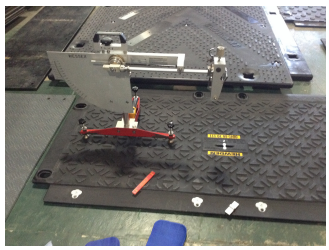
Advance Group
Unit 16 Atley Business Park
Atley Way
Cramlington
Northumberland
NE23 1WP
T: 01670 783884
E: e.riley@advance-group.co.uk
W: www.advance-group.co.uk

Ground-Guards Ltd
Rudgate
Walton
Leeds
LS23 7AU

Date of Test: 28-SEP-16
Operator: Nicky Sexton
Pendulum: SK1428
Slider: Slider 55
Test Standard: BS7976 part 2

Specific Test Location: Laboratory
Temperature: 15.2 °C (To 1 decimal place)
Description of floor material: Maxi track mp
Sloping/Level: LEVEL
Direction A:
Direction B: 90 Degrees
Direction C: 45 Degrees
Latitude/Longitude: 53.916706340434885/-1.3184986576665638



Slip Test Results

DIR' N	CONT' N				1	2	3	4	5	MEAN	PREV	RISK
A	DRY	91	91	91	93	96	95	91	100	95		Low
A	WET	87	87	86	86	87	86	86	86	86		Low
B	DRY	99	92	95	100	92	92	92	90	93		Low
B	WET	85	89	88	88	88	87	87	87	87		Low
C	DRY	99	100	96	100	98	99	100	100	99		Low
C	WET	86	86	86	86	85	85	85	85	85		Low

Existing Controls and Recommendations

Existing Controls in place to mitigate water ingress/contamination

- No controls

Factors Affecting effectiveness of controls

- Test

Recommendations that may individually or collectively increase the PTV (Pendulum Test Values) in wet conditions or mitigate down the risk of the floor surface becoming wet.

- Test

ADVANCE GROUP™
Cleaning - Testing - Treatment

Please find attached the results from the Pendulum Testing.

The tests were carried out in accordance with BS7976 part 2. A surface roughness meter is used to measure the ability of the floor's surface to puncture the hydrodynamic squeeze film. The film forms a barrier between sole and floor and significantly reduces grip, in the same way that a car tyre aquaplanes. The minimum recommended valley to peak height for a water wet surface is 20µm.

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 7976 and the UKSRG Guidelines 2005.

These industry standard methods of testing are essentially the same but with a slight difference between the two methods of preparation of the rubber sliders. 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

Surface roughness, in particular the Rz value, describes the ability of a floor to puncture the hydrodynamic squeeze film. It is also a valuable tool to assess the wear level as over time traffic will

smooth a floor surface, changing its slip risk potential. Advance Group use a Surtronic Duo surface roughness meter for assessment. The meter moves a stylus along the test surface, measuring the floor profile's average vertical peak to valley distance in microns. A test site will be measured ten times using this method, with tests carried out in random directions in an area local to the pendulum test. This is in line with UKSRG guidelines.

Surface roughness can be used to give a general indication of the slip risk potential of a floor, though it is by no means a comprehensive test. Advance Group use surface roughness measurements married to pendulum results to enable accurate ongoing monitoring of the surface. The UKSRG published the data shown in the table below to use in conjunction with pendulum testing.

Rz (um)	Slip Potential
<10	High
10-20	Moderate
>20	Low

Site Assessment

A site assessment is designed to highlight factors that have an impact on slip risk potential. The Advance Group 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.

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.

An Advance Group 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 whereupon I will be happy to help in any way I can.

Reducing PTV Results for slopes

The UK Slip Resistance Group (UKSRG) Guidelines state

"The target PTV on a slope compared to a level walkway needs to be increased by: 100 x tan α (where α is the slope angle)".

Simply put, this 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 HSL has determined the minimum slip resistance should be increased by a value of 1.76 (PTV) for every 1 degree of slope; for ease and to be conservative (i.e. safer) use value of 2 PTV for every 1 degree of slope.

The following figures have been calculated for you as follows:

DDA Requirements – The DDA (Disability Discrimination Act) dictates floor slopes should NOT be greater than an angle of 5 degrees, which relates to a maximum gradient value of 1 in 12.

Using the table drawn below, you can determine the angle / or gradient quite simply - The first row of the table below shows a max of 4.7 degrees (Or approx. 5 degrees) at a gradient of 1 in 12.

Typical floor slope angle for a wheelchair
3 - 4 Degrees
(Also see info in the table below)

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 (0.017455) = 1.74	**38**	37.74
2 degrees	100 x Tangent of 2 degrees (0.034921) = 3.49	**40**	39.49
3 degrees	100 x Tangent of 3 degrees (0.052408) = 5.24	**42**	41.24
4 degrees	100 x Tangent of 4 degrees (0.069927) = 6.99	**43**	42.99
5 degrees	100 x Tangent of 5 degrees (0.087489) = 8.74	**45**	44.74

Date: 08 December 2015

Your Ref: Emma Riley

Our Ref: 4087

Advance Group
Unit 16, Atley Business Park
North Nelson Industrial Estate
Cramlington
Northumberland
NE23 1WP

Certificate of Conformity for TRL (55) Rubber

Description and Part Number	Qty	Specification
881032/1 - Mounted TRL Rubber (55) Slider – Large – for Main Tester. Batch No. 866	1	Hardness : BS ISO 48:2010 Lüpke Resilience : BS ISO 4662:2009

Temperature :	0°C	10°C	20°C	30°C	40°C
Hardness IRHD	54	55	55	55	54
Resilience % (limits)	43-49	58-65	66-73	71-77	74-79
Resilience % (mean results)	47	60	67	71	75

The hardness, at all the specified temperatures, was within the specified limit of 55 ± 5 IRHD.

The Lüpke resilience was within the specified limits.

The TRL rubber supplied, Batch Number 866, conforms to the test specifications laid down by the UK Slip Resistance Group.

Recommended date of disposal : 08.12.2016

Certified that the whole of the supplies detailed above have been inspected, tested and unless otherwise stated, conform in all respects with the requirements of the contract or order.

Signed : Date of issue : 08.12.2015

Munro Instruments Ltd. Gilbert House, 406 Roding Lane South, Woodford Green, Essex, IG8 8EY UK
P +44 (0) 20 8551 7000 / F +44 (0) 20 8551 4565 / E info@munroinstruments.co.uk / www.munroinstruments.co.uk
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	**C2763**
Customer Name	**ACA Ltd**
Date Calibrated	**07/01/2016**
Expiry Date	**06/01/2017**

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 3:2002

The procedures used are contained in the company's Quality Manual, which has been accredited under ISO 9001:2000

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 2002 Clause 4 note 2)

Authorised by

WESSEX PRECISION INSTRUMENTS LTD

Wessex Test Precision Instruments Ltd, Unit 11, Knightcott Ind Est, Banwell, W-S-M, N Somerset BS29 6JN Tel: 01934 824000
Email sales@wessextestequipment.co.uk