

# Coefficient Slip Resistance Test

**CLIENT:** MLP Corporation  
203 N Edgerton St.  
Fairland, IN 46126

**Test Report No:** TJ5152-2

**Date:** November 1, 2017

**SAMPLE ID:** Standard Custom Shower Pan – Gruber Mold

**SAMPLING DETAIL:** Test samples were submitted to the laboratory directly by the client. No special sampling conditions or sample preparation were observed by QAI.

**DATE OF RECEIPT:** Samples were received at QAI on October 13, 2017.

**TESTING PERIOD:** October 30, 2017.

**AUTHORIZATION:** Signed Work Order (17SP101101) by Jesse Martin on October 11, 2017.

**TEST PROCEDURE:** Test and evaluate the submitted samples to *ASTM F462-79 (Reapproved 2007)*  
*Standard Consumer Safty Specification for Slip-Resistant Bathing Facilities.*

**TEST RESULTS:** The samples **meet** the criteria of ASTM F462-79. Detailed test results are presented in the subsequent pages of this report.

**Prepared By**

**Signed for and on behalf of**  
**QAI Laboratories, Inc.**



**Jeff Foster**  
Laboratory Test Technician



**Christopher Clark**  
Plumbing Project Manager

Water Temperature: 70°F  
Initial Reference Surface Reading: 0.70 Coefficient of Friction: 0.04  
Final Reference Surface Reading: 0.70 Coefficient of Friction: 0.04

Measurement Zone	1	2	3	4	5	6	7	8	9
Reading 1	3.60	3.80	3.70	3.70	3.80	3.70	3.80	3.70	3.80
Reading 2	3.50	3.80	4.00	3.80	3.60	3.80	3.80	3.60	3.70
Average	3.55	3.80	3.85	3.75	3.70	3.75	3.80	3.65	3.75
Coef/Fric	0.32	0.35	0.35	0.34	0.34	0.34	0.35	0.33	0.34

Least Coefficient of Friction: 0.32

Does the 1-1/2 x 3" template always touch textured area? Yes

Minimum requirement for coefficient of friction is 0.04

\*\*\* END OF TEST REPORT \*\*\*

# Trench Drain Test

DATE: 5/31/2016

TEST REPORT

TEST NO.: 42078

FOR: MARSTONE PRODUCTS LTD  
203 N. Edgerton  
Fairland, IN 46126

Page 1 of 6

Background: MARSTONE submitted one Cultured Marble Showerbase, for evaluation per CSA B45.5-11/IAPMO Z124-11. The showerbase was received in good condition on 5/18/2016. Visual inspection was performed with no defects noted. All testing and sample preparation was performed by Universal Laboratory personnel with no outside services required. The following information is provided:

Order entry Log Date: 5/18/2016 Log No.: 582179

Product Description: 60" X 34" Left/Right Trench Drain Shower Pan

Material: Cultured Marble

Color: White 3" Drain Located in the Trench Drain

Scope & Purpose: Testing to assure the compliance of the product to CSA B45.5-11/IAPMO Z124-11 standard's requirements for acceptability as a showerbase plumbing fixture for the manufacturer, listee, installer, and end user.

Preparation: CSA B45.5-11/IAPMO Z124-11

Temperatures & Preparation:

Ambient Lab. Temp.

5.4 Color-Fastness Test

5.5.1 Stain Resistance Test Specimen

5.6.1.1 Wear Test Specimen

5.10 Colourfastness

5.11 Stain

5.12.1 Wear

5.12.2 Cleanability

5.15 Chemical resistance

5.16 Thermal Shock

5.25.4 Water Absorption

Test Procedures: CSA B45.5-11/IAPMO Z124-11

4.4.1 Flanges

4.1.2/5.4 Surface Finishes

4.2 Waste fittings openings

5.3 Warpage tolerances

5.5 Subsurface test

5.6 Waste fitting Connection

5.7 Point Impact

5.8 Structural Integrity Tests

5.9 Radii Load Test For Bathtubs

5.10 Colourfastness

5.11 Stain Resistance

5.12 Cleanability and Wear

5.13 Ignitability

5.14 Cigarette

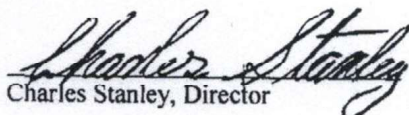
5.15 Chemical resistance

5.16 Thermal Shock

Test Results: The test results are provided in the attached data report.

CONCLUSION: The Cultured Marble Showerbase Tested, Meets The Requirements  
Per CSA B45.5-11/IAPMO Z124-11, Per Paragraphs Tested.

Note: "We certify that all portions of each test performed were under continuous, direct supervision of this laboratory."

  
Charles Stanley, Director

This report shall not be reproduced. Except in full, without the written approval of Universal Laboratory, Inc



## CSA B45.5-2011/IAPMO Z124-2011 PLASTIC PLUMBING FIXTURES

4.4	Bathtubs and shower bases: Showerbase	
4.4.1	Flanges:	N/A
4.4.2	Slope to the waste outlet: Unit's slope is within the maximum slope of 4% to the waste outlet. Unit's slope is within the minimum slope of 1%.	COMPLIES
4.4.4	Minimum dimensions for Showerbase: Thresholds shall be at least 2" above top of waste outlet. 6" Above No overflow: Not applicable	COMPLIES
5	Test Requirements	
5.2	Load test for grab bars: Not applicable	
5.3	Warpage tolerance test	COMPLIES
5.3.1	Unit was placed on flat, level surface to determine the amount of deviation from the horizontal plane that exists at its edges. Used a feeler gauge to test per 5.3.1 instructions. Would not slide under the unit at any area.	
5.3.2	Performance: (a) There was no Warpage exceeding 5mm/m (0.06 in/ft); (b) No warpage exceeding 7.5 mm/m (0.09 in/ft); and (c) Total Warpage did not exceed 16 mm (0.063 in).	
5.4	Surface examination test:	COMPLIES
5.4.1	Unit was washed with a solution of standard liquid detergent and water, rinsed and dried. Then rubbed with a sponge and a 50% solution of water and water-soluble black ink. Ink rinsed immediately from the surface with water and dried before examination. Surface was examined for defects with the unaided eye from a distance of between 300 and 610 mm (1 and 2 ft) using a light source of partially diffused artificial light giving an illuminance on the surface of $1615 \pm 540$ lx ( $150 \pm 50$ foot-candles).	
5.4.2	The unit was free from cracks, chipped areas, and blisters and no other defects were found. The fixture was also free from blemished and defects on the visible surface to the extent specified in Table 1.	
5.5	Subsurface test	COMPLIES
5.5.1	The subsurface test was conducted on two different areas of the unit. Washed with a liquid detergent and water solution, rinsed and dried. The specimens were rubbed with normal hand pressure for 25 cycles with 600 grit wet silicon carbide abrasive paper. Following the abrasion the test areas were rinsed with water and dried. Standard dirt (5g (0.18 oz.)) was rubbed into each area with a dampened chamois with heavy thumb pressure in a circular motion for 25 cycles and allowed to dry for one hour. Then washed by rubbing areas with a clean, dampened chamois and liquid detergent. The surface of the areas were then examined per 5.4.1.	
5.5.2	There were no visible voids larger than 1.6 mm (0.063 in) in diameter below the original finish surface, and the less that the maximum allowed number of voids smaller than 1.6 mm (0.063 in) in the two test areas.	

This report shall not be reproduced. Except in full, without the written approval of Universal Laboratory, Inc



FOR: MARSTONE PRODUCTS LLC

Page 3 of 6

## CSA B45.5-2011/IAPMO ANSI Z124-2011 PLASTIC PLUMBING FIXTURES

5.6	Waste Fitting Connection Test of Shower Base	COMPLIES
5.6.1	Procedure for bathtubs and shower bases Drain-Fitting Connection Test: The test load was applied by means of a lever arm 600 mm long connected to the drain and extending horizontally. The weight and lever arm test load was applied in three radial positions, two of which were approximately 180° apart.	
5.6.3	There were no visible cracks in the fixture when inspected with the fitting in place after testing per 5.6.1 using a load of $220 \pm 4$ N ( $50 \pm 1$ lbf).	
5.7	Point Impact Load Test	COMPLIES
5.7.1.2	A 1.5" steel ball with a weight of $2.20 \pm 0.05$ N ( $0.50 \pm 0.01$ lbf) was dropped from a height of 900 mm (36 in) to strike six different locations, as follows: (i) 3 locations on flat areas in bottom of fixture; (ii) 3 locations on the rim, from a height of 600 mm (24 in) to strike 3 locations on radii in the bottom of fixture, and one of those was in a corner of the fixture.	
5.7.2	Performance: There were no cracks or chips in the surface of the unit when examined per items (b) to (d) of Clause 5.4.1	
5.8	Structural Integrity Tests	
5.8.1 - 5.8.1.1	Load test for seats:	Not applicable
5.8.2	Load test for rims and bottoms:	COMPLIES
5.8.2.2.1	A preload of $1335 \pm 22$ N ( $300 \pm 5$ lbf) test load applied to the center bottom of unit and left for 2 to 3 minutes to allow for settlement of unit, then removed for ten to fifteen minutes and then reapplied to the same area and deflection under the load measured with a deflectometer with a reading accuracy of 0.025 mm (0.001 in). The load was removed and after the removal of the load the residual deflection was measured.	
5.8.2.3	Performance: There were no cracks in the surface and the deflection under the test load did not exceed 3.81 mm (0.150 in) and the maximum residual deflection 10 minutes after removal of load did not exceed 0.203 mm (0.008 in). Under Load: <u>.060"</u> Residual Deflection: <u>.004"</u>	
5.8.4	Wall Surrounds:	Not applicable
5.9	Radii Load Test For Showers	Not applicable
5.10	Colourfastness Test	COMPLIES
5.10.2 & 5.10.3	Conditions and Procedure: Test specimen was cut from the unit. With one half shielded as a control, the test specimen was exposed to ultraviolet radiation for 200 hours by using clear glass filters in an Xenon Arc Weatherometer. The Black-panel temperature was maintained at $63 \pm 5^\circ$ C. The test sample was then stored away from light source at $73 \pm 9^\circ$ F for 72 hours and then evaluated.	
5.10.4	There was no appreciable change in color of the specimen when tested in accordance with 5.10.2 and 5.10.3.	

This report shall not be reproduced. Except in full, without the written approval of Universal Laboratory, Inc



## CSA B45.5-2011/IAPMO ANSI Z124-2011 PLASTIC PLUMBING FIXTURES

## 5.11 Stain Resistance / Clause 5.11.1 Stain Resistance Test

COMPLIES

The maximum stain resistance rating shall be the sum of the individual stain ratings of each of the covered and uncovered stain areas and shall not exceed 50 when tested in accordance with Clause 5.11.1 through 5.11.2.3.

## 5.11.3 Performance: The maximum reduction in the thickness allowable of the surface material with a stain having a rating of 5 is 0.175mm.

COVERED	REAGENTS	UN-COVERED
<u>1</u>	Black crayon	<u>1</u>
<u>1</u>	Black liquid shoe polish	<u>1</u>
<u>2</u>	Blue washable ink	<u>1</u>
<u>1</u>	Lipstick	<u>1</u>
<u>3</u>	Hair dye	<u>2</u>
<u>1</u>	Iodine solution (1% alcohol sol)	<u>0</u>
<u>3</u>	Gentian violet solution (2% aqueous )	<u>3</u>

Stain Rating: 12Stain Rating: 9Total Stain Rating Covered & Uncovered: 21Reduction of material: Not Applicable

## 5.12 Cleanability and Wear Test

## 5.12.1 Wear Test Procedure

COMPLIES

## 5.12.1.1 through 5.12.1.2 Specimens preparation and test equipment preparation

## 5.12.1.3 Procedure: Each specimen was subject to 7,600 scrub cycles.

## 5.12.1.3.3 Samples removed from test machine, rinsed in water, dried, and measured for cleanability per 5.12.2 for reduction in surface material. There was no wear-through of the surface material in the middle third of the specimens.

## 5.12.2 Cleanability Test Results:

The white-light reflectance of 3 specimens did not lose more than 5% white-light reflectance after being cleaned and not more than 2% white-light reflectance after an additional cleaning with abrasive cleaner, when tested in accordance with 5.12.2. Average of 3 specimens First Cleaning: 3% Second Cleaning: 1.0%.



## CSA B45.5-2011/IAPMO ANSI Z124-2011 PLASTIC PLUMBING FIXTURES

5.13

## Ignitability Test

Ignitability of the Unexposed Surface:

Ignition Test:

5 specimens were removed from unit and placed in a draft free laboratory hood. The flame from a propane torch was applied to the center of the backside of each specimen at a 45° angle for 30 seconds and removed and flame time recorded. After 1 minute the flame was reapplied to same area for 30 seconds and removed and timed again for burn rate. Ignition test results:

COMPLIES

<u>Sample No.</u>	<u>First Burn Rate</u>	<u>Second Burn Rate</u>
1	8	6
2	6	2
3	7	5
4	9	8
5	5	4

Requirements: All specimens shall cease to burn, if ignited, within 30 seconds after removal of burner.

5.14

## Cigarette Test

5.14.1

Three lighted cigarettes, different brands, were placed 1" in from edge of specimens and allowed to burn for 2 minutes. Cigarettes were removed and specimens allowed to cool, then cleaned with cheesecloth.

COMPLIES

5.14.2

All visible stains were removed with household cleaning powder, no sandpaper needed to remove stains. There was no ignition or progressive glow of the specimens during or after contact with the cigarettes.

5.15

## Chemical Resistance Test

5.15.2

Two drops of each of the following reagents were applied to surface specimens on two sets of samples. One set left uncovered and one set covered with watch glasses; reagents used: Naphtha, Ethyl alcohol, Amyl acetate, Ammonium hydroxide, 1%, Citric-acid 10% water, Urea, 6.0% water solution, Hydrogen peroxide 3% water, Sodium hypochlorite 6% solution, Toluene, Ethyl acetate, Lye, 1% to 2% water solution, and Acetone, and allowed to remain for 16 hours. Watch glasses and excess reagent removed from specimens and then specimens were kept for 24 hours at  $23 \pm 2^\circ\text{C}$  ( $74.3 \pm 3.6^\circ\text{F}$ ) and a relative humidity of  $50 \pm 5\%$ . Then examined per 5.4.1.

COMPLIES

5.4.1 Unit was washed with a solution of standard liquid detergent and water, rinsed and dried. Then rubbed with a sponge and a 50% solution of water and water-soluble black ink. Ink rinsed immediately from the surface with water and dried before examination. Surface was examined for defects with the unaided eye from a distance of between 300 and 610 mm (1 and 2 ft) using a light source of partially diffused artificial light giving an illuminance on the surface of  $1615 \pm 540$  lx ( $150 \pm 50$  foot-candles).

5.4.2

The unit was free from cracks, chipped areas, and blisters and no other defects were found.

5.15.3

Performance: The surface finish was unaffected by the reagents, except for superficial changes removable by sanding with 400-grit sandpaper and water. Damage resulting from the testing did not impair the serviceability of the fixture and can be easily repairable using abrasive and polishing compounds to approximate the original finish

This report shall not be reproduced. Except in full, without the written approval of Universal Laboratory, Inc



FOR: MARSTONE PRODUCTS LLC

Page 6 of 6

## CSA B45.5-2011/IAPMO ANSI Z124-2011 PLASTIC PLUMBING FIXTURES

## 5.16 Thermal Shock Resistance Test

**COMPLIES**

5.16.2 Showerbase was set up where water at  $150^{\circ}\text{F} \pm 4^{\circ}\text{F}$  would impinge on surface where water would normally strike for 1.5 minutes, drain for 30 seconds, followed by water at  $50^{\circ} \pm 4^{\circ}\text{F}$  for 1.5 minutes and drain for 30 seconds. Water rate at  $3.78 \pm 0.80 \text{ L/min}$  ( $1.0 \pm 0.2 \text{ gpm}$ ). This procedure constitutes one complete cycle. This test was continued for **250** cycles.

5.16.3 There was no cracking, crazing, blistering, de-lamination or spalling of unit.

## 5.17 Water resistance test for bathtubs and showers:

**COMPLIES**

Three specimens are installed in a boil test tank and boiled for 100 hours using distilled water.

RATE CHANGE

<u>SPECIMEN NO.</u>	<u>LOSS OF</u>			<u>COLOR</u>	<u>SURFACE PROFILE</u>	<u>TOTAL RATING</u>
	<u>GLOSS</u>	<u>CRACKS</u>	<u>BLISTERING</u>			
No. 1	0	0	0	0	0	0
No. 2	0	0	0	0	0	0
No. 3	0	0	0	0	0	0

RATING 0 NO CHANGE

REQUIREMENTS: MAXIMUM RATING 9 ON ALL THREE SPECIMENS.  
MAXIMUM ON ANY ONE SPECIMEN RATING 4.

## 5.25.4 Water Absorption Test

**COMPLIES**

5.25.4.1 Three specimens cut from unit, sealed edges, conditioned for 24 hours in oven at  $50 \pm 3^{\circ}\text{C}$  ( $122 \pm 5^{\circ}\text{F}$ ), then cooled to ambient laboratory temperature, and weighed and then immersed in distilled water  $23 \pm 1^{\circ}\text{C}$  ( $73 \pm 2^{\circ}\text{F}$ ) for 24 hours, then removed one at a time and dried. Then weighed within 30 seconds after removal from water. The percentage increase was then calculated to the nearest 0.01%.

5.25.4.2 The three specimens tested did not absorb any water in excess of 0.5% by mass.

This report shall not be reproduced. Except in full, without the written approval of Universal Laboratory, Inc



203 N. Edgerton Street | PO Box 220 | Fairland, Indiana 46126

MADE IN THE USA 

Phone 317.835.9000

Fax 317.835.3050

[www.mplcompany.net](http://www.mplcompany.net)

---

# Standard Drain Test



DATE: 5/31/2016

TEST REPORT

TEST NO.: 42078-A

FOR: MARSTONE PRODUCTS LTD  
203 N. Edgerton  
Fairland, IN 46126

Page 1 of 6

Background: MARSTONE submitted one Cultured Marble Showerbase, for evaluation per CSA B45.5-11/IAPMO Z124-11. The showerbase was received in good condition on 5/18/2016. Visual inspection was performed with no defects noted. All testing and sample preparation was performed by Universal Laboratory personnel with no outside services required. The following information is provided:

Order entry Log Date: 5/18/2016 Log No.: 582179

Product Description: 60" X 34" Center Drain Shower Pan

Material: Cultured Marble

Color: White 3" Drain in Center of Pan

Scope & Purpose: Testing to assure the compliance of the product to CSA B45.5-11/IAPMO Z124-11 standard's requirements for acceptability as a showerbase plumbing fixture for the manufacturer, listee, installer, and end user.

Preparation: CSA B45.5-11/IAPMO Z124-11

Temperatures & Preparation:

Ambient Lab. Temp.

5.4 Color-Fastness Test

5.5.1 Stain Resistance Test Specimen

5.6.1.1 Wear Test Specimen

5.10 Colourfastness

5.11 Stain

5.12.1 Wear

5.12.2 Cleanability

5.15 Chemical resistance

5.16 Thermal Shock

5.25.4 Water Absorption

Test Procedures: CSA B45.5-11/IAPMO Z124-11

4.4.1 Flanges

4.1.2/5.4 Surface Finishes

4.2 Waste fittings openings

5.3 Warpage tolerances

5.5 Subsurface test

5.6 Waste fitting Connection

5.7 Point Impact

5.8 Structural Integrity Tests

5.9 Radii Load Test For Bathtubs

5.10 Colourfastness

5.11 Stain Resistance

5.12 Cleanability and Wear

5.13 Ignitability

5.14 Cigarette

5.15 Chemical resistance

5.16 Thermal Shock

Test Results: The test results are provided in the attached data report.

CONCLUSION: The Cultured Marble Showerbase Tested, Meets The Requirements  
Per CSA B45.5-11/IAPMO Z124-11, Per Paragraphs Tested.

Note: "We certify that all portions of each test performed were under continuous, direct supervision of this laboratory."

  
Charles Stanley, Director

This report shall not be reproduced. Except in full, without the written approval of Universal Laboratory, Inc

FOR: MARSTONE PRODUCTS LLC

Page 2 of 6

## CSA B45.5-2011/IAPMO Z124-2011 PLASTIC PLUMBING FIXTURES

4.4	Bathtubs and shower bases: Showerbase	
4.4.1	Flanges:	N/A
4.4.2	Slope to the waste outlet: Unit's slope is within the maximum slope of 4% to the waste outlet. Unit's slope is within the minimum slope of 1%.	COMPLIES
4.4.4	Minimum dimensions for Showerbase: Thresholds shall be at least 2" above top of waste outlet. 6" Above No overflow: Not applicable	COMPLIES
5	Test Requirements	
5.2	Load test for grab bars: Not applicable	
5.3	Warpage tolerance test	COMPLIES
5.3.1	Unit was placed on flat, level surface to determine the amount of deviation from the horizontal plane that exists at it's edges. Used a feeler gauge to test per 5.3.1 instructions. Would not slide under the unit at any area.	
5.3.2	Performance: (a) There was no Warpage exceeding 5mm/m (0.06 in/ft); (b) No warpage exceeding 7.5 mm/m (0.09 in/ft); and (c) Total Warpage did not exceed 16 mm (0.063 in).	
5.4	Surface examination test:	COMPLIES
5.4.1	Unit was washed with a solution of standard liquid detergent and water, rinsed and dried. Then rubbed with a sponge and a 50% solution of water and water-soluble black ink. Ink rinsed immediately from the surface with water and dried before examination. Surface was examined for defects with the unaided eye from a distance of between 300 and 610 mm (1 and 2 ft) using a light source of partially diffused artificial light giving an illuminance on the surface of $1615 \pm 540$ lx ( $150 \pm 50$ foot-candles).	
5.4.2	The unit was free from cracks, chipped areas, and blisters and no other defects were found. The fixture was also free from blemished and defects on the visible surface to the extent specified in Table 1.	
5.5	Subsurface test	COMPLIES
5.5.1	The subsurface test was conducted on two different areas of the unit. Washed with a liquid detergent and water solution, rinsed and dried. The specimens were rubbed with normal hand pressure for 25 cycles with 600 grit wet silicon carbide abrasive paper. Following the abrasion the test areas were rinsed with water and dried. Standard dirt (5g (0.18 oz.)) was rubbed into each area with a dampened chamois with heavy thumb pressure in a circular motion for 25 cycles and allowed to dry for one hour. Then washed by rubbing areas with a clean, dampened chamois and liquid detergent. The surface of the areas were then examined per 5.4.1.	
5.5.2	There were no visible voids larger than 1.6 mm (0.063 in) in diameter below the original finish surface, and the less that the maximum allowed number of voids smaller than 1.6 mm (0.063 in) in the two test areas.	

This report shall not be reproduced. Except in full, without the written approval of Universal Laboratory, Inc



FOR: MARSTONE PRODUCTS LLC

Page 3 of 6

## CSA B45.5-2011/IAPMO ANSI Z124-2011 PLASTIC PLUMBING FIXTURES

- 5.6 Waste Fitting Connection Test of Shower Base  
5.6.1 Procedure for bathtubs and shower bases COMPLIES  
Drain-Fitting Connection Test: The test load was applied by means of a lever arm 600 mm long connected to the drain and extending horizontally. The weight and lever arm test load was applied in three radial positions, two of which were approximately 180° apart.  
5.6.3 There were no visible cracks in the fixture when inspected with the fitting in place after testing per 5.6.1 using a load of  $220 \pm 4$  N ( $50 \pm 1$  lbf).
- 5.7 Point Impact Load Test COMPLIES  
5.7.1.2 A 1.5" steel ball with a weight of  $2.20 \pm 0.05$  N ( $0.50 \pm 0.01$  lbf) was dropped from a height of 900 mm (36 in) to strike six different locations, as follows: (i) 3 locations on flat areas in bottom of fixture; (ii) 3 locations on the rim, from a height of 600 mm (24 in) to strike 3 locations on radii in the bottom of fixture, and one of those was in a corner of the fixture.  
5.7.2 Performance: There were no cracks or chips in the surface of the unit when examined per items (b) to (d) of Clause 5.4.1
- 5.8 Structural Integrity Tests  
5.8.1 - 5.8.1.1 Load test for seats: Not applicable
- 5.8.2 Load test for rims and bottoms: COMPLIES  
5.8.2.2.1 A preload of  $1335 \pm 22$  N ( $300 \pm 5$  lbf) test load applied to the center bottom of unit and left for 2 to 3 minutes to allow for settlement of unit, then removed for ten to fifteen minutes and then reapplied to the same area and deflection under the load measured with a deflectometer with a reading accuracy of 0.025 mm (0.001 in). The load was removed and after the removal of the load the residual deflection was measured.  
5.8.2.3 Performance: There were no cracks in the surface and the deflection under the test load did not exceed 3.81 mm (0.150 in) and the maximum residual deflection 10 minutes after removal of load did not exceed 0.203 mm (0.008 in). Under Load: 0.92" Residual Deflection: 0.000"
- 5.8.4 Wall Surrounds: Not applicable
- 5.9 Radii Load Test For Showers Not applicable
- 5.10 Colourfastness Test COMPLIES  
5.10.2 & 5.10.3 Conditions and Procedure:  
Test specimen was cut from the unit. With one half shielded as a control, the test specimen was exposed to ultraviolet radiation for 200 hours by using clear glass filters in an Xenon Arc Weatherometer. The Black-panel temperature was maintained at  $63 \pm 5^\circ$  C. The test sample was then stored away from light source at  $73 \pm 9^\circ$  F for 72 hours and then evaluated.  
5.10.4 There was no appreciable change in color of the specimen when tested in accordance with 5.10.2 and 5.10.3.

This report shall not be reproduced. Except in full, without the written approval of Universal Laboratory, Inc



FOR: MARSTONE PRODUCTS LLC

Page 4 of 6

## CSA B45.5-2011/IAPMO ANSI Z124-2011 PLASTIC PLUMBING FIXTURES

## 5.11 Stain Resistance / Clause 5.11.1 Stain Resistance Test

COMPLIES

The maximum stain resistance rating shall be the sum of the individual stain ratings of each of the covered and uncovered stain areas and shall not exceed 50 when tested in accordance with Clause 5.11.1 through 5.11.2.3.

5.11.3 Performance: The maximum reduction in the thickness allowable of the surface material with a stain having a rating of 5 is 0.175mm.

COVERED	REAGENTS	UN-COVERED
<u>1</u>	Black crayon	<u>1</u>
<u>1</u>	Black liquid shoe polish	<u>2</u>
<u>0</u>	Blue washable ink	<u>0</u>
<u>2</u>	Lipstick	<u>1</u>
<u>2</u>	Hair dye	<u>2</u>
<u>0</u>	Iodine solution (1% alcohol sol)	<u>1</u>
<u>3</u>	Gentian violet solution (2% aqueous )	<u>3</u>

Stain Rating: 9Stain Rating: 10Total Stain Rating Covered & Uncovered: 19Reduction of material: Not Applicable

## 5.12 Cleanability and Wear Test

## 5.12.1 Wear Test Procedure

COMPLIES

## 5.12.1.1 through 5.12.1.2 Specimens preparation and test equipment preparation

5.12.1.3 Procedure: Each specimen was subject to 7,600 scrub cycles.

5.12.1.3.3 Samples removed from test machine, rinsed in water, dried, and measured for cleanability per 5.12.2 for reduction in surface material. There was no wear-through of the surface material in the middle third of the specimens.

## 5.12.2 Cleanability Test Results:

The white-light reflectance of 3 specimens did not lose more than 5% white-light reflectance after being cleaned and not more than 2% white-light reflectance after an additional cleaning with abrasive cleaner, when tested in accordance with 5.12.2. Average of 3 specimens First Cleaning: 3.3% Second Cleaning: 0.93%.

This report shall not be reproduced. Except in full, without the written approval of Universal Laboratory, Inc

## CSA B45.5-2011/IAPMO ANSI Z124-2011 PLASTIC PLUMBING FIXTURES

5.13

## Ignitability Test

Ignitability of the Unexposed Surface:

Ignition Test:

COMPLIES

5 specimens were removed from unit and placed in a draft free laboratory hood. The flame from a propane torch was applied to the center of the backside of each specimen at a 45° angle for 30 seconds and removed and flame time recorded. After 1 minute the flame was reapplied to same area for 30 seconds and removed and timed again for burn rate. Ignition test results:

<u>Sample No.</u>	<u>First Burn Rate</u>	<u>Second Burn Rate</u>
1	3	8
2	5	6
3	6	10
4	3	8
5	7	10

Requirements: All specimens shall cease to burn, if ignited, within 30 seconds after removal of burner.

5.14

## Cigarette Test

COMPLIES

5.14.1

Three lighted cigarettes, different brands, were placed 1" in from edge of specimens and allowed to burn for 2 minutes. Cigarettes were removed and specimens allowed to cool, then cleaned with cheesecloth.

5.14.2

All visible stains were removed with household cleaning powder, no sandpaper needed to remove stains. There was no ignition or progressive glow of the specimens during or after contact with the cigarettes.

5.15

## Chemical Resistance Test

COMPLIES

5.15.2

Two drops of each of the following reagents were applied to surface specimens on two sets of samples. One set left uncovered and one set covered with watch glasses; reagents used: Naphtha, Ethyl alcohol, Amyl acetate, Ammonium hydroxide, 1%, Citric-acid 10% water, Urea, 6.0% water solution, Hydrogen peroxide 3% water, Sodium hypochlorite 6% solution, Toluene, Ethyl acetate, Lye, 1% to 2% water solution, and Acetone, and allowed to remain for 16 hours. Watch glasses and excess reagent removed from specimens and then specimens were kept for 24 hours at  $23 \pm 2^\circ\text{C}$  ( $74.3 \pm 3.6^\circ\text{F}$ ) and a relative humidity of  $50 \pm 5\%$ . Then examined per 5.4.1.

5.4.1 Unit was washed with a solution of standard liquid detergent and water, rinsed and dried. Then rubbed with a sponge and a 50% solution of water and water-soluble black ink. Ink rinsed immediately from the surface with water and dried before examination. Surface was examined for defects with the unaided eye from a distance of between 300 and 610 mm (1 and 2 ft) using a light source of partially diffused artificial light giving an illuminance on the surface of  $1615 \pm 540 \text{ lx}$  ( $150 \pm 50 \text{ foot-candles}$ ).

5.4.2

The unit was free from cracks, chipped areas, and blisters and no other defects were found.

5.15.3

The fixture was also free from blemished and defects on the visible surface to the extent specified in Table 1. Performance: The surface finish was unaffected by the reagents, except for superficial changes removable by sanding with 400-grit sandpaper and water. Damage resulting from the testing did not impair the serviceability of the fixture and can be easily repairable using abrasive and polishing compounds to approximate the original finish

This report shall not be reproduced. Except in full, without the written approval of Universal Laboratory, Inc



FOR: MARSTONE PRODUCTS LLC

Page 6 of 6

## CSA B45.5-2011/IAPMO ANSI Z124-2011 PLASTIC PLUMBING FIXTURES

- 5.16 Thermal Shock Resistance Test **COMPLIES**
- 5.16.2 Showerbase was set up where water at  $150^{\circ}\text{F} \pm 4^{\circ}\text{F}$  would impinge on surface where water would normally strike for 1.5 minutes, drain for 30 seconds, followed by water at  $50^{\circ} \pm 4^{\circ}\text{F}$  for 1.5 minutes and drain for 30 seconds. Water rate at  $3.78 \pm 0.80 \text{ L/min}$  ( $1.0 \pm 0.2 \text{ gpm}$ ). This procedure constitutes one complete cycle. This test was continued for 250 cycles.
- 5.16.3 There was no cracking, crazing, blistering, de-lamination or spalling of unit.
- 5.17 Water resistance test for bathtubs and showers: **COMPLIES**  
Three specimens are installed in a boil test tank and boiled for 100 hours using distilled water.

RATE CHANGE

<u>SPECIMEN NO.</u>	<u>LOSS OF</u>		<u>CRACKS</u>	<u>BLISTERING</u>	<u>COLOR</u>	<u>SURFACE PROFILE</u>	<u>TOTAL RATING</u>
	<u>GLOSS</u>						
No. 1	0		0	0	0	0	0
No. 2	0		0	0	0	0	0
No. 3	0		0	0	0	0	0

RATING 0 NO CHANGE

REQUIREMENTS: MAXIMUM RATING 9 ON ALL THREE SPECIMENS.  
MAXIMUM ON ANY ONE SPECIMEN RATING 4.

- 5.25.4 Water Absorption Test **COMPLIES**
- 5.25.4.1 Three specimens cut from unit, sealed edges, conditioned for 24 hours in oven at  $50 \pm 3^{\circ}\text{C}$  ( $122 \pm 5^{\circ}\text{F}$ ), then cooled to ambient laboratory temperature, and weighed and then immersed in distilled water  $23 \pm 1^{\circ}\text{C}$  ( $73 \pm 2^{\circ}\text{F}$ ) for 24 hours, then removed one at a time and dried. Then weighed within 30 seconds after removal from water. The percentage increase was then calculated to the nearest 0.01%.
- 5.25.4.2 The three specimens tested did not absorb any water in excess of 0.5% by mass.

This report shall not be reproduced. Except in full, without the written approval of Universal Laboratory, Inc





203 N. Edgerton Street | PO Box 220 | Fairland, Indiana 46126

MADE IN THE USA 

Phone 317.835.9000

Fax 317.835.3050

[www.mplcompany.net](http://www.mplcompany.net)

---

# IAPMO Z124-2022 Test



# TEST REPORT

5001 East Philadelphia Street  
Ontario, California – USA 91761-2816  
Ph: 909.472.4100 | Fax: 909.472.4243  
<http://www.iapmortl.org>

**Report Number:** 2078-24004

**IAPMO R&T File No.:** 9194

**Report Issued:** June 25, 2024

**Lab Project No.:** 43484

**Client:** MPL COMPANY  
203 N. Edgerton  
Fairland, Indiana 46126

**Source of Samples:** On April 23, 2024, during a routine inspection at the manufacturer's warehouse in Fairland, IN, an IAPMO inspector, Sal Farruggia, selected sample shower base for Continuous Compliance Testing. The sample was sent by the manufacturer and received in good condition by IAPMO R&T Lab on April 29, 2024. The IAPMO inspection marks/stickers were on the package and there was no sign of tampering.

**Date of Testing:** June 17, 2024 to June 21, 2024

**Sample Description:** Plastic shower

Model: CTR-48X36

Please refer to the drawings and photo for detail.

**Scope of Testing:** The purpose of the testing was to determine if the sample of the plastic bathtub shower met the applicable requirements of Sections 4.1, 4.2, 4.4, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8 and 5.9 of CSA B45.5-22/IAPMO Z124-2022 entitled, "Plastic Plumbing Fixtures".

**CONCLUSION:** The sample tested of the plastic shower, models listed above, from MPL Company, **COMPLIED** with the applicable requirements of Sections 4.1, 4.2, 4.4, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8 and 5.9 of CSA B45.5-22/IAPMO Z124-2022.

Tested by,

Rogelio Estrada, Test Technician

Approved by,

Xuefeng (Jeff) Huang, Director - Fixture Testing

*All testing and sample preparation for this report was performed under the continuous, direct supervision of IAPMO R&T Lab, unless otherwise stated. The statement of compliance is based on the test results compared to the standard specifications without considering measurement uncertainty. The observations, test results and conclusions in this report apply only to the specific samples tested and are not indicative of the quality or performance of similar or identical products. Only the Client shown above is authorized to copy or distribute the report, and then only in its entirety. If presented with a copy of a Test Report without the IAPMO R&T Lab watermark background, contact IAPMO R&T Lab for verification. Any use of the IAPMO R&T Lab name for the sale or advertisement of the tested material, product or service is prohibited absent the advance written consent of IAPMO R&T Lab.*

**Primary Standard:** CSA B45.5-22/IAPMO Z124-2022. Sections Tested/Evaluated:

- 4.1 General
- 4.2 Waste Fitting Openings, Drainage and Overflows
- 4.4 Bathtubs and Shower Bases
- 5 Test Requirements
- 5.2 Stress Tests for Grab Bars and Grip Rails
- 5.3 Warpage Tolerance Test
- 5.4 Surface Examination Test
- 5.5 Subsurface Test
- 5.6 Waste Fitting Connection Test
- 5.7 Point Impact Test
- 5.8 Structural Integrity Test
- 5.9 Radii Load Test for Water Closets, Urinals, Bathtubs, and Showers

**Note:** Sections not specifically listed above were considered not applicable to the subject product.

**Test Results:** All tests and evaluations were conducted per the written procedures as specified in the standards.

CSA B45.5-22/IAPMO Z124-2022

4.1 General

4.1.2 Surface Finish – COMPLIED

The fixture surfaces were free from defects to the extent specified in the standard when evaluated per clause 5.4. Refer to clause 5.4.

4.1.3 Coated Parts – NOT APPLICABLE

Coated parts other than those covered in Clause 4.3.1.2 shall comply with the applicable requirements of ASME A112.18.1/CSA B125.1.

Findings: The sample did not contain any coated parts.

4.1.4 Different Materials – NOT APPLICABLE

Fixtures made of a combination of plastic and other materials shall comply with the applicable requirements of ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, or ASME A112.19.3/CSA B45.4.

Findings: The sample was made of plastic only.

4.1.5 Accessible Design Fixtures - NO TESTING CONDUCTED

Fixtures designed to be accessible shall comply with the dimensional requirements specified in CAN/CSA-B651 or ICC/ANSI A117.1.

Findings: The sample was not evaluated for accessible design.



## 4.2 Waste Fitting Openings, Drainage and Overflows

### 4.2.1 Openings and Drainage

#### 4.2.1.1 COMPLIED

The fixture:

- (a) Had a waste fitting outlet the center of which was located at the lowest point of the fixture.
- (b) Drained to the waste outlet.

4.2.1.2 COMPLIED. Except when proprietary (i.e. non-standard) waste fittings are provided by the manufacturer, the dimensions of the waste outlet shall be as shown in Figure 1.

Findings: The sample met the required dimensions of

Figure 1(h) for shower

	Requirement (in)	CTR-48 X36
		Found (in)
Outlet Diameter	3.25 – 3.50	3.26

4.2.1.3 N/A. Factory-supplied waste fittings shall comply with ASME A112.18.2/CSA B125.2.

Findings: The waste fitting was not supplied.

### 4.2.2 Overflows

#### 4.2.2.2 Bathtubs – NOT APPLICABLE

Overflows in bathtubs may be provided at the option of the manufacturer. When overflows are provided, their dimension, location, and position in relation to the waste outlet in the fixture shall be as shown in Figure 7. Variations in location, geometry, diameter, and angle of orientation of the overflow opening shall be acceptable when factory-provided waste and overflow fittings are used.

Findings: The tested sample was not a bathtub.

## 4.4 Bathtubs and Shower Bases

### 4.4.1 Flanges – COMPLIED

4.4.1.2 Shower bases intended for installation against and securing to a wall shall incorporate a continuously raised flange at least 25 mm (1.0 in) above the threshold, as shown in Figure 8 and comply with Clauses 4.4.1.3 to 4.4.1.5. The measured height of flange was 0.84 inch

4.4.1.3 The flange was

- (a) integral with the bathtub or shower base; or

4.4.1.4 Bathtubs and shower bases using field-installed flanges shall be marked in accordance with Clause 6.3

4.4.1.5 The bottom of any hole in the flange or corner treatment was not less than 0.3 inch above the rim.

#### 4.4.2 Slope to the Waste Outlet – COMPLIED

Bathtubs and shower bases shall have a maximum slope of 4% to the waste outlet.

Findings:

Minimum Slop	Maximum Slop
1.9	3.6

#### 4.4.3 Diameter, Spacing, and Grippable Length of Grab Bars – NOT APPLICABLE

Findings: The shower base was not provided with any grab bar.

#### 4.4.4 Bathtubs with Pressure Sealed Doors – NOT APPLICABLE

Bathtubs with pressure sealed doors shall comply with ASME A112.19.15.

Findings: The sample tested was a shower base and had no pressure sealed doors

#### 4.4.5 Supply Fittings – NOT APPLICABLE

Finding: No supply fitting was provided.

### 5 Test Requirements

#### 5.2 Stress Tests for Grab Bars and Grip Rails

##### 5.2.1 Load Test for Grab Bars – NOT APPLICABLE

The load test for grab bars was tested in accordance with Clause 5.2.1 using a 1.3 kN (292 lbf) applied vertically downward, for grab bars mounted horizontally and pulling downward at an angle of  $30 \pm 5^\circ$  from the wall, for grab bars mounted vertically. Following the removal of the load, the grab bar was subject to a water leakage test in accordance with Clause 5.18(c) with the water spray aimed at the points where the specimen was mounted for 30 min.

Grab bars shall not break or detach from the fixture. In addition,

- a) there shall be no leakage between the grab bar and the fixture;
- b) the fixture shall not show signs of cracking or other defects when inspected in accordance with Clause 5.4.1(d); and
- c) with the load removed, the grab bar shall not rotate within the fixture.

Findings: The sample did not have grab bar

#### 5.3 Warpage Tolerance Test – COMPLIED

The fixture met the warpage requirements in Clause 5.3.2 when tested in accordance with paragraph 5.3.1 of the standard.

- (a) warpage at the edges of the fixture that set against a wall or floor, or into cabinets or countertops, did not exceed 0.06 in/ft;
- (b) warpage at all other edges of the fixture did not exceed 0.09 in/ft; and
- (c) total warpage of any linear dimension did not exceed 0.63 in.

#### 5.4 Surface Examination Test – COMPLIED

When evaluated in accordance with Clause 5.4.1, the unit was free from cracks, chipped areas and blisters. There were no other defects that exceeded those allowed by Table 1.

## 5.5 Subsurface Test – COMPLIED

The sample was washed with a solution of standard liquid detergent and water, rinsed with water, and dried. Then, the bathtub was rubbed with normal hand pressure for at least 25 cycles with 600-grit wet silicon carbide abrasive paper with each test area of approximately 16 in<sup>2</sup> at two different non-adjacent areas. Following the abrasion, the bathtub was rinsed with water and dried. Then, 0.18 oz of standard dirt was applied by rubbing the dirt with a dampened chamois and heavy thumb pressure in a circular motion for approximately 25 cycles. The dirt was then dried for at least 1 h. Finally, the bathtub was washed with a clean, dampened chamois and standard liquid detergent and the surface examined in accordance with Clause 5.4.1(d).

Findings: There were no voids larger than 0.063 inch and no more than eight voids less than 0.063 inch were found.

## 5.6 Waste Fitting Connection Test – COMPLIED

The waste fitting connection was tested in accordance with Clause 5.6.1 using a 50 lbf load with a 24 in. lever arm connected as shown in Figure 9. The load was applied and examine for cracks with the load in place. Two additional radial locations were applied at approximately 180° apart and examined for cracks with the load in place.

Findings: There were no visible cracks in the bottom surface of the specimen.

## 5.7 Point Impact Load Test – COMPLIED

When tested in accordance with Clause 5.7.1.2, a 1-1/2 inch diameter, 1/2 pound steel ball was dropped three times from a height of 36 inches to strike at three different points on flat areas on the specimen and at three different locations on the rim or threshold. The 1-1/2 inch diameter 1/2 pound ball was also dropped from 24 inches to strike 3 different points on the radii in the bottom of the specimen with at least one strike in a corner.

Findings: There were no cracks or chips on the surface of the specimen when examined in accordance with items (b) to (d) of clause 5.4.1.

## 5.8 Structural Integrity Test

### 5.8.1 Load Test for Bathtub and Shower Seats – NOT APPLICABLE

The seat should be loaded at 300 lbf to the centre of the seat using a 6 in. diameter load-distribution disk resting on a 0.5 in thick sponge rubber or equivalent pad for 2 minutes.

Findings: The sample did not have shower seat.

### 5.8.2 Load Test for Bathtub Rims and Bottoms and Shower Thresholds and Bottoms – COMPLIED

When tested to clauses 5.8.2.2.1/5.8.2.2.2 and 5.8.2.2.3 with 300 lbf load, there shall be no damage to the fixture. The deflection under load shall be less than 0.150” maximum and the residual deflection shall be less than 0.008”.

Findings: There was no cracks in the surface of the specimen when examined in accordance with items (b) to (d) of clause 5.4.1.

	Load Deflection (in.)		Residual Deflection (in.)	
	Required	Found	Required	Found
Bottom	0.150 max	0.036	0.008 max	0.001



5.8.3 Area Impact Load Test for Bathtub and Shower Wall Surrounds – NOT APPLICABLE

Findings: The sample did not have wall surrounds.

5.8.4 Load Test for Bathtub and Shower Wall Surrounds –NOT APPLICABLE

A load of 25 lbf was applied to the specimen wall using a 3 in. diameter load-distribution disc resting on a 0.5 in. thick sponge rubber pad for 1 minute and then unloaded for 2 minutes. This constituted one cycle and repeated 10 cycles. The deflection under the load did not exceed 0.25 in.

Findings: The tested sample shower base did not have wall surrounds.

5.8.5 Load Test for Unsupported Bathtub Areas –NOT APPLICABLE

When tested in accordance with Clause 5.8.5.1, a load of  $10 \pm 0.1$  lb was applied at the central point of all unsupported tub wall areas below the rim of the bathtub by means of a 1 inch diameter steel rod rounded to a 1/2 inch radius at the end in contact with the bathtub. The deflection was measured opposite the applied load. The deflection under the applied load shall not exceed 0.125 inch at any individual point.

Finding: The tested shower base sample did not have unsupported bathtub areas.

5.9 Radii Load Test for Water Closets, Urinals, Bathtubs, and Showers – COMPLIED

When tested in accordance with Clause 5.9.1, the outside radii of finished surfaces of the unit were tested with a 0.5 in diameter nylon rod applying a load of approximately 10 lbf at an angle tangent to the radius.

Findings: The unit tested did not show signs of cracks when examined in accordance with items (b) to (d) of clause 5.4.1.

**Photograph of the Sample Tested:**

