

September 11 2020

Volaré Tile Concepts

Attention: Entoni Volarevic, Jack Purcell
 4 – 12 Amsterdam St
 Richmond VIC 3121

Report No.: R-3671 REV A

RE: In-House Wet Pendulum Slip Resistance Testing

Test Site:	1 Moonlight Drive, Lysterfield VIC 3156
Test Date:	September 11 2020
Test Personnel:	Cassandra Sullivan
Products:	Entiva Q-Stone Charcoal External Tiles, 300 x 600mm; 4X
Sampling:	Sampling conducted by client
Preparation:	Washed with water, rinsed then dried
Fixed/Unfixed:	Unfixed
Air Temperature:	N/A
Test Equipment:	Munro Stanley Skid Resistance Tester (Pendulum) Serial Number 2035
Test Standard:	AS 4586: 2013 Slip resistance classification of new pedestrian surface materials – Appendix A.
Slider Rubber:	Slider 96 Batch No. #2232 prepared on P400 & 3µm lapping film
Direction of Testing:	N/A
Test Methodology: Induction Group conducted testing consistent with the test methodology specified by Australian Standard AS 4586: 2013, with specific consideration to the following subsections of the standard: <i>A6.3.2 Test sample</i> A minimum of five individual specimens shall be selected at random from the lot. If a sheet product, a single specimen shall be of a sufficient size to enable testing at five locations. <i>A6.3.3 Size of test specimen</i> The minimum size of the specimen shall be 100 mm × 150 mm. Where the specimen size is smaller, additional specimens shall be fixed to a suitable surface to provide the minimum required specimen size. Four (4) Entiva Q-Stone Charcoal External Tiles, each having a dimension of 300 x 600mm, were tested at a total of five (5) locations, which was deemed a sufficient size to enable testing of five (5) specimens per the specifications set out above.	

British Pendulum Number:	Specimen Number					SRV	Class
	1	2	3	4	5		
Entiva Q-Stone Charcoal External Tiles	74	70	70	70	72	71	P5

Test Results:

The wet slip resistance test results indicate that the contribution of the floor surface to the risk of slipping under wet conditions for the Entiva Q-Stone Charcoal External Tiles was *very low* and has an SRV of **71 (P5)** when tested with Slider 96.

Classification Criteria:

Classifications assigned are derived from AS 4586: 2013 *Slip Resistance Classification of New Pedestrian Surface Materials*². Refer to Classification criteria referenced in Table 2 below, which has been derived from Australian Standards AS/NZS 4663: 2004 and AS 4586: 2013.

Notwithstanding the foregoing, classification assigned must take into account:

- all such Entiva Q-Stone Charcoal External Tiles referenced in this report are represented in terms of wet pendulum slip resistance properties by the Entiva Q-Stone Charcoal External Tiles for which slip resistance testing was undertaken, and
- slope correction factors, where applicable.

Slip resistance testing conducted on a slope of $\geq 1.5^\circ$ (2.6%) will have a Slope Correction Value (SCV) applied, dependant on the maximum gradient of the area tested. The corrected results, where applicable, must be applied to the Slip Resistance Value (SRV) and reported as the SCV, and resulting classification, within the results.

Figure 1: Entiva Q-Stone Charcoal External Tiles



Description of Test Specimens, including Size & Quantity:	Entiva Q-Stone Charcoal External Tiles, 300 x 600mm; 4X. Refer to Figure 1.
AS 4586: 2013 Classification:	P5

Table 2: Classification of Wet Pendulum Results

Pendulum Mean BPN		Notional [†] Contribution of the Floor Surface to the Risk of Slipping When Wet	AS 4586: 2013 Equivalent Classification
Slider 96*	Slider 55*		
>54	>44	<i>Very Low</i>	P5
45-54	40-44	<i>Low</i>	P4
35-44	35-39	<i>Moderate</i>	P3
25-34	20-34	<i>High</i>	P2
12-24	<20	<i>Very High</i>	P1
<12		<i>Extremely High</i> **	P0

NOTES:

- * While either of these rubbers may be used, the test report shall specify which was used; as noted above, testing was conducted using Slider 96.
- † The term 'notional' has been used to highlight the need to consider all potential contributing factors to a slip incident.
- It is expected that these wet surfaces will be more slip resistant when dry.
- ** In Table 2, the term '*Extremely High*' for BPN test results below 12 (AS 4586: 2013 classification P0) has been used. This terminology is not contained in any of the referenced standards, however Induction Group considers this to be a reasonable and appropriate assessment and description of the pedestrian surface condition when such results are obtained.

Result Interpretation:

Any interpretation of test results shall be based on HB 198: 2014 *Guide to the Specification and Testing of Slip Resistance of Pedestrian Surfaces*³ and/or the relevant sections of the NCC. Refer to Tables 3A and 3B (below).

Should you have any questions, please contact us directly.

Yours sincerely,

INDUCTION GROUP

Reviewed by:



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HB 198: TABLE 3A
MINIMUM WET PENDULUM TEST OR OIL-WET INCLINING PLATFORM
CLASSIFICATIONS THAT ARE DEEMED-TO-SATISFY THE BUILDING
APPLICATIONS IN THE NCC

Location	Wet Pendulum test	Oil-wet inclining platform test
Stair Treads and Stairway Landings in Buildings Covered by NCC Volumes One and Two		
Stair treads and a stairway landing (when dry)	P3	R10
Stair treads and a stairway landing (when wet)	P4	R11
Nosings for Stair Treads and Stairway Landings in Buildings Covered by NCC Volumes One and Two		
Dry stair tread, a stair non-skid nosing strip and a stairway landing	P3	
Wet stair tread, a stair non-skid nosing strip and a stairway landing	P4	
Ramps in Buildings Covered by NCC Volumes One and Two		
Ramps not steeper than 1:14 gradient (when dry)	P3	R10
Ramps not steeper than 1:14 gradient (when wet)	P4	R11
Ramps steeper than 1:14 up but not steeper than 1:8 (when dry)	P4	R11
Ramps steeper than 1:14 up but not steeper than 1:8 (when wet)	P5	R12

NOTE:

- NCC compliance is demonstrated by achieving the values set out in this Table for either the wet pendulum test or the oil-wet inclining ramp test. It is not necessary to meet both criteria

HB 198: TABLE 3B

**WET PENDULUM TEST OR OIL-WET INCLINING PLATFORM
CLASSIFICATIONS FOR APPLICATIONS WHERE THE NCC DOES NOT
SPECIFY SLIP RESISTANCE REQUIREMENTS**

Location	Wet Pendulum test	Oil-wet inclining platform test
External Pavements and Ramps		
External ramps including sloping driveways, footpaths etc. steeper than 1 in 14	P5	R12
External ramps including sloping driveways, foot paths etc., under 1:14, external sales areas (e.g. markets), external carpark areas, external colonnades, walkways, pedestrian crossings, balconies, verandas, carports, driveways, courtyards and roof decks.	P4	R11
Undercover car parks	P3	R10
Hotels, Offices, Public Buildings, Schools and Kindergartens		
Entries and access areas including hotels, offices, public buildings, schools, kindergartens, common areas of public buildings, internal lift lobbies.		
Wet Area	P3	R10
Transitional Area	P2	R9
Dry Area	P1 (see Note 3)	R9
Toilet Facilities in offices, hotels and shopping centres	P3	R10
Hotel apartment bathrooms, ensuites and toilets	P2	A
Hotel apartment kitchens and laundries	P2	R9
Supermarkets and Shopping Centres		
Fast food outlets, buffet food servery areas, food courts and fast food dining areas in shopping centres	P3	R10
Shop and supermarket fresh fruit and vegetable areas	P3	R10
Shop entry areas with external entrances	P3	R10
Supermarket aisles (except fresh fruit areas)	P1 (see Note 3)	R9
Other separate shops inside shopping centres - wet	P3	R10
Other separate shops inside shopping centres - dry	P1 (see Note 3)	R9
Loading docks, Commercial Kitchens, Cold Stores, Serving areas		
Loading docks undercover and commercial kitchens	P5	R12
Serving areas behind bars in public hotels and clubs, cold stores and freezers	P4	R11
Swimming pools and Sporting Facilities		
Swimming pool ramps and stairs leading to water	P5	C
Swimming pool surrounds and communal shower rooms	P4	B
Communal changing rooms	P3	A
Undercover concourse areas of sports stadiums	P3	R10
Hospitals and Aged Care Facilities		
Bathrooms and ensuites in hospitals and aged care facilities	P3	B
Wards and corridors in hospital and aged care facilities	P2	R9

NOTES TO TABLE 3B:

1. The slip resistances of pedestrian surface materials set out in Table 3B are intended as guidance in the context of design for pedestrian safety, taking account other factors including abnormal wear, maintenance, abnormal contamination, the presence (or otherwise) of water or other lubricants, the nature of the pedestrian traffic (including age, gait and crowding), footwear (or lack thereof), slope, lighting and handrails.
2. The minimum classifications listed in Table 3B are P1 and R9. It is inappropriate for Table 3B to list the lower classification, P0, since there is no lower limit on Classification P0. Notwithstanding the foregoing, some smooth and polished floor surfaces which do not achieve Classification P1 may be considered to provide a safe walking environment for normal pedestrians walking at a moderate pace, provided the surfaces are kept clean and dry; however, should these surfaces become contaminated by either wet or dry materials, or be used by pedestrians in any other manner, they may become unsafe. Therefore, the type of maintenance, the in-service inspection of floors, other environmental conditions and use should be taken into account when selecting such products.
3. When using the oil-wet inclining platform 'R' classifications, consideration should also be given to the determination and use of volumetric displacement 'V' classifications. In some cases, a specifier may choose either a particular combination of R and V values, or a more severe R value alone. For example, either R10 + V4, or R11.

REFERENCES

1. Australian Standard AS 4663: 2013 *Slip Resistance measurement of existing pedestrian surfaces*, Standards Australia, Sydney, New South Wales.
2. Australian Standard AS 4586: 2013 *Slip resistance classification of new pedestrian surface materials*, Standards Australia, Sydney, New South Wales.
3. Standards Australia Handbook HB 198: 2014 *Guide to the specification and testing of slip resistance of pedestrian surfaces*, Standards Australia, Sydney, New South Wales.
4. Australian and New Zealand Standard AS/NZS 4663: 2004 *Slip Resistance measurement of existing pedestrian surfaces*, Standards Australia, Sydney, New South Wales.
5. Australian and New Zealand Standard AS 4586: 2004 *Slip resistance classification of new pedestrian surface materials*, Standards Australia, Sydney, New South Wales.
6. AS/NZS 3661.2: 1994 *Slip resistance of pedestrian surfaces - Guide to the reduction of slip hazards*, Standards Australia, Sydney, New South Wales.