PENDULUM TEST REPORT

INHOUSE TESTING

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Floor Test Results

Details

Ref No	PT-21-025
Date of Test	1st November 2021
Customer	Aston Crean
Project	N/A
Location	In House Test
Zone	N/A
Carried out by	Paul Deegan
Floor Surface	Reims Gris Glazed Porcelain 450 x 450

Overview of Testing Conducted

As instructed by our client we have conducted floor pendulum testing in accordance with BS 7976-2 / UKSRG Guidelines at the location stated above. Tests conducted using in date calibrated equipment and methods recognised in Irish courts as accurate, consistent and which provide repeatable values; tests recommended and approved by the HSE (Health and Safety Executive) to determine if floors are able to prevent slips. The HSE has recommended the probability of floor slip should be a minimum of 1 in 1 million footfalls and a 'Pendulum Test Value' (PTV) of 36 relates to this probability rating (in the range 0 to 110 where 0 is the worst value). Typically, a floor very rarely fails the test when the floor is dry but when the floor is WET or CONTAMINATED with liquid or dry contaminants (such as cooking oil or water) then the PTV drops significantly; the HSE has determined over 90% of slips occur on WET or contaminated floors.

General Statement

All areas tested in an "**as found**" condition. For each individual area, tests have been carried out using a Calibrated KSS Pendulum Tester.

Our understanding of **"as found"** conditions is normally a cleaned floor. Our results then possibly reflect the floor condition prior to the start of a working day.

Please note during the course of the day and depending upon floor trafficking or possibly spillage incidents the potential for slip as shown in the tables of test results will adversely increase. (all spillage occurrences should be immediately attended to; the affected area being left clean and dry).

Pendulum tests carried out, except where otherwise stated, under dry conditions followed by a wet contaminant (potable water).

Slider Details	Pendulum Tester Details	Incline/Flat Testing
Slider 96 Rubber	KSS Pendulum Tester CN 926 – 25/03/22	Flat Testing

Floor Test Results

TICK WHEN ACTIONED √

1. ☒ Secured hinged foot to base
2. ☒ Check Validity and note down /record Calibration Number of the pendulum. Do not use if pendulum is outside the recalibration due date
3. ☒ Note down/record Serial number of the pendulum
4. ☒ Note slider type requirement

Sliders if already used and still in service

5. ☒ Select slider
6. ☒ Check slider date and note same
7. ☒ Note slider type & batch number
8. ☒ Check certificate of conformity for slider
9. ☒ Check wearing edge of slider replace if worn in excess of 4mm
10. ☒ Ensure slider is clean of contamination
11. ☒ Fit slider correctly to the pendulum

Preliminary checking of the instrument

12. ☒ Check level of the pendulum
13. ☒ In free hang position ensure pointer is in line with the pendulum arm
14. ☒ In free hang position check pendulum foot is parallel to the base
15. ☒ Check instrument for Zero position
16. ☒ Set the "Setting Distance" 124 –126 mm
17. ☒ Tighten the hand wheel at the back of the Pendulum
18. ☒ Condition the slider (slider 96 - P400 Grit paper then Polishing paper - slider 55 P400 grit paper only)

Test(s) can now be carried out ensuring first 16 & 17 above have been re verified

19. ☒ Record Date and time of Test
20. ☒ Record each location of test and any other relevant observations
21. ☒ On completion of Tests or at intervals check zeroing of the instrument
22. ☒ Dry instrument and clean before returning to storage case.

Floor Test Results

Results

N/S	1	2	3	4	5	6	7	8	MEDIAN
DRY	68	68	67	67	67	67	67	67	67
WET	58	60	58	60	60	60	60	60	60
DIAG	1	2	3	4	5	6	7	8	MEDIAN
DRY	69	69	68	67	67	68	68	68	68
WET	58	60	60	60	60	60	60	60	60
E/W	1	2	3	4	5	6	7	8	MEDIAN
DRY	72	73	72	72	71	71	71	71	72
WET	59	59	60	60	60	60	61	61	60

AVERAGE DRY	69

AVERAGE WET	60

The guide below shows the various levels of slip risk which is used in the Irish court of law to determine the slip potential of a floor. The HSE (Health and Safety Executive) and UKSRG have deemed that the safe floor level is 36 PTV.

This is for a flat floor with no incline or "Wear and Tear"

Minimum Slip Resistance Value (Wet Pendulum Test Value)	Risk / Chance of Slip (people)	Slip Potential
36	1 in 1,000,000	LOW RISK
34	1 in 100,000	MODERATE RISK
29	1 in 10,000	MODERATE RISK
27	1 in 200	MODERATE RISK
24	1 in 20	HIGH RISK
20	1 in 2	VERY HIGH RISK

Floor Test Results

Which Rubber Slider should be used?

Slider 55 Rubber - nominal hardness of 55 IRHD, these rubber sliders are designed to replicate the tyre of a car. Usually used to test rough surfaces which are used by vehicles, such as roads or motorways. This slider is also used in areas used by **Barefoot** pedestrians such as swimming pools, bathrooms and changing rooms.

Slider 96 Rubber - Nominal hardness of 96 IRHD, these sliders are usually used to test smooth surfaces such as internal flooring, wooden flooring, ceramic tiles and other walkways used by **Shod** pedestrians.

Rubber Sliders must be replaced once there is more than 4 mm of wear on each side of the rubber.

Site Images

Floor Test Results

Standards

1. **BS EN 1097 - 8:2020**
   Testing Aggregates. Methods for determination of mechanical properties. Specifies the method for determining the polished stone value (PSV) of a coarse aggregate used in road surfacing's.

2. **BS EN 1344: 2013**
   Clay and silicate pavers for flexible pavements Pt. 1 – specification for pavers.

3. **BS EN 12616: 2013, BS EN 12228 : 2013**
   Artificial sports surfaces: *person/surface interaction slip resistance on wet and dry.*

4. **BS 7188:1998+A2:2009**
   Impact absorbing playground surfaces. - *Impact absorbing playground surfacing- Performance requirements and test methods*

5. **BS 7932: 2003**
   Method for determination of Polished Paver Value. *Relates to the determination of the unpolished and polished pendulum test value of surfacing units for pedestrian or traffic purposes, using a flat-bed polishing machine with pendulum test equipment.*

6. **BS 8204-3:2004+A2:2011**
   Onsite flooring Part 3. Code of practice for polymer modified cementitious flooring.

7. **ASTM E303: 93 (2018)**
   Standard test method for measuring the surface frictional properties using the British Pendulum Tester. - *American Standards for using Pendulum Tester*

8. **BS EN 1097-8:2020**
   Tests for mechanical and physical properties of aggregates. Determination of polished stone value - *determining the polished stone value (PSV) of a coarse aggregate used in road surfacing's.*

7. **DIN 51 097:1992:** Testing of floor coverings.
   Determination of anti-slip properties. Wet-loaded ***bare foot*** *areas. Walking method – Ramp test.*

8. **DIN 51 130:1992:** Testing of floor coverings.
   Determination of anti-slip properties.
   Workrooms and work areas with increased risk of slip. ***Shod Pedestrians****. Walking method – Ramp test.*

9. **BS 7976-2:2002+A1:2013** Pendulum testers - *use of a pendulum tester*

11. **BS EN 1436:2018**
    Road marking materials. *Road marking materials. Road marking performance for road users and test methods*

12. **BS EN 13036 –4** Road and airfield surface characteristics. *Method for measurement of slip/skid resistance of a surface: The pendulum test*

Floor Test Results

Irish Legislation

Under the Safety, Health and Welfare at Work Act 2005, employers have a duty of care to ensure the safety of their employees is not compromised by such situations as slippery surfaces.

This legislation is enhanced under the Safety, Health and Welfare at Work (General Application) Regulations 2007

Regulation 9 (1) states:

"*An employer shall ensure that -*
a) The floors of rooms have no dangerous bumps, holes or slopes and are fixed, stable and, so far as is reasonably practicable, ***not slippery.***

The surfaces of floors and traffic routes should be free from any hole, slope or uneven or ***slippery*** *surface which is likely to:*
a) Cause a person to slip, trip or fall, etc..

Floor surfaces which are likely to become wet or to be subject to spillages should be of a type which does not become unduly slippery. Where there is likely to be danger, protection should be provided, for example, through protective footwear, slip resistant floor surfaces, fencing off and adequate maintenance."

According to the Health & Safety Authority's latest figures, Slips, Trips and Falls (STF) are the second most common type of workplace accidents and wet floors are the cause of most STF incidents.

The HSA recommend that, having identified the risk of slippery surfaces:

- use cleaning methods that do not create slippery surfaces
- use stick-on strips or mats
- abrade or ***treat the surface chemically***
- remove build-ups of ice regularly, grit or salt ice as appropriate
- ensure that people entering the area wear slip resistant footwear suitable for the type of work.

Specific legal requirements still exist, mainly in the form of Regulations and Approved Codes of Practice, but words and phrases such as "adequate", "suitable and sufficient" and "so far as is reasonably practicable" require active management rather than passive minimal compliance.