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Suregrip Non Slip Surface

Specification

Introduction
Suregrip antislip surface is an abrasive faced composite material, manufactured in house. It is supplied in sheet form, in various thicknesses to suit the application. It is also manufactured as a profiled sheet for steps and as a tactile surface for use at the head of staircases.

Technical Specification
The sheet material comprises a hand laid laminate of fibreglass chopped strand and woven mat, with fire inhibited orthophthalic polyester resin. Graded quartz grit is encapsulated into the surface, to provide an abrasive, durable, surface. Standard sheet size is 2.440 m x 1.220m. Thicknesses 6mm, 8mm, 10mm,12mm

Profiled sheets are produced fully gritted,with rounded nosing for use on steps or square nosed The nose area of these profiles is normally yellow quartz throughout..
Standard size 300mm x 2440mm . Internal nose depth 32mm or 42mm. Thicknesses 6mm 8mm 10mm.

Tactile surface sheets are fully gritted and have a series of raised ribs bonded into the laminate.
Standard panels are 1220mm wide x 1000mm long and have ribs extending 1000mm across the width and extending 800mm along the sheet, commencing 100mm in. When used in conjunction with a profiled step, this gives the required 400mm warning from the nose of the step.

Recommended Applications.
6mm thickness material is designed for fully supported applications, such as overlaying existing ramps or platforms.
8mm thickness material is for pedestrian or wheelchair use in conjunction with support centres of 400mm and where the span width is 1220mm or less
10mm thickness material is for heavy pedestrian or wheelchair use or where the span width is greater than 1220mm.
12mm thickness is for industrial and light vehicular applications.

Weather Resistance
This material is not affected by high or low temperatures, rain or snow and resists fading through UV sunlight

Suregrp plyboard Panels
General Specifacation
Description
SUREGRP PANELS are a range of anti slip decking systems, engineered to fit a wide range of applications – from simple structures to bridge and platform constructions.
Features include:
Choice of colours · Chemical resistant, a light weight anti slip surface, choice of thickness, durable, suitable for platforms footbridges, open mesh flooring, concrete flooring
Technical Data
Description: Anti slip safety flooring panels, Colours, any ral colour, Edge detailing 50mm & 75mm Sight lines in white or yellow. For applications internal or external. Overall thickness available in your choice of thickness.
Chemical resistance Detergents, alcohol, lubricant oils and detergents, greases.

Maintenance
should be regularly cleaned to prevent the accumulation of oil, grease, dirt and other contaminants on the walking surface, which may reduce the anti slip properties. To clean use either of the following methods.
1. Warm water with a mild detergent
and a strong bristled brush. and a strong bristled brush. Pressure jet cleaning (A maximum pressure 1000 psi (68 bar) and temperature of 80°C is recommended to avoid damage to the wearing course).
After cleaning, the surface should be thoroughly rinsed with clean water and left to dry before allowing back into service
Whilst suregrp plyboard panels have a high resistance to solvents, oils and chemicals, it is not recommended that these substances be used as cleaning agents. Accidental spillages of such substances should be immediately removed using either of the cleaning methods above.

TESTS
The product was tested in both wet and dry conditions using a Pendulum tester and following the guidelines presented by the UK Slip Resistance Group.

Additionally an accelerated wear test was carried out on the product and the testing repeated in an attempt to assess the likely performance of the product following the most rigorous in-service conditions it is likely to encounter in normal use.

From the investigation carried out the following conclusions can be drawn;

- BS 4592[(5)] was published by BSI and came into effect on December 29th 2006, it provides guidance on the classification of products like 'Suregrip' against specific performance requirements.

- Based on the results of this investigation it is apparent that the 'Suregrip' product would, as supplied and when used as a horizontal surface, be classified in accordance with BS 4592-0: 2006[(5)] as **"an enhanced slip resistant surface"**.

- The 'Suregrip' product is also used as an inclined surface. Based on the test results obtained in this investigation then for inclined surfaces between 1 in 12 to 1 in 15 the 'Suregrip' product would again be classified as **"an enhanced slip resistant surface"**.

- While not required by BS 4592 this assessment of the product included testing after an accelerated wear regime considered highly likely to provide the most rigorous in-service conditions it is likely to encounter. Based on the pendulum test values generated then for the 'Suregrip' product, after accelerated wear and used for horizontal surfaces, the classification would be changed to that of **"a slip resistant surface"**.

- After the accelerated wear regime and on an inclined surface of between 1 in 12 to 1 in 15 the classification of the 'Suregrip' product would remain as **"a slip resistant surface"**.

Contents

1 Introduction

At the request of West Midlands Centre for Constructing Excellence (WMCCE) and on behalf of A & J Stevenson an investigation into the performance of the ‘Suregrip’ floor product was carried out.

The aim of the BRE investigation was to establish the performance characteristics of the ‘Suregrip’ product supplied specifically with respect to its potential for slip. The investigation and assessment of performance carried out does not constitute a third party approval or product certification.

The product was tested in both wet and dry conditions using a Pendulum tester and following the guidelines presented by the UK Slip Resistance Group.

Additionally an accelerated wear test was carried out on the product and the testing repeated in an attempt to assess the likely performance of the product following the most rigorous in-service conditions it is likely to encounter in normal use.

2. Description of the project

2.1 General

The aim of the BRE investigation was to establish the performance characteristics of the 'Suregrip' flooring product with respect to its potential for slip.

2.2 Slip resistance testing

The slip resistance testing was carried out using a TRRL Pendulum tester and followed the method described in "The assessment of floor slip resistance" The UK Slip Resistance Group Guidelines (UKSRG) Issue 3 2005[(1)]. The test was carried out in both a wet and dry (as found) condition using the Four "S" / Standard pedestrian hard rubber.

2.3 Accelerated wear

Accelerated wear of the flooring product was carried out using the Polished Paver test.

The test methodology for determining the polished paver value (PPV) consists of the application of an accelerated polishing regime using a flat-bed polisher. This methodology is described in full in BS 7932[(6)] 'Method for determination of the polished paver value (PPV)'. Essentially this test artificially abrades a surface to mimic the effect of foot or vehicle traffic, in this case it has been used to provide an accelerated wear regime estimated to reflect the most rigorous in-service conditions it is likely to encounter in normal use for a period of at least 10 years.

Test Stage	Description
1.	New product as supplied. • 4 No. tests* using the Four "S" rubber – floor dry. • 4 No. tests using the Four "S" rubber – floor wet.
2.	Product after accelerated wear • 4 No. tests using the Four "S" rubber – floor dry. • 4 No. tests using the Four "S" rubber – floor wet.

***Note:** Each test consists of a set of 5 readings made in each of 3 directions

Table 1. Summary of testing carried out

3. Findings

3.1 Background to Slip Testing

Slip resistance testing is a significant component in the avoidance of accidents, but it is also one of the most complex attributes of flooring in buildings to assess. The factors affecting slipperiness are discussed in some detail in the BRE publication 'Floors and Flooring'[3].

3.1.1 Why do people slip?

People slip because at that instant the frictional force between the shoe and the floor is too small to resist the horizontal component of the force applied to the floor. When a person, with his or her leg inclined at an angle to the vertical, places the foot on the floor, a force is applied to the floor that may be resolved into a horizontal component **(H)** and a vertical component **(V)**. To walk without slipping, the horizontal component must always be less than the frictional force **(F)** between the shoe or foot and the floor, hence for safety:

$$F > H$$

where $F = \mu V$ and μ is the coefficient of friction, which depends upon the nature of the shoe and materials, and any third body interference such as water, dust, polish etc.

It follows that, for safety:

$$\mu V > H$$

or $$\mu = H/V$$

Conversely, if **H/V** exceeds the coefficient of friction, a slip will occur, but whether that leads to a fall depends on many other factors.

3.1.2 Coefficients of friction

Work at BRE has established that the average coefficient of friction produced when walking was between 0.16 and 0.22 – depending on the direction of movement and sex of the person. It was initially established that only one person in a million was likely to exceed a value of 0.4, although these data were later refined as shown in Table 2.

Risk 1 in:	**Straight walking**	**Turning: Left foot**	**Turning: Right foot**
1, 000, 000	0.36	0.40	0.36
100, 000	0.34	0.38	0.34
10, 000	0.29	0.34	0.33
200	0.27	0.31	0.32
20	0.24	0.27	0.29

Table 2 Coefficients of friction between foot and floor[2,3]

3.1.3 Measurement of slip resistance

While many instruments have been designed for measuring the slipperiness of flooring, the TRRL pendulum tester has generally found most favour. It is a technique favoured by the UK Slip Resistance Group and was the method adopted for this investigation.

Essentially this technique measures the frictional resistance between a slider mounted on the end of a pendulum and the floor surface.

3.1.4 Guidance in relation to results achieved

In the late 1960's and 1970's much work was done by the Greater London Council (GLC) Scientific Branch using the pendulum apparatus at accident sites. It published the following assessed values of resistance to slipperiness and related categories of safety (GLC Bulletin No. 43 [(4)]):

Safety Category	Dangerous	Marginal	Satisfactory	Excellent
Pendulum Test Value (PTV)	<19	20-39	40-74	>75

Table 3 - Assessment of Potential for Slip - Pendulum Tester + TRRL Rubber

These values of slip resistance are read directly from the pendulum scale. They are called slipperiness coefficients or pendulum test values (PTV's) and are about 100 times greater than the coefficients of friction. The values have been used widely in assessing the slipperiness of floorings.

In the late 1980's the TRRL rubber slider on the pendulum tester was criticised for not providing a close enough comparator to the typical shoe sole and this led to the development of the Four "S" rubber which has now been adopted in the guidelines recommended by The UK Slip Resistance Group[(1)]. The Four "S" slider is applicable for use on normal flooring materials that are not enhanced to provide additional safety for hazardous conditions. The TRRL rubber is a softer compound and because of this is considered more appropriate for replicating the performance of a 'barefoot' situation. Due to the hardness of the TRRL rubber its performance is related to temperature and care must be taken to correct the measured value to a floor temperature of 20°C. No temperature correction is required for the Four "S" rubber.

The results generated by the Pendulum tester show the potential for slip - the lower the number the greater the potential for slip, conversely the higher the number the less 'slippery' the surface.

When using the Pendulum tester (with Four 'S' Rubber) the potential for slip of a floor or flooring material is typically assessed against the criteria highlighted in Table 4 and taken from the UKSRG issue 3[(1)].

Potential for Slip	High	Moderate	Low
Pendulum Test Value (PTV)	0 -24	25 - 35	36+

Table 4 - Assessment of Potential for Slip - Pendulum Tester + Four "S" Rubber

With the Four 'S' Rubber generally a value of 36 is taken as a safe threshold. Values less than 25 indicate a high slip risk, 25 to 35 indicate a moderate risk of slip, above 36 indicates a low slip risk. It is typical to assess the floor in the likely condition for use - hence in an area where a floor is likely to be wetted it is generally sensible to look at both the wet and dry condition.

3.2 Assessment of walkways and inclined surfaces

Floor surfaces like the 'Suregrip' product are reported to be frequently used as walkways and may be applied as coverings to otherwise slippery ramps or similarly inclined surfaces (see Section 4.2). As such these products may be assessed against the criteria set out in BS 4592[(5)].

3.3 Test results – slip resistance

Full details of the results obtained are presented in Appendix B for the samples tested. Table 5 provides a summary of the results obtained.

Test	Floor type	Slider Rubber type	Mean PTV – wet (CoF)		Mean PTV – dry (CoF)	
1	New 'Suregrip'	Four "S"	68	(0.68)	78	(0.78)
2	'Suregrip' after accelerated wear regime	Four "S"	51	(0.51)	67	(0.67)

Table 5. Summary of slip resistance measurements

4. Discussion of findings

4.1 General

The results obtained can be assessed against the criteria presented in Table 4 and the potential for slip determined. This assessment has been summarised in Table 6.

Test	Comments on surface	Rubber slider type	Potential for slip PTV - Wet	Potential for slip PTV - Dry
1	New 'Suregrip'	Four "S"	Low	Low
2	'Suregrip' after accelerated wear regime	Four "S"	Low	Low

Table 6. Assessment of slip potential (UKSLG) based on PTV

Assessment of slip should be made as part of a risk management process and as such it is essential to determine what the typical conditions of service should be. Based on the nature of the product i.e. as an industrial type flooring, it would seem prudent to consider the typical service condition for the product to be wet.

On the basis that the service conditions are wet then Table 6 highlights that the potential for slip of the 'Suregrip' product (as supplied), determined using the pendulum tester with Four "S" rubber, would be 'low'.

An assessment of the potential for slip as low does not mean that slip accidents will not happen - it indicates that in terms of risk an accident is less likely to happen than had it been classed as moderate or high. A low potential for slip would indicate (based on Table 2) that the likelihood of a slip accident occurring would generally be greater than one in one million (1:1,000,000).

However, it should also be noted that the assessment of the slip characteristics of a floor are dependent upon the activities of those people using the floor in a given environment. The assessment criteria discussed in this section of the report are essentially based on unencumbered people walking on the floor. People carrying objects, twisting and turning and/or running not walking are more likely to slip than those walking in essentially a straight line with no burden. For products like 'Suregrip' this issue is tackled in relation to the performance requirements and subsequent classification provided by BS 4592[(5)], see Section 4.2.

It is also possible that some products may excessively wear during service while most specifications typically only state a slip requirement for the product as supplied. To this end the 'Suregrip' product was exposed to an accelerated wear regime estimated to reflect intensive use under industrial conditions for a period of at least 10 years. The accelerated wear regime did not significantly alter the performance of the 'Suregrip' product and the classification of its potential for slip in line with the UKSLG guidelines remained unchanged.

4.2 Assessment of the product for use as a 'walkway'

Section 4.1 discussed issues of slip assessment in relation to a non specific or more general situation. It is apparent that the 'Suregrip' product is used as an industrial type flooring and more specifically as a walkway, sometimes in an inclined situation. BS 4592[(5)] was published by BSI and came into effect on December 29th 2006. It was prepared by Subcommittee B/208/1, Stairs and walkways – Industrial, under the authority of Technical Committee B/208, Stairs and walkways. Within this document the slip

resistance requirements of the surfaces covered are identified. BS 4592[5] makes allowance for testing using the pendulum tester following the UK Slip Resistance Group Guidelines and stipulates that testing should be in water wet conditions

While BS 4592[5] is published in seven parts, Part 0 provides 'Common design requirements and recommendations for installation'. Information presented in Sections 3, 7 and Annex C of this document essentially identifies four types of flooring and associated performance requirements as follows;

- ***Unsuitable for wet conditions*** **-** those surfaces where in water contaminated conditions the CoF is less than 0.4.
- ***Slip resistant flooring*** – a floor surface that is suitable for use where users are walking or turning in dry or water contaminated conditions, which produces coefficient of friction (CoF) results of 0.4 or more.
- ***Enhanced slip resistant flooring*** – a floor surface that is suitable for use where users are engaged in strenuous activity (for example, pushing or pulling equipment) in dry or water contaminated conditions, which produces CoF results of 0.6 or more.
- ***Inclined floorings –*** The additional CoF required for inclined floorings shall be determined by taking the tangent of the angle of the incline and adding that to the minimum CoF for each classification level.

  It is reported that under typical conditions of use as an inclined surface the angle of incline of the 'Suregrip' product would typically range from between 1 in 12 to 1 in 15. In accordance with the guidance offered in BS 4592[5] then for the angles of incline noted 0.08 and 0.07 respectively needs to be added to the minimum CoF for each classification level.

Table 7 provides a summary of the slip requirements and classifications in BS 4592[5].

BS 4592 Classification	**Minimum Coefficient of Friction**		
	Horizontal surface	**Inclined surface 1 in 12 (4.8°)**	**Inclined surface 1 in 15 (3.8°)**
Unsuitable for wet conditions	Less than 0.4	Less than 0.48	Less than 0.47
Slip resistant flooring	0.4 to less than 0.6	0.48 to less than 0.68	0.47 to less than 0.67
Enhanced slip resistant flooring	0.6 or more	0.68 or more	0.67 or more

Table 7. Summary of slip requirements and classifications – BS 4592-0:2006 [5]

Taking the results presented in Table 5 and the information in Table 7 it is apparent that the 'Suregrip' product would, as supplied i.e. new and when used as a horizontal surface, be classified in accordance with BS 4592-0: 2006[5] as **"an enhanced slip resistant surface".**

The 'Suregrip' product is also used as an inclined surface. Based on the test results obtained in this investigation then for inclined surfaces between 1 in 12 to 1 in 15 the 'Suregrip' product, as supplied, would again be classified as **"an enhanced slip resistant surface".**

While not required by BS 4592[5] this assessment of the product included testing after an accelerated wear regime considered highly likely to provide the most rigorous in-service conditions it is likely to encounter in normal use. Based on the pendulum test values generated and presented in Table 5 then the 'Suregrip' product, after accelerated wear and used for horizontal surfaces, the classification would be changed to that of **"a slip resistant surface".**

After the accelerated wear regime and on an inclined surface of between 1 in 12 to 1 in 15 the classification of the 'Suregrip' product would remain as **"a slip resistant surface"**.

These results and associated classifications in accordance with BS 4592[5] have been summarised as Table 8.

Product description	**Conditions of use**	**Slider Rubber type**	**Mean PTV – wet (CoF)**	**BS 4592 Clasification**
'Suregrip' – as supplied.	horizontal surface	Four S	68	Enhanced slip resistant surface
'Suregrip' – as supplied.	Inclined surface 1 in 12 (4.8°)	Four S	68	Enhanced slip resistant surface
'Suregrip' – as supplied.	Inclined surface 1 in 15 (3.8°)	Four S	68	Enhanced slip resistant surface
'Suregrip' – after accelerated wear	horizontal surface	Four S	51	Slip resistant surface
'Suregrip' – after accelerated wear	Inclined surface 1 in 12 (4.8°)	Four S	51	Slip resistant surface
'Suregrip' – after accelerated wear	Inclined surface 1 in 15 (3.8°)	Four S	51	Slip resistant surface

Table 8. Summary of results and classification of 'Suregrip' product to BS 4592[5].

5. Conclusions and recommendations

From the investigation carried out the following conclusions can be drawn;

- The 'Suregrip' product is typically used as a horizontal or inclined surface as an industrial walkway and as such the typical service condition for the product has been considered to be wet.
- An assessment of the of the product using the Pendulum Tester and in accordance with the guidelines presented by the UK Slip Resistance Group, indicates the slip potential to be "low" in either the dry or wet test condition.
- An assessment of slip potential as "low" does not mean that slip accidents will or will not happen. As the measured Pendulum Test Value (PTV) increases so the likelihood of an accident occurring for straight walking is reduced. The likelihood of an accident occurring would be increased if the pedestrian is twisting, turning, running, or is carrying a load.
- BS 4592[(5)] was published by BSI and came into effect on December 29th 2006, it provides guidance on the classification of products like 'Suregrip' against specific performance requirements.
- Based on the results of this investigation it is apparent that the 'Suregrip' product would, as supplied and when used as a horizontal surface, be classified in accordance with BS 4592-0: 2006[(5)] as **"an enhanced slip resistant surface"**.
- The 'Suregrip' product is also used as an inclined surface. Based on the test results obtained in this investigation then for inclined surfaces between 1 in 12 to 1 in 15 the 'Suregrip' product would again be classified as **"an enhanced slip resistant surface".**
- While not required by BS 4592 this assessment of the product included testing after an accelerated wear regime considered highly likely to provide the most rigorous in-service conditions it is likely to encounter in normal use. Based on the pendulum test values generated then for the 'Suregrip' product, after accelerated wear and used for horizontal surfaces, the classification would be changed to that of **"a slip resistant surface".**.
- After the accelerated wear regime and on an inclined surface of between 1 in 12 to 1 in 15 the classification of the 'Suregrip' product would remain as **"a slip resistant surface"**.

6. References

(1) UK Slip Resistance Group — The assessment of Floor Slip Resistance. The UK Slip Resistance Group guidelines. Issue 3 2005.

(2) BRE (Yates, T & Richardson, D) — Flooring, paving and setts. Requirements for safety in use. BRE Information Paper, IP 10/00, March 2000.

(3) BRE (P W Pye & H W Harrison) — BRE Building Elements. Floors and Flooring. Performance, diagnosis, maintenance, repair and avoidance of defects. BR 332. 1997.

(4) Greater London Council — Slip resistance of floors, stairs and pavings. GLC Bulletin No 43(2nd Series), Item No 5. London, GLC, 1971.

(5) British Standards Institution — BS 4592-0:2006. Industrial type flooring and stair treads – Part 0: Common design requirements and recommendations for installation.

(6) British Standards Institution — BS 7932: 1998. Method for determination of the polished paver value (PPV).

Appendix A – Photographic record of product supplied and tested

Plate 1: ‘Suregrip’ product as supplied

Plate 2: ‘Suregrip’ product – sample after accelerated wear

Appendix B – Detailed test results

SAMPLES AS RECEIVED

Sample – Suregrip (234140/07/07)
Sample 61
Tested by - Ian Rance, BRE
Machine – TRL Pendulum Tester
Temperature (°C) – 20

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	As supplied	0°	73	77	77	Dry	79	79	79	79	79	**77**
4 S	As supplied	45°	76	75	74	Dry	74	74	74	74	74	
4 S	As supplied	90°	76	77	77	Dry	77	77	77	77	77	

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	As supplied	0°	69	69	66	Wet	66	66	66	66	66	**66**
4 S	As supplied	45°	65	66	64	Wet	65	65	65	66	64	
4 S	As supplied	90°	67	67	67	Wet	67	67	67	67	67	

Sample – Suregrip (234140/07/07)
Sample 62
Tested by - Ian Rance, BRE
Machine – TRL Pendulum Tester
Temperature (°C) – 20

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	As supplied	0°	76	78	79	Dry	77	77	77	77	77	**78**
4 S	As supplied	45°	78	77	76	Dry	77	77	78	77	77	
4 S	As supplied	90°	80	80	80	Dry	80	80	80	80	80	

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	As supplied	0°	69	68	67	Wet	66	66	66	66	66	**69**
4 S	As supplied	45°	72	73	71	Wet	71	71	71	69	70	
4 S	As supplied	90°	72	71	71	Wet	70	70	70	70	70	

Sample – Suregrip (234140/07/07)
Sample 63
Tested by - Ian Rance, BRE
Machine – TRL Pendulum Tester
Temperature (°C) – 20

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	As supplied	0°	76	75	78	Dry	76	76	76	76	76	**78**
4 S	As supplied	45°	77	79	79	Dry	79	79	79	79	79	
4 S	As supplied	90°	76	77	79	Dry	80	80	80	80	80	

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	As supplied	0°	76	73	70	Wet	70	70	70	70	70	**70**
4 S	As supplied	45°	72	71	70	Wet	70	71	72	73	71	
4 S	As supplied	90°	72	70	71	Wet	70	69	69	69	69	

Sample – Suregrip (234140/07/07)
Sample 64
Tested by - Ian Rance, BRE
Machine – TRL Pendulum Tester
Temperature (°C) – 20

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	As supplied	0°	75	76	77	Dry	77	78	78	78	79	**77**
4 S	As supplied	45°	76	76	76	Dry	75	75	75	75	75	
4 S	As supplied	90°	79	79	79	Dry	79	79	79	79	79	

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	As supplied	0°	67	65	65	Wet	66	66	66	66	66	**66**
4 S	As supplied	45°	71	69	66	Wet	66	66	66	66	66	
4 S	As supplied	90°	67	66	66	Wet	66	66	66	66	66	

SAMPLES AFTER ACCELERATED WEAR

Sample – Suregrip (234140/07/07)
Sample 232
Tested by - Ian Rance, BRE
Machine – TRL Pendulum Tester
Temperature (°C) – 20

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	Acc Wear	0°	70	69	69	Dry	69	69	69	69	69	**69**
4 S	Acc Wear	45°	65	65	65	Dry	65	65	65	65	65	
4 S	Acc Wear	90°	73	73	75	Dry	74	73	73	72	72	

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	Acc Wear	0°	46	49	47	Wet	46	46	46	45	45	**49**
4 S	Acc Wear	45°	56	56	56	Wet	55	55	55	55	55	
4 S	Acc Wear	90°	49	47	46	Wet	46	46	45	45	45	

Sample – Suregrip (234140/07/07)
Sample 233
Tested by - Ian Rance, BRE
Machine – TRL Pendulum Tester
Temperature (°C) – 20

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	Acc Wear	0°	65	64	64	Dry	64	64	64	64	64	**67**
4 S	Acc Wear	45°	68	69	69	Dry	69	69	69	68	68	
4 S	Acc Wear	90°	69	69	69	Dry	69	68	67	66	66	

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	Acc Wear	0°	50	50	49	Wet	49	48	48	47	47	**50**
4 S	Acc Wear	45°	59	56	56	Wet	56	56	55	55	55	
4 S	Acc Wear	90°	50	49	49	Wet	48	47	46	46	46	

Sample – Suregrip (234140/07/07)
Sample 235
Tested by - Ian Rance, BRE
Machine – TRL Pendulum Tester
Temperature (°C) – 20

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	Acc Wear	0°	69	69	69	Dry	69	69	69	69	69	**65**
4 S	Acc Wear	45°	61	62	62	Dry	63	62	62	61	61	
4 S	Acc Wear	90°	65	65	65	Dry	65	65	65	65	65	

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	Acc Wear	0°	59	60	60	Wet	59	59	58	57	57	**53**
4 S	Acc Wear	45°	50	47	47	Wet	46	45	45	44	44	
4 S	Acc Wear	90°	61	59	59	Wet	57	57	57	57	57	

Sample – Suregrip (234140/07/07)
Sample 236
Tested by - Ian Rance, BRE
Machine – TRL Pendulum Tester
Temperature (°C) – 20

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	Acc Wear	0°	62	63	64	Dry	64	64	64	64	64	**65**
4 S	Acc Wear	45°	71	70	69	Dry	69	69	69	69	69	
4 S	Acc Wear	90°	60	61	62	Dry	63	63	63	63	63	

Rubber	Condition		1	2	3		4	5	6	7	8	Mean
4 S	Acc Wear	0°	52	51	50	Wet	49	49	48	48	48	**51**
4 S	Acc Wear	45°	60	60	59	Wet	59	59	58	58	57	
4 S	Acc Wear	90°	50	49	49	Wet	48	47	47	47	47	