

**TorTest<sup>SM</sup> Floor Friction Testing Service**  
**SOTTER ENGINEERING CORPORATION**  
Consultants

26705 Loma Verde, Mission Viejo, CA 92691  
Telephone: 949-582-0889 FAX: 949-916-2193

*Licensed by the State of California  
Board of Professional Engineers  
And Land Surveyors*

*Approved by the City of Los Angeles  
for testing slip resistance of flooring*

### Flooring Slip Resistance Test Results

Client: **Unicorn Tile Corp**

Report date: 12/11/13

Flooring: **Atlas Stone Brushed porcelain tile**

Tile size: 12"x12"

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Test no.: 1312-1025

Date tested: 12/6/13

#### ANSI A137.1 Dynamic Coefficient of Friction Test

The American National Standards Institute (ANSI) published the A137.1-2012 American National Standard test for measuring dynamic coefficient of friction (DCOF) of common hard-surface indoor level floor materials in 2012. This ANSI standard has been incorporated as a requirement in "Section 2103.6 Ceramic Tile" of the 2012 International Building Code published by the International Code Council.

**Average Wet Dynamic Coefficient of Friction (DCOF), after cleaning with Renovator #120, and tested with BOT-3000E digital tribometer using SBR rubber slider and 0.05% SLS water solution:**

**Tile #1 Wet:** 0.57, 0.57, 0.58, 0.58; **Avg. = 0.58; Dry:** 0.59, 0.60, 0.61, 0.61; **Avg. = 0.60**

**Tile #2 Wet:** 0.58, 0.59, 0.59, 0.59; **Avg. = 0.59; Dry:** 0.62, 0.62, 0.62, 0.61; **Avg. = 0.62**

**Tile #3 Wet:** 0.58, 0.58, 0.58, 0.58; **Avg. = 0.58; Dry:** 0.62, 0.62, 0.62, 0.62; **Avg. = 0.62**

**Overall average: Wet: 0.58; Dry: 0.61**

**T = 60 degrees F; Relative humidity = 42%; BOT recalibration due June 28, 2014**

**BOT-3000E strain gauge verified on day of test. Reference tile before/after results: passed/passed**

High dynamic coefficient of friction values indicate potentially good traction. The ANSI A137.1 standard, Section 6.2.2.1.10, recommends a **minimum** average DCOF of **0.42** for indoor level floors for high slip resistance. (It has no recommendation for outdoor floors or for ramps.) Slip resistance can be affected by factors such as floor coatings, abrasives, detergents, contamination, chemical treatments, and wear.

Respectfully submitted,  
SOTTER ENGINEERING CORPORATION



J. George Sotter, P.E., Ph.D.  
President



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### Flooring Slip Resistance Test Results

Client: **Unicorn Tile Corp**

Report date: 12/11/13

Flooring: **Atlas Stone Lappato porcelain tile**

Tile size: 12"x12"

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Test no.: 1312-1026

Date tested: 12/6/13

#### ANSI A137.1 Dynamic Coefficient of Friction Test

The American National Standards Institute (ANSI) published the A137.1-2012 American National Standard test for measuring dynamic coefficient of friction (DCOF) of common hard-surface indoor level floor materials in 2012. This ANSI standard has been incorporated as a requirement in "Section 2103.6 Ceramic Tile" of the 2012 International Building Code published by the International Code Council.

**Average Wet Dynamic Coefficient of Friction (DCOF), after cleaning with Renovator #120, and tested with BOT-3000E digital tribometer using SBR rubber slider and 0.05% SLS water solution:**

**Tile #1 Wet:** 0.37, 0.32, 0.29, 0.28; **Avg. = 0.32; Dry:** 0.59, 0.56, 0.55, 0.55; **Avg. = 0.56**

**Tile #2 Wet:** 0.33, 0.31, 0.30, 0.32; **Avg. = 0.32; Dry:** 0.55, 0.53, 0.50, 0.52; **Avg. = 0.53**

**Tile #3 Wet:** 0.36, 0.28, 0.30, 0.28; **Avg. = 0.31; Dry:** 0.57, 0.55, 0.51, 0.48; **Avg. = 0.53**

**Overall average: Wet: 0.32; Dry: 0.54**

**T = 60 degrees F; Relative humidity = 42%; BOT recalibration due June 28, 2014**

**BOT-3000E strain gauge verified on day of test. Reference tile before/after results: passed/passed**

High dynamic coefficient of friction values indicate potentially good traction. The ANSI A137.1 standard, Section 6.2.2.1.10, recommends a **minimum** average DCOF of **0.42** for indoor level floors for high slip resistance. (It has no recommendation for outdoor floors or for ramps.) Slip resistance can be affected by factors such as floor coatings, abrasives, detergents, contamination, chemical treatments, and wear.

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### Flooring Slip Resistance Test Results

Client: **Unicorn Tile Corp**

Report date: 12/11/13

Flooring: **Atlas Stone Natural porcelain tile**

Tile size: 12"x12"

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Test no.: 1312-1024

Date tested: 12/6/13

#### ANSI A137.1 Dynamic Coefficient of Friction Test

The American National Standards Institute (ANSI) published the A137.1-2012 American National Standard test for measuring dynamic coefficient of friction (DCOF) of common hard-surface indoor level floor materials in 2012. This ANSI standard has been incorporated as a requirement in "Section 2103.6 Ceramic Tile" of the 2012 International Building Code published by the International Code Council.

**Average Wet Dynamic Coefficient of Friction (DCOF), after cleaning with Renovator #120, and tested with BOT-3000E digital tribometer using SBR rubber slider and 0.05% SLS water solution:**

**Tile #1 Wet:** 0.52, 0.49, 0.48, 0.47; **Avg. = 0.49; Dry:** 0.60, 0.56, 0.59, 0.60; **Avg. = 0.59**

**Tile #2 Wet:** 0.51, 0.49, 0.46, 0.44; **Avg. = 0.48; Dry:** 0.65, 0.61, 0.62, 0.63; **Avg. = 0.63**

**Tile #3 Wet:** 0.49, 0.47, 0.43, 0.44; **Avg. = 0.46; Dry:** 0.60, 0.62, 0.62, 0.63; **Avg. = 0.62**

**Overall average: Wet: 0.48; Dry: 0.61**

**T = 60 degrees F; Relative humidity = 42%; BOT recalibration due June 28, 2014**

**BOT-3000E strain gauge verified on day of test. Reference tile before/after results: passed/passed**

High dynamic coefficient of friction values indicate potentially good traction. The ANSI A137.1 standard, Section 6.2.2.1.10, recommends a **minimum** average DCOF of **0.42** for indoor level floors for high slip resistance. (It has no recommendation for outdoor floors or for ramps.) Slip resistance can be affected by factors such as floor coatings, abrasives, detergents, contamination, chemical treatments, and wear.

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