



MATERIALS TESTING REPORT

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Test Date: 27-May-09
 Tester: Mathew Overton
 Report by: Gregory Stavaridis
 Report Date: 16-Jul-09

Testing Standard Information	
Reference:	ASTM C 1028
Name:	Determining the Static Coefficient of Friction of Ceramic Tile & Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method
Test for:	Static Coefficient of Friction

Sample Information	
Description:	Architectural Pavers - Old World
Color:	Limestone
Size:	12X12X1.75
Date of Production:	18-Mar-09
Other:	

Summary of Results for Static Coefficient of Friction							
Dry			Wet				
Minimum		Test Result	Pass/Fail	Minimum		Test Result	Pass/Fail
0.6	≤	1.03	PASS	0.6	≤	0.76	PASS

NOTES:

Minimum Static Coefficient of Friction value of 0.60 is not a law, but what has been deemed "industry standard" from similar projects/products, various recommendations, etc.

"Reference" data refers to Section(s) of Standard Reference

Manually Entered Data

Calculated Data

Calibration		
Dry	Wet	Reference
$X_D = 0.86 - R_D/NW$ where: X_D = dry calibration factor R_D = sum of the four recorded dry force readings, lb (kg) N = number of pulls (4) W = weight of heel assembly plus 50-lb (22-kg) weight, lb (kg)	$X_W = 0.51 - R_W/NW$ where: X_W = wet calibration factor R_W = sum of the four recorded wet force readings, lb (kg) N = number of pulls (4) W = weight of heel assembly plus 50-lb (22-kg) weight, lb (kg)	7, 9 7.7, 9.3

Calibration Calculations																																														
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Calibration performed on Standard Tile <table border="0"> <tr> <td>Pull #</td> <td>Dry Force Reading (lbs)</td> </tr> <tr> <td>1</td> <td>31.4</td> </tr> <tr> <td>2</td> <td>31.2</td> </tr> <tr> <td>3</td> <td>27.6</td> </tr> <tr> <td>4</td> <td>29.7</td> </tr> <tr> <td>R_D =</td> <td>119.9 lbs</td> </tr> <tr> <td>N =</td> <td>4 pulls</td> </tr> <tr> <td>W_{50} =</td> <td>48.97 lbs</td> </tr> <tr> <td>W_{HA} =</td> <td>1.26 lbs</td> </tr> <tr> <td>W =</td> <td>50.23 lbs</td> </tr> <tr> <td>X_D =</td> <td>0.26</td> </tr> </table>	Pull #	Dry Force Reading (lbs)	1	31.4	2	31.2	3	27.6	4	29.7	R_D =	119.9 lbs	N =	4 pulls	W_{50} =	48.97 lbs	W_{HA} =	1.26 lbs	W =	50.23 lbs	X_D =	0.26	Calibration performed on Standard Tile <table border="0"> <tr> <td>Pull #</td> <td>Wet Force Reading (lbs)</td> </tr> <tr> <td>1</td> <td>27.8</td> </tr> <tr> <td>2</td> <td>27.1</td> </tr> <tr> <td>3</td> <td>26.7</td> </tr> <tr> <td>4</td> <td>26.8</td> </tr> <tr> <td>R_W =</td> <td>108.4 lbs</td> </tr> <tr> <td>N =</td> <td>4 pulls</td> </tr> <tr> <td>W_{50} =</td> <td>48.97 lbs</td> </tr> <tr> <td>W_{HA} =</td> <td>1.26 lbs</td> </tr> <tr> <td>W =</td> <td>50.23 lbs</td> </tr> <tr> <td>X_W =</td> <td>-0.030</td> </tr> </table>	Pull #	Wet Force Reading (lbs)	1	27.8	2	27.1	3	26.7	4	26.8	R_W =	108.4 lbs	N =	4 pulls	W_{50} =	48.97 lbs	W_{HA} =	1.26 lbs	W =	50.23 lbs	X_W =	-0.030	5.4, 7.5
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Static Coefficient of Friction Calculations						
Dry			Wet			Reference
$F_D = (R_D/NW) + X_D$ where: F_D = static coefficient of friction for dry surface R_D = total of the 12 dry force readings N = number of pulls (12) W = total weight of the heel assembly plus 50-lb (22-kg) weight, lb (kg)			$F_W = (R_W/NW) + X_W$ where: F_W = static coefficient of friction for wet surface R_W = total of the 12 wet force readings N = number of pulls (12) W = total weight of the heel assembly plus 50-lb (22-kg) weight, lb (kg)			12
Test Procedure						
Dry			Wet			Reference
Surface	Pull #	Force Reading (lbs)	Surface	Pull #	Force Reading (lbs)	8, 10
1	1	39.7	1	1	41.3	
1	2	34.7	1	2	40.7	
1	3	44.3	1	3	38.1	
1	4	41.2	1	4	42.2	
2	1	34.7	2	1	39.7	
2	2	45.6	2	2	41.8	
2	3	38.3	2	3	38.5	
2	4	36.0	2	4	40.9	
3	1	40.9	3	1	36.6	
3	2	33.9	3	2	40.7	
3	3	37.7	3	3	38.2	
3	4	34.3	3	4	37.7	
	$R_D =$	461.3 lbs		$R_W =$	476.4 lbs	
	$N =$	12 pulls		$N =$	12 pulls	
	$W_{50} =$	48.97 lbs		$W_{50} =$	48.97 lbs	
	$W_{HA} =$	1.26 lbs		$W_{HA} =$	1.26 lbs	
	$W =$	50.23 lbs		$W =$	50.23 lbs	
	$F_D =$	1.03		$F_W =$	0.76	