

UN SOLIDS TEST REPORT

10.7 Lite Latch Drum with Non- Gasketed Cover

Test Type: Design Qualification

Additional Package Designs Covered by this report:

N/A

Test Report Number: LL10.7-01

Completion Date: 4/16/2018

Test Facility/Packaging Manufacturer

Test Facility: M&M Industries, Inc.
316 Corporate Place
Chattanooga, TN 37419

Packaging Manufacturer: M&M Industries, Inc.
316 Corporate Place
Chattanooga, TN 37419

Completed By: 
Title: Quality Assurance Manager


President

INST PN: 78679

PACKAGE FILL WEIGHT INFORMATION

Overall package tare weight:	<u>2.77</u>	kg	
Filling Substance weight:	<u>45.23</u>	kg	<u>99.71 lbs. (Approx.)</u>
Package UN weight - Gross:	<u>48</u>	kg	

UN MARKING




Additional UN Marks covered by this report:

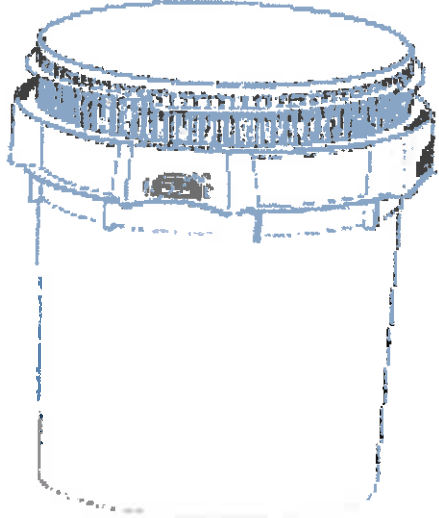

NA

CLOSURE METHOD: PER ATTACHED INSTRUCTIONS

NOTES:

It is the responsibility of the end user to determine authorization for use of the packaging under the Hazardous Materials Regulations.
The use of packaging methods or components other than those documented in this report may render this certification invalid.

COVER		DRAWING
Description		
Cover Size:	10.7	
Style:	Lite Latch	
Fittings:	N/A	
Gasket:	N/A	
Wall Thickness:		
Method of Manufacture: Injection Molded		
Material:	High Density Polyethylene	
Mold #	14719	
Tare Weight (kg):	0.65	
Overall Dimensions		
Height:	2.41"	
Top Diameter:	14.88"	
Bottom Diameter:	15.08"	
Thread Dimensions		
Major Diameter:	14.70"	
Minor Diameter:	13.93"	
Markings	M&M Industries, Inc. www.mmpail.com	
	SPI "2" HDPE Recycling Symbol Tamper Removal Instructions In Spanish and English Opening and closing instruction in multiple languages.	

DRUM		DRAWINGS
Description		
Pail Size:	10.7	
Style:	Lite Latch	
Gasket	NA	
Method of Manufacture: Injection Molded		
Material:	High Density Polyethylene	
Wall Thickness:	0.125	
Mold#	14715	
Tare Weight (kg):	2.12	
Capacity		
Overflow without cover in place (Water)(kgs):	41.8	
Overall Dimensions		
Height:	20.71"	
Diameter Below Stacking Lug:	13.17"	
Bottom Diameter:	12.15"	
Diameter at Curl (M2 Only):	NA	
Thread Dimensions		
Major Diameter:	14.47"	
Minor Diameter:	13.52"	
Markings	M&M Industries, Inc. 10.7 U.S. GALS. N.R.C. 125 U.S. AND FOREIGN PATENTS PENDING SPI "2" HDPE Recycling Symbol	
		

DROP TEST CALCULATIONS

Maximum Fill Capacity with cover in place(water):	<u>38.9</u> kg	
95% Of Maximum fill Capacity (water):	<u>36.95</u> kg	
Overall Package Tare Weight:	<u>2.77</u> kg	
Actual Filling substance weight:	<u>45.23</u> kg	<u>99.71</u> lb.
Package Test Weight:	<u>48</u> kg	<u>105.82</u> lb.

1 lb.= 0.4535924kg 1 kg = 2.204622 lb.

Packing Group

Allowed (Chemical): Y(PG II&III)

Package Test Level: Y(PG II&III)

Gross Mass (UN Mark on pall) 48 kg

DROP TEST			
Sample Size:	6 Samples/3 per orientation		
Test Contents:	Sand Mesh 2-635		
Additional Test Contents:	Vermiculite	12 Bags	Approx. Weight of Add. Contents 24KG
Conditioning:	-18 C (0 F) sample temperature at time of test, min. 24 hr. conditioning.		
Drop Height:	Inches: 48	Meters: 1.2 (PG II)	1 m=3.280840 ft.
Test Equipment:	Mechanical Drop Tester and thermometer in filled sample (inside freezer)		
Test Standard:	Title 49 CFR; Section 178.603		
Target:	A rigid, non-resilient, flat and horizontal surface.		

Criteria for passing the test for solids:

Any discharge from a closure is slight and ceases immediately after impact with no further leakage; and no rupture is permitted in packaging's for materials in Class 1 which would permit spillage of loose explosive substances or articles from the outer packaging.

DROP TEST SET-UP AND RESULTS		
Drop Orientation	Sample	Results
Diagonal Top Chime	1	PASS
Diagonal Top Chime	2	PASS
Diagonal Top Chime	3	PASS
Flat on Side	1	PASS
Flat on Side	2	PASS
Flat on Side	3	PASS

STACKING & STACKING STABILITY TEST CALCULATIONS/RESULTS

Stack Test Minimum Load Calculation								
Number of packages in a 3m High Stack (118/ Nesting Height (NH)-1)								
<u>(118</u>	/	<u>NH)</u>	=	<u>#</u>	-	<u>-1</u>	=	<u>#3m HS</u>
118	/	20.38	=	5.80	-	1	=	4.80
Stack Test Load Calculation (Individual Package)								
		<u>Gross Mass</u>	X	<u>#3m HS</u>	=	<u>Load</u>		
		48	X	4.80	=	230.40	kg	
						Approx.		507.94 lbs.
Actual Weight Placed on Palls:						<u>597.5</u>	lbs	<u>271.02</u> kgs

TEST INFORMATION

Stack Test
 Test contents: Sand mesh size 2-635
 Additional test contents: Vermiculite 12 bags Approx. Weight of Add. Contents 24KG
 Conditioning: Standard room temperature/RH
 Equipment: Dead load weight/ Guided load fixture
 Test Duration: 24 hours
 Test Standard: Title 49 CFR; Section 178.606

Criteria for passing the Stack Test

No test sample may leak or show any deterioration which could adversely affect transportation safety or any distortion likely to reduce its strength, or cause instability in stacks of packages.

STACK TEST RESULTS

SAMPLE #	START TIME	DURATION	END TIME	RESULTS
1	1:00 PM	24 hours	1:00 PM	Pass
2	1:00 PM	24 hours	1:00 PM	Pass
3	1:00 PM	24 hours	1:00 PM	Pass

STACK STABILITY RESULTS

RESULTS	CRITERIA FOR PASSING THE TEST
Pass	<ul style="list-style-type: none"> -In guided load tests, stacking stability must be assessed after test completion. -Two filled packaging's of the same type must be placed on the test sample -The stacked packages must maintain their position for 1 hour. For stack stability, M&M places the filled samples one on top of the other. The bottom sample is rotated to the top until all three samples have been subjected to stacking stability for one hour each

Additional Drops (If REQUIRED for Variation 5)

Criteria for passing the test for solids

Any discharge from a closure is slight and ceases immediately after impact with no further leakage; and no rupture is permitted in packaging's for materials in Class 1 which would permit spillage of loose explosive substances or articles from the outer packaging.

Description:

Sample	Drop Orientation	Results
1	Diagonal Top Chime	
2	Diagonal Top Chime	
3	Diagonal Top Chime	

Description:

Sample	Drop Orientation	Results
1	Diagonal Top Chime	
2	Diagonal Top Chime	
3	Diagonal Top Chime	

Description:

Sample	Drop Orientation	Results
1	Diagonal Top Chime	
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Description:

Sample	Drop Orientation	Results
1	Diagonal Top Chime	
2	Diagonal Top Chime	
3	Diagonal Top Chime	

ASTM D999 VIBRATION TESTING



Open Head Drums for Vibration Testing

TEST REPORT #: 18-MN10109

TESTING PERFORMED FOR:

M & M INDUSTRIES, INC.
316 Corporate Place
Chattanooga, TN 37419

ATTN: Tabitha Nunley

TESTING PERFORMED BY:

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

April 9, 2018

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OBJECTIVE

To conduct vibration testing on the following two open head containers:

- Variable 1: 10.7 Gallon Open Head Drum with Screw Top Cover
- Variable 2: 12.0 Gallon Dual Thread Drum with Screw Top Cover

INDUSTRY STANDARD REFERENCES


Vibration:	ASTM D999: Standard Test Method for Vibration Testing of Shipping Containers
	ISO 2247: Packaging – Complete, Filled Transport Packages – Vibration Test at Fixed Low Frequency


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©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.

COMPONENT INFORMATION (TEN-E PACKAGING SERVICES QUALITY CONTROL AUDIT)

COVER (Variable 1)		DRAWING
Manufacturer: M&M Industries, Inc., Chattanooga, TN		
Description:	Solid Tamper Evident Threaded Cover	
Material/Pigment:	High Density Polyethylene, Natural	
Method of Manufacture:	Injection Molded	
Tare Weight:	657 Grams	
Overall Dimensions:		
• Height	2.364"	
• Top Diameter	14.572"	
• Bottom Diameter	15.178"	
• Inner Skirt Diameter	13.371"	
Wall Thickness:		
• Minimum	0.103"	
Thread Dimensions:		
• T	14.683"	
• E	13.985"	
Markings (QC Audit):	M M&M Industries 2/18 www.mmpail.com 14719 2 SPI "2" HDPE Recycling Symbol	

OPEN HEAD PLASTIC DRUM (Variable 1)		DRAWING
Manufacturer: M&M Industries, Inc., Chattanooga, TN		
Description:	10.7 Gallon Open Head Threaded Drum	
Material/Pigment:	High Density Polyethylene, White	
Method of Manufacture:	Injection Molding	
Tare Weight:	2.100 Grams	
Capacity:		
• Rated	10.7 Gallon	
• Overflow	40.1 Kg (10.6 Gallons)	
Overall Dimensions:		
• Height	20.757"	
• Diameter Above Top Fin:	16.621"	
• Diameter Below Stacking Lug	13.135"	
• Bottom Diameter	12.164"	
Wall Thickness:	Body	Bottom Head
• Minimum	0.123"	0.116"
Thread Dimensions:		
• T	14.453"	
• E	13.637"	
Markings (QC Audit):	 1H2 / Y53 / S / 18 / USA / M2074 M M&M Industries www.ultimatepail.com 10.7 U.S. GALS. N.R.C. .125 U.S. AND FOREIGN PATENTS PENDING 14715 3 3/18 SPI "2" HDPE Recycling Symbol	



TEST SAMPLE PREPARATION

TEST SAMPLE PREPARATION

VARIABLE 1: 10.7 Gallon Open Head Drum with Screw Top Cover

Overall Package Tare Weight: 2.8 Kg

95% Maximum Fill Capacity:
Clay/Coal/Steel Weight 50.2 Kg

Package Test Weight:
Clay/Coal/Steel Weight 53.0 Kg 116.8 Lbs.

CLOSING METHOD

- **Screw Top Cover:** To close, seat lid on top of pail. Rotate lid clockwise until the line on the lid above the trigger is located to the left of the mark on the side of the pail. Continue rotating until the lid is fully tightened.
Inspect lid after application to confirm it is properly seated.

Refer to Appendix A for Manufacturer's Closure Instructions

VARIABLE 2: 12.0 Gallon Dual Thread Drum with Screw Top Cover

Overall Package Tare Weight: 3.6 Kg

95% Maximum Fill Capacity:
Clay/Coal/Steel Weight 49.4 Kg

Package Test Weight:
Clay/Coal/Steel Weight 53.0 Kg 116.8 Lbs.

CLOSING METHOD

- **Screw Top Cover:** Seat lid on top of drum. Rotate lid counter-clockwise until it drops down (this will help prevent cross-threading). Then, rotate lid clockwise until the raised rectangular mark on the lid is located to the left of the raised capsule-shaped marks on the left side of the drum trigger. Continue rotating until the lid is fully tightened.
Inspect lid after application to confirm it is properly seated.

Refer to Appendix B for Manufacturer's Closure Instructions


TEST PROCEDURES AND RESULTS

VIBRATION TEST

Variable 1: 10.7 Gallon Open Head Drum with Screw Top Cover

TEST INFORMATION		TEST CRITERIA
TEST CONTENTS:	Clay 1/Coal Mix (8-600 mesh)/Steel Weight	<ul style="list-style-type: none"> Immediately following the period of vibration, each package must be removed from the platform, turned on its side and observed for any evidence of leakage. A packaging passes the vibration test if there is no rupture or leakage from any of the packages. No test sample should show any deterioration which could adversely affect transportation safety or any distortion liable to reduce packaging strength. (\$178.608)
SAMPLE PREPARATION:	Refer to Section II	
CONDITIONING:	Ambient	
TABLE DISPLACEMENT:	1"	
TEST FREQUENCY:	4.0 Hz	
TEST DURATION:	1 Hour	
TEST EQUIPMENT:	Vertical motion using L.A.B. 6000 Transportation Simulator	

VIBRATION TEST SET-UP AND RESULTS

	Sample #	Results	Comments/Observations
	1	PASS	No leakage or damage.
	2	PASS	
	3	PASS	

DISCLAIMER OF WARRANTIES

TEN-E PACKAGING SERVICES, INC. certifies that the previously described testing services have been performed in accordance with standard good laboratory practices, ASTM D999 and ISO 2247. The results included within this test report relate only to the items tested. **ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY THAT THE PACKAGING TESTED IS MERCHANTABILITY, FIT FOR A PARTICULAR PURPOSE OR IN COMPLIANCE WITH ANY FEDERAL OR STATE REGULATIONS, ARE DISCLAIMED.** In no event shall TEN-E Packaging Services, Inc. liability exceed the total amount paid by M & M Industries, Inc., for services rendered.


Peter Stamoff
Packaging Engineer
TEN-E Packaging Services, Inc.
1686 County Road 74
Newport, MN 56055

M&M INDUSTRIES, INC.

MANUFACTURER'S NOTIFICATION FOR M & M INDUSTRIES, INC. UN/DOT PACKAGING FOR HAZARDOUS SOLIDS/LIQUIDS

At M&M Industries, we understand your goal to safely transport your valuable products along roads and highways. You want to provide your customers with value while keeping their trust. While we are legally bound to provide you with the following information, M&M Industries also wants you to know we value your endeavor and want to help you reach your goal, everyday.

Under the U.S. Department of Transportation's Title 49CFR it is the Shipper's Responsibility to determine that the packaging or container is an authorized packaging, including all part 173 requirements. The selected packaging must be properly assembled for transportation in accordance with the manufacturer's notification. Please do all testing and research necessary to ensure that you have selected the proper M & M Industries container for use with your product.

To meet UN/DOT Standards, this package must be properly closed for shipment. At the time of transfer, the packaging does not meet the UN standard because it is disassembled. Only when assembled as specified in the closure instructions below, and using the components described herein, is this packaging certified to meet the UN standard. Failure to follow the closure instructions or substituting package components with components other than those identified in the following paragraph will render the UN/DOT Certification invalid.

A copy of the manufacturer's notification, including closure instructions must be made available for inspection by a representative of the Department of Transportation upon request for at least 90 days once the package is offered to the initial carrier for transportation in commerce, as of this time (June 2013). However, M&M Industries recommends that you retain these documents for a minimum of 365 days after the package is offered for shipment. The current record retention requirements are subject to change and are found in 49CFR 173.22(a)(4), <http://www.ecfr.gov>

M&M Industries takes superb pride in our Quality Assurance program and systems. However, even with our very best efforts, fittings on covers / pails can become damaged or shift during transportation or storage after leaving our facility. M&M Industries recommends that fillers/offers take all steps deemed necessary to check the fittings on each pail / cover, to meet your quality standards. An example of this is a screw cap on a cover that may vibrate or back off during transportation. The offeror of a hazardous material may be open to liability if they do not take the necessary precautions. Should you have any questions, please contact customer service at (800) 331-5305.

THESE CLOSURE INSTRUCTIONS REMAIN IN EFFECT UNTIL FURTHER NOTICE.

Lite Latch ® Containers

May 16, 2018

CLOSURE INSTRUCTIONS FOR:

Lite Latch ® Containers

Identification of Packaging: This packaging type is identified by:

Gallon Size	Lite Latch Pail mold numbers	Corresponding Lite Latch Lid mold numbers	Lid diameter (ref only, measured at base of lid)
1.0 gallon	12583, 12588	12584, 12589	
2.0 gallon	12610, 12611	12608, 12609	
2.5 Gallon	12681	12608, 12609	
3.0 Gallon	12428, 12429	11554, 11947, 12294, 12295, 12430, 12431, 12607, 12678, 12679, 12688	
3.5 Gallon	11552, 11945, 12384, 12534	11554, 11947, 12294, 12295, 12430, 12431, 12607, 12678, 12679, 12688	12.84"
5.0 Gallon	11553, 11946, 12427	11554, 11947, 12294, 12295, 12430, 12431, 12607, 12678, 12679, 12688	12.84"
6.5 Gallon	11999, 12000, 12385, 12533	11554, 11947, 12294, 12295, 12430, 12431, 12607, 12678, 12679, 12688	12.84"
10.7 Gallon	14715	14719	15.08"

UN Markings for Lite Latch ® Containers:

An appropriate UN marking must be maintained for each M&M Industries container design. The UN markings for M&M Industries Lite Latch ® containers are listed below.

Container Size	UN Rating
3.5 Gallon Lite Latch	1H2/Y19/S
5.0 Gallon Lite Latch	1H2/Y25/S
6.5 Gallon Lite Latch	1H2/Y30/S
10.7 Gallon Lite Latch	1H2/Y48/S

NOTE: Lite Latch ® containers are UN certified for solids only, using NON-GASKETED lids.

In accordance with the U.S. Department of Transportation's Title 49CFR, Section 178.2, manufacturers of U.N. Standard/DOT Specification packages are required to notify in writing each person to whom that packaging is transferred of all requirements in this part not met at the time of transfer, and with information specifying the type(s) and dimensions of the closures, including gaskets and any other components needed to ensure that the packaging is capable of successfully passing the applicable performance tests. This information must include any procedures to be followed, including closure instructions for inner packagings and receptacles, to effectively assemble and close the packaging for the purpose of preventing leakage in transportation.

Specifically, the following items pertain to the Lite Latch ® containers:

- Lite Latch ® containers are certified to the UN/DOT performance oriented packaging standards and are marked with the appropriate UN markings on the container.
- The Lite Latch ® pail must always be used with the correct Lite Latch ® lid in order to meet the UN/DOT performance oriented packaging standards.
- Lite Latch ® containers are not UN certified for liquids.

CLOSURE INSTRUCTIONS FOR SOLIDS:

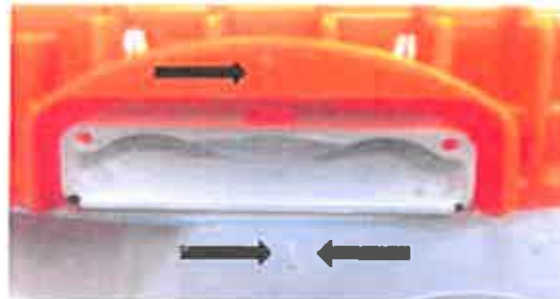
Packaging Components required:

- Appropriately marked UN/DOT certified M & M Industries pail
- Matching lid size with trigger attached, non-gasketed

All sizes, NON-GASKETED lid:

To close, seat lid on top of pail. Rotate lid clockwise until the line on the lid above the trigger is located to the left of the mark on the side of the pail (see Ill 1). Continue rotating until the lid is fully tightened. Inspect lid after application to confirm it is properly seated.

Illustration 1 – Line on lid is located to left of line on pail when lid is fully tightened.



Revision History:

Original issue – September 11, 2014

Revised- 5/16/18 added 10.7 Gallon Lite Latch to Instructions

Revision History:

Original issue – September 11, 2014

Revised- 5/16/18 added 10.7 Gallon Lite Latch to Instructions

Revised 6/18/18 added 12.0 Gallon Lite Latch to Instructions, added all other Lite Latch parts that were not on the instructions.

Revised 8/31/18 added 7.7 Lite Latch to instructions.