

UN SOLIDS TEST REPORT

2.0 M2 Pail with Plain 2.0 M2 Cover

Test Type: Periodic Retest

Additional Package Designs Covered by this report:

N/A

Test Report Number: M220-06

Completion Date: 4/13/2018

Test Facility/Packaging Manufacturer

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

Packaging Manufacturer: M&M Industries, Inc.
4739 W. Jefferson Street
Phoenix, AZ 85043

Completed By: Terry Jken
Title : Quality Assurance Manager

Glen H. M.

President

INST PN: 78632

PACKAGE FILL WEIGHT INFORMATION

| | | | |
|------------------------------|------|----|----------------------|
| Overall package tare weight: | 0.57 | kg | |
| Filling Substance weight: | 8.43 | kg | 18.58 lbs. (Approx.) |
| Package UN weight - Gross: | 9 | kg | |

UN MARKING

| | |
|---|--------------|
| U | 1H2/Y9/S/18 |
| N | U.S.A./M2074 |

Additional UN Marks covered by this report:

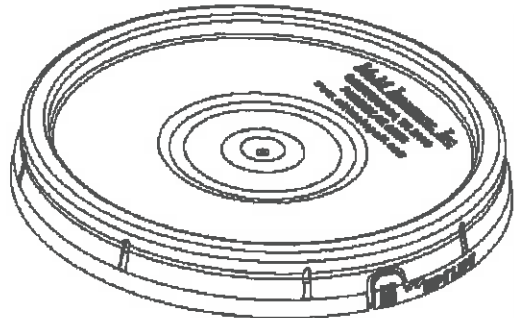
| |
|-----|
| N/A |
|-----|



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: | 2.0 | |
| Style: | M2 | |
| Fittings: | N/A | |
| Gasket: | 2.0 M2 - .130" - .160" Dia x 29.005" - 29.255" L EPDM(Bates) | |
| Wall Thickness: | 0.07 | |
| Method of Manufacture: Injection Molded | | |
| Material: | High Density Polyethylene | |
| Mold # | 11850 | |
| Tare Weight (kg): | 0.13 | |
| Overall Dimensions | | |
| Height: | .86" | |
| Top Diameter: | 9.70" | |
| Bottom Diameter: | 9.93" | |
| Thread Dimensions | | |
| Major Diameter: | NA | |
| Minor Diameter: | NA | |
| Markings | M&M Industries, Inc. Chattanooga, TN 37419 Phoenix, AZ 85043 www.ultimatepail.com SPI "2" HDPE Recycling Symbol | |

| DRUM | | DRAWINGS |
|---|---|--|
| Description | |  |
| Pail Size: | 2.0 | |
| Style: | M2 | |
| Gasket | NA | |
| Method of Manufacture: Injection Molded | | |
| Material: | High Density Polyethylene | |
| Wall Thickness: | 0.065 | |
| Mold# | 11849 | |
| Tare Weight (kg): | 0.44 | |
| Capacity | | |
| Overflow without cover in place (Water)(kgs): | 9.12 | |
| Overall Dimensions | | |
| Height: | 9.58" | |
| Diameter Below Stacking Lug: | 9.10" | |
| Bottom Diameter: | 8.30" | |
| Diameter at Curl (M2 Only): | 9.57" | |
| Thread Dimensions | | |
| Major Diameter: | NA | |
| Minor Diameter: | NA | |
| Markings | <p>M&M Industries, Inc. Chattanooga, TN 37419 Phoenix, AZ 85043 www.ulitmatepail.com</p> <p>SPI "2" HDPE Recycling Symbol 2.0 U.S. GALS N.R.C. .065</p> <p>  1H2/Y9/S/18 U.S.A./M2074 </p> | |

DROP TEST CALCULATIONS

| | | | |
|---|------|----|-----------|
| Maximum Fill Capacity with cover in place(water): | 8.72 | kg | |
| 95% Of Maximum fill Capacity (water): | 8.28 | kg | |
| Overall Package Tare Weight: | 0.57 | kg | |
| Actual Filling substance weight: | 8.43 | kg | 18.58 lb. |
| Package Test Weight: | 9 | kg | 19.84 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 pail) 9 kg

| DROP TEST | | | | |
|---------------------------|---|--------|---------------------------------|------------------------------|
| Sample Size: | 6 Samples/3 per orientation | | | |
| Test Contents: | Sand Mesh 2-635 | | | |
| Additional Test Contents: | Vermiculite | 5 Bags | Approx. Weight of Add. Contents | 1.0 kg |
| 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) | | | | | | | | | |
| (118 | / | NH) | = | # | - | -1 | = | #3m HS | |
| 118 | / | 9.50 | = | 12.43 | - | 1 | = | 11.43 | |
| Stack Test Load Calculation (Individual Package) | | | | | | | | | |
| | | Gross Mass | X | #3m HS | = | Load | | | |
| | | 9 | X | 11.43 | = | 102.87 | kg | | |
| | | | | | | Appox. | | 226.79 | lbs. |
| Actual Weight Placed on Pails: 297.5 lbs 134.94 kgs | | | | | | | | | |

| TEST INFORMATION | |
|---------------------------|---|
| Stack Test | |
| Test contents: | Sand mesh size 2-635 |
| Additional test contents: | Vermiculite 5 bags Approx. Weight of Add. Contents 1.0 kg |
| 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 | 12:00PM | 24 hours | 12:00PM | Pass |
| 2 | 12:00PM | 24 hours | 12:00PM | Pass |
| 3 | 12:00PM | 24 hours | 12:00PM | 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. <p>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</p> |

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 | |
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| 3 | Diagonal Top Chime | |

M2/M2 and M2/M4 pails

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3. ONLY the 5 through 5.5 gallon M2 pails with M4 lids are UN certified for liquid hazardous materials, and only for ground or vessel transportation.
4. M2/M2 (tear tab lid) and M2/M4 (non-tear tab lid) containers are NOT UN certified for air transportation of liquids.

A. CLOSURE INSTRUCTIONS FOR THE M2/M2 and M2/M4 PAIL AND LIDS:

1. Pneumatic press with six" cylinder – 5-5.5 gallon sizes ONLY (Figure A),
 - a. Adjust downward stroke of top plate so that it goes beyond pail rim by 1/16-1/8"
 - b. Center the pail and lid under the press.
 - c. Apply a minimum of 80 psi from a regulated air supply to the lid listening for a defining snap.
 - d. Inspect lid after application to confirm it is properly seated.

Figure A: Pneumatic Press



2. Rubber mallet (minimum 16 oz.) – all sizes 2 gallon through 5.5 gallon
 - a. Center the lid on the pail.
 - b. Hammer the cover into place by striking cover in the center of the cover's outerring (Figure B).
 - c. Strike cover until it snaps onto the rim of the pail. For best results, strike cover starting at 12 o'clock position, then 6 o'clock, then 3 o'clock and 9 o'clock. Continue to hammer the cover into place 360 degrees, until the cover is evenly seated all the way around the pail.
 - d. Inspect lid after application to confirm it is properly seated.

Figure B



M2/M2 and M2/M4 pails

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Properly seated M2 lid:



Improperly seated M2 lid:



Properly seated M4 lid:



Improperly seated M4 lid:



3. When using the cover with the screw cap fitting, the recommended application torque for the 70mm caps is 120 inch pounds. Use a calibrated torque wrench to apply the closure to the fitting.
4. If Rieke pail spout is supplied separately, refer to spout installation instructions below.