

# Technical Bulletin



## The myths surrounding the slip resistance of grates

### *A HIGHER SLIP RATING DOES NOT NECESSARILY PROVIDE THE BETTER SOLUTION*

With the increase in litigation and compensation for injuries caused by slips and falls, designers now must closely consider specifying grates and floor surfaces that comply with the appropriate Standard for slip resistance.

There is a perception that a higher slip resistance rating will provide a better solution. However, trip hazards can be introduced where a grate has a higher slip resistance rating compared with the surrounding floor surface.

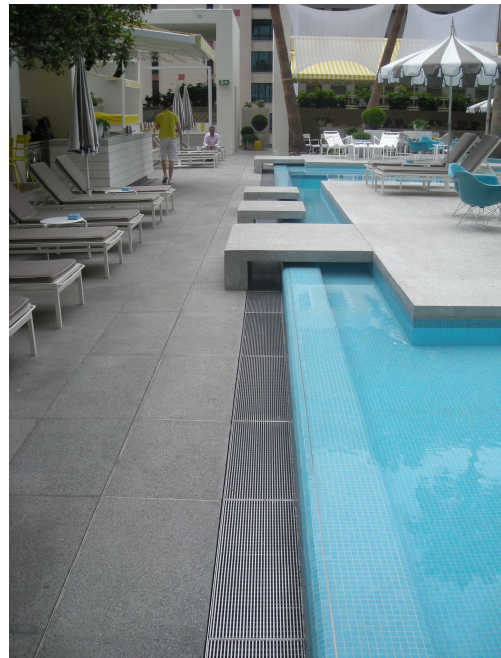
It is important for designers not to lose sight of the desired objective and specify a product that is relevant for the application with a suitable slip resistance rating.

In June 2014, Standards Australia published a handbook, SA HB 198:2014 *Guide to the specification and testing of slip resistance of pedestrian surfaces*, to provide:

- Commentary on AS 4586-2013 *Slip resistance classification of new pedestrian surface materials*,
- Commentary on parts of the National Construction Code (NCC) that reference AS 4586 and slip resistance requirements of pedestrian surfaces in particular applications,
- General guidance for specifying pedestrian surface materials.

In order to assess the slip resistance of a grate or floor surface, three tests are specified in AS 4586:

- **Wet pendulum** for pedestrian areas that can become wet with rain water. This is designed to be applied to urban stormwater grates.
- **Wet-barefoot inclining platform** for wet areas where footwear/shoes are not worn. This is designed to be applied to urban stormwater grates in specific areas such as pools, waterparks, beach areas etc.
- **Oil-wet inclining platform** for commercial and industrial areas that can be contaminated with oil or grease. This is designed to be applied to internal industrial and commercial environments such as commercial kitchens and food processing factories.



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The following tables provide guidance on slip resistance for particular applications based on the test methods in AS 4586-2013. For further details, refer to *Section 5 Selection of Pedestrian Surface Materials* in SA HB 198:2014.



It is recommended to specify the same slip resistance rating for both the grate and surrounding floor surface to avoid introducing trip hazards arising from surfaces with differential slip ratings.

**Table 1**

Minimum slip resistance classifications that comply with the regulations in the National Construction Code

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

For more details refer to Section 5 and Table 3A, SA HB 198:2014.

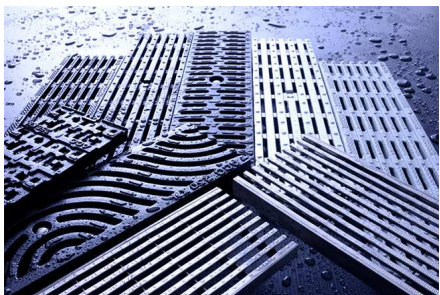
**Table 2**

Minimum classifications recommended in SA HB 198:2014 for particular applications

Location	Wet pendulum test	Inclining platform test
<b>External Pavements and Ramps</b> External ramps including sloping driveways, footpaths etc. steeper than 1 in 14 External ramps including sloping driveways, footpaths 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 Undercover car parks	P5 P4 P3	R12 R11 R10
<b>Hotels, Offices, Public Buildings, Schools and Kindergartens</b> Entries and access areas including hotels, offices, public buildings, schools, kindergartens, common areas of public buildings, internal lift lobbies Wet areas Transitional area Dry area Toilet facilities in offices, hotels and shopping centres Hotel apartment bathrooms, en suites and toilets Hotel apartment kitchens and laundries	P3 P2 P1 P3 P2 P2	R10 R9 R9 R10 A R9
<b>Supermarkets and Shopping Centres</b> Fast food outlets, buffet food servery areas, food courts and fast food dining areas in shopping centres Shops and supermarket fresh fruit and vegetable areas Shop entry areas with external entrances Supermarket aisles (except fresh food areas) Other separate shops inside shopping centres – wet Other separate shops inside shopping centres – dry	P3 P3 P3 P1 P3 P1	R10 R10 R10 R9 R10 R9
<b>Loading Docks, Commercial Kitchens, Cold Stores, Serving Areas</b> Loading docks under cover and commercial kitchens Serving areas behind bars in public hotels and clubs, cold stores and freezers	P5 P4	R12 R11
<b>Swimming Pools and Sporting Facilities</b> Swimming pool ramps and stairs leading to water Swimming pool surrounds and communal shower rooms Communal changing rooms Undercover concourse areas of sports stadiums	P5 P4 P3 P3	C B A R10
<b>Hospital and Aged Care Facilities</b> Bathrooms and en suites in hospitals and aged care facilities Wards and corridors in hospital and aged care facilities	P3 P2	B R9

For more details refer to Section 5 and Table 3B, SA HB 198:2014.

## ACO's Heelsafe® Anti-Slip Grates



To help prevent public falls and injuries, ACO believes that small slotted grates should also be slip resistant.

Each **Heelsafe® Anti-Slip** grate complies with various user and legislative requirements, including AS 4586 for slip resistance. **Heelsafe® Anti-Slip** grates have features for tread durability and are available in a choice of stainless steel, ductile iron and plastic designs. To view details for each grate visit, [www.heelsafe.com.au](http://www.heelsafe.com.au)

The following tables list the slip resistance ratings and the complying **Heelsafe® Anti-Slip** grate with reference to the suitable ACO Drain trench drain. For more information visit, [www.acodrain.com.au](http://www.acodrain.com.au)

**Table 3**

Wet Pendulum Test Slip Resistance Classifications

Rating	Grate Description	Available with the following channels:					
		K100/KS100 H100K/H100KS	K200/KS200 H200K/H200KS	K300/KS300 H300K/H300KS	S100K/ H100SK	S200K/ H200SK	S300K/ H300SK
P5	Composite Slotted <b>Heelsafe® Anti-Slip</b>	✓	-	-	-	-	-
P4	Iron Wave <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-
	Plastic Intercept <b>Heelsafe® Anti-Slip</b>	✓	-	-	-	-	-
	Stainless 5 Star <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-
P3	Iron Decorative <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-
	Iron Galvanised Intercept <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-
	PowerDrain Iron Intercept <b>Heelsafe® Anti-Slip</b>	-	-	-	✓	✓	✓
	Stainless Wedgewire <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-
P2	Iron Intercept <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-

**Table 4**

Wet-Barefoot Inclining Platform Test Slip Resistance Classifications

Rating	Grate Description	Available with the following channels:					
		K100/KS100 H100K/H100KS	K200/KS200 H200K/H200KS	K300/KS300 H300K/H300KS	S100K/ H100SK	S200K/ H200SK	S300K/ H300SK
C	Stainless 5 Star <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-
B	Composite Slotted <b>Heelsafe® Anti-Slip</b>	✓	-	-	-	-	-
	Plastic Intercept <b>Heelsafe® Anti-Slip</b>	✓	-	-	-	-	-
	Stainless Wedgewire <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-





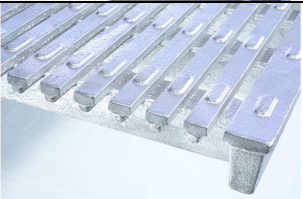


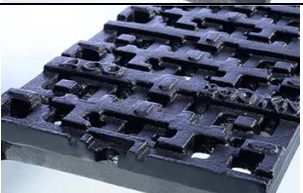

**Table 5**

Oil-Wet Inclining Platform Test Slip Resistance Classifications

Rating	Grate Description	Available with the following channels:					
		K100/KS100/ H100K/H100KS	K200/KS200/ H200K/H200KS	K300/KS300/ H300K/H300KS	S100K/ H100SK	S200K/ H200SK	S300K/ H300SK
R11	Composite Slotted <b>Heelsafe® Anti-Slip</b>	✓	-	-	-	-	-
	Stainless 5 Star <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-
R10	Iron Decorative <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-
	Iron Galvanised Intercept <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-
	Iron Wave <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-
	PowerDrain Iron Intercept <b>Heelsafe® Anti-Slip</b>	-	-	-	✓	✓	✓
	Stainless Wedgewire <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-
R9	Iron Intercept <b>Heelsafe® Anti-Slip</b>	✓	✓	✓	-	-	-
	Plastic Intercept <b>Heelsafe® Anti-Slip</b>	✓	-	-	-	-	-



**Table 6**Summary of the slip ratings for ACO's **Heelsafe**<sup>®</sup> Anti-Slip grate

<p>Stainless 5 Star <b>Heelsafe</b><sup>®</sup> Anti-Slip Grate</p> <p><b>P4</b> – Wet Pendulum  <b>C / C<sup>1</sup></b> – Wet-Barefoot Inclining Platform  <b>R11 / R11<sup>1</sup></b> – Oil-Wet Inclining Platform</p>	
<p>Stainless Wedgewire <b>Heelsafe</b><sup>®</sup> Anti-Slip Grate</p> <p><b>P3</b> – Wet Pendulum  <b>C / B<sup>1</sup></b> – Wet-Barefoot Inclining Platform  <b>R10 / R10<sup>1</sup></b> – Oil-Wet Inclining Platform</p>	
<p>Plastic Intercept <b>Heelsafe</b><sup>®</sup> Anti-Slip Grate</p> <p><b>P4</b> – Wet Pendulum  <b>C / B<sup>1</sup></b> – Wet-Barefoot Inclining Platform  <b>R9 / R10<sup>1</sup></b> – Oil-Wet Inclining Platform</p>	
<p>Composite Slotted <b>Heelsafe</b><sup>®</sup> Anti-Slip Grate</p> <p><b>P5</b> – Wet Pendulum  <b>B / C<sup>1</sup></b> – Wet-Barefoot Inclining Platform  <b>R11 / R10<sup>1</sup></b> – Oil-Wet Inclining Platform</p>	
<p>Iron Galvanised Intercept <b>Heelsafe</b><sup>®</sup> Anti-Slip Grate</p> <p><b>P3</b> – Wet Pendulum  <b>R10 / R10<sup>1</sup></b> – Oil-Wet Inclining Platform</p>	
<p>Iron Intercept <b>Heelsafe</b><sup>®</sup> Anti-Slip Grate</p> <p><b>P2</b> – Wet Pendulum  <b>R10 / R9<sup>1</sup></b> – Oil-Wet Inclining Platform</p>	
<p>Iron Wave <b>Heelsafe</b><sup>®</sup> Anti-Slip Grate</p> <p><b>P4</b> – Wet Pendulum  <b>R10 / R10<sup>1</sup></b> – Oil-Wet Inclining Platform</p>	
<p>Iron Decorative <b>Heelsafe</b><sup>®</sup> Anti-Slip Grate</p> <p><b>P3</b> – Wet Pendulum  <b>R10 / R10<sup>1</sup></b> – Oil-Wet Inclining Platform</p>	
<p>PowerDrain Iron Intercept <b>Heelsafe</b><sup>®</sup> Anti-Slip Grate</p> <p><b>P3</b> – Wet Pendulum  <b>R10 / R10<sup>1</sup></b> – Oil-Wet Inclining Platform</p>	

<sup>1</sup> Test direction (perpendicular / parallel) relative to the grate's length. NATA endorsed test reports available.