TEN-E Packaging Services, Inc.

UNITED NATIONS / DOT PERFORMANCE CERTIFICATION

GREIF

31HA1 PERIODIC DESIGN REQUALIFICATION

330 Gallon Cross-Bottled Composite IBC with Greif GCube Bottle, Schuetz Cage, Corner Protectors, 6” Cap (EPDM Gasket), Butterfly Valve

TEST REPORT #: 24-MN40020

un 31HA1 / Y / * / USA / M*** / 3855 / 2047

* Insert the month and year (last two digits) of manufacture
M***, Insert Manufacturer’s Registered Symbol

TESTING PERFORMED FOR:

GREIF Packaging LLC
366 Greif Parkway
Delaware, OH 43015

ATTN: John Foryt

TESTING PERFORMED BY:

TEN-E PACKAGING SERVICES, INC.
1666 County Road 74
Newport, MN 55055
Phone: 651-459-0671
Fax: 651-459-1430

February 8, 2024

TABLE OF CONTENTS

NOTES AND COMMENTS

The test data in this report may be used by the assembler of the given repaired or remanufactured IBC design type for self-certification of the UN marked container. Each service provider (assembler) must insert the appropriate manufacturer's registered symbol (or other applicable identification information) in the UN mark. Failure to include this information within the UN marking may render the certification invalid.

This report documents the testing of the 330 gallon design. Smaller versions of this design may be authorized based on the definition of a different design type under 49 CFR §178.801(c)(7). Below is the calculated authorized gross mass for a 275 gallon version of this design.

275 Gallon Greif GCube Bottle with Schuetz Cage with Corner Protectors	
UN MARKING (275 Gallon IBC):	(un) 31HA1 / Y / ** / USA / M**** / 3855 / 1689
PACKAGING IDENTIFICATION CODE:	31HA1 (178.707 Composite IBC)
PERFORMANCE STANDARD:	Y (Packaging meets Packing Group II and III tests)
MONTH AND YEAR OF MANUFACTURE:	**
STATE AUTHORIZING ALLOCATION OF THE MARK:	USA
MANUFACTURER'S REGISTERED NUMBER:	M****, Insert Manufacturer's Registered Number
STACKING TEST LOAD:	3,855 Kg (8,500 Lbs.)
MAXIMUM PERMISSIBLE GROSS MASS:	1,689 Kg (3,724 Lbs.)
INFORMATION FOR CALCULATION:	• **Capacity:** 1041 Liter • **Tare Weight:** 57 Kg • **Specific Gravity:** 1.6

SECTION I: CERTIFICATION

PERIODIC DESIGN REQUALIFICATION of the Greif 330 Gallon Cross-Bottled Composite IBC with Greif GCube Bottle, Schuetz Cage, Corner Protectors, 6" Cap (EPDM Gasket), Butterfly Valve

TEN-E Packaging Services, Inc. is a current DOT UN Third-Party Certification Agency under §107.403 and certifies that the **Greif Packaging LLC** 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	49 CFR REFERENCE	TEST LEVEL	TEST CONTENTS	TEST COMPLETED	TEST RESULTS
Vibration	178.819	3.3 Hz – 1 Hour	Water	February 5, 2024	PASS
Bottom Lift	178.811	2,694.9 Kg	Water	February 5, 2024	PASS
Stacking	178.815	3,855.6 Kg – 24 Hours	Water	February 6, 2024	PASS
Leakproofness	178.813	20 kPa – 10 Minutes	Empty	February 7, 2024	PASS
Hydrostatic	178.814	70 kPa – 10 Minutes	Water	February 7, 2024	PASS
Drop	178.810	1.6 m	Methanol/Water Solution	February 8, 2024	PASS

TEST REPORT NUMBERS:	24-MN40020, 19-MN40108
UN MARKING: (CFR 49 – 178.703)	(un) 31HA1 / Y / * / USA / M*** / 3855 / 2047
PACKAGING IDENTIFICATION CODE:	31HA1 (178.707 Composite IBC)
PERFORMANCE STANDARD:	Y (Packaging meets Packing Group II and III tests)
MONTH AND YEAR OF MANUFACTURE:	*
STATE AUTHORIZING ALLOCATION OF THE MARK:	USA
PACKAGING CERTIFICATION AGENCY:	(+AATEN-E Packaging Services, Inc. (Newport, MN CAA #2006030022)
SYMBOL OF THE MANUFACTURER:	M****
STACKING TEST LOAD:	3,855.6 Kg (8,500.0 Lbs.)
MAXIMUM PERMISSIBLE GROSS MASS:	2,047.0 Kg (4,513.9 Lbs.)
PERIODIC DESIGN REQUALIFICATION DATE:	February 8, 2025
ADDITIONAL REQUIRED RIGID PLASTIC & COMPOSITE IBC MARKINGS (CFR 49 – 178.703(b)):	
RATED CAPACITY AT 20ºC (liters):	Insert Rated Capacity of IBC in Liters
TARE MASS (Kg):	Insert Individual IBC Tare Mass
GAUGE TEST PRESSURE (kPa):	70 kPa
DATE OF LAST LEAKPROOFNESS TEST:	Insert Month & Year of Last Leakproofness Test
DATE OF LAST INSPECTION:	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 **Greif Packaging LLC** for services rendered. In the event of future changes to the above referenced test standards, it is the responsibility of **Greif Packaging LLC** 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:
Greif Packaging LLC
366 Greif Parkway
Delaware, OH 43015

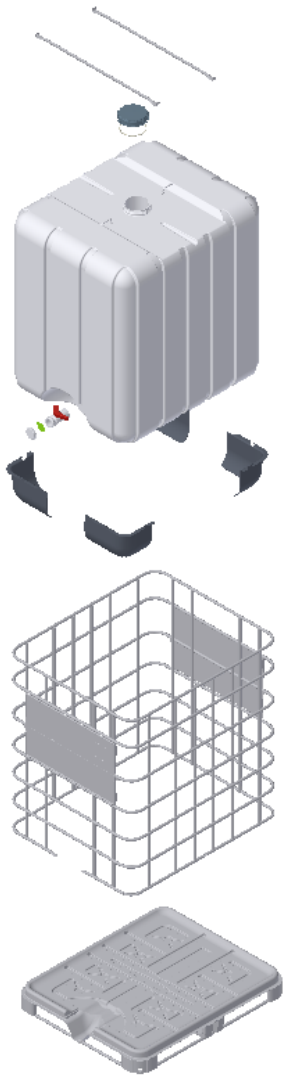
Oscar Mejia
Technician
TEN-E Packaging Services, Inc.
1666 County Road 74
Newport, MN 55055

Larry J. Anderson
Manager, Technical Services
TEN-E Packaging Services, Inc.
1666 County Road 74
Newport, MN 55055

SECTIONS II & V: PACKAGING DESCRIPTIONS / COMPONENT DRAWINGS

330 Gallon Cross-Bottled Composite IBC with Greif GCube Bottle, Schuetz Cage, Corner Protectors, 6” Cap (EPDM Gasket), Butterfly Valve

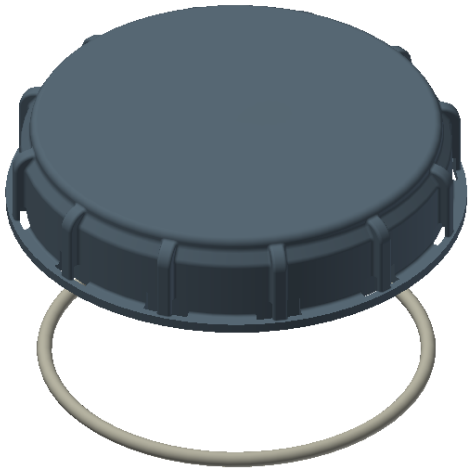
ASSEMBLY DRAWING

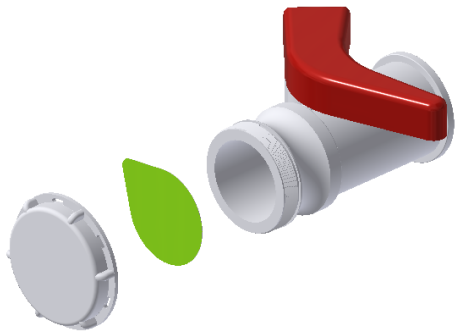


TEST LEVELS

Certification Type:		Periodic Design Requalification	
Packaging Code Designation:		31HA1	
Packing Group:		II	
Specific Gravity:		1.6	
Test Pressure:		70 kPa	
TEST SAMPLE PREPARATION (Refer to Section IV)			
Overall IBC Tare Weight: (Sample #1 and Sample #2)		64.0 Kg	141.1 Lbs.
Net Fill Weight (98% Maximum Capacity):			
Water	(Sample #1)	1,270.1 Kg	2,800.1 Lbs.
Methanol/Water	(Sample #2)	1,218.2 Kg	2,685.7 Lbs.
IBC Test Weight:			
Water	(Sample #1)	1,334.1 Kg	2,941.1 Lbs.
Methanol/Water	(Sample #2)	1,282.2 Kg	2,826.7 Lbs.
Maximum Permissible Gross Mass:		2,096.1 Kg	4,621.0 Lbs.
CLOSING METHODS			
6” Fill Port Cap:			
Application Torque:		65 Ft-Lbs.	
Equipment:		Torque Wrench #742	
Dispensing Valve:			
Application Method:		Installed by Manufacturer	
Refer to Appendix A for Manufacturer’s Closure Instructions			

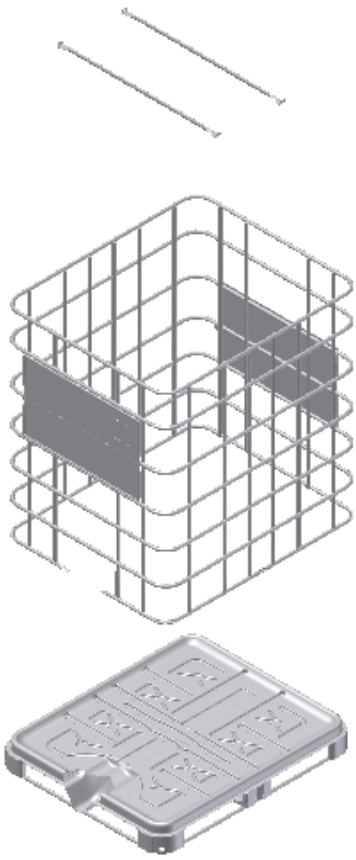
COMPONENT INFORMATION

6” THREADED CAP (CLSC00041GG20001)		DRAWING
Manufacturer: Greif, Italy		
Description:	6” Threaded Fill Port Cap	
Material:	High Density Polyethylene, Black	
Tare Weight:	139 Grams	
Overall Dimensions:		
• **Height**	42.52 mm (1.674”)	
• **Top Diameter**	161.77 mm (6.369”)	
• **Bottom Diameter**	182.98 mm (7.204”)	
Thread Dimensions (to Bottle):		
• **Major Diameter**	163.27 mm (6.428”)	
• **Minor Diameter**	154.56 mm (6.085”)	
Markings (QC Audit):	GC 2A 9/23 SPI “2” HDPE Recycling Symbol	
GASKET		
Description:	Tan EPDM Gasket	
Tare Weight:	11 Grams	
Thickness:	6.90 mm (0.272”)	
Diameter:	156.0 mm (6.142”)	

DISPENSING VALVE		DRAWING
Manufacturer: Greif, Alsip, IL		
BUTTERFLY VALVE		
Description:	2” Integrated Butterfly Valve	
Material:	High Density Polyethylene, White with Red Glass filled Polypropylene Handle	
Tare Weight:	N/A	
Overall Dimensions:		
• **Length**	98.50 mm (3.878”)	
• **Width/Diameter**	79.17 mm (3.117”)	
• **Height**	124.58 mm (4.905”)	
Thread Dimensions	**To Accommodate Closure**	
• **Major Diameter**	63.34 mm (2.494”)	
• **Minor Diameter**	61.36 mm (2.416”)	
Markings (QC Audit):	GC 311-23	
VALVE CLOSURE		
Description:	2” NPS Threaded Valve Closure	
Material:	Polyethylene, White	
Tare Weight:	17.723 Grams	
Overall Dimensions:		
• **Height**	15.67 mm (0.617”)	
• **Diameter**	77.27 mm (3.042”)	
Thread Dimension:		
• **Major**	63.81 mm (2.512”)	
• **Minor**	61.98 mm (2.440”)	
Seal:	Laminated Foil Induction Seal	
Markings (QC Audit):	5/23 1 SPI “2” PE-HD Recycling Symbol	

RIGID PLASTIC INNER RECEPTACLE		DRAWING
Manufacturer: Greif, Houston, TX		
Description:	330 Gallon Rigid Plastic Inner Receptacle with: • 6” Buttress Threaded Top Opening • Integrated Dispensing Valve - Bottom	
Material:	High Density Polyethylene, Natural, GBC3	
Method of Manufacture:	Blow Molded	
Tare Weight:	18.5 Kg (with Valve)	
Capacity:		
• **Rated**	330 Gallons	
• **Overflow**	342.4 Gallons (1,296.0 Liters)	
Overall Dimensions:		
• **Length**	1,155.70 mm (45-1/2”)	
• **Width**	965 37 mm (38-1/8”)	
• **Height**	1,231.90 mm (48-1/2”)	
6” Fill Port Opening Thread Dimensions:		
• **Major Diameter**	159.28 mm (6.271”)	
• **Minor Diameter**	151.43 mm (5.962”)	
• **Neck Height**	31.62 mm (1.245”)	
2” Dispensing Valve Opening Thread Dimensions:		
• **Major Diameter**	74.09 mm (2.917”)	
• **Minor Diameter**	68.52 mm (2.698”)	
Wall Thickness:	1.5 mm (Nominal)	
Markings (QC Audit):	(un) 31HA1 GBC USA GBC23 HOU 01 1/24 01/13/24 04:19:45 SPI “02” PE-HD Recycling Symbol	
CORNER SUPPORT INSERTS		
Description:	(4) Plastic Corner Supports	
Material:	Polyethylene, Black	
Tare Weight:	274 Grams	
Overall Dimensions:	13-1/2” (L) x 10” (W) x 8” (H)	
Markings (QC Audit):	SCHUTZ 35.2 SPI “2” HD-PE Recycling Symbol	

OUTER RECEPTACLE AND PALLET		DRAWING
Manufacturer: Schütz, North Branch, NJ		
SUPPORT BARS		
Material:	(2) Galvanized Steel Oval Shaped Top Support Bars	
Tare Weight:	414 Grams (Each)	
Length:	965.20 mm (38”)	
Attachment Method:	(2) Star Head Screws Per Bar	
CAGE		
Description:	Galvanized Steel Cage With • (2) Front and Rear Steel Panels Secured with Clips & (2) Side Steel Panels Secured with Clips • Galvanized Steel Tubular Style Bars • Galvanized Steel Plate • 4-Way Entry Galvanized Steel Frame Pallet	
Material:	Galvanized Steel Cage and Pallet	
Tare Weight:	43.0 Kg (Includes Cage, Plate, Pallet)	
Dimensions:		
• **Length**	1,200.15 mm (47-1/4”)	
• **Width**	1,003.30 mm (39-1/2”)	
• **Height w/o Pallet**	1,241.42 mm (48-7/8”)	
• **Height with Pallet**	1,355.72 mm (53-3/8”)	
Attachment Method:	(9) Star Head Screws (1) each corner (1) each centered on two sides and back (1) each side of recessed area for outlet flange	
Markings (QC Audit):	SCHUTZ ECOBULK / RECOBUL 12/4 1K1	



SECTION III: TEST PROCEDURES AND RESULTS

VIBRATION TEST

TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Water	• An IBC passes the vibration test if there is no rupture or leakage. (§178.819)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	Ambient	
TABLE DISPLACEMENT:	1”	
TEST FREQUENCY:	3.3 Hz	
TEST DURATION:	1 Hour	
TEST EQUIPMENT:	Vertical motion using L.A.B. 10000 Transportation Simulator	

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

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

BOTTOM LIFT TEST

TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Water	
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	Ambient	
NUMBER OF LIFTS:	8 (Four-Way Entry with 2 Lifts per Direction of Entry)	• 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)
FORK TINE PENETRATION:	Entry 1 & 2: 36” Entry 3 & 4: 30”	
COMBINED GROSS MASS LIFTED:	2,694.9 Kg (5,941.2 Lbs.) (Refer to Section IV)	
TEST EQUIPMENT:	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
			

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

STACKING TEST

TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Water	• 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)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	Ambient	
TEST LOAD APPLIED:	3,855.6 Kg (8,500 Lbs.) (Refer to Section IV)	
TEST DURATION:	24 Hours	
TEST EQUIPMENT:	L.A.B. G23077 Compression System	

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

Results	Comments/Observations
PASS	The IBC met the criteria for passing the test. 0.01” maximum deflection after 24 Hours. No leakage.

LEAKPROOFNESS TEST

TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Empty	• 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)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	Ambient	
TEST PRESSURE:	20 kPa	
TEST DURATION:	10 Minutes	
AREA OF PRESSURIZATION:	Through Top Head	
TEST EQUIPMENT:	Regulated Air Source #: 2 Pressure Gauge #: 615 & 641	

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

Set-Up Photo	Leakproofness Photo	Leakproofness Photo
		

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

HYDROSTATIC PRESSURE TEST

TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Water	• 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)
WATER TEMPERATURE:	20.2°C (68.4°F)	
FILL CAPACITY:	Maximum Capacity	
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	Ambient	
TEST PRESSURE:	70 kPa	
TEST DURATION:	10 Minutes	
AREA OF PRESSURIZATION:	Through Top Head	
TEST EQUIPMENT:	Regulated Water Source #: 2 Pressure Gauge #: 615 & 641	

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

Set-Up Photo	Hydrostatic Pressure Photo	Hydrostatic Pressure Photo
		

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

DROP TEST

TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Methanol/Water Solution (0.964 SG)	• 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. • The IBC shall be capable of being lifted by an appropriate means until clear of the floor for five minutes. • A slight discharge from closures upon impact is not considered a failure provided that no further leakage occurs. (§178.810)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	-18°C (0°F) Chamber #202	
TEST CONTENTS TEMP.:	-18.3°C (-0.9°F)	
DROP HEIGHT:	1.6 Meters (63”) (Refer to Section IV)	
DROP ORIENTATION:	Most Vulnerable Part of Base	
TEST EQUIPMENT:	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. Deformation seen to the bottle and pallet upon impact.

REGULATORY AND INDUSTRY STANDARD REFERENCES

REGULATORY REFERENCES			
TEST	**49 CFR①**	**UN②**	**IMDG③**
	October 2023 Edition	**23rd Edition**	**2022 Edition**
Vibration:	178.819	6.5.6.13	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:	ASTM④ D7387:	Standard Test Method for Vibration Testing of IBCs Used for Shipping Liquid Hazardous Materials (Dangerous Good)
	ISO⑤ 2247:	Packaging – Complete, Filled Transport Packages – Vibration Test at Fixed Low Frequency
Stacking:	ASTM④ D8409:	Standard Guide for Conducting Stacking Tests on UN Packagings Using Guided or Unguided Loads
	ASTM④ D4577:	Standard Test Method for Compression Resistance of a Container Under Constant Load
	ISO⑤ 2234:	Packaging – Complete, Filled Transport Packages – Stacking Test using Static Load
Pressure:	ASTM④ D8134:	Standard Guide for Conducting Internal Hydrostatic Pressure Tests on United Nations (UN) IBC Design Types
Drop:	ASTM④ D5276:	Standard Test Method for Drop Test of Loaded Containers by Free Fall
	ASTM④ D7790:	Standard Test Method for the Preparation of Plastic Packagings Containing Liquids for United Nations (UN) Drop Testing
	ISO⑤ 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:	**64.0**	**Kg**	**141.1**	**Lbs.**
Overall IBC Tare Weight (IBCTW)-Sample 2:	**64.0**	**Kg**	**141.1**	**Lbs.**
Overflow Capacity (OFC):				
Water	**1,296.0**	**Kg**	**2,857.2**	**Lbs.**
Methanol/Water	**1,243.0**	**Kg**	**2,740.3**	**Lbs.**
Actual Load Applied for Bottom Lift (BLALA):	**1,360.8**	**Kg**	**3,000.0**	**Lbs.**
Packing Group	**II**			
Product Specific Gravity (PSG):	**1.60**		**Min Wt To Be Applied**	
Packing Group Multiplication Factor (MF):	**1.00**		2,834.9	Lbs. (Btm Lift)
# of IBC Stacked During Transportation (#IBC):	**2**			

98% OF OVERFLOW

Overflow Capacity (OFC) x 98%

OFC	x	98%					
1,296.0	x	98% =	**1,270.1**	**Kg**	**2,800.1**	**Lbs. Water**	Sample #1
1,243.0	x	98% =	**1,218.2**	**Kg**	**2,685.7**	**Lbs. Methanol/Water**	Sample #2

IBC TEST WEIGHT (IBCW)

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

IBCTW	+	98% OFC =					
64.0	+	1,270.1	**1,334.1**	**Kg**	**2,941.1**	**Lbs. Water**	Sample #1
64.0	+	1,218.2	**1,282.2**	**Kg**	**2,826.7**	**Lbs. Methanol/Water**	Sample #2

AUTHORIZED IBC GROSS MASS (AIBCGM)

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

IBCTW	+	(PSG	x	98% OFC)		
64.0	+	1.60	x	1,270.1		
		2,096.1	**Kg**	**4,621.0**	**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

AIBCGM	x	1.25	=	Minimum Required Load			
2,096.1	x	1.25	=	**2,620.3**	**Kg**	**5,776.6**	**Lbs.**

Combined Gross Mass Lifted

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

IBCW	+	ALA	=	Total Load Lifted			
1,334.1	+	1,360.8	=	**2,694.9**	**Kg**	**5,941.2**	**Lbs.**

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

AIBCGM	x	#IBC (-1)	x	1.8	=	Minimum Required Load			
2,096.1	x	1.00	x	1.8	=	**3,773.2**	**Kg**	**8,318.3**	**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**
1.60	x	1.00		**Required Drop Height**	**Actual Drop Height**
		1.60	**Meter**	**63.0 Inches**	**63 Inches**

APPENDIX A: MANUFACTURER'S CLOSURE INSTRUCTIONS

GREIF
PACKAGING SUCCESS TOGETHER™

IBC CLOSURE NOTIFICATION

Country: USA

DOT Regulations in 49 CFR 178.2 (c)(1) require that Greif Packaging LLC provides a closure notification statement on 31HA1 composite IBCs, including inner receptacles and service equipment. For non-UN inner receptacles, the following closure notification also applies.

CLOSURE NOTIFICATION STATEMENT

- Top openings in Greif UN IBC's must be fitted with 6" or 9" caps and gaskets supplied by Greif, Inc.
- 6" threaded top closures are to be torqued to the following based on the gasket:
  - EPDM gaskets = 65 ft-lbs
  - SBR and Santoprene gaskets = 45 ft-lbs
  - Viton gaskets = 75 ft-lbs
- 9" threaded top closures must be torqued to 85 ft-lbs
- Plugs in both cap sizes must be torqued to the following:
  - 2" NPT and Buttress plugs = 20 ft-lbs
  - 3/4" plugs inside 2" plugs = 9 ft-lbs
  - 3/4" manual vent plugs from Stainlez = 2 ft-lbs.
- Representative service equipment in the form of a bottom Greif Italy plastic collar valve must be tightened to a torque of 40 ft-lbs minimum. All other plastic collar valves and metal collar valves must be tightened to a torque of 50 ft-lbs minimum.
  - For valve installation, the starting orientation of the valve handle should approximately be at the 11 o'clock position.
  - Once the valve is in position, hand tighten the collar until gasket contact occurs. Confirm the valve is approximately at the 11 o'clock position before proceeding with the required torque application.
  - The required torque should be obtained when the handle is prior to or at the 12 o'clock position.
  - If torque is reached prior to the handle being at the 12 o'clock position, the valve handle must be adjusted clockwise to the 12 o'clock position; additional torque may be applied to level valves that do not reach the 12 o'clock position with the required torque application.
  - Should the valve orientation pass the 12 o'clock position prior to reaching required torque, loosen valve and reposition prior to re-starting the installation process.
- 2" weld on valves have no closing torque required.

NOTE: The filler is responsible for verifying closing torque on all closures and valves that are pre-installed. Greif completes testing to the minimum of the stated ranges for all closures where applicable.

Rigid Industrial Packaging & Services
366 Greif Parkway – Delaware, Ohio 43015

Corporate Office
425 Winter Road – Delaware, Ohio 43015
www.greif.com

Product Type: IB2

May 4, 2021 – rev0

GREIF
PACKAGING SUCCESS TOGETHER™

LEAKPROOFNESS TESTING STATEMENT

Greif Packaging LLC manufactures composite IBCs that are compliant with all applicable regulatory requirements in 49 CFR for the design types marked as 31HA1. Greif applies a UN mark to every inner receptacle manufactured in its North America facilities that is compliant with DOT regulations, including 49 CFR 178.703.

Every inner receptacle manufactured by Greif in North America is visually inspected and leakproofness tested in compliance with 49 CFR 178.813. For inner receptacles sold with representative service equipment preinstalled, i.e. bottom discharge valve, every unit is visually inspected and leak-tested with the valve in place, and the leakproofness testing date, as performed by Greif on its inner receptacles.

The remanufacturer or service provider who installs Greif inner receptacles in structural equipment is responsible for the full UN mark, in accordance with the test report, on rebottled or remanufactured units.

Rigid Industrial Packaging & Services
366 Greif Parkway – Delaware, Ohio 43015

Corporate Office
425 Winter Road – Delaware, Ohio 43015
www.greif.com