



## Sample Lab Test Report

Link Test Report: 130231-2  
Test Description: SAE J661 Rev Feb 1997 Brake Lining Quality  
Purpose of Test: To Evaluate the Characteristics of Brake  
Materials  
Program: J661noinsp.chp  
Lining Material: METALLIC  
Test Date(s): 1/27/2013 to 1/27/2013

## Requested By

**ROYAL FRICTION PRODUCTS INCORPORATION**  
QUALITY CONTROL DEPARTMENT  
1500-701 WEST GEORGIA STREET  
VANCOUVER BC V7Y 1C6  
CANADA

## Tested By:

**Testing Coordination and Facility**  
North America Laboratory Test Operations  
13840 Elmira Ave.  
Detroit, MI 48227  
[www.linkeng.com](http://www.linkeng.com)  
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Fax: (313) 933-0710



Test Number  
130231-2

Customer Reference  
METALLIC

## SAE J661 Rev Feb 1997 Brake Lining Quality Test

### Test Information

Customer Name	Royal Friction Products Incorporation
Requestor	Quality Control Department
Test Procedure	SAE J661
Program Number	J661noinsp.chp
Test Coordinator	COLEMAN, TIM
Test Equipment	Chase Machine 12\1
Test Dates	1/27/2013 to 1/27/2013
Datalogger	v1.0.10
Template Version	2.01

### Setup Details

Sample Material	METALLIC
Sample Size	25.4mm x 25.4mm
Sample Manufacturer	Royal Friction Products Incorporation
Test Pressure	1034.21 kPa

### Sample Test Summary

Normal Friction Coefficient	0.352	Pass
Normal Friction Class	F	
Hot Friction Coefficient	0.335	Pass
Hot Friction Class	E	
Minimum Bold Coefficient	0.312	Pass
Max Variation Below Average	0.000	Pass
Max % Variation for Bold Readings	0%	Pass

**Pass / Fail**

**Pass**

**Comments:**

**Created by:** Timothy Coleman      **Title** Lead Technician      **Date** 1/28/2013  
(313) 625-4000

**Reviewed by:** Timothy Coleman      **Title** Lead Technician      **Date** 1/28/2013  
(313) 625-4000

Data applicable to the materials tested. **Valid if signed by the test engineer.** Report can be copied in full.  
Bilateral uncertainty of measurements 0.63% of FS. Coverage factor of 2. Confidence of 95%. Details available upon request.



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**Test Number**  
Sample 1 Sample 2 Sample 3 Sample 4 Sample 5  
130231-B1

Manufacturer  
**ROYAL FRICTION  
PRODUCTS INC.**  
Material  
**METALLIC**

**Initial Baseline**  
Application Sample 1 Sample 2 Sample 3 Sample 4 Sample 5  
1 0.310  
20 0.351

Normal **0.352** **F**

**First Fade**  
Temp (°C) Sample 1 Sample 2 Sample 3 Sample 4 Sample 5  
93.3 0.323  
260.0 0.325  
(or Temp @ 10min)

Hot **0.335** **E**

**First Recovery**  
Temp (°C) Sample 1 Sample 2 Sample 3 Sample 4 Sample 5 Average Norm/Hot  
260.0 0.339 0.339  
204.4 0.338 0.338 Hot  
148.9 0.346 0.346 Hot  
93.3 0.335 0.335

**Wear**  
Application Sample 1 Sample 2 Sample 3 Sample 4 Sample 5  
1 0.338  
100 0.334

**Second Fade**  
Temp (°C) Sample 1 Sample 2 Sample 3 Sample 4 Sample 5 Average Max Var. < Average Norm/Hot % Var  
93.3 **0.343** **0.343** **0.000** **Normal**  
121.1 **0.345** **0.345** **0.000** **Normal**  
148.9 **0.347** **0.347** **0.000** **Normal**  
176.7 **0.354** **0.354** **0.000** **Normal**  
204.4 **0.370** **0.370** **0.000** **Normal**  
232.2 **0.363** **0.363** **0.000** **Hot**  
260.0 **0.355** **0.355** **0.000** **Hot**  
287.8 **0.351** **0.351** **0.000** **Hot**  
315.6 0.328 0.328 0.000 Hot  
343.3 0.317 0.317 0.000 Hot  
(or Temp @ 10min)

**Second Recovery**  
Temp (°C) Sample 1 Sample 2 Sample 3 Sample 4 Sample 5 Average Max Var. < Average Norm/Hot % Var  
315.6 0.323 0.323 0.000  
260.0 0.314 0.314 0.000 Hot  
204.4 0.312 0.312 0.000 Hot  
148.9 **0.324** **0.324** **0.000** **Hot**  
93.3 **0.312** **0.312** **0.000**

**Final Baseline**  
Application Sample 1 Sample 2 Sample 3 Sample 4 Sample 5  
1 0.321  
20 0.341



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Manufacturer: ROYAL FRICTION PRODUCTS INC.  
Material: METALLIC  
Test Pressure: 1034.21 kPa

Normal  
Hot

**0.352**  
**0.335**

**F**  
**E**

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**Wear**

	Initial	Final	Loss		Specific Wear	
Weight (gr)	10.55	10.282	0.268	3%	1.82E-01	gr/kWh
Thickness (cm)	0.645	0.62	0.025	4%	1.09E-01	cm <sup>3</sup> /kWh

**Baseline**

Event	Initial		Final	
	Force (N)	$\mu$	Force (N)	$\mu$
1	209	0.310	213	0.321
5	225	0.339	222	0.332
10	228	0.341	218	0.327
15	237	0.351	230	0.340
20	235	0.351	227	0.341

**Wear**

Event	Force (N)	$\mu$
1	226	0.338
10	233	0.345
20	237	0.353
30	221	0.332
40	229	0.343
50	228	0.342
60	230	0.349
70	229	0.344
80	218	0.325
90	224	0.336
100	222	0.334

**First Fade**

Time (sec)	Force (N)	$\mu$	Temp (°C)
0	210	0.323	94
30	233	0.348	114
60	244	0.367	141
90	254	0.381	169
120	250	0.377	194
150	242	0.364	218
180	236	0.359	238
210	228	0.342	256
240	213	0.317	272
270			
300			
330			
360			
390			
420			
450			
480			
510			
540			
570			
600			

**Second Fade**

Time (sec)	Force (N)	$\mu$	Temp (°C)
0	224	0.343	95
30	230	0.349	109
60	233	0.347	129
90	236	0.351	152
120	242	0.360	174
150	245	0.362	197
180	240	0.358	218
210	243	0.363	239
240	232	0.353	258
270	242	0.356	275
300	242	0.362	289
330	224	0.336	303
360	220	0.330	315
390	226	0.338	324
420	212	0.320	336
450			
480			
510			
540			
570			
600			

**First Recovery**

Event	Force (N)	$\mu$	Temp (°C)
1	227	0.339	253
2	224	0.338	202
3	230	0.346	147
4	225	0.335	94

**Second Recovery**

Event	Force (N)	$\mu$	Temp (°C)
1	217	0.323	306
2	209	0.314	253
3	208	0.312	201
4	213	0.324	148
5	210	0.312	93



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Manufacturer: ROYAL FRICTION PRODUCTS INC.  
Material: METALLIC  
Test Pressure: 1034.21 kPa

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### Coefficient of Friction

