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*Certified by the City of Los Angeles as an official slip resistance testing laboratory for flooring*

CERTIFIED



# Flooring Slip Resistance Test Results: Assessment for Sustainable Slip Resistance (SSR)

Client: **xxxxxxxxxxxxxxxxxxxx** Report date: 6/13/18
Flooring: **xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**
Page 1 of 3 Sample no.: 1806-1328 Date tested: 6/12/18
Sample Size: 12”x12” How and when sample obtained: supplied by client on 6/11/18

Figure 1 shows (one of) the sample(s). Red, green, blue, and white color references are included, with a U.S. penny (1/16 inch thick) for scale. The back of the tile is included to aid in positive identification.

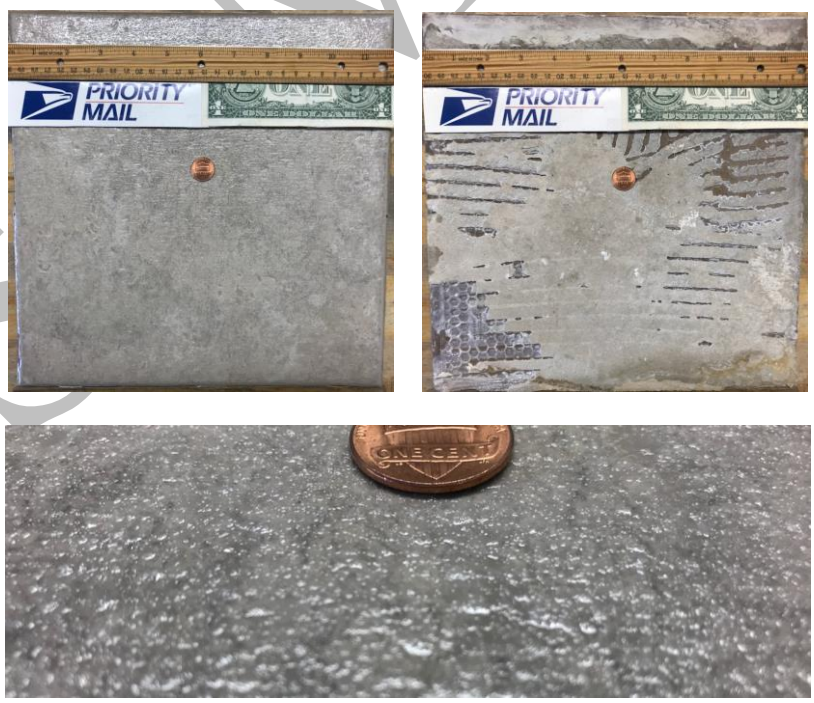


Figure 1: (clockwise from top left) front, back and close-up of sample tested

**AS HB198:2014 (AS/NZS 4586) Pendulum Sustainable Slip Resistance (SSR) Test**
Tested before and after wet abrasion using a 3M heavy duty green pad loaded with 1000 grams (2.2 lb) of weight. This report applies to the sample tested only. The pendulum is the national standard test device for pedestrian slip resistance in at least 50 nations on five continents and has been endorsed by Ceramic Tile Institute of America since 2001. It has been in continuous use since 1970 for assessing slip resistance of pedestrian surfaces, and is the most widely accepted slip resistance test device worldwide. The trailing edge of a three-inch-wide spring-loaded slider, which is attached to the end of a 20-inch pendulum, contacts the tested surface when the pendulum is released from a horizontal position. The slider contact path length is pre-set to 124-126 mm (approximately 5 inches). The pendulum pushes a pointer that stops and stays at the high point of the pendulum's swing. For more information and video, please visit https://safetydirectamerica.com/pendulumfloorsliptesting. The hard Four S ("Standard Shoe Sole Simulating") rubber is generally used for pendulum testing unless the flooring area will be primarily used by barefoot people, in which case the softer TRL rubber may be used. The soft rubber is more representative of bare feet and soft shoe soles, such as is usually found on running shoes.

**Pendulum Test Value (PTV), as received, with Four S (96) hard rubber slider:**
**Dry: 71 Wet: 47**

**Pendulum Test Value, after 500 cycles of abrasion, with Four S rubber slider:**
**SSR Wet: 45**

High Pendulum Test Values indicate potentially good traction. AS HB 198: 2014 recommends a range of situation-specific minimum Pendulum Test Values as shown in the attached table below. The Ceramic Tile Institute of America (CTIOA) and United Kingdom Slip Resistance Group (UKSRG) make a more general recommendation and say that a minimum pendulum test value of 36 for level floors is considered "low slip potential". According to CTIOA and UKSRG, values of 25-35 are classed as "moderate slip potential". Values of 0-24 have "high slip potential". Slip resistance can be affected by factors such as floor coatings, abrasives, detergents, contamination, chemical treatments, and wear.

The abrasion method is used to assess the propensity of flooring to lose wet slip resistance. A typical specification for Sustainable Slip Resistance of new flooring is that the wet PTV after **500 cycles of abrasion** should be **35 or higher**.

Respectfully submitted,
SOTTER ENGINEERING CORPORATION

George Sotter

J. George Sotter, P.E., Ph.D.
President

| Building or walkway type | Line no. | Location or function of area | Minimum wet PTV (or BPN) | |
|---|---|---|---|---|
| | | | Hard rubber slider | Soft rubber slider |
| External pavements and ramps | 1 | External ramps with slopes steeper than 1 in 14 (4.1 degrees) | 55 | 45 |
| | 2 | External ramps, slopes less than 1 in 14 | 45 | 40 |
| | 3 | Level surfaces: external sales areas (e.g. markets), external car parks, external colonnades, walkways, pedestrian crossings, balconies, verandas, carports, driveways, courtyards, roof decks | 45 | 40 |
| | 4 | Car parks, undercover | 35 | 35 |
| Hospitals and aged care facilities | 5 | Bathrooms and ensuites in hospitals and aged care facilities | 35 | 35 |
| | 6 | Wards and corridors in hospital and aged care facilities | 25 | 20 |
| Hotels, offices, public buildings, schools, kindergartens; entries and access areas including common areas, internal elevator lobbies | 7 | Dry area | 12 | NS |
| | 8 | Hotel bathrooms, ensuites and toilets | 25 | 20 |
| | 9 | Hotel kitchens and laundries | 25 | 20 |
| | 10 | Restroom facilities in offices, bars and shopping centers | 35 | 35 |
| | 11 | Transitional areas, intended to be kept dry | 25 | 20 |
| | 12 | Wet area | 35 | 35 |
| Kitchens (commercial), serving areas, cold stores | 13 | Commercial kitchens | 55 | 45 |
| | 14 | Serving areas behind bars in bars and clubs | 45 | 40 |
| | 15 | Cold stores and freezers | 45 | 40 |
| Loading docks | 16 | Loading docks under cover | 55 | 45 |
| Sports stadiums | 17 | Undercover concourse areas | 35 | 35 |
| Supermarkets and shopping centers | 18 | Dry areas in separate shops in shopping centers | 12 | NS |
| | 19 | Fast food outlets, buffet food servery areas, food courts and fast food dining areas in shopping centers | 35 | 35 |
| | 20 | Fresh fruit and vegetable areas in shops and supermarkets | 35 | 35 |
| | 21 | Shop entry areas with external entrances | 35 | 35 |
| | 22 | Supermarket aisles (except fresh food areas) | 12 | NS |
| | 23 | Wet areas in separate shops in shopping centers | 35 | 35 |
| Swimming pools and sporting facilities | 24 | Communal changing rooms | 35 | 35 |
| | 25 | Communal shower rooms | 45 | 40 |
| | 26 | Swimming pool decks | 45 | 40 |
| | 27 | Swimming pool ramps and stairs leading to water | 55 | 45 |
| Stairs | 28 | Dry treads or landings | 35 | 35 |
| | 29 | Wet treads or landings | 45 | 40 |
| NS - not specified | | | | |

Table 1. Recommended minimum PTV from the June 2014 Australian standard. The minimum values in this table are both more permissive (values below 36) and more conservative (values above 36) than the CTIOA and UKSRG standards discussed on the previous page. We consider the standard summarized on this page to be the world's most sophisticated. However, the choice between the two is left to the reader.