MPL Company

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

MADE IN THE USA

Phone 317.835.9000
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Coefficient Slip Resistance Test

QAI LABORATORIES
CERTIFICATION TESTING INSPECTION

1325 North 108th E. Avenue
Tulsa, OK 74116
918.437.8333 ph. | 918.437.8487 fx.

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.

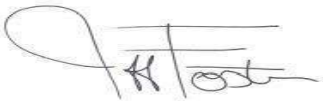
TESTING PERIOD: October 30, 2017.

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.*

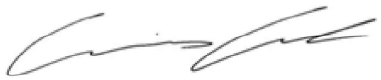
TEST RESULTS: The samples **meet** the criteria of ASTM F462-79. Detailed test results are presented in the subsequent pages of this report.

Prepared By



Jeff Foster
Laboratory Test Technician

Signed for and on behalf of QAI Laboratories, Inc.



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 ***

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Trench Drain Test

DATE: 5/31/2016 TEST REPORT TEST NO.: 42078

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

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

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 ± 540 1x (150 ± 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.	

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 ± 4 N (50 ± 1 lbf).

5.7 Point Impact Load Test — COMPLIES

5.7.1.2 A 1.5" steel ball with a weight of 2.20±0.05 N (0.50±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 ± 22N (300 ± 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: .060" Residual Deflection: .004"

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 ± 5° C. The test sample was then stored away from light source at 73 ± 9°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.

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
1	Black crayon	1
1	Black liquid shoe polish	1
2	Blue washable ink	1
1	Lipstick	1
3	Hair dye	2
1	Iodine solution (1% alcohol sol)	0
3	Gentian violet solution (2% aqueous)	3

Stain Rating: 12 Stain Rating: 9

Total Stain Rating Covered & Uncovered: 21 Reduction 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:

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:

Sample No.	First Burn Rate	Second Burn Rate
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 COMPLIES

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 . All visible stains were removed with household cleaning powder, no sandpaper needed to remove stains.

5.14.2 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 COMPLIES

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 ± 2°C (74.3 ±3.6°F) and a relative humidity of 50 ±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 ± 540 lx (150 ± 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.

5.15.3 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

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°F ± 4°F would impinge on surface where water would normally strike for 1.5 minutes, drain for 30 seconds, followed by water at 50° ± 4°F for 1.5 minutes and drain for 30 seconds. Water rate at 3.78 ±0.80 L/min (1.0± 0.2 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

SPECIMEN NO.	LOSS OF GLOSS	CRACKS	BLISTERING	COLOR	SURFACE PROFILE	TOTAL RATING
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 ± 3°C (122 ± 5°F), then cooled to ambient laboratory temperature, and weighed and then immersed in distilled water 23 ± 1°C (73 ± 2°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.

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Standard Drain Test

DATE: 5/31/2016

TEST REPORT

TEST NO.: 42078-A

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

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

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. COMPLIES

Unit's slope is within the minimum slope of 1%.

4.4.4 Minimum dimensions for Showerbase:

Thresholds shall be at least 2" above top of waste outlet. 6" Above COMPLIES

No overflow: Not applicable

5 Test Requirements

5.2 Load test for grab bars: Not applicable

5.3 Warpage tolerance test

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. COMPLIES

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:

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 ± 540 1x (150 ± 50 foot-candles). COMPLIES

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

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. COMPLIES

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.

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 ± 4 N (50 ± 1 lbf).

5.7 Point Impact Load Test

5.7.1.2 A 1.5" steel ball with a weight of 2.20±0.05 N (0.50±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. — COMPLIES

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:

5.8.2.2.1 A preload of 1335 ± 22N (300 ± 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. — COMPLIES

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: .000"

5.8.4 Wall Surrounds: — Not applicable

5.9 Radii Load Test For Showers — Not applicable

5.10 Colourfastness Test

5.10.2 & 5.10.3 Conditions and Procedure: — COMPLIES

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 ± 5° C. The test sample was then stored away from light source at 73 ± 9°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.

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
1	Black crayon	1
1	Black liquid shoe polish	2
0	Blue washable ink	0
2	Lipstick	1
2	Hair dye	2
0	Iodine solution (1% alcohol sol)	1
3	Gentian violet solution (2% aqueous)	3

Stain Rating: **9** Stain Rating: **10**

Total Stain Rating Covered & Uncovered: **19** Reduction 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%.**

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:

Sample No.	First Burn Rate	Second Burn Rate
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

5.14.1 COMPLIES

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 . All visible stains were removed with household cleaning powder, no sandpaper needed to remove stains.

5.14.2 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 COMPLIES

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 ± 2°C (74.3 ±3.6°F) and a relative humidity of 50 ±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 ± 540 lx (150 ± 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.

5.15.3 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

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5.16 Thermal Shock Resistance Test **COMPLIES**

5.16.2 Showerbase was set up where water at 150°F ± 4°F would impinge on surface where water would normally strike for 1.5 minutes, drain for 30 seconds, followed by water at 50° ± 4°F for 1.5 minutes and drain for 30 seconds. Water rate at 3.78 ±0.80 L/min (1.0± 0.2 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

SPECIMEN NO.	LOSS OF GLOSS	CRACKS	BLISTERING	COLOR	SURFACE PROFILE	TOTAL RATING
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 ± 3°C (122 ± 5°F), then cooled to ambient laboratory temperature, and weighed and then immersed in distilled water 23 ± 1°C (73 ± 2°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.