

Client:
 Berwyn Slate Quarry
 The Horseshoe Pass
 Llangollen
 North Wales
 LL20 8DP

Test Site:
 Slip Testing Head Office
 Cramlington
 NE23 1WP

Date of Test: 17-JAN-23
Location of Test: Sliptesting HQ
Description of surface/material: Sawn Face

Condition of surface/material: Good
Temperature: 12.8 °C To 1 decimal place
Level / Gradient: Level

Operator ID: Ross Mclean
Reporting Standard: BS EN 16165:2021
Pendulum ID: SK1428 - Jan 22
Slider ID: Slider 96
Direction A: Right to left
Direction A: Direction of traffic ; B: 90 Degrees ; C: 45 Degrees



DIR' N	CONT' N				1	2	3	4	5	MEAN	PREV	RISK
A	DRY	75	75	74	74	74	73	73	73	73	0	Low
A	WET	70	70	70	69	69	69	69	69	69	0	Low
B	DRY	75	75	74	74	74	74	73	73	74	0	Low
B	WET	70	70	70	69	69	69	69	69	69	0	Low
C	DRY	75	75	74	74	74	73	73	73	73	0	Low
C	WET	70	70	69	69	69	69	69	69	69	0	Low

Observations and recommendations

No further action is required as the surface is suitably rough / profiled / conditioned to provide adequate levels of grip in wet conditions. The average PTV of the surface is equal to or greater than 36 which classifies the surface as Low Risk.



SLIPTESTING

Please find attached the results from the Pendulum Testing.

The tests were carried out in accordance with BS EN 16165:2021. A site assessment is an important component in determining the slip risk of any given floor. The HSE's pedestrian slip potential model highlights important environmental factors in a slip. Contaminating substances, frequency and methods of cleaning, types of footwear and likely pedestrian behaviour all affect the potential for a slip incident and are given due consideration.

Coefficient of dynamic friction measurement is carried out in accordance with BS EN 16165:2021 and the UKSRG Guidelines 2022. Testing has been carried out in accordance with the UKSRG Guidelines as both the HSE and UKSRG agree that this is best practice.

A prepared standard rubber slider attached to a weighted 'shoe' is allowed to swing from a horizontal point of release. The slider is mounted on a spring-loaded bracket and makes contact with the floor for a known distance. The height to which the shoe travels after contacting the floor gives a reading of the Pendulum Test Value (PTV, formally known as SRV Slip Resistance Value). The dynamic coefficient of friction of a test surface has a direct and measurable effect on the PTV reading obtained.

Test surfaces are subject to eight measurements of the PTV with the first three being discounted from calculations of the mean. Tests are carried out in the principal direction, at 45° to the principal direction and at 90° to the principal direction. Each direction is tested under both wet and dry conditions, totalling 48 measurements. A mean value is generated for wet and dry tests based on the performance in different directions. A slip potential classification can then be applied using the following table from the UKSRG Guidelines.

PTV	Slip Potential
<25	High
25-35	Moderate
>35	Low

Site Assessment

A site assessment is designed to highlight factors that have an impact on slip risk potential. The Slip Testing site assessment follows the pedestrian slip risk potential model as developed by the HSE alongside guidance published by the UKSRG and our own expert knowledge and experience.

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SLIPTESTING

Information required to complete the site assessment is gathered primarily at the time and location of the test based on observations made by the test operator. Less obvious information, such as cleaning regimes or shoe control measures, is supplied by the person responsible for the site, or a representative of that person. Where information is uncertain, or an assumption is made, it is made clear that this is the case.

A Slip Testing site assessment aims to provide the client with all necessary information of the factors contributing to slip risk of the tested areas. Drawing assessment criteria from a wide range of expert sources ensures that a complete and thorough report of slip risk is produced. Knowledge of factors adversely affecting slip risk allows intelligent decision making in ongoing health and safety procedures.

As our company not only offers anti-slip solutions to a wide variety of shopping centres and Government buildings nationwide, we are well positioned to offer expert advice on the cleaning and maintenance of all floor surfaces.

If you wish to discuss any of the information in more detail please contact me directly and I will be happy to help in any way I can.

Yours sincerely

Emma Riley
Director

Floor testing – Testing on Slopes

It stands to reason that the steeper the slope, the more likely you are to slip on that slope, yet one of the biggest mistakes we see is a lack of understanding that a slope on a floor requires an increase in the Slip Resistance Value (SRV) also known as the Pendulum Test Value (PTV). On a horizontal floor the HSE expects a Pendulum Test Value of 36 PTV on a WET or CONTAMINATED floor but for every 1 degree of slope the PTV must increase by approximately 2 PTV (1.75 PTV to be more precise).

*The value of 36 PTV has been determined by the UK Health and Safety Executive / UK Health and Safety Laboratories as the minimum Floor Test Value necessary to ensure when a floor is WET or CONTAMINATED (which is far worse than any DRY floor) that the **minimum probability of slip is maintained at 1 in 1 million** termed by the HSE as a 'Low Probability of Slip'.

Example – Pendulum Test Value on a Slope of 5 degrees

If the slope was 5 degrees then an additional value of 9 PTV is required (5 x 1.75 PTV) on top of the 36 PTV making 45 PTV. When floor testing, we accurately measure the floor with a digital inclinometer and adjust the readings accordingly.

Source of Information in respect to PTV results for slopes

Guidelines created by the UK Slip Resistance Group (UKSRG) who are a main advisory body to the UK HSE, the UK Government and instrumental in the British Standards state:

"the target PTV on a slope compared to a level walkway needs to be increased by: $100 \times \tan a$ (where a is the slope angle)" which simply put means for every 1 degree of slope, an increase in Pendulum Test Value is required to ensure the HSE recommended minimum probability of slip is maintained at 1 in 1 million. The following figures have been calculated for you as follows:

Values of Tangents and the relationship to Pendulum Test Values (PTV)			
Slope Angle	Calculations	New Minimum PTV Value Required	Exact
		Nearest Whole Figure	
1 degree	100 x Tangent of 1 degree (0.0174550) = 1.75	38	37.75
2 degrees	100 x Tangent of 2 degrees (0.034921) = 3.50	40	39.50
3 degrees	100 x Tangent of 3 degrees (0.052408) = 5.25	42	41.25
4 degrees	100 x Tangent of 4 degrees (0.069927) = 7.00	43	43.00
5 degrees	100 x Tangent of 5 degrees (0.087489) = 8.75	45	44.75

Standard Materials Certificate



UKAS certificate number: 126/21
Batch number: B2705
Our reference: 12062
Date of issue: 06/04/22

Part No: 881032/2
Mounted Rubber Slider 45(96) - Large

Certificate issued to:
Tritlington Broom Frmhse
Morpeth
Northumberland
NE61 3DT

Tests conducted by:
Smithers Rapra
Shawbury
Shropshire
SY4 4NR UK

On behalf of:
Munro Instruments Ltd
44-45 Burnt Mill, Elizabeth Way,
Harlow, Essex
CM20 2HU UK

Test Results

Temperature (°C)	BS ISO 48-2:2018		BS ISO 4662:2009	
	IRHD	IRHD Spec Limits	Lüpke Resilience	Lüpke Resilience Spec Limits
0	n/a	n/a	n/a	n/a
5	n/a	n/a	20	19-23
10	n/a	n/a	n/a	n/a
20	n/a	n/a	n/a	n/a
23	95	94-98	23	22-26
30	n/a	n/a	n/a	n/a
40	n/a	n/a	27	26-30

Hardness was determined at the specified temperatures in accordance with BS ISO 48-2:2018. The hardness as measured, at all specified temperatures, was within the specified limit of 96±2 IRHD.

Resilience was determined at the specified temperatures in accordance with BS ISO 4662:2009. Five readings were taken on duplicate test pieces. The Lüpke Resilience as measured, was within the specified limits.

The overall expanded uncertainty of the hardness measurements is quoted as $X \pm 2$. The uncertainty has been estimated using a coverage factor $k=2$, providing a confidence level of approximately 95%.

Recommended date of disposal

It is recommended that sliders are disposed of 12 months after issue, on 06/04/23.

Declaration

The above results are accurate representations of the data supplied by Smithers Rapra in certificate 126/21. The whole of the supplies detailed above conform with the requirements of the contract order.

Authorised by

Signed:

John Adams
Director, Munro Instruments Ltd
06/04/22

Munro Instruments Ltd, 44-45 Burnt Mill, Elizabeth Way, Harlow, Essex, CM20 2HU, UK
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Company Registration Number: 06965050 VAT Number: GB 977 7939 30

Calibration Certificate

Manufacturer's Machine ID Number **SK1428**

Item Tested **TRRL Type Skid Tester**

Calibration Certificate Number **C3202**

Customer Name **Slip Testing Limited**

Date Calibrated **25/01/2022**

Expiry Date **24/01/2023**

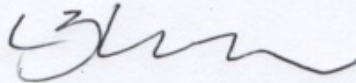
We certify that this machine has been calibrated in accordance with BS EN 1097-8 : 2009, BS EN 13036:part 4:2011 and BS7976:Part 3:2013

The procedures used are contained in the Company's Quality Manual, which has been accredited under ISO 9001:2008

Findings and adjustments are recorded in the Customer Report Form supplied with this Certificate.

The instrument should be re-calibrated within one year of the calibration date.
(BS EN 1097-8:2009 Clause D.1.1 & BS7976 – 3 2013 Clause 4 note 2)

Authorised by



WESSEX PRECISION INSTRUMENTS LTD

Issue 6.0 22/05/2021

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