CSIRO

Industrial Research Services

Manuf. & Materials Technology, 14 Julius Ave (Riverside Corp. Park), North Ryde, NSW, 2113, Australia
Telephone: 61 2 9490 5614 Facsimile: 61 2 9490 5777 Email: tiles@csiro.au Web: http://www.cmse.csiro.au

Registered Testing Authority - CSIRO

15 July 2009

Our Ref. ES13 / 71 03/0212

TEST REPORT No. SY4970-2

Requested by: Olympic Tiles
on (date): 14 July 2009
Manufacturer: Taicera
Product Desc.: Shaded Bushhammer Charcoal 60 cm x 60 cm G68529

Sampling details:
Where: Delivered
Date: 14 July 2009
By whom: Courier
How (methods): N/A

This test report consists of 3 pages

SUMMARY OF SLIP RESISTANCE TESTS PERFORMED:

		Result	Class
AS/NZS 4586:2004	Slip resistance classification of new pedestrian surface materials Appendix A: WET Pendulum (Four S slider): Mean BPN:	63	V [HIGH*]

* = CSIRO classification

In order to interpret the classifications, please refer to Standards Australia Handbook 197, An Introductory Guide to the Slip Resistance of Pedestrian Surface Materials which recommends minimum classifications for a wide variety of locations.

It is important to realise that test results obtained on unused factory-fresh samples may not be directly applicable in service, where proprietary surface coatings, contamination, wear and subsequent cleaning all influence the behaviour of the pedestrian surface.

Please note that this test/result is issued to you on an INDICATION ONLY basis as tests are conducted on a particular shade/production, not necessarily to material you would be receiving.
Olympic Tiles Pty Ltd will not be held responsible for the item not meeting this result.
It is the responsibility of the end user to carry out appropriate testing for the tiles intended use.

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SLIP RESISTANCE CLASSIFICATION OF NEW PEDESTRIAN SURFACE MATERIALS

WET PENDULUM TEST METHOD

TEST CARRIED OUT IN ACCORDANCE WITH
AS/NZS 4586:2004 (Appendix A)

Test Date: 15 July 2009

RESULTS: Location: North Ryde Slip Resistance Laboratory
Rubber slider used: Four S
Conditioned with grade P400 paper, dry

Sample: Unfixed
Cleaning: Acetone
Temperature: 23°C

Pendulum Friction Tester: Stanley (S/N: 0312, calibrated 02/03/07)
Test conducted by: Hugh McMullen

	Specimen 1	2	3	4	5
Last 3 swings	**62**	**64**	**62**	**63**	**63**
	62	**64**	**61**	**63**	**63**
	62	**63**	**61**	**63**	**62**
Averages	**62**	**64**	**61**	**63**	**63**

Mean BPN : 63

CLASS : V [HIGH*]

* = CSIRO classification.
Where products are to be used in wet barefoot areas, it is more appropriate to test to Appendix C of AS/NZS 4586 (which is technically equivalent to DIN 51097).

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REPORT NO: 4970-2
ISSUE DATE: 15 July 2009
MANUFACTURER: Taicera
TILE DESC: Shaded Bushhammer Charcoal 60 cm x 60 cm G68529

Date and Place 15 July 2009, North Ryde, NSW

Name, Title and Digital Signature:

HUGH MCMULLEN
Laboratory Manager
Tel: 61 2 94905614
Fax: 61 2 94905777
Email: Hugh.McMullen@csiro.au

***CSIRO recommended classification of Slip Resistance as determined from:**
AS/NZS 4586: 2004 Slip Resistance Classification of New Pedestrian Surface Materials (Appendices A & D).

Wet Pendulum Class	BPN 4S Rubber	CSIRO Class LOW	CSIRO Class MEDIUM	CSIRO Class HIGH
V	>54	54-57	58-61	>61
W	45-54	45-48	49-51	52-54
X	35-44	35-38	39-41	42-44
Y	25-34	25-28	29-31	32-34
Z	<25	<18	18-21	22-25
Oil Wet Ramp Class	**Angle (degrees)**	**CSIRO Class LOW**	**CSIRO Class MEDIUM**	**CSIRO Class HIGH**
R9	≥6 to <10	≥6 to 7.5	7.6 to 9	9.1 to 9.9
R10	≥10 to <19	≥10 to 12	12.1 to 15	15.1 to 18.9
R11	≥19 to <27	≥19 to 21	21.1 to 24	24.1 to 26.9
R12	≥27 to <35	≥27 to 29	29.1 to 32	32.1 to 34.9
R13	≥35	≥35 to 36	36.1 to 38	≥38.1
This table should not be read or relied upon without reference to the CSIRO/Standards Australia publication: AS/NZS 4586 Slip Resistance Classification of New Pedestrian Surface Materials (Appendices A & D).				

CSIRO has categorized the AS4586 classifications into sub-groups Low, Medium & High. The slip resistance test classification is still determined according to AS 4586 Australian Standard (Appendices A & D). The added information of Low, Medium and High allows professionals to make a better judgement of pedestrian floor requirements.

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REPORT NO: 4970-2 Addendum
ISSUE DATE: 15 July 2009
MANUFACTURER: Taicera
PRODUCT DESC: Shaded Bushhammer Charcoal 60 cm x 60 cm G68529

DETERMINATION OF Rz SURFACE ROUGHNESS

(Using a Taylor-Hobson Surtronic 10 Rz roughness meter using a 0.8mm cut-off length)

Test Date: 15 July 2009

RESULTS

Location: Slip Resistance Laboratory

	Rz values
1	24.3
2	17.3
3	26.9
4	27.4
5	24.7
6	42.0
7	19.5
8	29.1
9	28.3
10	19.5

Surface Roughness (Rz) mean = 25.9 microns

BS 7976:2002, Pendulum Testers, requires a different test foot preparation (lapping paper) for pedestrian surfaces that have a Rz roughness of less than 15 microns. This lapping paper tends to reduce the pendulum result, sometimes appreciably. CSIRO recommends the use of this procedure (CSIRO COF1) as an adjunct to AS/NZS 4586. It helps to discriminate among products that have marginal wet slip resistance and to identify those that may be dangerous if wet.

The measurement of the various aspects of surface roughness is complex given the number of potential roughness parameters. While there is still some uncertainty as to exactly what type of roughness needs to be measured, peak-to-trough roughness (Rz) gives a useful guide to the likely slip resistance in wet conditions. Research has suggested that hard floors need to have a slightly higher Rz roughness than polymeric floors for the same degree of safety in wet conditions, but whatever flooring material is used an Rz roughness value of at least 10 microns is required where wet slip resistance may be required. In circumstances where wetness is normal or expected, this figure should be increased by a factor of 2 or more.

Greater peak surface roughnesses are likely to be required where floors slope or where the floor is likely to become contaminated with high viscosity liquids.