

TimberTech XLM

Slip resistance test summary

This document explains the exceptional slip resistance properties of the TimberTech XLM decking boards. The XLM decking has been evaluated through four slip assessment methods. A summary of the outstanding results which allow for its use in commercial / public high traffic areas e.g. decks around resort pools or entry and exit ramps to public buildings are shown below.

Testing was completed in Australia for Australian conditions by CSIRO.

Summary of results

Test	Result	Class
Wet Pendulum (across board)	Mean BPN: 48	W
Wet Pendulum (along board)	Mean BPN: 44	X
Oil Wet Ramp (across Board)	Acceptance angle: 26.9°	R11
Oil Wet Ramp (along Board)	Acceptance angle: 20.6°	R11
Wet Barefoot Ramp	Mean Angle: 19°	B

Slip resistance testing for TimberTech XLM

Australian Standard AS/NZS 4586 Slip resistance classification of pedestrian surface materials outlines four test methods to classify and assess the frictional properties of floor surfaces and include the following slip resistance test methods, note there is no direct correlation between these four slip resistance testing

TimberTech XLM has been evaluated to all of the tests outlined below, the results are shown under each heading and the classification is indicated in green.

Test methods:

- Wet pendulum slip resistance test
- Dry floor friction slip resistance test
- Wet barefoot slip resistance test
- Oil wet ramp slip resistance test

Wet Pendulum Slip Resistance Test

TimberTech XLM Result: Four S Mean BPN: 48 (across the board) 44 (along the board)

The wet pendulum slip resistance test (AS/NZS 4586 Appendix A) is generally conducted using a Stanley London Pendulum Friction Tester. This pendulum device consists of a weighted foot with a test slider that swings down and slides across the surface wetted with water. The weighted foot comprises a spring loaded rubber test slider that exerts a prescribed force over the specimen as it slides across the surface. The results are expressed as a British Pendulum Number (BPN) and classified according to AS/NZS 4586 as shown in the table below:

AS/NZS 4586 classifies the surface based on the mean BPN where the Australian Standard for onsite slip testing AS/NZS 4663 expresses the result in terms of BPN. AS/NZS 4663 also provides a notional contribution of the floor surface to the risk of slipping when water wet as given below:

Pendulum Mean BPN		AS/NZS 4586 Classification	AS/NZS 4663 Notional* contribution of the floor surface to the risk of slipping when wet
Four S	TRL		
>54	>44	V	Very Low (Best possible result)
45-54	40-44	W	Low
35-44		X	Moderate
25-35		Y	High
<25		Z	Very High (Worst possible result)

While there are 2 rubber slider materials that may be used, Four S (simulated standard shoe sole) is generally accepted as the material to assess the slip resistance for the general public wearing suitable footwear.

TRL (Transport Research Laboratory) rubber is predominantly used for highly slip resistant and profiled surfaces. Research has indicated that TRL rubber may provide a better indication of barefoot slip resistance due to the softer yielding nature of the material, being more comparable to human skin than Four S rubber.

Dry Floor Friction Slip Resistance Test

TimberTech XLM Result: CoF 0.86 Dry, 0.83 Wet

The dry floor friction slip resistance slip test (AS/NZS 4586 Appendix B) uses a battery operated machine commonly referred to as the "dry FFT" or "Tortus". The dry FFT measures the force opposing the motion of a 9 mm diameter test slider of Four S rubber as it moves across the surfaces at a constant speed of 1m/min. The average of two measurements of 800 mm is taken and the results are expressed as Coefficient of Friction (CoF). The coefficient of friction is a ratio of the horizontal and vertical forces and the slip resistance test results are classified as follows:

Floor friction tester mean value	AS/NZS 4586 Classification	AS/NZS 4663 Notional* contribution of the floor surface to the risk of slipping when dry
≥ 0.40	F	Moderate to very low (Best possible result)
< 0.40	G	High to very high (Worst possible result)

Oil Wet Ramp Slip Resistance Test

TimberTech XLM Result: Angle 26.9° (across the board) 20.6° (along the board)

The oil wet ramp slip resistance test (AS/NZS 4586 Appendix D) differs to the wet barefoot ramp test, in that instead of water, an amount of motor oil is placed on the test surface and the two test persons wear safety boots rather than barefoot. Three calibration boards are walked on in a similar manner to the wet barefoot ramp test. These calibration boards are then used to provide a correction factor to standardise the walkers. Studies have shown that the correction factor reduces variance to 2.2 degrees (95% confidence interval). The slip resistance test classification is determined by the mean angle of inclination achieved and a correction factor based on the angle of inclination of the 3 calibration panels.

Mean Angle of Inclination (Degrees)	AS/NZS 4586 Classification
≥ 6 < 10	R9 (Best possible result)
≥ 10 < 19	R10
≥ 19 < 27	R11
≥ 27 < 35	R12
≥ 35	R13 (Worst possible result)

Wet Barefoot Ramp Slip Resistance Test

TimberTech XLM Result: Angle 19°

The wet barefoot ramp slip resistance test (AS/NZS 4586 Appendix C) uses a panel of the test surface which is constructed on a ramp large enough for a person to walk on (600mm wide x 1000mm long). Two test people attach themselves to a safety harness, after bathing their feet for 10 minutes to soften the skin, walk bare foot on the test surface while the angle of the platform is increased until the limit of safe walking is achieved. This is generally when the test walker slips or feels that they will slip on the board. The angle that the limit of safe walking is obtained is known as the mean angle of inclination. Three calibration boards A, B & C are also tested, with the classification of the test panel based on the mean angle of inclination obtained in comparison with the calibration boards.

Mean Angle of Inclination (Degrees)	AS/NZS 4586 Classification
≥ 12	A (Worst possible result)
≥ 18	B
≥ 24	C (Best Possible result)

CLASSIFICATION GUIDE FOR PUBLIC WET BAREFOOT AREAS, HB 197, TABLE 4

Class.	Min. Angle	Areas of application
A	12°	<ul style="list-style-type: none"> - barefoot passages (mostly dry) - individual and communal changing and locker rooms - swimming pool floors in non-swimmer areas, if the water depth in the entire area (of a pool) is more than 80cm
B	18°	<ul style="list-style-type: none"> - barefoot passages not classified in group A - shower rooms - pool surrounds - in the vicinity of disinfecting spray facilities - swimming pool floors in the non-swimmer areas, where the water depth is less than 80cm - non swimmer sections of wave-action pools - lifting platforms - toddler's paddling pools - ladders leading into water - stairs leading into the water with a maximum width of 1m and handrails on both sides - ladders and stairs outside the pool area - seating and resting steps and benches
C	24°	<ul style="list-style-type: none"> - stairs leading into the water, if not classified in Group B - walk-through wading pools - sloping pool edges