



MSD-95 "MOMENTUM" Container

The Otto Multi-System Design MSD-95 "Momentum" rollout container consists of injection-molded, high density polyethylene plastic body, hinged lid, two (2) hinge pins, two (2) plastic wheel assemblies, and a solid steel axle.

The Otto MSD-95 Momentum rollout refuse container is compatible with fully automated arm lifter systems and standard, semi-automated bar lifter systems.

This container complies with ANSI Z245.30-2008 and ANSI Z245.60-2008 standards for Container Safety and Compatibility Requirements.

VOLUME CAPACITY:

The total actual volume of the Otto MSD-95 Momentum container is 103.6 gallons (per ANSI Z245.30-2008, Appendix A, Volumetric Loading Capacity).

Base: 98.5 gal Lid: 5.1 gal

LOAD RATING:

Per the ANSI Z245.30-2008 Standard, the Otto MSD-95 Momentum rollout refuse container is capable of accommodating a load of 335 lbs.

WEIGHT:

The completed assembly weight of the Otto MSD-95 Momentum container is 35.7 lbs. when equipped with Otto's 10" injection molded wheels. Other wheel options are also available.

DIMENSIONS:

Loading Height: 41.60"
Overall Height: 42.80"
Overall Width: 29.50"
Overall Depth: 34.18"
Minimum Grip Diameter: 28.7"



CONTAINER BODY:

The Otto MSD-95 Momentum Container Body is injection-molded from High Density Polyethylene (HDPE). The container body has smooth surfaces both on the interior and exterior. The interior is free of crevices and recesses where refuse could become trapped, in order to allow complete emptying. The average wall thickness is 0.15" on the container sidewalls and 0.15" on the bottom section. The high-density polyethylene has a density of 0.945 to 0.954 grams cm³. The Melt Index (MI) of the HDPE is 3.5 to 6.0.

The top of the container body is reinforced with a rim around its entire perimeter. This feature adds structure and stability to the Otto MSD-95 Momentum container and provides a flat surface for the lid to close on. The top of the rim has a rain lip to prevent water from entering the container with the lid closed. The handles are integrally molded into the container body at the top rim. The underside of the rim is reinforced with a total of thirty-two (32) integrally molded-in gussets spaced around the entire circumference of the container.

The front of the container has a molded recess that provides for the front "catch," or lower lift, bar. The Otto MSD-95 Momentum container is with a 1" rotating steel catch bar with spring clips that allow for easy installation and prevent the bar from coming out in use. The steel catch bar is factory-installed and captured through structural external ribs molded into the container Body. The clip-style metal catch bar is freely rotating, 1" OD (outside diameter) roll-formed steel with HDPE endcaps. The wall thickness of this bar is .050", hot rolled steel with an iron zinc clear chromate top coat shielding for corrosion protection.

The bottom of the container has dual molded in wear ridges that extend both around its perimeter and around the center of the container bottom. The wear ridges provide additional protection against abrasive wear if the container is slid on asphalt or pavement and improve impact resistance of the bottom of the container. There is a recessed area molded above the middle of the axle which allows a person's foot to be placed directly upon the axle to allow the container to be easily tilted, even with a full load.

The inside bottom of the Otto MSD-95 Momentum container has a cylindrical-shaped energy absorbing detail, approximately 7" in diameter, integrally molded into its floor. This detail has been engineered to protect the floor of an empty container from impact when being loaded with heavy objects.

The Otto rollout container has an integrally molded front upper attachment dual rib form to facilitate semi-automated lifting. This feature meets all ANSI compatibility dimensions for semi-automated tipper designs.

Otto containers are designed for nesting and easy stacking for shipment and storage. Stacking ribs are molded onto the exterior of the top rim to prevent containers from becoming wedged together during shipment. The 95 Momentum MSD cart introduces a new standard for freight efficiency, with 728 containers in a 53' truckload.



The weight of the container body is 25.5 lbs. This weight does not include any other components.

LID:

The Otto MSD-95 Momentum container Lid is injection- molded from HDPE and is attached to the container body using two (2) HDPE snap-lock hinge pins. The lid rotates freely about the hinge a full 270 degrees. The lid, when closed, rests on the top rim of the container body, providing a secure tight fit around the entire perimeter between the lid and base. This prevents rain, insects and vermin from entering the container, as well as preventing the escape of most odors when the lid is closed.

The lid is molded with a hand-hold lip that extends across the full width of the front of the lid and wraps around both corners. This allows the lid to be easily opened from three sides without contact with refuse or residue.

The Otto MSD-95 Momentum lid attachments are cylindrical-shaped and double-ribbed, creating an extremely robust attachment to the container body. The locking mechanism for the lid hinge pin, which is inserted into the attachments, is retained beneath a molded-in step feature within the lid.

The minimum material thickness in the lid is 0.12".

The weight of the lid is 4.35 lbs.

HINGE PIN:

The Otto MSD-95 Momentum lid Hinge Pins are injection-molded from HDPE. The hinge pins secure the lid to the integrally molded lid hinge and handle detail. Two (2) hinge pins are used to secure the lid. The hinge pins are installed at the factory using a rubber mallet. At installation, the truncated conical center portion of the hinge pin compresses and snaps into the open slot in each side of the handle detail. This prevents vandalism and securely fastens the lid to the container base. The hinge pins can be removed with a special tool available from Otto.

LID HINGE AND HANDLE DETAIL:

The Otto MSD-95 Momentum Lid Hinge is integrally molded to the container body and lid. The diameter is 1.2" and provides 1.8" clearance for gloved hands.

AXLE:



The Otto MSD-95 Momentum machined solid steel Axle has a 3/4" diameter. The axle is zinc plated to protect against rust and corrosion. The diameter of the axle allows the container to be easily rolled on any surface and supports a fully loaded container. The axle will withstand a 375-lb. load without permanent deformation. The weight of the axle is 2.8 lbs.

WHEELS:

The Otto MSD-95 Momentum container may be ordered with multiple types of 10" wheels. The standard wheel is an injection molded snap-on wheel with integral spacer.

MARKINGS:

All Otto MSD-95 Momentum carts are hot stamped with a unique sequenced serial number to facilitate distribution and control. The customer's name or logo can be hot stamped on the container's body or lid. The containers are permanently marked with the month and year of production, mold number, material identification, patent number, model, and manufacturer's insignia.

WORKMANSHIP:

The Otto MSD-95 Momentum plastic material — high-density polyethylene — is manufactured from virgin raw materials by major petrochemical companies, (e.g., Exxon, Chevron-Phillips, Dow) and includes no recycled or regenerated plastic or foreign material. Up to 50% recycled material (PCR) content may be available upon request on particular colors, where suitable PCR feedstock is available.

COLOR:

Otto's standard colors are Dark Blue, Cobalt Blue, Kelly Green, Forest Green, Dark Gray, Light Gray, Brown, and Black. Other colors are also available.

All injection-molded parts are specifically prepared to be colorfast so that the plastic appearance does not alter appreciably in normal use. Due to the use of UV (ultraviolet) stable pigments and the injection molding process, Otto containers have excellent color fastness.



UV LIGHT STABILIZATION:

The Otto MSD-95 Momentum container is stabilized against ultraviolet degradation with 0.3% (3000 PPM) Tinuvin 783 HALS UV additive by weight and provides product viability for a minimum of 10 years of outdoor exposure. Otto has been using this HALS formulation for 25+ years with excellent performance well beyond 10 years.

RECYCLABILITY:

The Otto MSD-95 Momentum container is produced with a fully recyclable thermoplastic High Density Polyethylene (HDPE) resin. This allows the material to be recycled and reused after the useful life of the container has been exceeded.

QUALITY ASSURANCE PROCEDURES AND PERFORMANCE TESTING:

The MSD-95 Momentum Container is designed to withstand the following series of performance tests. The performance test requirements were designed to simulate the type of situations encountered in actual use. The severity of some tests was scaled to anticipate an expected 10-year life.

<u>Test Description</u>	<u>Test Requirements</u>
Semi-Automated Lifter Life Cycle	ANSI Z245.30-2008
Fully-Automated Lifter Life Cycle	ANSI Z245.30-2008
Drop Test (300 Lb. @ 12 Feet)	10 Drops without Damage
Wind Test	See 3 rd party wind resistance testing
Upper Attachment Pull Test	Ductile Performance
Durability During Pulling Test	ANSI Z245.30-2008

The following Quality Assurance tests are performed according to ASTM procedures.

Material Testing

1. Melt Flow Index Test: To check that the polymer batch matches the supplier certification. This is testing procedure ASTM D1238.
2. Colorant Color Match: Compare lot based color chips to the color chip master to ensure consistency.



In-Process Quality Tests

1. Drop Test: Cart is raised 12' under load and dropped 4 times consecutively with inspection after each drop. This confirms ductile entire body performance.
 - a. 95 gallon- 300 lbs payload is used.
2. Upper Attachment Pull Test- Confirms ductile body performance
3. Bar Pull Test: Bar pulled to failure. Confirms ductile body performance in lower bar region.
4. Fit Checks: Mating components (axle, lift bar, lid) installed onto carts after cooled to ensure proper fit, form & function.
5. Weight & Thickness Checks: Evaluates molding process.

All designs, specifications, and components are subject to change at the manufacturer's sole discretion at any time without notice. Data published herein is informational in nature and shall not be construed to warranty suitability of the unit for any particular purpose as performance may vary with the conditions encountered.

TEST REPORT

TEST DATE: 18 April 2019

SUBJECT: ANSI Z245.30 – 2008 TESTING

PRODUCT TESTED: THE OTTO MOMENTUM - 95 GALLON MSD ROLLOUT CART

TEST: **APPENDIX A – VOLUMETRIC LOADING CAPACITY FOR CARTS**

TEST DESCRIPTION: This test determines the carts load capacity for the body and lid.

TEST PROCEDURE – (Conforms to ANSI Z245.30-2008 – APPENDIX A – TANK METHOD)

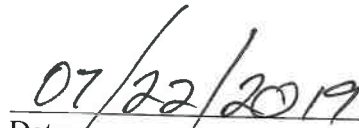
1. The cart is placed empty in a tank with sufficient capacity to receive the cart and to permit the cart to be positioned level.
2. The container and cart are simultaneously filled with water at standard temperature city water.
3. The water flowing into the cart is measured by flow meter to an accuracy of $\pm 2\%$ of the cart capacity (± 0.7 gal).
4. Position the lid level and fill with standard temperature water measuring the flow with a flow meter.

TEST RESULTS:

Cart Capacity = **98.5** gallons

Lid Capacity = **5.1** gallons


F. L. Patterson
Consulting Engineer
4915 Sadie's Place
Wingate, NC 29174


Date

TEST REPORT

TEST DATE: 23 April 2019

SUBJECT: ANSI Z245.30 – 2008 TESTING

PRODUCT TESTED: THE OTTO MOMENTUM - 95 GALLON MSD ROLLOUT CART

TEST: **APPENDIX B – SLOPE STABILITY TEST METHOD FOR CARTS**

TEST DESCRIPTION: This test checks the carts stability on a 5° concrete slope.

MINIMUM PERFORMANCE STANDARD: The cart must stand in any direction – minimum of three different orientations.

TEST PROCEDURE – (Conforms to ANSI Z245.30-2008 – APPENDIX B)

1. The cart is tested in both the empty and loaded conditions. The loaded condition conforms to the ANSI standard = 340 pounds with the volume of material occupying at least 70% of the total capacity of the cart. The actual load was 340 pounds.
2. Place the cart on a 5° inclined surface and verify stability by observation.
3. Rotate the cart 180° and re-verify stability.
4. Rotate the cart 90° and re-verify stability.

TEST RESULTS:

<u>Test Condition</u>	<u>Result</u>
Loaded	Stable all three orientations.
Unloaded	Stable all three orientations.

SUMMARY: The cart **PASSED** the requirements of ANSI Z245.30-2008 APPENDIX B



F. L. Patterson
Consulting Engineer
4915 Sadie's Place
Wingate, NC 29174



Date

TEST REPORT

TEST DATE: 18 April 2019

SUBJECT: ANSI Z245.30 – 2008 A TESTING

PRODUCT TESTED: THE OTTO MOMENTUM - 95 GALLON MSD ROLLOUT CART

TEST: **APPENDIX C - DURABILITY DURING PULLING (CURB TEST)**

TEST DESCRIPTION: This test determines whether the cart's handles, wheels, and axles will withstand the repeated forces experienced during normal 10-year useful life.

MINIMUM PERFORMANCE STANDARD: ANSI Z245.30-2008 APPENDIX C requires that after testing the handles, wheels, axles, their attachments to the container, and the container itself must remain functional.

TEST PROCEDURE: (Conforms to ANSI Z245.30-2008 APPENDIX C):

1. The cart is loaded with a standard load (according to the ANSI standard = 340pounds) with the volume of material occupying at least 70% of the total capacity of the cart. (The actual load was 340 pounds.)
2. Using the cart's handles, the loaded cart is pushed off a curb. The curb height was 5.5 inches. (Actual curb height was 6"). The cart is pulled back up a slope to repositioned at the top of the curb in lieu of repositioning an empty cart by pulling up the curb. The test is repeated for 520 cycles (drops).
3. The carts are set down onto a concrete surface.
4. The temperature to be normal room temperature (73° degrees F +/- 5).

Test Condition

Push/pull drop of full cart

Result

No significant damage.

SUMMARY: The cart **PASSED** the requirements of ANSI Z245.30-2008 APPENDIX C



F. L. Patterson
Consulting Engineer
4915 Sadie's Place
Wingate, NC 29174



Date

TEST REPORT

TEST DATE: 18 & 23 April & 20 June 2019

SUBJECT: ANSI Z245.30 – 2008 TESTING

PRODUCT TESTED: THE OTTO MOMENTUM - 95 GALLON MSD ROLLOUT CART

TEST: **APPENDIX D – LOADING AND UNLOADING FOR CARTS**

TEST DESCRIPTION: This test determines that the cart can be safely loaded and unloaded (dumped) using a compatible lifter during a normal 10-year useful life.

MINIMUM PERFORMANCE STANDARD: The ANSI Z245.30-2008 requires that after testing the cart does not suffer any damage or permanent deformation such that it cannot be safely used in accordance with ANSI Z245.30-2008 or that renders the cart incapable of meeting the lifter requirements.


TEST PROCEDURE – (Conforms to ANSI Z245.30-2008 – APPENDIX D)

1. The cart is loaded with a standard load (according to the ANSI standard = 340pounds) with the volume of material occupying at least 70% of the total capacity of the cart. (The actual load was 341 pounds.)
2. Semi-automated Lifter - The cart is positioned on a stationary Semi-automated lifter with attachment to the integrated upper attachment envelope. The loaded cart is raised and dumped, then lowered and reloaded. Cycle Time = 8 seconds minimum. The test is repeated for 520 cycles.
3. Automated Refuse Truck – Side Grabber – The cart is positioned on a normal ground level concrete surface. Using the normal truck mechanism, the truck operator engages, lifts, lowers, and releases the container. The test is repeated for 520 cycles.

TEST RESULTS: Semi-automated – No Significant Damage
Automated – No Significant Damage

SUMMARY: The carts tested **PASSED** the requirements of ANSI Z245.30-2008 APPENDIX D.


F. L. Patterson
Consulting Engineer
4915 Sadie's Place
Wingate, NC 29174


Date

TEST REPORT

TEST DATE: 23 April 2019

SUBJECT: ANSI Z245.30 – 2008 TESTING

PRODUCT TESTED: THE OTTO MOMENTUM - 95 GALLON MSD ROLLOUT CART

TEST: **APPENDIX E – CENTER-OF-BALANCE POSITION FOR CARTS**

PERFORMANCE STANDARD: The center of the cart handle at the center-of-balance point must be 29 inches to 40 inches from the ground plane.

TEST DESCRIPTION: This test determines the height of the handle of a two-wheeled cart at the center-of-balance position.

TEST PROCEDURE – (Conforms to ANSI Z245.30-2008 – APPENDIX E)

1. The cart is loaded with a standard load (according to the ANSI standard = 340pounds) with the volume of material occupying at least 70% of the total capacity of the cart. (The actual load was 341pounds.)
2. The cart is placed on a hard, flat surface.
3. The cart wheels are blocked to prevent movement.
4. The cart is tipped on the wheels to its natural balance point.
5. The distance from the ground to the center of the cart handle is measured to an accuracy of ± 0.25 inches.

TEST RESULTS:

The center of the cart handle at the center-of-balance = 32.25"

SUMMARY: The cart **PASSED** the requirements of ANSI Z245.30-2008 APPENDIX E.



F. L. Patterson
Consulting Engineer
4915 Sadie's Place
Wingate, NC 29174


Date

TEST REPORT

TEST DATE: 23 April 2019

SUBJECT: ANSI Z245.30 – 2008 TESTING

PRODUCT TESTED: THE OTTO MOMENTUM - 95 GALLON MSD ROLLOUT CART

TEST: **APPENDIX F – FORCE TO TIP TEST FOR CARTS**

PERFORMANCE STANDARD: The tipping force is to be a maximum of 120 pounds.

TEST DESCRIPTION: This test determines the tipping force of a two-wheeled cart on a level surface.


TEST PROCEDURE – (Conforms to ANSI Z245.30-2008 – APPENDIX F)

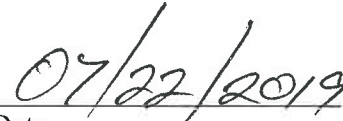
1. The cart is loaded with a standard load (according to the ANSI standard = 340pounds) with the volume of material occupying at least 70% of the total capacity of the cart. (The actual load was 340 pounds.)
2. The cart is placed on a hard, flat surface.
3. The cart wheels are blocked to prevent movement.
4. The cart handle is attached to a digital force gage set to record the maximum force applied capable of measuring the force to $\pm 3\%$ of the measured value.
5. Horizontal force is applied to bring the cart to its balance point.

TEST RESULTS:

The tipping force = 87.5 pounds (3 test Average)

SUMMARY: The cart **PASSED** the requirements of ANSI Z245.30-2008 APPENDIX F.


F. L. Patterson
Consulting Engineer
4915 Sadie's Place
Wingate, NC 29174


Date

TEST REPORT

TEST DATE: 23 April 2019

SUBJECT: ANSI Z245.30 – 2008 TESTING

PRODUCT TESTED: THE OTTO MOMENTUM - 95 GALLON MSD ROLLOUT CART

TEST: **APPENDIX G – LID TEST FOR CARTS**

PERFORMANCE STANDARD: The cart lid must not collapse and fall into the container.

TEST DESCRIPTION: This test determines the resistance of the cart lid to a specified load.

TEST PROCEDURE – (Conforms to ANSI Z245.30-2008 – APPENDIX G)

1. The empty cart is placed on a level surface with the lid closed.
2. A load of 80 pounds is placed in the center of the lid on a round area 8 inches in diameter at room temperature.
3. The load is maintained cart for 15 minutes.

TEST RESULTS:

No significant lid distortion – lid maintained its position without falling into the cart.

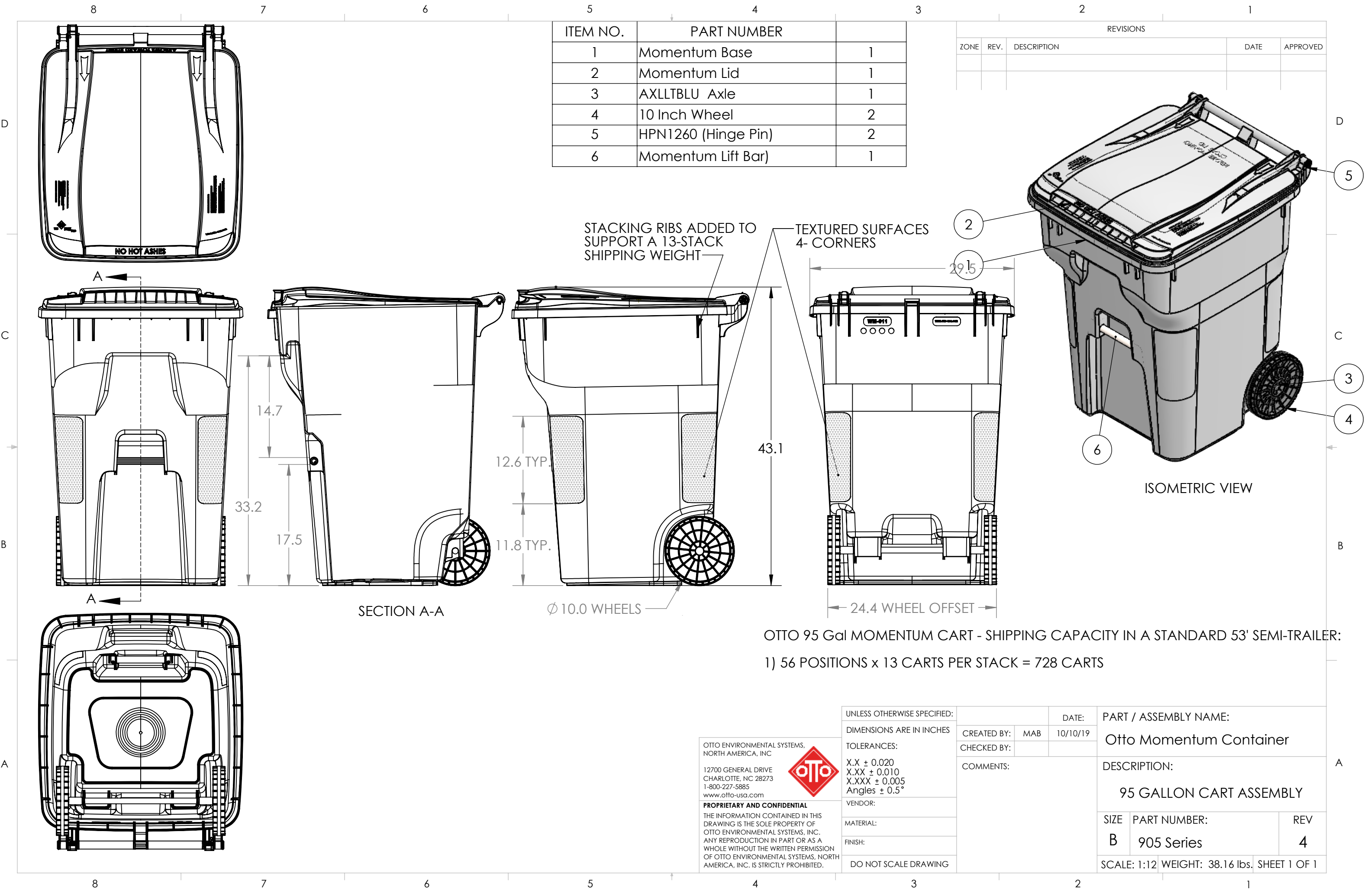
SUMMARY: The cart **PASSED** the requirements of ANSI Z245.30-2008 APPENDIX G.



F.L. Patterson
Consulting Engineer
4915 Sadie's Place
Wingate, NC 29174



Date



ITEM NO.	PART NUMBER	
1	Momentum Base	1
2	Momentum Lid	1
3	AXLLTBLU Axle	1
4	10 Inch Wheel	2
5	HPN1260 (Hinge Pin)	2
6	Momentum Lift Bar	1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED

STACKING RIBS ADDED TO
SUPPORT A 13-STACK
SHIPPING WEIGHT

TEXTURED SURFACES
4- CORNERS

ISOMETRIC VIEW

OTTO 95 GdI MOMENTUM CART - SHIPPING CAPACITY IN A STANDARD 53' SEMI-TRAILER:

1) 56 POSITIONS x 13 CARTS PER STACK = 728 CARTS

OTTO ENVIRONMENTAL SYSTEMS,
NORTH AMERICA, INC

12700 GENERAL DRIVE
CHARLOTTE, NC 28273
1-800-227-5885
www.otto-usa.com

PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS
DRAWING IS THE SOLE PROPERTY OF
OTTO ENVIRONMENTAL SYSTEMS, INC.
ANY REPRODUCTION IN PART OR AS A
WHOLE WITHOUT THE WRITTEN PERMISSION
OF OTTO ENVIRONMENTAL SYSTEMS, NORTH
AMERICA, INC. IS STRICTLY PROHIBITED.



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

X.X ± 0.020
X.XX ± 0.010
X.XXX ± 0.005
Angles ± 0.5°

VENDOR:

MATERIAL:

FINISH:

DO NOT SCALE DRAWING

CREATED BY:

MAB

CHECKED BY:

COMMENTS:

DATE:

10/10/19

PART / ASSEMBLY NAME:

Otto Momentum Container

DESCRIPTION:

95 GALLON CART ASSEMBLY

SIZE

B

PART NUMBER:

905 Series

REV

4

SCALE: 1:12 WEIGHT: 38.16 lbs. SHEET 1 OF 1



95 MOMENTUM



SPECIFICATIONS

MODEL	Momentum 95G
LOAD RATING	335 Pounds
ASSEMBLY WEIGHT (approximately) ..	35.7 Pounds
STACKING	13 High
LTL STACKING	11 High
TOTAL QUANTITY (53' Truck)	728

95MOMENTUM

BUILT FOR TODAY'S COLLECTION NEEDS

Durability increased with "double-pinned" lid attachment

Longevity increased with contoured lid that reduces warp and water entrapment

Unique, contoured body designed for automated lifting equipment

Less time on repairs with quick-release wheels

Molded foot access and large handle make maneuvering easier, even with heavy loads in place

Sanitary, easy-open lift lip

Lasts longer with UV resistant plastic for long-term exposure to sunlight

Fully sealed container means no leakage

Corrosion-resistant hardware protects and increases durability

Industry-leading shipping optimization of 728 per truckload

AVAILABLE COLORS

The Momentum container is available in 8 standard colors. Over 80 custom colors available upon request.



68 - Dark Blue



51 - Light Blue



56 - Green



65 - Forest Green



50 - Dark Gray



51 - Light Gray



63 - Brown



60 - Black

YOUR CART YOUR WAY!

Your cart is your billboard; every trash day passersby see your company name. Take the opportunity to stand out from the rest.

At Otto, we work with you to design your carts, so you get the most from your investment.

Customize your cart with color logos, lid graphics, or custom color. We can also include serialization, RFID, barcodes, and more.

Make your carts, **Truly Your Carts.**

Contact your Area Sales Manager to explore your options.

Otto Environmental Systems North America, Inc.

12700 General Drive, Charlotte, North Carolina 28273

800-795-6886 • info@otto-usa.com • otto-usa.com

© Otto Environmental Systems North America, Inc.

info

Otto/09092019

Full Service Solutions



OTTO INNOVATION