Advanced Packaging
Technology Laboratories, Inc.
200 Larkin Drive • Unit H • Wheeling, Illinois 60090 • ph: 847.520.4343 • fx: 847.520.4365

laboratory report

Section 1

Re: MX 1000 – Plastic Skid

Report Number: HM 13088
Date of Report: 3/27/2025
Date of Test: 3/20/2025

Test performed by: **Advanced Packaging Technology Laboratories, Inc.**
200 Larkin Drive, Unit H
Wheeling, IL 60090

Test conducted for: **Schuetz Container Systems**
200 Aspen Hill Road
North Branch, NJ 08876

Attention: Brian Minnich

Items tested: One (1) sample set of composite IBC's intended for the transport of hazardous liquids.

Container: 275 GAL/1000-liter HDPE rectangular receptacle inside steel frame work

Approximate Overall Dimensions on Pallet (O.D.): 47.5" L X 39.5" W X 45.5" H (45" Nestled height)

Nominal Tare Weight: 137.836 lbs.
Nominal Gross Weight: 3819.3 lbs.

Object of test: Design re-qualification testing to determine compliance with applicable sections of 49 CFR pertaining to the transport of dangerous goods – Packing Group II.

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

un

31HA1 / Y / 03 25* / USA / +BR12713 / 3175 / 1732
Tare Weight: 62.52 kg

Marking is not to scale, for example purposes only. Marking must be in accordance with 178.3.
*indicates the month and last two digits of year of manufacture as per 178.703 (a) (1) (iv).

Expiration: This package certification expires 1 year from the date of this report.

Rafael Cameron
UN/DOT Manager

Charles Hernandez
UN/DOT Project Lead

Table of Contents

Section 2 - Package Description

IBC

Package Identification:	UN 31HA1
Manufacturer:	SCHUTZ, North Branch, NJ 08876
Tank Style:	Rectangular style container with rectangular tubular steel grid cage, bottom steel plate, plastic skid
Cage/Plate Material:	Galvanized tubular steel
Bottom steel plate Material:	Galvanized steel
Manufacturing Method:	Frame: Welded and assembled with hardware Inner Receptacle: blow molded
Part Number:	MX 1000 – Plastic Skid
Maker's Certification:	31HA1/Y/02 25/USA/+AA8489/ 3175/1706/1040L/60KG/100 kPa Scheutz4

Outer dimensions				
Length	47.5	in (min)	1206.5	mm (min)
Width	39.5	in (min)	1003.3	mm (min)
Overall Height	45.5	in (min)	1155.7	mm (min)
Nestled Stacking Height	45	in (min)	1143	mm (min)
Steel Framework Tare Weight	20865.6	grams	46	lbs.
Steel Protective Bottom / Plastic Skid Tare Weight	22226.4	grams	49	lbs.
Hardware	220.4	grams	0.485	lbs.
Tubular style bracing bars	841.6	grams	1.855	lbs.

Quantity:	One (1)
Unique features:	None
Note:	• Unit was received with all components in place as a finished IBC • All item identifications are found in the drawing at the back of this report. Assembly is found in the drawings. The lab did not assemble this unit. • Two (2) steel tubular style bars (420.8 grams each) are used to secure the top of the container to steel frame.

Inner Receptacle

Manufacturer:	SCHUTZ, North Branch, NJ 08876						
Part number:	Container MX 1000						
Style:	275-gallon plastic receptacle						
Manufacturing method:	Extrusion blow molded						
Material:	Opaque "Natural" HDPE						
Location:	Inside steel framework						
Discharge Type:	DN150 HPDE screw butterfly valve with induction foil seal						
Indicated Capacity	275		Gallons		1040.875		Liters
98% of Maximum Capacity	275.759		Gallons		1043.747		Liters
Maximum Capacity	281.387		Gallons		1065.049		Liters
Dimensions:	Diameter	N/A		in	N/A		mm
	Length	45.25		in	1149.35		mm
	Width	37.5		in	952.5		mm
	Height	39.375		in	1000.125		mm
Thickness range:		Minimum	Maximum		Minimum	Maximum	
	Top	0.179	0.229	in	4.546	5.816	mm
	Bottom	0.105	0.188	in	2.667	4.775	mm
	Sides	0.075	0.095	in	1.905	2.413	mm
Gram weight:	18144 grams (40 lbs.)						
Quantity:	One (1)						
Orientation:	See closure instructions						
Resin manufacturer:	Proprietary						
Resin grade:	Proprietary						
Melt-flow index:	Proprietary				g/10 min		
Density:	Proprietary				g/cm^3		

6" Receptacle Closure

Manufacturer:	SCHUTZ, North Branch, NJ 08876				
Part number:	DN 225				
Style:	Twist type screw cap				
Closure material:	Green HDPE				
Closure gram weight:	212.6 grams				
O-Ring material:	EDPM (Ethylene propylene Dien Monomer) Synthetic Rubber				
O-Ring gram weight:	12.1 grams				
Dimensions:	Diameter	7.43	in	188.722	mm
	Height	1.47	in	37.338	mm
	Thickness (min)	0.16	in	4.064	mm
O-Ring dimensions:	Diameter	6.06	in	153.924	mm
	Thickness (min)	0.24	in	6.096	mm
Application torque:	75 ft. lbs.				
Quantity:	One (1)				
Equipment:	Torque Wrench (1503MFRMH-QR)				

Additional Test Information

Overall tare weight of package:	137.836	lbs.	62.51	kg.
Test contents:	Methanol / water solution			
Specific Gravity	0.95			
Test weight of package:	2368.334	lbs.	1074.07	kg.
Authorized package gross weight based on SG:	3819.3		lbs.	

Third-Party Laboratory Assembly and Closure Instructions

1. Third party testing laboratory received the IBC welded and assembled.
2. Remove cap and plug from top of IBC.
3. Fill IBC to correct weight and levels.
4. Seal and secure IBC 6" opening closed with 6" HDPE twist type cap and torque the cap to 75ft/lbs. with Torque Wrench (1503MFRMH-QR).

Equipment used to prepare the packages for testing

☐ Tape dispenser- ULINE, 2" wide hand-held, #H-150

☐ Tape dispenser- ULINE, 3" wide hand-held, #H-1162

☐ Glue gun- 3M Industrial, Set @ 220° F, # 75S9

☐ Poly bag sealer- MEC roller style, Set @ 410° F, #ME-803HW

☐ Bander- ULINE H-540/ H-572 strapping tensioner

☒ Hand assembled

☒ Other: Torque Wrench (1503MFRMH-QR)

☒ Other: Toyota Forklift Truck, #30690

SCHUETZ
packaging update

PACKAGING CLOSURE INFORMATION
March 22, 2023

CLOSURE SPECIFICATIONS FOR TIGHT HEAD DRUMS

PLUGS MUST BE TORQUED TO THE FOLLOWING

2" NPS AND 2" BUTTRESS - 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" NPS AND 2" BUTTRESS - 20 FT LBS
3/4" NPS - 9 FT LBS
note: closures must have gaskets to seal

CLOSURE SPECIFICATIONS FOR IBC'S

FILL PORT CAP 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 *17 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 and 2" buttress plug - 20 ft lbs**

Dip tubes - 20 ft lbs

Old style valves and EVOH valves
VALVE NUT - 55 FT LBS
Note: caps, valves, and plugs must have gaskets to seal

New Style valves – the valves are molded on and can not be replaced.

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

Package Preparation – For All Testing

The packages were filled to a minimum of 98% full (see Section 4 for calculation).

Package Panel Orientation – For All Test setups

Vibration Standard

Test Method: 49 CFR 178.819 using ASTM 999-08 (Method A1)

Test contents of inner containers:	Water			
Number of packages tested:	One (1)			
Weight of packages tested:	2368.334	lbs.		
Duration:	1 hour			
Frequency:	4.18	Hz	250.8	rpm

The packages were conditioned in accordance with 49 CFR 178.802 to 50% +/- 2% relative humidity at 23 °C +/- 2 °C for at least 24 hours. The samples were placed on the table and the steel shim (2" wide x 20" long by 1/16" thick, steel) was used (inserted a minimum of 10" under the test sample and along the full length of the IBC on all sides) to assist in adjusting the frequency.

Results

Package #	Pass / Fail	Description of Results
1	Pass	No visible damage or leakage. The IBC remained centered on the pallet. The pallet remained intact and all boards showed no signs of fatigue.

Pass/Fail Criteria

A packaging passes the vibration test if there is no rupture or leakage. The test sample should show any deterioration which could adversely affect transportation safety or any distortion liable to reduce packaging strength.

Bottom Lift Test
Test Method: 49 CFR 178.811

Test contents of inner containers:	Water
Number of packages tested:	One (1)
Number of possible entry/lifting points:	Four (4)

The packages were conditioned in accordance with 49 CFR 178.802 to 50% +/- 2% relative humidity at 23 °C +/- 2 °C for at least 24 hours. The tested IBC was raised and lowered twice by a lift truck with the forks centrally positioned and spaced at three quarters of the dimension of the side of entry. The forks must penetrate to three quarters of the direction of entry. The test must be repeated from each possible direction of entry.

Bottom lift test weight:	4800.00	lbs.	2177.265	kg
Rounded up from required weight:	4774.12	lbs.	2165.526	kg

See Section 4 for Calculation

Results

Package #	Pass / Fail	Description of Results
1	Pass	No damage or leakage of contents. The package lifted clear of the ground without any IBC damage.

Stacking Test (nestled)

Test Method: 49 CFR 178.815

Free standing:	☒	Guided Load:	☐	
Packages tested:	One (1)	Test duration:	24	hours

The packages were conditioned in accordance with 49 CFR 178.802 to 50% +/- 2% relative humidity at 23 °C +/- 2 °C for at least 24 hours.

Stacking test weight:	7000.00	lbs.	3175.179	kg
Rounded up from:	6874.74	lbs.	3118.361	kg

See Section 4 for Calculation.

The stacking test load was applied to the top of the packages by loading the unit with the stacking test weight (above) and the weight was maintained for 24 hours.

Results

Package #	Pass / Fail	Description of Results
1	Pass	No damage or leakage of content. No change in appearance, looks like new.

Pass/Fail Criteria

No loss of contents and no permanent deformation which renders the corrugated intermediate bulk container unsafe for transportation, and no loss of content.

Drop Test

Test Method: 49 CFR 178.810

Test contents of inner containers:	Methanol / water solution	
Number of packages tested:	One (1)	
Drop height:	1.6	meters

Testing was conducted to certify the package for Packing Group:	II	
Specific Gravity	1.6	
Weight of package as tested:	2368.33	lbs.

Conditioning

The packages were conditioned in accordance with 49 CFR 178.802 to -18 °C or lower for at least 24 hours. Drop testing was conducted within two (2) minutes after removing the test package from the conditioning chamber.

Results

Package #	Orientation	Results & Description
2	Bottom angled to corner no more than 5 degrees	Pass. Steel framework bowed outward on impact. Container is able to be lifter through all 4 entry points. Top steel bracing bars bowed inward. No leakage.

Pass/Fail Criteria

A package is considered to successfully pass the drop tests if no loss of contents is achieved. A slight discharge that stops flowing from a closure upon impact is not considered to be a failure of the intermediate bulk container if it stops.

Hydrostatic Pressure Test

Test Method: 49 CFR 178.814 10 minutes minimum duration.

Sample Number	Applied Pressure	Duration	Pass/Fail
IBC #1	100 kPa	30 min.	Pass

Pass/Fail Criteria

An IBC passes the hydrostatic test if for each test sample there is no leakage of liquid from the package.

Leakproofness Test

Test Method: 49 CFR 178.813 Duration determined by time necessary to check for leaks.

Sample Number	Applied Pressure	Duration	Pass/Fail
IBC #1	20 kPa	30 min.	Pass

Pass/Fail Criteria

No leakage

Stack Test Weight (nestled)

Load = 1.8 x N
N = combined maximum permissible gross mass of number of IBC's intended to be stacked.
S= Number of IBC's stacked on top. S=1
Where: N = S x 3819.3 lbs.
Required applied weight = 6874.74 lbs.

Actual superimposed weight	7000.00	lbs.	3175.179	kg

Bottom Lift Test Weight

Load = 1.25 x Gross Mass
Required applied weight = 4774.12 lbs.

Actual applied load	4800.00	lbs.	2177.265	kg

Section 4 - Calculations

Capacity

Capacity of IBC:	281.387	gallons	1065.049	liters

Weight of Test Package

Steel Framework:	20865.6	grams	20.865	kg	46	lbs.
Steel Base with Pallet:	22226.4	grams	22.226	kg	49	lbs.
Inner Receptacle:	18144	grams	18.144	kg	40	lbs.
Closure and hardware:	1286.7	grams	1.286	kg	2.836	lbs.
Total:	62522.7	grams	62.522	kg	137.836	lbs.

Filled Test Package Weight

Weight of fill (100% full):	2230.498	lbs.	1011.747	kg
Weight of filled package:	2368.334	lbs.	1074.269	kg

Drop Test Height

Maximum specific gravity of certification:	1.6	
Packing group of certification:	II	
Drop height:	1.6	meters

Note: Drop Height was adjusted as per 178.810 (d) (3) (ii)

Marked Weight to Accommodate Actual Product

Weight of fill	3681.492	lbs.	1669.913	kg
Total tare weight	137.836	lbs.	62.521	kg
Weight of fill + Tare weight	3819.328	lbs.	1732.435	kg
Marked weight rounded down	3819.3	lbs.	1732	kg

Certified Weights

Certified actual product weight	3681.492	lbs.	1669.913	kg
Certified product weight + Tare weight	3819.328	lbs.	1732.435	kg
Certified gross weight (rounded down)	3819.3	lbs.	1732	kg

Section 5 - Drawings and Pictures of Packaging Components

ECOBULK
MX

Perfect for transport and storage.

- Approved for filling products of a maximum density of 1.9
- Perfectly suited for high bay warehousing
- Can be stacked up to 4-high
- Reinforced, warp resistant tubular steel grid jacket
- Additional corner guards to protect the inner container
- Available in a variety of equipment packages

In case of technical concerns or questions: ...@schuetz.net

SCHUTZ PACKAGING SYSTEMS

www.schuetz.net

Material

Inner bottle	Outer container
Extrusion blow-moulded HDPE	Welded tubular steel grid, galvanized
SMP protective barrier (optional)	Bottom plate
Additional UV and light protection of the filling product (optional)	To provide stability and to facilitate minimum residual contents from the inner container

Pallets (4-way entry)

steel frame | steel skid | plastic skid | full-plastic skid

Certifications

UN 31 HA1/Y (optional)
Maximum density 1.9 g/cm³

SCHÜTZ FOODCERT (optional)
System certification for food (contains materials that are FDA compliant)

Capacity

MX 640
640 litres (170 gal)

MX 820
820 litres (220 gal)

MX 1000
1,000 litres (275 gal)

MX 1250
1,250 litres (330 gal)

Filling opening

DN 150 with screw cap

DN 225 with screw cap

DN 400 with clamp-ring lid (only for MX 1000)

Outlet valves

Integrated butterfly valve DN 50, DN 80

Screwable butterfly valve DN 150

Integrated ball valve DN 50

Dimensions (mm)

MX 640
1,200 x 800 x 1,000 (L x W x H)

MX 820
1,200 x 1,000 x 1,000 (L x W x H)

MX 1000
1,200 x 1,000 x 1,160 (L x W x H)

MX 1250
1,200 x 1,000 x 1,350 (L x W x H)

Weight

MX 640
48 kg with plastic skid pallet

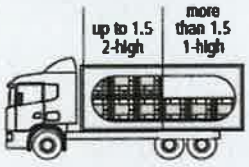
MX 820
51 kg with steel pallet
54 kg with plastic skid pallet

MX 1000
56 kg with steel pallet
59 kg with plastic skid
59 kg with full-plastic pallet

MX 1250
65 kg with steel pallet
68 kg with plastic skid pallet

Dynamic load

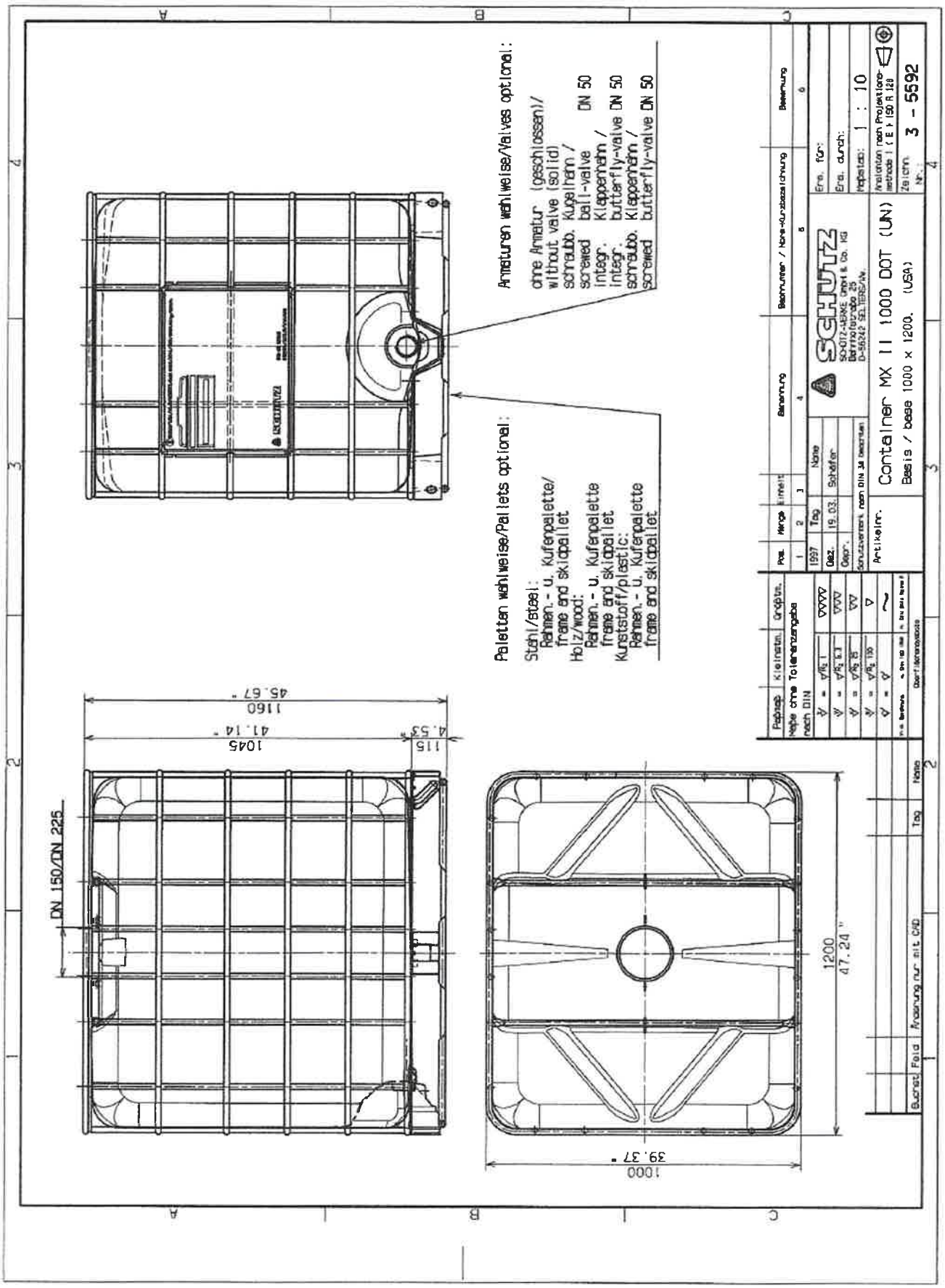
Filled ECOBULK according to the specific weight of the filling goods

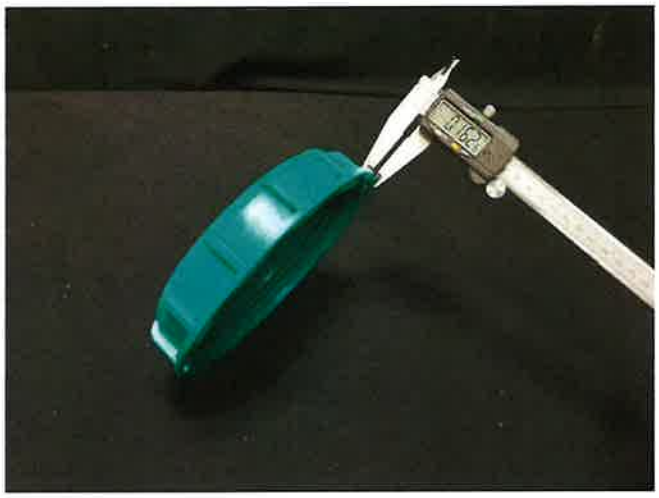


Static load

Max. 4-high

08/2023


Armaturen wahlweise/Valves optional:
ohne Armatur (geschlossen)/
without valve (solid)
schraubb. Kugelhahn /
screwed ball-valve DN 50
integr. Klappenahm /
integr. butterfly-valve DN 50
schraubb. Klappenahm /
screwed butterfly-valve DN 50
Paletten wahlweise/Pallets optional:
Stahl/Stael:
Rahmen - u. Kufenpalette/
frame and skidpallet
Holz/wood:
Rahmen - u. Kufenpalette
frame and skidpallet
Kunststoff/plastic:
Rahmen - u. Kufenpalette
frame and skidpallet
DN 150/DN 225
1160
45.67"
1045
41.14"
115
4.53"
1200
47.24"
1000
39.37"
SCHUTZ
SCHUTZ-WERKE GmbH & Co. KG
Container MX II 1000 DOT (UN)
Basis / base 1000 x 1200. (USA)
3 - 5592



Appendix A - Test Equipment and Instrumentation

Instrument or Equipment	Manufacturer	Model Number	Serial Number
Gram Scale	Mettler Toledo	PG4002-S	1122253714
Electronic Scale	American Scientific Products	TL-1600S	19538
Vibration Table	MTS	840	381A
Compression Tester	Tinius-Olsen	Electromatic	62560
Digital Micrometer	Mitutoyo	Digimatic	29376130
Mechanical Micrometer	Mitutoyo	MIC	LFM-1
Puncture Tester	TMI	A942	A942
Conditioning Chamber #2	Midwest Labs	922A	55455
Conditioning Chamber #6	Thermotron	SM-16C	23409
Conditioning Chamber #12	Thermotron	SM-16C	23408
Conditioning Chamber #16	Thermotron	SM-32C	42371
Drop Hook	Vestil	LM-HP	N/A
Fork Lift	Caterpillar	GC25K	AT 82C-90656
Fork Lift	Allis Chalbers	ACC40 PS	ALF111630

Calibration reports, certifications or additional information available upon request.

Appendix B - Definitions / Abbreviations / Conversions

Definitions

Proprietary – Customer was unable to obtain the required data or the MFG refused to provide this data due to trade secrets.

Types of Fiberboard: Single - wall **(SW)**, Double - wall **(DW)**, Triple - wall **(TW)**

Abbreviations

MD - Machine direction
CMD - Cross direction
N/A - Not applicable
N/T - Not tested
N/I - Not indicated
DNA - Does not apply
MSF – 1000 square feet
B/A – Board analysis

Conversions

1 gallon water = 8.344 lbs.
1 mm = 25.4 inches
1 kg. = 2.2046 lbs.
1 ounce = 28.349 grams
meters^3 = 0.028 ft^3
1 fl. Oz. = 29.573 cc
mils = inches / 0.001
1 meters = 39.369 inches
1 meters = 3.28 feet
1 lbs. = 453.6 grams
1 gal = 3.785 liters