17.7 Kg	(39.0 Lbs.)
Water	18.2 Kg	(40.1 Lbs.)
Authorized Package Gross Mass:	32.9 Kg	(72.5 Lbs.)

CLOSING METHODS – INNER PACKAGING

Application Torque	50 In-Lbs
Equipment:	Kaps-All Electronic Torque Tester #701

CLOSING METHODS – SHIPPER

Top Flaps:

Type:	(3M) Pressure Sensitive Tape; Supplied by PurePak
Width:	48mm (2")
Overlap:	2" Minimum
Tape Pattern:	Center Seam
Inner Flaps:	4-3/4” Width Gap
Outer Flaps:	Meet

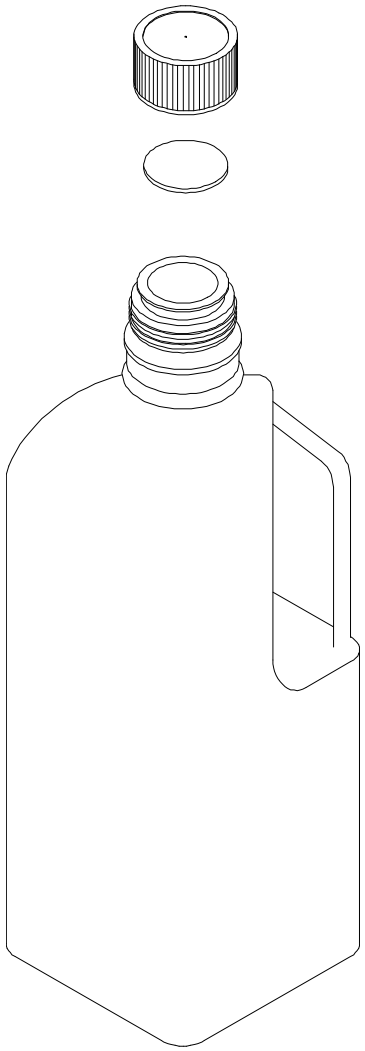
Bottom Flaps:

Type:	Hot Melt Glued; Prepared By PurePak
Inner Flaps:	4-3/4” Width Gap
Outer Flaps:	Meet

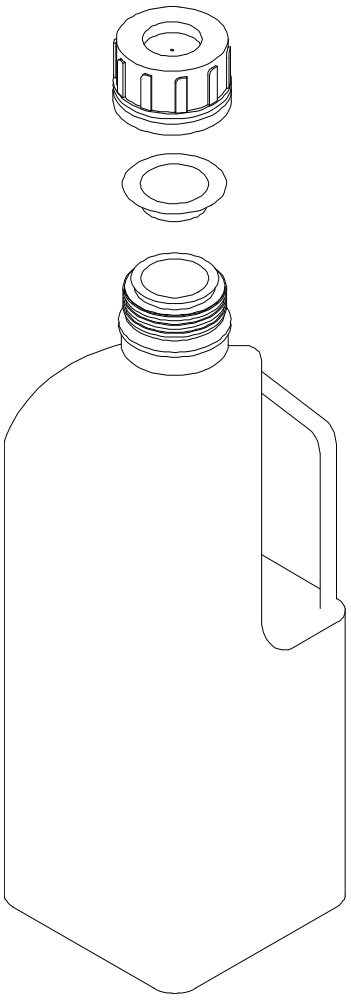
COMPONENT INFORMATION

CLOSURE	
Manufacturer: Rexam Plastic Packaging: Evansville, IN (Dwg. #: QIM-317-4937)	
Description:	38mm Threaded Closure
Quantity:	6
Material:	Polypropylene
Density:	0.900 g/cc
Tare Weight:	10.3 Grams
Overall Dimensions:	
• **Height**	1.016” ± 0.015”
• **Diameter**	1.701” ± 0.015”
Thread:	
• **Type**	38
• **Style**	439
Finish Dimensions:	
• **T**	1.483” ± 0.007”
• **E**	1.389” ± 0.007”
Markings (QC Audit):	35
LINER	
Description:	Polyethylene Foam Liner
Tare Weight:	0.64 Grams
Thickness:	0.054”
Diameter:	1.380”
PLASTIC BOTTLE	
Manufacturer: Heise Industries: East Berlin, CT	
Description:	2.6 Liter Plastic Bottle
Quantity:	6
Material/Pigment:	High Density Polyethylene / Natural (PPQ Resin)
Method of Mfg:	Blow Molded
Density:	0.947 g/cc
Tare Weight:	208 Grams ± 8 Grams
Capacity:	
• **Rated**	2.6 Liter
• **Overflow**	2600mL ± 30mL
Overall Dimensions:	
• **Height**	12.120” ± 0.080”
• **Width**	5.302” ± 0.080”
• **Depth**	5.302” ± 0.080”
Finish Dimensions:	
• **T**	1.461” ± 0.012”
• **E**	1.375”
• **Thread Pitch**	0.1636”
Wall Thickness:	
• **Minimum**	0.040”
Markings (QC Audit):	NONE

Drawing



CLOSURE		Drawing
Manufacturer: George MENSHEN GmbH: Finnentrop, Germany		
Description:	45mm Threaded Closure	
Quantity:	6	
Material:	High Density Polyethylene	
Density:	0.924 g/cc	
Tare Weight:	10.28 Grams	
Overall Dimensions:		
• **Height**	30.3mm	
• **Diameter**	51.3mm	
Thread:		
• **Type**	45mm	
• **Style**	Buttress	
Finish Dimensions:		
• **T**	1.812”	
• **E**	1.675”	
• **Thread Pitch**	4mm	
Markings (QC Audit):	7	
LINER		
Description:	PTFE Liner	
Tare Weight:	0.90 Grams	
Thickness:	0.009”	
Diameter:	1.764”	
PLASTIC BOTTLE		
Manufacturer: Heise Industries: East Berlin, CT		
Description:	2.6 Liter Plastic Bottle	
Quantity:	6	
Material/Pigment:	High Density Polyethylene / Natural (PPQ Resin)	
Method of Mfg:	Blow Molded	
Density:	0.946 g/cc	
Tare Weight:	208 Grams ± 8 Grams	
Capacity:		
• **Rated**	2.6 Liter	
• **Overflow**	2614mL ± 30mL	
Overall Dimensions:		
• **Height**	12.120” ± 0.010”	
• **Width**	5.302” ± 0.080”	
• **Depth**	5.302”	
Finish Dimensions:		
• **T**	1.772” ± 0.010”	
• **E**	1.644” ± 0.010”	
• **Thread Pitch**	4mm (0.1575”	
Wall Thickness:		
• **Minimum**	0.036”	
Markings (QC Audit):	NONE	



SHIPPER		
Manufacturer: International Paper; Los Angeles, CA (Design #: 031029258)		
Description:	Regular Slotted Container	
Material/Flute (Inner to Outer):	Double Wall Mottled White Corrugated Fiberboard; B/C-Flute	
Basis Weight (Outer to Inner) Lbs./MSF:		
• **Specification**	42 / 26 / 42 / 26 / 42	
• **Measured**	41.8 / 26.5 / 38.7 / 26.7 /42.9	
Combined Wt. of Facings:	123.4	
Tare Weight:	677 Grams	
Dimensions		
	Specification Dimensions (Inside)	**Measured Dimensions (Outside)**
• **Length**	13-3/4”	14-1/4”
• **Width**	9”	9-7/8”
• **Height**	12-3/8”	13-5/8”
Board Caliper (Nominal):	0.267”	
Manufacturer’s Joint:	Inside Glued, 1-1/4” Lap	
No Box Manufacturer’s Certification:		
Markings (QC Audit):	NONE	

SECTION III: TEST PROCEDURES AND RESULTS

DROP TESTS — Taped Top & Bottom with 45mm Threaded Closure (Variable #1)

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
TEST CONTENTS:	Methanol/Water Solution (0.970 SG)	• For packaging containing liquid, each packaging does not leak. • There can be no damage to the outer packaging likely to adversely affect safety during transport and there is no leakage of the filling substance from the inner packaging. • Any discharge from a closure is slight and ceases immediately after impact with no further leakage. (§178.603)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	-18°C (0°F), Chamber #201	
TEST CONTENTS TEMP.:	-18.3ºC (-0.94ºF)	
DROP HEIGHT:	1.9 Meters (75”) (Refer to Section IV)	
TEST EQUIPMENT:	L.A.B. Accu Drop 160 #301	

DROP ORIENTATIONS & TEST RESULTS

Sample #1: Flat on Bottom	Sample #2: Flat on Top	Sample #3: Flat on Long Side
		
PASS: No leakage or damage.	**PASS:** No leakage or damage.	**PASS:** No leakage or damage.

Sample #4: Flat on Short Side	Sample #5: Bottom Corner	*Sample #1: Top Corner
		
PASS: No leakage or damage.	**PASS:** No leakage. Slight deformation to shipper on impact.	**PASS:** No leakage. Slight deformation to shipper on impact.

* Flat on Bottom Drop sample was also used for the Top Corner Drop

DROP TESTS	Taped Top & Glued Bottom with 45mm Threaded Closure (Variable #2)

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
TEST CONTENTS:	Methanol/Water Solution (0.970 SG)	• For packaging containing liquid, each packaging does not leak. • There can be no damage to the outer packaging likely to adversely affect safety during transport and there is no leakage of the filling substance from the inner packaging. • Any discharge from a closure is slight and ceases immediately after impact with no further leakage. (§178.603)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	-18°C (0°F), Chamber #201	
TEST CONTENTS TEMP.:	-18.4ºC (-1.12ºF)	
DROP HEIGHT:	1.9 Meters (75") (Refer to Section IV)	
TEST EQUIPMENT:	L.A.B. Accu Drop 160 #301	

DROP ORIENTATIONS & TEST RESULTS		
Sample #9: Flat on Bottom	**Sample #10: Flat on Top**	**Sample #11: Flat on Long Side**
		
PASS: No leakage or damage.	**PASS:** No leakage or damage.	**PASS:** No leakage or damage.
Sample #12: Flat on Short Side	**Sample #13: Bottom Corner**	***Sample #9: Top Corner**
		
PASS: No leakage or damage.	**PASS:** No leakage. Slight deformation to shipper on impact.	**PASS:** No leakage. Slight deformation to shipper on impact.

* Flat on Bottom Drop sample was also used for the Top Corner Drop

DROP TESTS	Taped Top & Bottom with 38-439 Threaded Closure (Variable #3)

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
TEST CONTENTS:	Methanol/Water Solution (0.970 SG)	• For packaging containing liquid, each packaging does not leak. • There can be no damage to the outer packaging likely to adversely affect safety during transport and there is no leakage of the filling substance from the inner packaging. • Any discharge from a closure is slight and ceases immediately after impact with no further leakage. (§178.603)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	-18°C (0°F), Chamber #201	
TEST CONTENTS TEMP.:	-18.4ºC (-1.12ºF)	
DROP HEIGHT:	1.9 Meters (75”) (Refer to Section IV)	
TEST EQUIPMENT:	L.A.B. Accu Drop 160 #301	

DROP ORIENTATIONS & TEST RESULTS		
Sample #17: Flat on Bottom	**Sample #18: Flat on Top**	**Sample #19: Flat on Long Side**
		
PASS: No leakage or damage.	**PASS:** No leakage or damage.	**PASS:** No leakage or damage.
Sample #20: Flat on Short Side	**Sample #21: Bottom Corner**	***Sample #17: Top Corner**
		
PASS: No leakage or damage.	**PASS:** No leakage. Slight deformation to shipper on impact.	**PASS:** No leakage. Slight deformation to shipper on impact.

* Flat on Bottom Drop sample was also used for the Top Corner Drop

DROP TESTS	Taped Top & Glued Bottom with 38-439 Threaded Closure (Variable #4)

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
TEST CONTENTS:	Methanol/Water Solution (0.970 SG)	• For packaging containing liquid, each packaging does not leak. • There can be no damage to the outer packaging likely to adversely affect safety during transport and there is no leakage of the filling substance from the inner packaging. • Any discharge from a closure is slight and ceases immediately after impact with no further leakage. (§178.603)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	-18°C (0°F), Chamber #201	
TEST CONTENTS TEMP.:	-18.4ºC (-1.12ºF)	
DROP HEIGHT:	1.9 Meters (75") (Refer to Section IV)	
TEST EQUIPMENT:	L.A.B. Accu Drop 160 #301	

DROP ORIENTATIONS & TEST RESULTS

Sample #25: Flat on Bottom	Sample #26: Flat on Top	Sample #27: Flat on Long Side
		
PASS: No leakage or damage.	**PASS:** No leakage or damage.	**PASS:** No leakage or damage.

Sample #28: Flat on Short Side	Sample #29: Bottom Corner	*Sample #25: Top Corner
		
PASS: No leakage or damage.	**PASS:** No leakage. Slight deformation to shipper on impact.	**PASS:** No leakage. Slight deformation to shipper on impact.

* Flat on Bottom Drop sample was also used for the Top Corner Drop

STACKING TESTS	Taped Top & Bottom (Variables #1 & #3)

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
TEST CONTENTS:	Empty	• There must be no leakage of the filling substance from the inner receptacle, or inner packaging. • There can be no deterioration that could adversely affect transport safety or any distortion liable to reduce the package's strength, cause instability in stacks of packages, or cause damage to inner packagings that is likely to reduce safety in transport. (§178.606)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	73°F / 50% RH, Chamber #202	
TEST LOAD APPLIED:	272.1 Kg (600.0 Lbs.) (Refer to Section IV)	
TEST DURATION:	24 Hours	
TEST EQUIPMENT:	Dead Load Weights	

STACKING TEST SET-UP AND RESULTS

Sample #	Maximum Deflection After 24 Hours	Results
6	1/8"	PASS
7	0"	PASS
8	0"	PASS
Stacking Stability:	Not conducted; required only for guided load tests.	

STACKING TESTS	Taped Top & Glued Bottom (Variable #2 & #4)

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
TEST CONTENTS:	Empty	• There must be no leakage of the filling substance from the inner receptacle, or inner packaging. • There can be no deterioration that could adversely affect transport safety or any distortion liable to reduce the package's strength, cause instability in stacks of packages, or cause damage to inner packagings that is likely to reduce safety in transport. (§178.606)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	73°F / 50% RH, Chamber #202	
TEST LOAD APPLIED:	272.1 Kg (600.0 Lbs.) (Refer to Section IV)	
TEST DURATION:	24 Hours	
TEST EQUIPMENT:	Dead Load Weights	

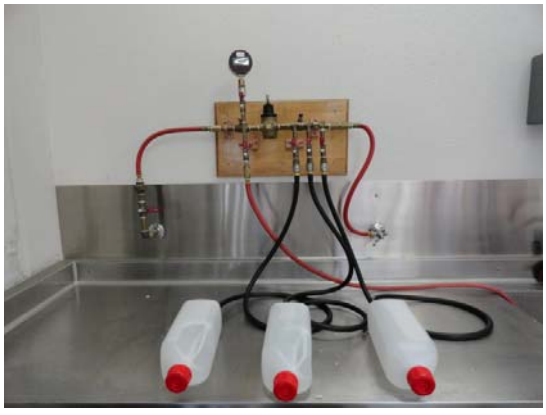
STACKING TEST SET-UP AND RESULTS

Sample #	Maximum Deflection After 24 Hours	Results
22	0"	PASS
23	0"	PASS
24	1/8"	PASS
Stacking Stability:	Not conducted; required only for guided load tests.	

PRESSURE DIFFERENTIAL TEST	45mm Threaded Closure

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
TEST CONTENTS:	Water	• Packaging for which retention of liquid is a basic function must be capable of withstanding the pressure requirements without leakage. (§173.27)
FILL CAPACITY:	Maximum Capacity	
CLOSURE APPLICATION:	Refer to Section II	
CONDITIONING:	Ambient	
TEST PRESSURE:	300kPa	
TEST DURATION:	30 Minutes	
AREA OF PRESSURIZATION:	Through the Bottom	
TEST EQUIPMENT:	Regulated Water Source Gauge #605	

HYDROSTATIC PRESSURE TEST SET-UP & RESULTS

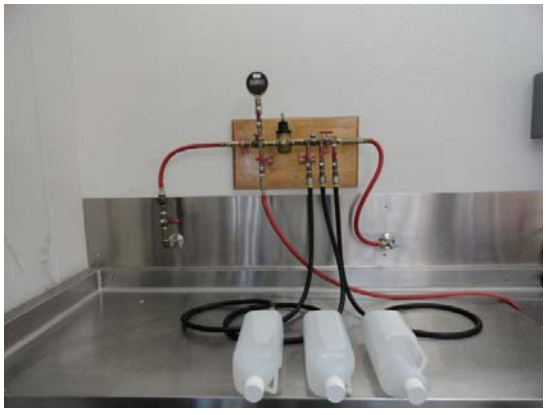


Sample #	Results	Comments / Observations
1	**PASS**	All three samples maintained the 300kPa test pressure for 30 minutes without leakage.
2	**PASS**	
3	**PASS**	

PRESSURE DIFFERENTIAL TEST	38-439 Threaded Closure

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
TEST CONTENTS:	Water	• Packaging for which retention of liquid is a basic function must be capable of withstanding the pressure requirements without leakage. (§173.27)
FILL CAPACITY:	Maximum Capacity	
CLOSURE APPLICATION:	Refer to Section II	
CONDITIONING:	Ambient	
TEST PRESSURE:	300kPa	
TEST DURATION:	30 Minutes	
AREA OF PRESSURIZATION:	Through the Bottom	
TEST EQUIPMENT:	Regulated Water Source Gauge #605	

HYDROSTATIC PRESSURE TEST SET-UP & RESULTS



Sample #	Results	Comments / Observations
1	PASS	All three samples maintained the 300kPa test pressure for 30 minutes without leakage.
2	PASS	
3	PASS	

REPETITIVE SHOCK VIBRATION TESTS	Taped Top & Bottom w/ 45mm Threaded Closure (V1)

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
TEST CONTENTS:	Water	Immediately following the period of vibration, each package must be removed from the platform, turned on its side and observed for any evidence of leakage. • 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. (§178.608)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	73°F / 50% RH, Chamber #202	
TABLE DISPLACEMENT:	1”	
TEST FREQUENCY:	4.0 Hz	
TEST DURATION:	1 Hour	
TEST EQUIPMENT:	Vertical motion using L.A.B. Palletizer Transportation Simulator #501	

VIBRATION TEST SET-UP & RESULTS (VARIABLE #1)

Sample #	Results	Comments / Observations
6	**PASS**	No leakage or damage.
7	**PASS**	
8	**PASS**	

REPETITIVE SHOCK VIBRATION TESTS	Taped Top & Glued Bottom w/ 45mm Threaded Closure (V2)

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
TEST CONTENTS:	Water	Immediately following the period of vibration, each package must be removed from the platform, turned on its side and observed for any evidence of leakage. • 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. (§178.608)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	73°F / 50% RH, Chamber #202	
TABLE DISPLACEMENT:	1”	
TEST FREQUENCY:	4.0 Hz	
TEST DURATION:	1 Hour	
TEST EQUIPMENT:	Vertical motion using L.A.B. Palletizer Transportation Simulator #501	

VIBRATION TEST SET-UP & RESULTS (VARIABLE #2)

Sample #	Results	Comments / Observations
14	**PASS**	No leakage or damage.
15	**PASS**	
16	**PASS**	

REPETITIVE SHOCK VIBRATION TESTS	Taped Top & Bottom w/ 38-439 Threaded Closure (V3)

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
TEST CONTENTS:	Water	Immediately following the period of vibration, each package must be removed from the platform, turned on its side and observed for any evidence of leakage. • 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. (§178.608)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	73°F / 50% RH, Chamber #202	
TABLE DISPLACEMENT:	1”	
TEST FREQUENCY:	4.0 Hz	
TEST DURATION:	1 Hour	
TEST EQUIPMENT:	Vertical motion using L.A.B. Palletizer Transportation Simulator #501	

VIBRATION TEST SET-UP & RESULTS (VARIABLE #3)

Sample #	Results	Comments / Observations
22	**PASS**	No leakage or damage.
23	**PASS**	
24	**PASS**	

REPETITIVE SHOCK VIBRATION TESTS	Taped Top & Glued Bottom w/ 38-439 Threaded Closure (V4)

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
TEST CONTENTS:	Water	Immediately following the period of vibration, each package must be removed from the platform, turned on its side and observed for any evidence of leakage. • 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. (§178.608)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	73°F / 50% RH, Chamber #202	
TABLE DISPLACEMENT:	1”	
TEST FREQUENCY:	4.0 Hz	
TEST DURATION:	1 Hour	
TEST EQUIPMENT:	Vertical motion using L.A.B. Palletizer Transportation Simulator #501	

VIBRATION TEST SET-UP & RESULTS

Sample #	Results	Comments / Observations
30	**PASS**	No leakage or damage.
31	**PASS**	
32	**PASS**	

COBB WATER ABSORPTION TESTS

TEST INFORMATION		CRITERIA FOR PASSING THE TEST
SAMPLE SIZE:	(5) 5” x 5” Squares	• An increase in mass greater than 155 g/m² over the 30 minute duration represents an unacceptable level of water resistance. (§178.516)
CONDITIONING:	73°F / 50% RH, Chamber #202	
WATER APPLIED:	100mL / Sample	
TEST DURATION:	30 Minutes / Sample	
TEST EQUIPMENT:	UWE Analytical Balance #102	
	Gurley Cobb Water Absorption Apparatus	

COBB WATER ABSORPTION TEST RESULTS	
Sample #	**Water Absorbed (g/m²)**
1	**94 g/m²**
2	**103 g/m²**
3	**107 g/m²**
4	**111 g/m²**
5	**116 g/m²**
AVERAGE:	**106.2 g/m²**
RESULT	**PASS**

REGULATORY AND INDUSTRY STANDARD REFERENCES

REGULATORY REFERENCES

TEST	49 CFR① October 2011 Edition	UN② 17th Edition	IMDG③ 2010 Edition	ICAO④ 2011-2012 Edition	IATA⑤ 53rd Edition
Drop:	178.603	6.1.5.3	6.1.5.3	6; 4.3	6.3.3
Stacking:	178.606	6.1.5.6	6.1.5.6	6; 4.6	6.3.6
Pressure:	173.27(c)	4.1.1.4.1	---	4; 1.1.6	5.0.2.9
Vibration:	178.608	---	---	4; 1.1.1	5.0.2.7
Cobb:	178.516	6.1.4.12.1	6.1.4.12.1	6; 3.1.11.1	6.2.12.2

① United States Department of Transportation Code of Federal Regulations (CFR) Title 49, Transportation, Parts 100-185
② The United Nations Recommendations on the Transport of Dangerous Goods — Model Regulations. (UN – Orange Book)
③ International Maritime Dangerous Goods Code (IMDG)
④ Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO)
⑤ International Air Transport Association (IATA) Dangerous Goods Regulations

INDUSTRY STANDARD REFERENCES

Drop:	ASTM⑥ D5276:	Standard Test Method for Drop Test of Loaded Containers by Free Fall
	ISO⑦ 2248:	Packaging – Complete, Filled Transport Packages – Vertical Impact Test By Dropping
Stacking:	ASTM⑥ D4577:	Standard Test Method for Compression Resistance of a Container Under Constant Load
	ISO⑦ 2234:	Packaging – Complete, Filled Transport Packages – Stacking Tests using Static Load
Hydrostatic Pressure:	ASTM⑦ D7660:	Standard Guide for conducting Internal Pressure Tests on United Nations (UN) Packagings
Vibration:	ASTM⑥ D999:	Standard Test Method for Vibration Testing of Shipping Containers
	ISO⑦ 2247:	Packaging – Complete, Filled transport Packages – Vibration Test at Fixed Low Frequency
Cobb:	ISO⑦ 535:	Paper and Board - Determination of Water Absorption - Cobb Method

⑥American Society for Testing and Materials (ASTM)
⑦International Organization for Standardization (ISO)

EQUIPMENT

All inspection, measuring and test equipment that can affect product quality is calibrated and adjusted at prescribed intervals, or prior to use, and is traceable to NIST, using ANSI Z540 as an overall guide for calibration certification.

SECTION IV: MATHEMATICAL CALCULATIONS — VARIABLE #1

INFORMATION USED FOR CALCULATIONS

Overall Packaging Tare Weight (PTW):	**1,993.0 Grams**	
Overflow Capacity (OFC):		**Methanol/Water SG**
Methanol/Water	**2,489.0 Grams**	**SG: 0.970**
Water	**2,566.0 Grams**	
Number of Inner Packagings (# IP):	**6**	
Packing Group	**II**	
Product Specific Gravity (PSG):	**1.900**	
Packing Group Multiplication Factor (MF):	**1.00**	
Overall Height of one Package (OH):	**13.63 Inches**	
Stack Test-# of Samples Tested Simultaneously:	**3**	

98% OF OVERFLOW

Overflow Capacity (OFC) x 98%

OFC	x	98%		
2,489.0	x	98% =	**2,439.3 Grams**	Methanol/Water
2,566.0	x	98% =	**2,514.7 Grams**	Water

PACKAGE TEST WEIGHTS

Overall Pkg Tare Weight (PTW) + (98% Overflow Capacity (OFC) x # of Inner Pkg (# IP)

PTW	+	(98% OFC	x	# IP)	
1,993	+	2,439	**x**	6	Methanol/Water
1,993	+	2,515	**x**	6	Water

Methanol/Water:	**16.6**	**Kg**	**36.5**	**Lbs.**
Water:	**17.0**	**Kg**	**37.4**	**Lbs.**

AUTHORIZED PACKAGE GROSS MASS CALCULATION (APGM)

Overall Pkg Tare Weight (PTW) + (Product SG (PSG) x 98% Overflow (OFC) x # of Inner Pkg (# IP))

PTW	+	(PSG	x	98% OFC	x	# IP)
1,993	+	1.9	x	2,515	x	6

30.6	**Kg**	**67.4**	**Lbs.**

DROP HEIGHT

Calculation For Product Specific Gravities Exceeding 1.2

Product Specific Gravity (PSG) x Packing Group Multiplication Factor (MF)

PSG	x	MF			Packing Group: II
1.9	x	1.00		Required Drop Height	Actual Drop Height
		1.90	**Meter**	**74.8 Inches**	**75 Inches**

STACKING TEST MINIMUM LOAD CALCULATIONS

Number of Packages in a 3m High Stack (118 / Overall Pkg Height (OH) -1)

118 / Overall Height of one Pkg (OH) - 1

(118	/	OH)	-1	=	# 3m HS
118	/	13.63	-1	=	7.7

Stacking Test Load Calculation (Individual Package)

Authorized Pkg Gross Mass (APGM) x # of Pkg in a 3m High Stack (# 3m HS)

APGM	x	# 3m HS
30.6	x	7.7

235.6 Kg **519.4 Lbs.**

Stacking Test Load Calculation

Samples x Authorized Pkg Gross Mass (APGM) x # of Pkg in a 3m High Stack (# 3m HS)

Samples	x	(APGM	x	# 3m HS)
3	x	30.6	x	7.7

706.9 Kg **1,558.4 Lbs.**

SECTION IV: MATHEMATICAL CALCULATIONS — VARIABLE #2

INFORMATION USED FOR CALCULATIONS

Overall Packaging Tare Weight (PTW):	**2,004.0 Grams**	
Overflow Capacity (OFC):		**Methanol/Water SG**
Methanol/Water	**2,489.0 Grams**	**SG: 0.970**
Water	**2,566.0 Grams**	
Number of Inner Packagings (# IP):	**6**	
Packing Group	**II**	
Product Specific Gravity (PSG):	**1.900**	
Packing Group Multiplication Factor (MF):	**1.00**	
Overall Height of one Package (OH):	**13.63 Inches**	
Stack Test-# of Samples Tested Simultaneously:	**3**	

98% OF OVERFLOW

Overflow Capacity (OFC) x 98%

OFC	x	98%		
2,489.0	x	98% =	**2,439.3 Grams**	Methanol/Water
2,566.0	x	98% =	**2,514.7 Grams**	Water

PACKAGE TEST WEIGHTS

Overall Pkg Tare Weight (PTW) + (98% Overflow Capacity (OFC) x # of Inner Pkg (# IP)

PTW	+	(98% OFC	x	# IP)	
2,004	+	2,439	**x**	6	Methanol/Water
2,004	+	2,515	**x**	6	Water

Methanol/Water:	**16.6**	**Kg**	**36.5**	**Lbs.**
Water:	**17.0**	**Kg**	**37.4**	**Lbs.**

AUTHORIZED PACKAGE GROSS MASS CALCULATION (APGM)

Overall Pkg Tare Weight (PTW) + (Product SG (PSG) x 98% Overflow (OFC) x # of Inner Pkg (# IP))

PTW	+	(PSG	x	98% OFC	x	# IP)
2,004	+	1.9	x	2,515	x	6

30.6	**Kg**	**67.4**	**Lbs.**

DROP HEIGHT

Calculation For Product Specific Gravities Exceeding 1.2

Product Specific Gravity (PSG) x Packing Group Multiplication Factor (MF)

PSG	x	MF			Packing Group: II
1.9	x	1.00		Required Drop Height	Actual Drop Height
		1.90	**Meter**	**74.8 Inches**	**75 Inches**

STACKING TEST MINIMUM LOAD CALCULATIONS

Number of Packages in a 3m High Stack (118 / Overall Pkg Height (OH) -1)

118 / Overall Height of one Pkg (OH) - 1

(118	/	OH)	-1	=	# 3m HS
118	/	13.63	-1	=	7.7

Stacking Test Load Calculation (Individual Package)

Authorized Pkg Gross Mass (APGM) x # of Pkg in a 3m High Stack (# 3m HS)

APGM	x	# 3m HS
30.6	x	7.7

235.6 Kg **519.4 Lbs.**

Stacking Test Load Calculation

Samples x Authorized Pkg Gross Mass (APGM) x # of Pkg in a 3m High Stack (# 3m HS)

Samples	x	(APGM	x	# 3m HS)
3	x	30.6	x	7.7

706.9 Kg **1,558.4 Lbs.**

SECTION IV: MATHEMATICAL CALCULATIONS — VARIABLE #3

INFORMATION USED FOR CALCULATIONS

Overall Packaging Tare Weight (PTW):	**1,986.0**	**Grams**	
Overflow Capacity (OFC):			**Methanol/Water SG**
Methanol/Water	**2,684.9**	**Grams**	**SG: 0.970**
Water	**2,768.0**	**Grams**	
Number of Inner Packagings (# IP):	**6**		
Packing Group	**II**		
Product Specific Gravity (PSG):	**1.900**		
Packing Group Multiplication Factor (MF):	**1.00**		
Overall Height of one Package (OH):	**13.63**	**Inches**	
Stack Test-# of Samples Tested Simultaneously:	**3**		

98% OF OVERFLOW

Overflow Capacity (OFC) x 98%

OFC	x	98%		
2,684.9	x	98% =	**2,631.3 Grams**	Methanol/Water
2,768.0	x	98% =	**2,712.7 Grams**	Water

PACKAGE TEST WEIGHTS

Overall Pkg Tare Weight (PTW) + (98% Overflow Capacity (OFC) x # of Inner Pkg (# IP)

PTW	+	(98% OFC	x	# IP)	
1,986	+	2,631	**x**	6	Methanol/Water
1,986	+	2,713	**x**	6	Water

Methanol/Water:	**17.7**	**Kg**	**39.0**	**Lbs.**
Water:	**18.2**	**Kg**	**40.1**	**Lbs.**

AUTHORIZED PACKAGE GROSS MASS CALCULATION (APGM)

Overall Pkg Tare Weight (PTW) + (Product SG (PSG) x 98% Overflow (OFC) x # of Inner Pkg (# IP))

PTW	+	(PSG	x	98% OFC	x	# IP)
1,986	+	1.9	x	2,713	x	6

	32.9	**Kg**	**72.5**	**Lbs.**

DROP HEIGHT

Calculation For Product Specific Gravities Exceeding 1.2

Product Specific Gravity (PSG) x Packing Group Multiplication Factor (MF)

PSG	x	MF			**Packing Group: II**
1.9	x	1.00		**Required Drop Height**	**Actual Drop Height**
		1.90	**Meter**	**74.8 Inches**	**75 Inches**

STACKING TEST MINIMUM LOAD CALCULATIONS

Number of Packages in a 3m High Stack (118 / Overall Pkg Height (OH) -1)

118 / Overall Height of one Pkg (OH) - 1

(118	/	OH)	-1	=	# 3m HS
118	/	13.63	-1	=	7.7

Stacking Test Load Calculation (Individual Package)

Authorized Pkg Gross Mass (APGM) x # of Pkg in a 3m High Stack (# 3m HS)

APGM	x	# 3m HS
32.9	x	7.7

253.3 Kg **558.4 Lbs.**

Stacking Test Load Calculation

Samples x Authorized Pkg Gross Mass (APGM) x # of Pkg in a 3m High Stack (# 3m HS)

Samples	x	(APGM	x	# 3m HS)
3	x	32.9	x	7.7

760.0 Kg **1,675.5 Lbs.**

SECTION IV: MATHEMATICAL CALCULATIONS — VARIABLE #4

INFORMATION USED FOR CALCULATIONS

Overall Packaging Tare Weight (PTW):	**1,997.0**	**Grams**	
Overflow Capacity (OFC):			**Methanol/Water SG**
Methanol/Water	**2,684.9**	**Grams**	**SG: 0.970**
Water	**2,768.0**	**Grams**	
Number of Inner Packagings (# IP):	**6**		
Packing Group	**II**		
Product Specific Gravity (PSG):	**1.900**		
Packing Group Multiplication Factor (MF):	**1.00**		
Overall Height of one Package (OH):	**13.63**	**Inches**	
Stack Test-# of Samples Tested Simultaneously:	**3**		

98% OF OVERFLOW

Overflow Capacity (OFC) x 98%

OFC	x	98%		
2,684.9	x	98% =	**2,631.3 Grams**	Methanol/Water
2,768.0	x	98% =	**2,712.7 Grams**	Water

PACKAGE TEST WEIGHTS

Overall Pkg Tare Weight (PTW) + (98% Overflow Capacity (OFC) x # of Inner Pkg (# IP)

PTW	+	(98% OFC	x	# IP)	
1,997	+	2,631	**x**	6	Methanol/Water
1,997	+	2,713	**x**	6	Water

Methanol/Water:	**17.7**	**Kg**	**39.0**	**Lbs.**
Water:	**18.2**	**Kg**	**40.1**	**Lbs.**

AUTHORIZED PACKAGE GROSS MASS CALCULATION (APGM)

Overall Pkg Tare Weight (PTW) + (Product SG (PSG) x 98% Overflow (OFC) x # of Inner Pkg (# IP))

PTW	+	(PSG	x	98% OFC	x	# IP)
1,997	+	1.9	x	2,713	x	6

	32.9	**Kg**	**72.5**	**Lbs.**

DROP HEIGHT

Calculation For Product Specific Gravities Exceeding 1.2

Product Specific Gravity (PSG) x Packing Group Multiplication Factor (MF)

PSG	x	MF			Packing Group: II
1.9	x	1.00		Required Drop Height	Actual Drop Height
		1.90	**Meter**	**74.8 Inches**	**75 Inches**

STACKING TEST MINIMUM LOAD CALCULATIONS

Number of Packages in a 3m High Stack (118 / Overall Pkg Height (OH) -1)

118 / Overall Height of one Pkg (OH) - 1

(118	/	OH)	-1	=	# 3m HS
118	/	13.63	-1	=	7.7

Stacking Test Load Calculation (Individual Package)

Authorized Pkg Gross Mass (APGM) x # of Pkg in a 3m High Stack (# 3m HS)

APGM	x	# 3m HS
32.9	x	7.7

253.3 Kg **558.4 Lbs.**

Stacking Test Load Calculation

Samples x Authorized Pkg Gross Mass (APGM) x # of Pkg in a 3m High Stack (# 3m HS)

Samples	x	(APGM	x	# 3m HS)
3	x	32.9	x	7.7

760.0 Kg **1,675.5 Lbs.**