Technical Services Laboratory Report
for

Bilco Brick
(Professional Brick)

ASTM C1634 of Concrete Masonry Units

Lancaster, Texas

AASHTO Accredited & ISO 9001:2015 Certified

Master Builders Solutions Admixtures US LLC
23700 Chagrin Blvd.
Cleveland, OH 44122
Telephone: (216) 839-7500

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INTRODUCTION

The Technical Services Laboratories of Master Builders Solutions Admixtures US, LLC received one set of normal weight concrete brick units, each measuring 2.75 x 2.625 x 9.625 inches, on 4/12/24. The units were identified as Professional Brick. Testing was requested to evaluate compliance with ASTM C1634-23, Specification for Concrete Facing Brick and Other Concrete Masonry Facing Units as well to determine if the samples meet the water repellency certification requirements established and administered by Master Builders Solutions. The submitted mix design can be found in Appendix A.

SAMPLE PREPARATION AND METHODS

Compressive strength, density, and absorption characteristics were determined in accordance with the testing procedures outlined in ASTM C140-23, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units. Compressive strength specimens were capped with high strength gypsum prior to testing per ASTM C1552-23, Standard Practice for Capping Concrete Masonry Units, Related Units and Masonry Prisms for Compression Testing.

Master Builders Solutions Water-Repellent Admixture test program consists of four testing procedures that are used to determine if the submitted concrete brick specimens meet the stringent requirements of water repellency certification. A brief outline of each testing procedure is given below.

Puddle Retention Test – A single Concrete Facing Brick and Other Concrete Masonry Facing Unit sample is arranged face up on a level surface and approximately 5 mL of water is placed on five different areas of the unit face. The water beading characteristics of the sample are visually determined during a 30-minute test period.

Wicking Resistance – A single Concrete Facing Brick and Other Concrete Masonry Facing Unit is partially submerged in water at a depth of approximately 1 in. The average height of capillary rise is measured to the nearest millimeter at the conclusion of a 24-hour submersion period.

Low Pressure Permeation Test – The results of low-pressure permeability testing are a function of flow vs. time and calculated pressure. The data generated are translated into an estimated wind-driven rain resistance equivalent.

Spray Bar Permeation Test – This test method simulates a steady rain flow over the face of a concrete unit. Water is sprayed onto the face using a spray-bar apparatus at a rate of 120 gallons per hour. Core dampness is visually monitored at 1-hour intervals for four hours.

RESULTS

The results of the C140 and water repellency testing are presented in Table 1. More complete data on compressive strength, density and absorption can be found in Appendix B.

Table 1 – Testing Results for Professional Brick

Density, lbs/ft³	137.7
Absorption, %	5.4
Absorption, lbs/ft³	7.4
Compressive Strength, psi	7440
Visible Puddle Retention	
30 minutes	Yes
Wicking	
Average capillary rise, cm	0.03
Water Permeation	
60 minutes, cm	10.2
Wind driven rain, mph	88
Spray Bar	
4 hours, %	0
4 hours, pinholes	0
Certification Result	**Pass**

CONCLUSION

The units tested meet the requirements of ASTM C1634-23, Concrete Facing Brick and Other Concrete Masonry Facing Units and meet the specifications for water repellency as administered and maintained by Master Builders Solutions Admixtures US, LLC. A certificate stating such conformance is attached below. Printed copies of the water repellency certificate can be requested by contacting your local Master Builders Solutions sales representative. This report and certificate may be used as supporting documentation for project submittals.

WATER REPELLANCY CERTIFICATION

CERTIFICATE OF
MANUFACTURER

MASTERPEL® ADMIXTURES WATER-REPELLENT CMU PRODUCER

Professional Brick

Bilco Brick - Lancaster, Texas

is a Certified Manufacturer of MasterPel® Admixture-Treated Concrete Masonry Units (CMU), having Concrete Mix Designs meet the performance requirements for Water Repellency, as set forth by Master Builders Solutions Admixtures US, LLC

Master Builders Solutions Water-Repellent Admixture Test Program requirements, tested within an **AASHTO Accredited and ISO 9001:2015 Certified Laboratory by ACI-Certified Masonry Lab Testing Technicians**

- ASTM C90 Compliance
- ASTM C140 Density, Absorption
- Wicking Resistance
- Puddle Retention Test
- Low-Pressure Permeation (Wind-Driven Rain) Test
- Spray Bar Permeation Test

CERTIFICATE NUMBER: 24-0283
CERTIFICATE ISSUE DATE: 5/15/24
CERTIFICATE EXPIRATION: 5/15/29

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APPENDIX B – Results

23700 Chagrin Blvd.
Beachwood, OH 44122
216.839.7238
www.master-builders-solutions.com

ASTM C140/C140-20 Test Report **W/O No.:** 24-0283
Sampling and Testing Concrete Masonry Units and Related Units

Client: Bilco Brick
Address: Lancaster, TX

Testing Agency: Master Builders Solutions US LLC
Date Samples Received: 4/12/2024

Unit Spec: ASTM C1634
Project ID: Professional Brick

Description: Professional Brick - King Size Concrete Brick
2.75 x 2.625 x 9.625

Summary of Test Results: Normal Weight Units

Physical Property	ASTM C1634 Specified Values	Average Test Results	
Net Compressive Strength	3500 min	7440	psi
Gross Compressive Strength	---	7080	psi
Density (Oven Dry Condition)	≥125	137.7	pcf
Absorption	10 max	7.4	pcf
Absorption %		5.4	%
Percent Solid	---	100.0	%
Net Cross-Sectional Area	---	24.6	$in.^2$
Gross Cross-Sectional Area	---	25.8	$in.^2$

Water Repellency Results

Visible Puddle Retention	
30 minutes	Yes
Wicking	
Average capillary rise, CM	0.03
Water Permeation	
60 minutes, CM	10.2
Wind Driven Rain, MPH	88
Spray Bar	
4 Hours, %	0
4 hours, Pinholes	0
Certification Results	**Pass**

Full Size Unit Measurements

Date Tested:		Avg. Width (in.)	Avg. Height (in.)	Avg. Length (in.)
5/13/2024	A	2.7	2.8	9.6
	B	2.7	2.9	9.6
	C	2.7	2.8	9.6
	Average	**2.68**	**2.83**	**9.63**

Compression Specimens

Date Tested:		Avg. Width (in.)	Avg. Height (in.)	Avg. Length (in.)	Cross-Sectional Area Gross ($in.^2$)	Cross-Sectional Area Net ($in.^2$)	Max. Load (lb)	Compressive Strength Gross (psi)	Compressive Strength Net (psi)
5/13/2024	A	2.7	2.8	9.6	25.8	25.4	179198	6960	7050
	B	2.7	2.9	9.6	26.1	24.0	181306	6950	7550
	C	2.7	2.8	9.6	25.6	24.3	187937	7350	7730
	Average	**2.68**	**2.83**	**9.63**	**25.8**	**24.6**	**182814**	**7080**	**7440**

Absorption Specimens

Date Tested:		Avg. Width (in.)	Avg. Height (in.)	Avg. Length (in.)	Min. Equivalent thickness (in.)
5/10/2024	A	2.7	2.8	9.6	2.6
	B	2.7	2.9	9.6	2.5
	C	2.7	2.8	9.6	2.5
	Average	**2.68**	**2.83**	**9.63**	**2.6**

Date Tested:		Received Weight (lb)	Immersed Weight (lb)	Saturated Weight (lb)	Oven-Dry Weight (lb)	Absorption (pcf)	Absorption (%)	Net Volume (ft^3)	Moisture Content (%)	Density (pcf)
5/10/2024 to 5/12/2024	A	5.8	3.3	5.9	5.6	7.4	5.5	0.04	53.5	135.8
	B	5.7	3.4	5.9	5.6	7.5	5.4	0.04	51.2	139.1
	C	5.6	3.3	5.7	5.4	7.4	5.3	0.04	53.6	138.3
Average		**5.7**	**3.3**	**5.8**	**5.5**	**7.4**	**5.4**	**0.04**	**52.8**	**137.7**

Rachael L. Barbour
Manager, Analytical Services