

TEST REPORT

Mechanical & Hardgoods Lab.

Report No. : HU10006/2014

Page : 1 of 7

Date : FEB. 21, 2014

The following merchandise was submitted and identified by the applicant as:

Product Description: Brake Pads
Style/ Item No.: R93035
Manufacturer/ Vendor: ROCKBERG GERMANY
Additional information: 16 pcs

We have tested the submitted sample(s) as requested and the following results were obtained:

Test Requested:

1. Internal shear strength of lining material (ISO 6311-1980) and (ISO 6314-1980)
2. Shear test procedure for disc brake pad and drum brake shoe assemblies (ISO 6312:2001)
3. Effects of heat on dimensions and form of disc brake pads (ISO 6313-1980)
4. Seizure to ferrous mating surface due to corrosion (ISO 6315-1980)

Test Method and Result: ---Please refer to the following page(s)---

Date of Receipt: JAN. 14, 2014

Testing Period: JAN. 15, 2014 ~ FEB. 21, 2014

Signed for and on behalf of
SGS Taiwan Ltd.

Owen Cheng

Owen Cheng
Manager



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1. Internal shear strength of lining material (ISO 6311-1980)

Test Procedure and Condition:

Method: Resistance to water, saline solution, oil and brake fluid (ISO 6314-1980) (See Photo H)

Group I: Store 2 samples in normal room atmosphere for 7 days. (See Photo C)

Group II: Store 3 samples in a bath of water for 7 days. (See Photo D)

Group III: Immerse 3 samples in a bath containing a solution of sodium chloride, 100g/l for 7 days. (See Photo E)

Group IV: Immerse 3 samples in bath of lubricating oil to specification oil no. 2 in ISO 1817, for 48 h. (See Photo F)

Group V: Immerse 3 samples in bath of specification brake fluid in ISO 4926, for 48 h. (See Photo G)

Test Result:

Item	Condition	Sheared area (A)	Shear force (F)	Average shear strength(τ)
1	Group I	20 mm x 20 mm (± 0.1 mm)	283.68	0.75
2			320.17	
3	Group II		239.32	0.70
4			246.74	
5			354.93	
6	Group III		258.48	0.67
7			273.64	
8			271.96	
9	Group IV		264.11	0.73
10			335.58	
11			274.29	
12	Group V		303.71	0.73
13			249.21	
14			323.11	

Remark:

Designation	Symbol	Unit
Shear strength	τ	kgf/mm ²
Shear force	F	kgf
Sheared area	A	mm ²

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2. Shear test procedure for disc brake pad and drum brake shoe assemblies (ISO 6312:2001)

Test Method and Condition: (See Photo J)

Parameter	Speed Transverse load
Load rate	(10 ± 1) mm/min
Distance from carrier to loading tool	(1 ± 0.2) mm
Loading tool radius	(1.5 ± 0.5) mm
Heating test	
Heating duration	30 min
Test dwell time after heating	30 s
Test temperature for disc brake pads	(300°C ± 10)°C
Sample type (tick box)	<input type="checkbox"/> full pad <input type="checkbox"/> pad section full lined shoe <input checked="" type="checkbox"/> segment of lining shoe <input type="checkbox"/> other
Sample area at point of shear (<i>A</i>)	23.3 x 48.3 mm ² (± 0.1 mm)
Special coatings	/

Test Result:

Item	Ambient test	Hot test
Number of samples tested:	2 pcs	3 pcs
Minimum shear strength (<i>F</i>)	897.59	720.44
Mean shear strength (τ)	0.80	0.64

Remark:

Designation	Symbol	Unit
Shear strength	τ	kgf/mm ²
Shear force	<i>F</i>	kgf
Sheared area	<i>A</i>	mm ²

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3. Effects of heat on dimensions and form of disc brake pads (ISO 6313-1980)

Method and Condition: ISO 6313-1980

- (a) Place the sample between the heater plate and clamping block. (See Photo K)
- (b) Heating the temperature of heater plate to 400°C at less than 10 min.
- (c) Record the change of sample thickness at highest temperature for the first and the second test period.

Test Result:

Item	First test period	Second test period
d_m	20.0 mm	20.02 mm
d_{Ai}	4.72 mm	4.74 mm
d_{Bi}	5.04 mm	5.02 mm
Δd_i	0.32 mm	0.28 mm

Remark:

Designation	Symbol
Mean thickness of specimen pad	d_m
Dimension possibly concerned, of the lining outline	d_{Ai}
Dimensions, possibly concerned, of the lining outline at ambient temperature after test	d_{Bi}
Changes of the possibly concerned dimensions of the lining outline: $\Delta d_i = d_{Bi} - d_{Ai}$	Δd_i

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4. Seizure to ferrous mating surface due to corrosion (ISO 6315-1980)

Method and Condition: ISO 6315-1980

- (a) Place six pads and a disc in the humidity chamber and hold the relative humidity $95 \pm 2\%$ at $50 \pm 3^\circ\text{C}$.
- (b) Place the pads in chamber for 4 hr and the disc for 1/2 hr.
- (c) Remove surplus moisture with water absorbent paper.
- (d) Locate the pads on the disc and hold in position under a pressure of 2500 kPa by test rigs.
- (e) Place the assemblies in the humidity chamber for 16 hr.
- (f) After exposure in chamber, place the assemblies in normal room atmosphere (relative humidity 65% at 20°C .) for 48 hr.
- (g) Remove the test rigs carefully.
- (h) Apply a steadily increasing force until the pad slips on the disc and record the maximum force.

Test Result:

Item	Size and quality of pads	Maximum force (N)
1	Surface: 10.70 cm ² ; Quality: 82.80 g	6.4
2	Surface: 11.57 cm ² ; Quality: 91.37 g	8.5
3	Surface: 11.81 cm ² ; Quality: 91.91 g	8.0
4	Surface: 11.76 cm ² ; Quality: 91.82 g	7.9
5	Surface: 11.81 cm ² ; Quality: 91.90 g	8.2
6	Surface: 11.78 cm ² ; Quality: 91.84 g	8.3

Remark:

Test Sample	Condition and Type
Pad	<input checked="" type="checkbox"/> new or <input type="checkbox"/> old ; <input type="checkbox"/> natural or <input checked="" type="checkbox"/> prepared
Disc	<input checked="" type="checkbox"/> new or <input type="checkbox"/> old ; <input checked="" type="checkbox"/> natural or <input type="checkbox"/> prepared

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- Picture(s) -

<p style="text-align: center;">HU10006/2014</p> 	<p style="text-align: center;">HU10006/2014</p> 
<p>Photo A : Appearance of the sample (As Received)</p>	<p>Photo B : Sample as Received</p>
<p style="text-align: center;">HU10006/2014</p> 	<p style="text-align: center;">HU10006/2014</p> 
<p>Photo C : Test segment - ISO 6311 - Group I</p>	<p>Photo D : Test segment - ISO 6311 - Group II</p>
<p style="text-align: center;">HU10006/2014</p> 	<p style="text-align: center;">HU10006/2014</p> 
<p>Photo E : Test segment - ISO 6311 - Group III</p>	<p>Photo F : Test segment - ISO 6311 - Group IV</p>

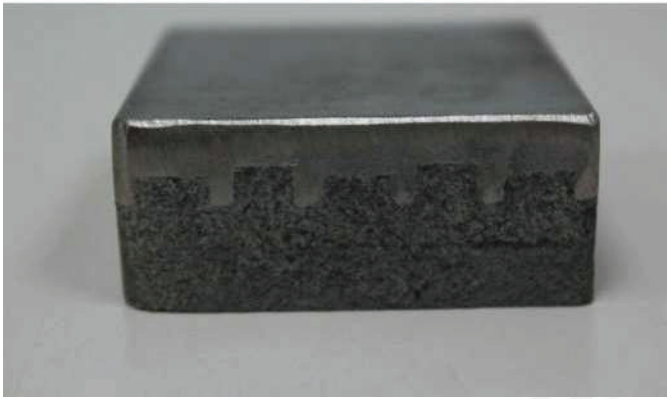
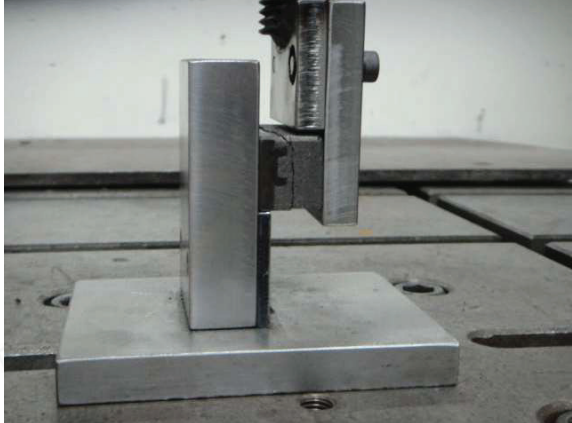
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<p>Photo G : Test segment - ISO 6311 - Group V</p>	<p>Photo H : Test setup - ISO 6311</p>
<p style="text-align: center;">HU10006/2014</p> 	<p style="text-align: center;">HU10006/2014</p> 
<p>Photo I : Test segment - ISO 6312</p>	<p>Photo J : Test setup - ISO 6312</p>
<p style="text-align: center;">HU10006/2014</p> 	<p style="text-align: center;">---</p>
<p>Photo K : Test setup - ISO 6313</p>	<p style="text-align: center;">---</p>

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