

**UNITED NATIONS / DOT  
PERFORMANCE CERTIFICATION**



**31HA1 PERIODIC DESIGN REQUALIFICATION**

**MX275 - 275 Gallon Composite IBC with 6" Fill  
Port Cap on Steel Pallet (Nova Resin)**

**TEST REPORT #: 17-MN40062**



31HA1 / Y / \* / USA / +AA6011 / 3855 / 2031

\* Insert the month and year (last two digits) of manufacture

**TESTING PERFORMED FOR:**

**SCHÜTZ CONTAINER SYSTEMS**

200 Aspen Hill Road  
P.O. Box 5950  
North Branch, NJ 08876-5950

**ATTN: Brian Minnich**

**TESTING PERFORMED BY:**

**TEN-E PACKAGING SERVICES, INC.**

1666 County Road 74  
Newport, MN 55055  
Phone: 651-459-0671  
Fax: 651-459-1430

October 10, 2017


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**SECTION I: CERTIFICATION**

**Periodic Design Requalification of the Schütz  
 MX275 - 275 Gallon Composite IBC with 6" Fill Port Cap on Steel Pallet (Nova Resin)**

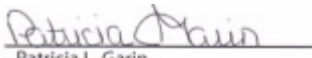
TEN-E Packaging Services, Inc. is a current DOT UN Third-Party Certification Agency under §107.403 and certifies that the Schütz Container Systems packaging referenced above has passed the standards of the DEPARTMENT OF TRANSPORTATION'S TITLE 49 CFR; Performance Oriented Packaging Standards, Section 178. This package is also certified under IMDG and the UN Recommendations on the Transport of Dangerous Goods. It is the responsibility of the end user to determine authorization for use under these regulations. The use of other packaging methods or components other than those documented in this report may render this certification invalid.

SUMMARY OF PERFORMANCE TESTS					
UN / DOT TEST	CFR REFERENCE	TEST LEVEL	TEST CONTENTS	TEST COMPLETED	TEST RESULTS
Vibration	178.819	3.3 Hz – 1 Hour	Water	October 9, 2017	PASS
Bottom Lift	178.811	2685.4 Kg	Water	October 9, 2017	PASS
Stacking	178.815	3855.5 Kg – 24 Hours	Water	October 10, 2017	PASS
Leakproofness	178.813	20 kPa – 10 Minutes	Empty	October 10, 2017	PASS
Hydrostatic	178.814	100 kPa – 10 Minutes	Water	October 10, 2017	PASS
Drop	178.810	1.9m	Methanol/Water	October 10, 2017	PASS
<b>TEST REPORT NUMBER(S):</b>			17-MN40062, 14-4113		
<b>UN MARKING: (CFR 49 – 178.703)</b>			 31HA1 / Y / ** / USA / +AA6011 / 3855 / 2031		
<b>PACKAGING IDENTIFICATION CODE:</b>			31HA1 (178.707 Composite IBC)		
<b>PERFORMANCE STANDARD:</b>			Y (Packaging meets Packing Group II and III tests)		
<b>MONTH AND YEAR OF MANUFACTURE:</b>			*		
<b>STATE AUTHORIZING ALLOCATION OF THE MARK:</b>			USA		
<b>PACKAGING CERTIFICATION AGENCY:</b>			(+AA) TEN-E Packaging Services, Inc. (Newport, MN CAA #2006030022)		
<b>THIRD PARTY PACKAGING IDENTIFICATION:</b>			+AA6011		
<b>STACKING TEST LOAD:</b>			3,855.5 Kg (8,500 Lbs.)		
<b>MAXIMUM PERMISSIBLE GROSS MASS:</b>			2,031.7 Kg (4,479 Lbs.)		
<b>PERIODIC DESIGN REQUALIFICATION DATE:</b>			October 10, 2018		
<b>ADDITIONAL REQUIRED RIGID PLASTIC &amp; COMPOSITE IBC MARKINGS (CFR 49 – 178.703(b)):</b>					
<b>RATED CAPACITY AT 20°C (liters):</b>			1041 Liters		
<b>TARE MASS (Kg):</b>			Insert individual IBC tare mass		
<b>GAUGE TEST PRESSURE (kPa):</b>			100 kPa		
<b>DATE OF LAST LEAKPROOFNESS TEST:</b>			Insert Month & Year of Last Leakproofness Test		
<b>DATE OF LAST INSPECTION:</b>			Insert Month & Year of Last Inspection		

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 Schütz Container Systems for services rendered. In the event of future changes to the above referenced test standards, it is the responsibility of Schütz Container Systems 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.

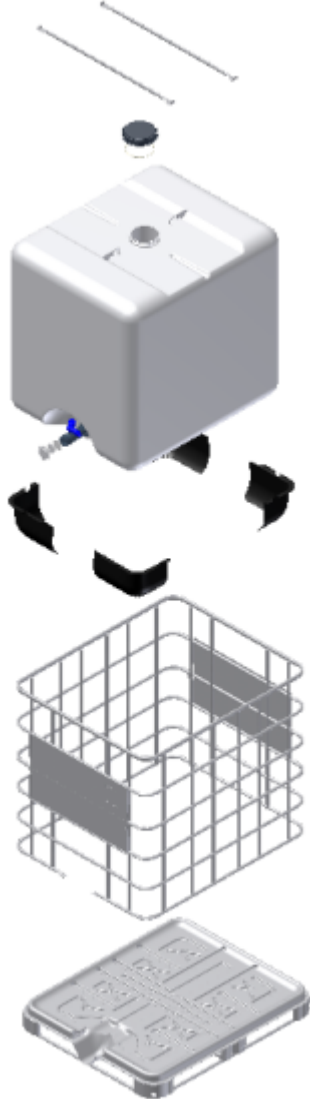
**MANUFACTURER:**  
 Schütz Container Systems  
 200 Aspen Hill Road  
 P.O. Box 5950  
 North Branch, NJ 08876-5950

  
 Ebrahim Kayeri  
 Technician  
 TEN-E Packaging Services, Inc.  
 1666 County Road 74  
 Newport, MN 55055



  
 Patricia L. Garin  
 Manager, Technical Services  
 TEN-E Packaging Services, Inc.  
 1666 County Road 74  
 Newport, MN 55055

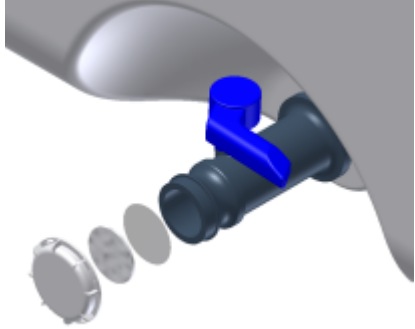
**SECTIONS II & V: PACKAGING DESCRIPTIONS / COMPONENT DRAWINGS**


**MX275 - 275 Gallon Composite IBC with 6" Fill Port Cap on Steel Pallet (Nova Resin)**

ASSEMBLY DRAWING	TEST LEVELS				
	Certification Type:	Periodic Design Requalification			
	Packaging Code Designation:	31HA1			
	Packing Group:	II			
	Specific Gravity:	1.9			
	Test Pressure:	100 kPa			
	<b>TEST SAMPLE PREPARATION</b> (Refer to Section IV)				
	Overall IBC Tare Weight:				
	Sample #1 and Sample #2		57.0 Kg		
	Net Fill Weight (98% Maximum Capacity):				
	Water	(Sample #1)	1,040.8 Kg		
Methanol/Water	(Sample #2)	997.7 Kg			
IBC Test Weight:					
Water	(Sample #1)	1,097.8 Kg	2,420.2 Lbs.		
Methanol/Water	(Sample #2)	1,054.7 Kg	2,325.1 Lbs.		
Maximum Permissible Gross Mass:	2,034.5 Kg	4,485.2 Lbs.			
<b>CLOSING METHODS</b>					
<b>6" Fill Port Cap:</b>					
Application Torque:	75 Ft-Lbs.				
Equipment:	Torque Wrench #742				
<b>Dispensing Valve (By Manufacturer):</b>					
Closure	Hand Tight and Foil Seal				
Refer to Appendix A for Manufacturer's Closure Instructions					

**COMPONENT INFORMATION**

6" THREADED CAP (Drawing No. 3-23948)		DRAWING
<b>Manufacturer: Schütz Container Systems, North Branch</b>		
<b>Description:</b>	Solid Screw Cap DN150 (6")	
<b>Material:</b>	High Density Polyethylene, Black	
<b>Tare Weight:</b>	208 Grams	
<b>Overall Dimensions:</b>		
• <b>Height</b>	38 mm (1.50")	
• <b>Bottom Diameter</b>	189 mm (7.44")	
<b>Thread Dimensions:</b>		
• <b>Major Diameter</b>	164.1 mm (6.46")	
• <b>Minor Diameter</b>	157.5 mm (6.20")	
<b>Markings (QC Audit):</b>	 31HA1 SCHÜTZ 29 S 6/16 SPI "02" PE-HD Recycling Symbol	
<b>Gasket Description:</b>	White Lucopren	
<b>Tare Weight:</b>	12 Grams	
<b>Thickness:</b>	6.2 mm (0.24")	
<b>Diameter:</b>	142 mm (5.59")	

DISPENSING VALVE (Drawing No.: 2-3058.1)		DRAWING
<b>Manufacturer:</b> Schütz Container Systems, North Branch, NJ		
<b>INTEGRATED VALVE</b>		
<b>Description:</b>	Integrated Butterfly Valve DN50 with 2" Camlock	
<b>Material:</b>	Valve: High Density Polyethylene; White Handle: Glass Filled Polypropylene; Blue	
<b>Overall Dimensions:</b>		
• <b>Length</b>	134.4 mm (5.29")	
• <b>Width/Diameter</b>	86.4 mm (3.40")	
• <b>Height</b>	132.1 mm (5.20")	
<b>Thread Dimensions</b>		
• <b>Major Diameter</b>	62.7 mm (2.47")	
• <b>Minor Diameter</b>	59.4 mm (2.34")	
<b>Markings (QC Audit):</b>	SCHÜTZ 6 7/17 A06322X1015403601 SPI "PP-GF" Recycling Symbol SPI "2" PE-HD Recycling Symbol	
<b>NPS THREADED VALVE CLOSURE</b>		
<b>Material:</b>	High Density Polyethylene, Natural	
<b>Tare Weight:</b>	19.914 Grams	
<b>Overall Dimensions:</b>		
• <b>Height</b>	14.2 mm (0.56")	
• <b>Diameter</b>	80.3 mm (3.16")	
<b>Thread Dimension:</b>		
• <b>Major Diameter</b>	63.5 mm (2.50")	
• <b>Minor Diameter</b>	59.9 mm (2.36")	
<b>Markings (QC Audit):</b>	SCHÜTZ 5 6 SPI "02" PE-HD Recycling Symbol	
<b>LINER</b>		
<b>Description:</b>	Polyethylene Foam Liner	
<b>Tare Weight:</b>	1.587 Grams	
<b>Diameter:</b>	54.4 mm (2.14")	
<b>Thickness:</b>	3.0 mm (0.12")	
<b>Seal:</b>	PE/Foil Induction Seal	

RIGID PLASTIC INNER RECEPTACLE (Drawing No.: 2-3058.1)		DRAWING
<b>Manufacturer: Schütz Container Systems, North Branch, NJ</b>		
<b>Description:</b>	275 Gallon Rigid Plastic Inner Receptacle with <ul style="list-style-type: none"> <li>• 6" Buttress Threaded Top Opening</li> <li>• Integrated Butterfly Valve Housing DN 50</li> </ul>	
<b>Material:</b>	High Density Polyethylene, Natural	
<b>Resin Type:</b>	HB-W646-U	
<b>Resin Manufacturer:</b>	Nova	
<b>Certificate of Compliance:</b>	See following page	
<b>Method of Manufacture:</b>	Blow Molded	
<b>As Molded Density*:</b>	0.939 g/cc	
<b>As Molded Melt Index*:</b>	5.840 g/10 min. (190/21.6)	
<b>Tare Weight:</b>		
• <b>Minimum</b>	15.5 Kg	
• <b>Actual</b>	16.0 Kg	
<b>Capacity:</b>		
• <b>Rated</b>	275 Gallons	
• <b>Overflow</b>	280.6 Gallons	
<b>Overall Dimensions:</b>		
• <b>Length</b>	1160 mm (45.67")	
• <b>Width</b>	960 mm (37.80")	
<b>Height:</b>		
• <b>Shoulder</b>	1010 mm (39.76")	
• <b>Top of Hold Down Loop</b>	1040 mm (40.95")	
<b>6" Fill Port Opening Dimensions (Drawing No. 3-41514-B):</b>		
• <b>Type/Style</b>	Buttress DN150 (6")	
• <b>Major Diameter</b>	S165x7	
• <b>Minor Diameter</b>	154.8 mm (6.09")	
• <b>Inside Diameter</b>	144 mm (5.67")	
• <b>Height</b>	34.5 mm (1.36")	
<b>Wall Thickness (Nominal):</b>	1.8 mm	
<b>Wall Thickness (Minimum):</b>		
• <b>Corner Bottom</b>	1.6 mm	
• <b>Corner Top</b>	1.8 mm	
• <b>Side Panels</b>	1.8 mm	
• <b>Bottom Edge</b>	1.8 mm	
• <b>Outlet Area</b>	4.0 mm	
• <b>Water Drainage Left/Right</b>	2.2 mm	
<b>Markings (QC Audit):</b>	(u/n) 31HA1 / M4128 / USA SCHUETZ 4 (NB) SCHÜTZ C90 9/17 SPI "2" PE-HD Recycling Symbol	
<b>Corner Support Inserts</b>		
• <b>Material:</b>	High Density Polyethylene, Black	
• <b>Tare Weight:</b>	278 Grams (each)	
• <b>Overall Dimensions:</b>	362 mm (14-1/4" L) x 254 mm (10" W) x 203 mm (8" H)	
<b>Markings (QC Audit)</b>	SCHÜTZ 20.1 SPI 02 PE-HD Recycling Symbol	

\* As molded density and melt index values may not be directly comparable to the value reported on the COC due to variances in how tests are conducted and due to the variance in the form of the material tested (COC/Resin Pellets vs. Plastic Strips from Molded Part/"As Molded" tests).



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F 7.2.2-01.42\_00 Nov 24, 2010 TEN E

## CERTIFICATE OF COMPLIANCE

CUSTOMER: TEN-E Packaging  
ADDRESS: 1666 County Road 74  
Newport, MN 55055

Sample Type (Check One)

(X) IBC    Tight Head Drum    Open Head Drum

TEN-E Project Number: 17-MN40062

QUANTITY: 2

DATE SHIPPED: 7/17/17

ARTICLE #: 4017647

DESCRIPTION: MX275 UN Wht/6"R TP2" solid Bfly 50 00  
Cam 1pc/steel frame 2-Plt XL:XL/TL

Resin Manufacturer: Nova

Resin type (from data sheet): HB-W646-U

Resin Lot Number: 50031149

Resin Melt Flow (from COA): 5.51 g/10mi

Resin Density (from COA): 0.945 g/cm<sup>3</sup>


Name: Otilia Alexa

Date: 7/17/17



**OUTER RECEPTACLE AND PALLET (Drawing No.: 3-5592)**

**Manufacturer: Schütz Container Systems, North Branch, NJ**


SUPPORT BARS		DRAWING
<b>Material:</b>	Galvanized Steel; 1mm Nominal Thickness	
<b>Tare Weight:</b>	408 Grams (each)	
<b>Length:</b>	977.9 mm (38-1/2")	
<b>Attachment Method</b>	(2) Star Head Screws Per Bar	
CAGE		
<b>Description:</b>	Galvanized Steel Cage With <ul style="list-style-type: none"> <li>• (2) Front and Rear Galvanized Steel Panels with Clips</li> <li>• Galvanized Steel Tubular Style Bars</li> <li>• Galvanized Steel Plate</li> <li>• 4-Way Entry Galvanized Steel Frame Pallet (1000x1200) (Dwg. No. 3-4095.1)</li> </ul>	
<b>Material:</b>	Galvanized Steel; 1mm Nominal Thickness	
<b>Tare Weight</b>	39.0 Kg (Includes Cage, Plate, Pallet)	
<b>Overall Dimensions:</b>		
• <b>Length</b>	1200 mm (47.24")	
• <b>Width</b>	1000 mm (39.37")	
• <b>Height w/o Pallet</b>	1045 mm (41.14")	
• <b>Height with Pallet</b>	1160 mm (45.67")	
<b>Attachment Method</b>	(9) Star Head Screws (1) each corner (1) each centered on two sides and back (1) each side of recessed area for outlet flange	
<b>Markings (QC Audit):</b>	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; flex-direction: column; justify-content: center; align-items: center; margin-right: 5px;"> <span style="font-size: 8px;">u</span> <span style="font-size: 8px;">n</span> </div> <div> <p>31HA1/Y/0917/USA/+AA6011 3656/2031/1040L/56 KG/100 kPa</p> <p>SCHUETZ 4                      ECOBULK/RECOBULK 4017647/ECOBULK MX275/27.09.17/S4/C/002 1015524967                      SCHÜTZ 4/7</p> </div> </div>	

**SECTION III: TEST PROCEDURES AND RESULTS**

**VIBRATION TEST**

TEST INFORMATION		TEST CRITERIA
<b>TEST CONTENTS:</b>	Water	<ul style="list-style-type: none"> <li>An IBC passes the vibration test if there is no rupture or leakage. (§178.819)</li> </ul>
<b>SAMPLE PREPARATION:</b>	Refer to Section II	
<b>CONDITIONING:</b>	Ambient	
<b>TABLE DISPLACEMENT:</b>	1"	
<b>TEST FREQUENCY:</b>	3.3 Hz	
<b>TEST DURATION:</b>	1 Hour	
<b>TEST EQUIPMENT:</b>	Vertical motion using L.A.B. 6000 Transportation Simulator	





**VIBRATION TEST SET-UP AND RESULTS (SAMPLE #1)**

	Results	Comments/Observations
	<b>PASS</b>	<p>The IBC met the criteria for passing the test.</p> <p>No leakage or damage.</p>

**BOTTOM LIFT TEST**

TEST INFORMATION		TEST CRITERIA
<b>TEST CONTENTS:</b>	Water	<ul style="list-style-type: none"> <li>For all IBC design types designed to be lifted from the base, there may be no permanent deformation which renders the IBC unsafe for transportation and no loss of contents. (\$178.811)</li> </ul>
<b>SAMPLE PREPARATION:</b>	Refer to Section II	
<b>CONDITIONING:</b>	Ambient	
<b>NUMBER OF LIFTS:</b>	8 (Four-Way Entry with 2 Lifts per Direction of Entry)	
<b>FORK TINE PENETRATION:</b>	Entry 1 & 2: 36" Entry 3 & 4: 30"	
<b>COMBINED GROSS MASS LIFTED:</b>	2,685.4 Kg (5,920.2 Lbs.) (Refer to Section IV)	
<b>TEST EQUIPMENT:</b>	Fork Truck Dead Load Weights	


**BOTTOM LIFT TEST SET-UP AND RESULTS (SAMPLE #1)**

Direction of Entry #1:	Direction of Entry #2:	Direction of Entry #3:	Direction of Entry #4:
			
<b>Results</b>		<b>Comments/Observations</b>	
Lift #1: <b>PASS</b>	Lift #5: <b>PASS</b>	The IBC met the criteria for passing the test.  No leakage or damage.	
Lift #2: <b>PASS</b>	Lift #6: <b>PASS</b>		
Lift #3: <b>PASS</b>	Lift #7: <b>PASS</b>		
Lift #4: <b>PASS</b>	Lift #8: <b>PASS</b>		

**STACKING TEST**

TEST INFORMATION		TEST CRITERIA
<b>TEST CONTENTS:</b>	Water	<ul style="list-style-type: none"> <li>For metal, rigid plastic and composite IBCs, there may be no permanent deformation, which renders the IBC unsafe for transportation, and no loss of contents. (§178.815)</li> </ul>
<b>SAMPLE PREPARATION:</b>	Refer to Section II	
<b>CONDITIONING:</b>	Ambient	
<b>TEST LOAD APPLIED:</b>	3,855.5 Kg (8,500.0 Lbs.) (Refer to Section IV)	
<b>TEST DURATION:</b>	24 Hours	
<b>TEST EQUIPMENT:</b>	L.A.B. G23077 Compression System	



**STACKING TEST SET-UP AND RESULTS (SAMPLE #1)**

	Results	Comments/Observations
	<b>PASS</b>	<p>The IBC met the criteria for passing the test.</p> <p>0" maximum deflection after 24 Hours.</p> <p>No leakage or damage.</p>

**LEAKPROOFNESS TEST**

TEST INFORMATION		TEST CRITERIA
<b>TEST CONTENTS:</b>	Empty	<ul style="list-style-type: none"> <li>For all IBC design types intended to contain solids that are loaded or discharged under pressure or intended to contain liquids, there may be no leakage of air from the IBC. (§178.813)</li> </ul>
<b>SAMPLE PREPARATION:</b>	Refer to Section II	
<b>CONDITIONING:</b>	Ambient	
<b>TEST PRESSURE:</b>	20 kPa	
<b>TEST DURATION:</b>	10 Minutes	
<b>AREA OF PRESSURIZATION:</b>	Through Top Head	
<b>TEST EQUIPMENT:</b>	Regulated Air Source #: 2 Pressure Gauge #: 615 & 640	



**LEAKPROOFNESS TEST SET-UP AND RESULTS (SAMPLE #1)**

		<b>Results</b>
		<b>PASS</b>
		<b>Comments/Observations</b>
		<p>The IBC met the criteria for passing the test.</p> <p>No leakage or damage.</p>

**HYDROSTATIC PRESSURE TEST**

TEST INFORMATION		TEST CRITERIA
<b>TEST CONTENTS:</b>	Water	<ul style="list-style-type: none"> <li>For rigid plastic and composite IBC design types intended to contain solids loaded or discharged under pressure or intended to contain liquids, there may be no leakage and no permanent deformation which renders the IBC unsafe for transportation. (§178.814)</li> </ul>
<b>WATER TEMPERATURE:</b>	21°C	
<b>FILL CAPACITY:</b>	Maximum Capacity	
<b>SAMPLE PREPARATION:</b>	Refer to Section II	
<b>CONDITIONING:</b>	Ambient	
<b>TEST PRESSURE:</b>	100 kPa	
<b>TEST DURATION:</b>	10 Minutes	
<b>AREA OF PRESSURIZATION:</b>	Through Top Head	
<b>TEST EQUIPMENT:</b>	Regulated Water Source #: 2 Pressure Gauge #: 615 & 640	

**HYDROSTATIC PRESSURE TEST SET-UP AND RESULTS (SAMPLE #1)**




		<b>Results</b>
		<b>PASS</b>
		<b>Comments/Observations</b>
		<p>The IBC met the criteria for passing the test.</p> <p>No leakage.</p>



**DROP TEST**

TEST INFORMATION		TEST CRITERIA
<b>TEST CONTENTS:</b>	Methanol/Water Solution (0.969 SG)	<ul style="list-style-type: none"> <li>• For all IBC design types, there may be no damage which renders the IBC unsafe to be transported for salvage or for disposable, and no loss of contents.</li> <li>• The IBC shall be capable of being lifted by an appropriate means until clear of the floor for five minutes.</li> <li>• A slight discharge from closures upon impact is not considered a failure provided that no further leakage occurs. (§178.810)</li> </ul>
<b>SAMPLE PREPARATION:</b>	Refer to Section II	
<b>CONDITIONING:</b>	-18°C (0°F) Chamber #202	
<b>TEST CONTENTS TEMP.:</b>	-18.9°C (-2.0°F)	
<b>DROP HEIGHT:</b>	1.9 Meters (75.0") (Refer to Section IV)	
<b>DROP ORIENTATION:</b>	Most Vulnerable Part of Base	
<b>TEST EQUIPMENT:</b>	Quick Release Hook Mechanism 5 Ton Overhead Hoist	

**DROP TEST SET-UP AND RESULTS (SAMPLE #2)**

Set-Up Photo:	Post Drop Photo:	Post Drop Photo:
		
Results:	Comments/Observations	
Pass	The IBC met the criteria for passing the test. No leakage. Damage to cage, bottle and pallet upon impact.	

## REGULATORY AND INDUSTRY STANDARD REFERENCES

REGULATORY REFERENCES			
TEST	49 CFR <sup>①</sup>	UN <sup>②</sup>	IMDG <sup>③</sup>
	October 2016 Edition	19 <sup>th</sup> Edition	2016 Edition
Vibration:	178.819	6.5.6.13	---
Bottom Lift:	178.811	6.5.6.4	6.5.6.4
Stacking:	178.815	6.5.6.6	6.5.6.6
Leakproofness:	178.813	6.5.6.7	6.5.6.7
Hydrostatic Pressure:	178.814	6.5.6.8	6.5.6.8
Drop:	178.810	6.5.6.9	6.5.6.9

① United States Department of Transportation Code of Federal Regulations (CFR) Title 49, Transportation, Parts 100-185

② The United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations (UN – Orange Book)

③ International Maritime Dangerous Goods Code (IMDG)

INDUSTRY STANDARD REFERENCES	
Vibration:	ASTM <sup>④</sup> D7387: Standard Test Method for Vibration Testing of IBCs Used for Shipping Liquid Hazardous Materials (Dangerous Good)
	ISO <sup>⑤</sup> 2247: Packaging – Complete, Filled Transport Packages – Vibration Test at Fixed Low Frequency
Stacking:	ASTM <sup>④</sup> D4577: Standard Test Method for Compression Resistance of a Container Under Constant Load
	ISO <sup>⑤</sup> 2234: Packaging – Complete, Filled Transport Packages – Stacking Test using Static Load
Pressure:	ASTM <sup>④</sup> D7660: Standard Guide for Conducting Internal Pressure Tests on United Nations (UN) Packagings
Drop:	ASTM <sup>④</sup> D5276: Standard Test Method for Drop Test of Loaded Containers by Free Fall
	ASTM <sup>④</sup> D7790: Standard Test Method for the Preparation of Plastic Packagings Containing Liquids for United Nations (UN) Drop Testing
	ISO <sup>⑤</sup> 2248: Packaging – Complete, Filled Transport Packages – Vertical Impact Test by Dropping

④ American Society for Testing and Materials (ASTM)

⑤ International Organization for Standardization (ISO)

## EQUIPMENT

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



**SECTION IV MATHEMATICAL CALCULATIONS**

**INFORMATION USED FOR CALCULATIONS**

Overall IBC Tare Weight (IBCTW)-Sample 1:	57.0 Kg	
Overall IBC Tare Weight (IBCTW)-Sample 2:	57.0 Kg	
Overflow Capacity (OFC):		
Methanol/Water	1,018.0 Kg	
Water	1,062.0 Kg	
Actual Load Applied for Bottom Lift (BLALA):	3,500.0 Lbs.	<b>Min Wt To Be Applied</b>
Packing Group	II	3,185.9 Lbs. (Btm Lift)
Product Specific Gravity (PSG):	1.9	
Packing Group Multiplication Factor (MF):	1.00	
# of IBC Stacked During Transportation (#IBC):	2	

**98% OF OVERFLOW**

Overflow Capacity (OFC) x 98%

<u>OFC</u>	x	<u>98%</u>			
1,062.0	x	98% =	<b>1,040.8 Kg</b>	<b>Water</b>	<b>Sample #1</b>
1,018.0	x	98% =	<b>997.7 Kg</b>	<b>Methanol/Water</b>	<b>Sample #2</b>

**IBC TEST WEIGHT (IBCW)**

Overall IBC Tare Weight (IBCTW) + 98% Overflow Capacity (OFC)

<u>IBCTW</u>	+	<u>98% OFC =</u>			
57.0	+	1,040.8	<b>1,097.8 Kg</b>	<b>2,420.2 Lbs. Water</b>	<b>Sample #1</b>
57.0	+	997.7	<b>1,054.7 Kg</b>	<b>2,325.1 Lbs. Methanol/Water</b>	<b>Sample #2</b>

**AUTHORIZED IBC GROSS MASS (AIBCGM)**

Overall IBC Tare Weight (IBCTW) + (Product SG (PSG) x 98% Overflow (OFC))

<u>IBCTW</u>	+	<u>(PSG</u>	x	<u>98% OFC)</u>	
57.0	+	1.9	x	1,040.8	
		<b>2,034.5 Kg</b>		<b>4,485.2 Lbs.</b>	

**BOTTOM LIFT CALCULATIONS**

The IBC must be loaded to 1.25 times the combined maximum permissible gross mass with load being evenly distributed

**Minimum Required Load**

Authorized IBC Gross Mass x 1.25

<u>AIBCGM</u>	x	<u>1.25</u>	=	<u>Minimum Required Load</u>			
2,034.5	x	1.25	=	<b>2,543.3 Kg</b>	<b>5,606.8</b>	<b>Lbs.</b>	

**Combined Gross Mass Lifted**

Actual Load Applied (ALA) + IBC Test Weight (IBCW)

<u>IBCW</u>	+	<u>ALA</u>	=	<u>Total Load Lifted</u>			
1,097.8	+	1,587.6	=	<b>2,685.4 Kg</b>	<b>5,920.2</b>	<b>Lbs.</b>	

**STACK TEST CALCULATIONS**

The IBC must be loaded to 1.8 times the combined maximum permissible gross mass of the number of similar IBCs that may be stacked on top of the IBC during transportation

**Minimum Required Load**

Authorized IBC Gross Mass x # of IBC Stack During Transportation (-1) x 1.8

<u>AIBCGM</u>	x	<u>#IBC (-1)</u>	x	1.8	=	<u>Minimum Required Load</u>		
2,034.5	x	1.00	x	1.8	=	<b>3,662.3 Kg</b>	<b>8073.9</b>	<b>Lbs.</b>

**DROP HEIGHT**

**Calculation For Product Specific Gravities Exceeding 1.2**

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

<u>PSG</u>	x	<u>MF</u>		<b>Packing Group:</b>	<b>II</b>
1.9	x	1.00		<u>Required Drop Height</u>	<u>Actual Drop Height</u>
		<b>1.90</b>	<b>Meter</b>	<b>74.8 Inches</b>	<b>75 Inches</b>

**APPENDIX A: MANUFACTURER'S CLOSURE INSTRUCTIONS****SCHUETZ**  
**packaging update**  
PACKAGING CLOSURE INFORMATION**CLOSURE SPECIFICATIONS FOR TIGHT HEAD DRUMS**

PLUGS MUST BE TORQUED TO THE FOLLOWING

2" NPT AND 2" BUTTRESS - 150 kPa and higher - 30 FT LBS, 100 kPa = 20 ft lbs

Dip tubes - 20 ft lbs      3/4" NPT - 9 FT LBS

Note: Closures must have gaskets to seal

**CLOSURE SPECIFICATIONS FOR OPEN HEAD DRUMS**

CLOSE AND SECURE LID WITH LOCKING RING - ATTACH HOLDING PIN FOR HANDLE TO KEEP RING CLOSED.

PLUGS MUST BE TORQUED TO THE FOLLOWING :

2" NPT AND 2" BUTTRESS - 20 FT LBS

3/4" NPT - 9 FT LBS

note: closures must have gaskets to seal

**CLOSURE SPECIFICATIONS FOR IBC'S**

FILL PORT CAP AND VALVE MUST BE TORQUED TO THE FOLLOWING:

6" AND 9" FILL PORT CAP - 75 FT LBS

2" plug in 6" or 9" fill port cap must be torqued to 15 ft lbs. ( Schuetz does not recommend that you remove this plug. Filling should be done through the 6" or 9" opening )

\* 56 x 4 mm plug - 20 ft lbs

Old style valves

VALVE NUT - 55 FT LBS

note: caps, valves, and plugs must have gaskets to seal

New Style valves - two turns and line up the hole in the valve body and the hole in the bottle insert and insert clip.

**NOTE: After filling and prior to transport, the shipper should check the tightness of closures to determine if the effects of heating, cooling or gasket relaxation have resulted in the need to tighten the closure**

\* - Underline indicates the latest change to the instructions.