

**UNITED NATIONS / DOT  
PERFORMANCE CERTIFICATION**



**31HA1 PERIODIC DESIGN REQUALIFICATION**

**MX330 - 330 Gallon Composite IBC with 6" Fill Port Cap  
on Steel Pallet (Basell Resin)**

**TEST REPORT #: 17-MN40094**



31HA1 / Y / \*\* / USA / +AA5805 / 3855 / 2056

\*\* 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 9, 2017

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**SECTION I: CERTIFICATION**

**Periodic Design Requalification of the Schütz  
 MX330 - 330 Gallon Composite IBC with 6" Fill Port Cap on Steel Pallet (Basell 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 5, 2017	PASS
Bottom Lift	178.811	2675.4 Kg	Water	October 5, 2017	PASS
Stacking	178.815	3855.6 Kg – 24 Hours	Water	October 6, 2017	PASS
Leakproofness	178.813	20 kPa – 10 Minutes	Empty	October 9, 2017	PASS
Hydrostatic	178.814	100 kPa – 10 Minutes	Water	October 9, 2017	PASS
Drop	178.810	1.6 m	Methanol/Water	October 6, 2017	PASS
<b>TEST REPORT NUMBER(S):</b>			17-MN40094, 14-4138		
<b>UN MARKING: (CFR 49 – 178.703)</b>			 31HA1 / Y / ** / USA / +AA5805 / 3855 / 2056		
<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>			+AA5805		
<b>STACKING TEST LOAD:</b>			3,855.5 Kg (8,500.0 Lbs.)		
<b>MAXIMUM PERMISSIBLE GROSS MASS:</b>			2,056.3 Kg (4,533.3 Lbs.)		
<b>PERIODIC DESIGN REQUALIFICATION DATE:</b>			October 9, 2018		
<b>ADDITIONAL REQUIRED RIGID PLASTIC &amp; COMPOSITE IBC MARKINGS (CFR 49 – 178.703(b)):</b>					
<b>RATED CAPACITY AT 20°C (liters):</b>			1250 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



  
 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**

**MX330 - 330 Gallon Composite IBC with 6" Fill Port Cap on Steel Pallet (Basell Resin)**

ASSEMBLY DRAWING	TEST LEVELS			
	Certification Type:	Periodic Design Requalification		
	Packaging Code Designation:	31HA1		
	Packing Group:	II		
	Specific Gravity:	1.6		
	Test Pressure:	100 kPa		
	<b>TEST SAMPLE PREPARATION</b> (Refer to Section IV)			
	Overall IBC Tare Weight: (Sample #1 and Sample #2)	67.0 Kg		
	Net Fill Weight (98% Maximum Capacity):			
	Water (Sample #1)	1,247.6 Kg		
	Methanol/Water (Sample #2)	1,194.7 Kg		
IBC Test Weight:				
Water (Sample #1)	1,314.6 Kg	2,898.1 Lbs.		
Methanol/Water (Sample #2)	1,261.7 Kg	2,781.5 Lbs.		
Maximum Permissible Gross Mass:	2,063.1 Kg	4,548.3 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>				
Valve to IBC Body	Threaded onto body with 2 complete turns. Shear pin then pushed into place.			
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>	416 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 32 S 7/16 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")	

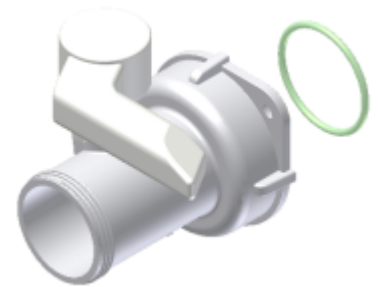
**DISPENSING VALVE (4-27482-B)**

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

**50mm BUTTERFLY VALVE**

**DRAWING**

<b>Description:</b>	50 mm Screwable Butterfly Valve, DN 50 Integrated Nut S75x6 and 2" Camlok with Flap Handle and PP Safety Guard Clip	
<b>Material:</b>	High Density Polyethylene with Glass Filled PP Handle	
<b>Tare Weight:</b>	215 Grams	
<b>Overall Dimensions:</b>		
• <b>Length (with cap)</b>	140 mm	(5.51")
• <b>Width</b>	96.5 mm	(3.80")
• <b>Height</b>	125.5 mm	(4.94")
<b>Thread Dimensions</b>	<b>To Accommodate Closure</b>	<b>To Accommodate Closure</b>
• <b>Major Diameter</b>	58.9 mm (2.32")	75.4 mm (2.97")
• <b>Minor Diameter</b>	56.1 mm (2.21")	70.1 mm (2.76")
<b>Markings (QC Audit):</b>	SCHÜTZ 7 6/17 18 A41408X1015426436 SPI "05" PP Recycling Symbol SPI "2" PE-HD Recycling Symbol SPI "PP-GF" Recycling Symbol	
<b>Gasket:</b>		
<b>Material:</b>	Green Rubber	
<b>Tare Weight:</b>	3.975 Grams	
<b>Diameter</b>	63.5 mm (2.50")	
<b>Thickness</b>	3.6 mm (0.14")	



DISPENSING VALVE (4-27482-B) - Continued		DRAWING
<b>NPS THREADED VALVE CLOSURE</b>		
<b>Material:</b>	High Density Polyethylene, White	
<b>Tare Weight:</b>	21.021 Grams	
<b>Overall Dimensions:</b>		
• <b>Height</b>	26.9 mm (1.06")	
• <b>Diameter</b>	76.7 mm (3.02")	
<b>Thread Dimensions:</b>		
• <b>Major Diameter</b>	60.2 mm (2.37")	
• <b>Minor Diameter</b>	57.4 mm (2.26")	
<b>Markings (QC Audit):</b>	SCHÜTZ 8/17 9 SPI "2" PE-HD Recycling Symbol	
<b>Disk</b>		
<b>Material:</b>	High Density Polyethylene, Red	
<b>Tare Weight:</b>	6.763 Grams	
<b>Overall Dimensions:</b>		
• <b>Diameter</b>	60.5 mm (2.38")	
• <b>Height:</b>	6.1 mm (0.24")	
<b>Markings (QC Audit):</b>	SCHÜTZ 19 6 SPI "02" PE-HD Recycling Symbol	
<b>Liner:</b>		
<b>Material:</b>	Polyethylene Foam Liner	
<b>Tare Weight:</b>	0.567 Grams	
<b>Diameter:</b>	54.6 mm (2.15")	
<b>Thickness:</b>	3.6 mm (0.14")	
<b>Seal:</b>	PE/Foil Induction Seal	

RIGID PLASTIC INNER RECEPTACLE (Drawing No.: 2-42634-B)		DRAWING
<b>Manufacturer: Schütz Container Systems, North Branch, NJ</b>		
<b>Description:</b>	330 Gallon Rigid Plastic Inner Receptacle with <ul style="list-style-type: none"> <li>• Butress Threaded Top Opening</li> <li>• Threaded Bottom Dispensing Valve Opening</li> </ul>	
<b>Material:</b>	High Density Polyethylene, Natural	
<b>Resin Type:</b>	Basell	
<b>Resin Manufacturer:</b>	Lupolen 4261 AG UV 60005	
<b>Certificate of Compliance:</b>	See following page	
<b>Method of Manufacture:</b>	Blow Molded	
<b>As Molded Density*:</b>	0.940 g/cc	
<b>As Molded Melt Index*:</b>	5.360 g/ 10 min (190/21.6)	
<b>Tare Weight:</b>		
• <b>Minimum</b>	18.5 Kg	
• <b>Actual</b>	20.0 Kg	
<b>Capacity:</b>		
• <b>Rated</b>	330 Gallons	
• <b>Overflow</b>	336.3 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>	1215 mm (47.83")	
• <b>Hold Down Loop</b>	1245 mm (49.02")	
<b>6" Fill Port Opening Dimensions (Drawing No. 3-41514-B):</b>		
• <b>Type/Style</b>	Butress DN150 (6")	
• <b>Major Diameter</b>	S165x7	
• <b>Minor Diameter</b>	152.9 mm (6.02")	
• <b>Inside Diameter</b>	144.0 mm (5.67")	
• <b>Height</b>	34.5 mm (1.36")	
<b>Dispensing Valve Opening Dimensions:</b>		
• <b>Type/Style</b>	DN50	
• <b>Diameter (OD)</b>	83 mm	
• <b>Major Diameter</b>	75.6 mm (2.94")	
• <b>Minor Diameter</b>	69.2 mm (2.72")	
<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>	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; padding: 2px; margin-right: 10px;"> u n </div> <div> 31HA1 / M4127 / USA  SCHUETZ 5 (PB)  SCHÜTZ C74 9/17  SPI "2" PE-HD Recycling Symbol </div> </div>	
<b>Corner Support Inserts:</b>		
<b>Material:</b>	High Density Polyethylene	
<b>Tare Weight:</b>	294 Grams (each)	
<b>Overall Dimensions:</b>	304.8 mm (12" L) x 203.2 mm (8" W) x 177.8 mm (7" H)	
<b>Markings (QC Audit):</b>	SCHÜTZ 16.3	

\* 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).





## CERTIFICATE OF COMPLIANCE

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

Sample Type (Check One)  
 IBC     Tight Head Drum     Open Head Drum

TEN-E Project Number:	17-MN40094
QUANTITY:	2
DATE SHIPPED:	9/22/17
ARTICLE #:	846600
DESCRIPTION:	MX330 UN Nat/6"R TP 2" Solid Bfly 50 VI NPS 3 pcs steel frame 2-Plt SL:XL?TI
Resin Manufacturer:	Basell
Resin type (from data sheet):	Lupolen 4261 AG UV 60005
Resin Lot Number:	MI517H1001
Resin Melt Flow (from COA):	6.4 g/10 mi
Resin Density (from COA):	0.9456 g/cm <sup>3</sup>
Name:	Otilia Alexa
Date:	9/22/17

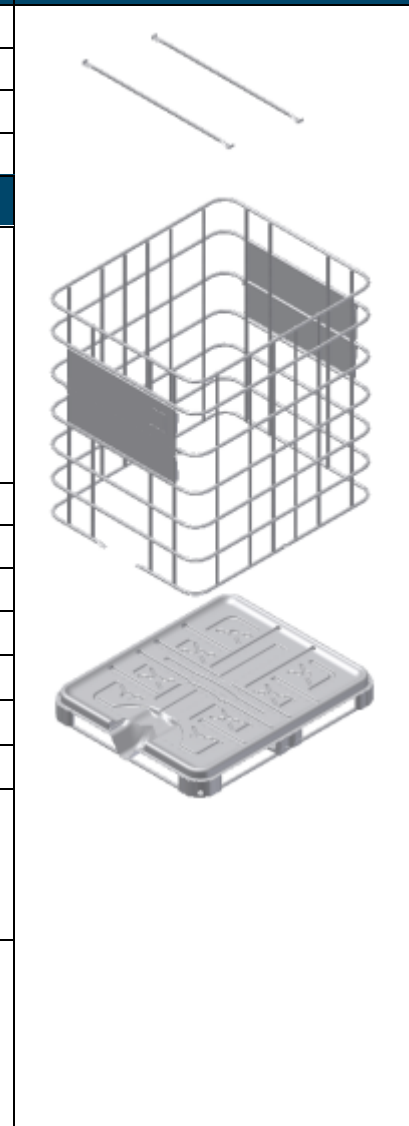
**OUTER RECEPTACLE AND PALLET (3-5593)**

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

**SUPPORT BARS**

**DRAWING**

<b>Material:</b>	Galvanized Steel; 1 mm Nominal Thickness
<b>Tare Weight:</b>	416 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 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; 1 mm Nominal Thickness									
<b>Tare Weight</b>	44.5 Kg (Includes Cage, Plate and 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>	1233 mm (48.54")									
• <b>Height with Pallet</b>	1350 mm (53.15")									
<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>	<table border="0"> <tr> <td rowspan="2" style="text-align: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> <span style="font-size: 8px; margin-right: 2px;">u</span> <span style="font-size: 8px;">n</span> </div> </td> <td>31HA1 / Y / 0917 / USA / +AA5805</td> </tr> <tr> <td>3724 / 2056 / 1249L / 67 KG / 100 kPa</td> </tr> <tr> <td colspan="2">SCHUETZ5                      ECOBULK/RECOBULK</td> </tr> <tr> <td colspan="2">846600/ECOBULK/MX330/22.09.17/S5/1/002</td> </tr> <tr> <td colspan="2">1015513104                      SCHÜTZ                      4/7</td> </tr> </table>	<div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> <span style="font-size: 8px; margin-right: 2px;">u</span> <span style="font-size: 8px;">n</span> </div>	31HA1 / Y / 0917 / USA / +AA5805	3724 / 2056 / 1249L / 67 KG / 100 kPa	SCHUETZ5                      ECOBULK/RECOBULK		846600/ECOBULK/MX330/22.09.17/S5/1/002		1015513104                      SCHÜTZ                      4/7	
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	3724 / 2056 / 1249L / 67 KG / 100 kPa									
SCHUETZ5                      ECOBULK/RECOBULK										
846600/ECOBULK/MX330/22.09.17/S5/1/002										
1015513104                      SCHÜTZ                      4/7										

**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>	The IBC met the criteria for passing the test.  No leakage or damage.

**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>	2,675.4 Kg (5,898.2 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>	3,855.6 Kg (8,500.0 Lbs.) (Refer to Section IV)	
<b>TEST DURATION:</b>	24 Hours	
<b>TEST EQUIPMENT:</b>	L.A.B. 6630 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.</li> </ul> (§178.813)
<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 style="text-align: center;">No leakage.</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>	20°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. Weld on back side of cage broke.</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>	-19.3°C (-2.7°F)	
<b>DROP HEIGHT:</b>	1.6 Meters (63.0") (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	
<b>Pass</b>	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:	67.0 Kg	
Overall IBC Tare Weight (IBCTW)-Sample 2:	67.0 Kg	
Overflow Capacity (OFC):		
Methanol/Water	1,219.0 Kg	
Water	1,273.0 Kg	<b>Min Wt To Be Applied</b>
Actual Load Applied for Bottom Lift (BLALA):	3,000.0 Lbs.	2,787.1 Lbs. (Btm Lift)
Packing Group		
Product Specific Gravity (PSG):	1.6	
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>			
1,273.0	x	98% =	1,247.6 Kg	Water	Sample #1
1,219.0	x	98% =	1,194.7 Kg	Methanol/Water	Sample #2

**IBC TEST WEIGHT (IBCW)**

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

<u>IBCTW</u>	+	<u>98% OFC =</u>			
67.0	+	1,247.6	1,314.6 Kg	2,898.1 Lbs. Water	Sample #1
67.0	+	1,194.7	1,261.7 Kg	2,781.5 Lbs. Methanol/Water	Sample #2

**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>	
67.0	+	1.6	x	1,247.6	
		2,063.1 Kg		4,548.3 Lbs.	

**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>			
2,063.1	x	1.25	=	<b>2,579.0 Kg</b>	<b>5,685.7</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>			
1,314.6	+	1,360.8	=	<b>2,675.4 Kg</b>	<b>5,898.2</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>		
2,063.1	x	1.00	x	1.8	=	<b>3,713.8 Kg</b>	<b>8187.4</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>	<u>        </u>
1.6	x	1.00		<u>Required Drop Height</u>	<u>Actual Drop Height</u>
		<b>1.60</b>	<b>Meter</b>	<b>63.0 Inches</b>	<b>63 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.