Physical Properties Test Report

Link Test Report:	105146-1-1
Test Description:	SAE J661 Rev Feb 1997 Brake Lining Quality Test
Purpose of Test:	To Evaluate the Characteristics of Brake Materials
Material Identification:	D1363
Test Date:	12/18/2020 to 12/18/2020

Requested By:

ROYAL BRAKES CANADA
HARRY DIBADJ
1500-701 WEST GEORGIA STREET
VANCOUVER, B.C. V7Y 1C6
CANADA

Report Approved By:

Radoslaw Mazurek

Supervising Engineer, M.Sc.

Date: 12/21/20

ACCREDITED ISO/IEC 17025 TESTING LABORATORY

LINK Engineering Company
Dearborn Technical Center
401 Southfield Road
Dearborn, MI 48120
www.linkeng.com
Phone: (313) 625-4000

SAE J661 Rev Feb 1997 Brake Lining Quality Test

Test Information

Customer Name	Royal Brakes Canada
Requestor	Harry Dibadj
Test Procedure	SAE J661
Program Number	J661noinsp.chp
Test Coordinator	E. DEJULES
Test Equipment	Chase Machine 12
Test Dates	12/18/2020 to 12/18/2020
Datalogger	v1.0.10
Template Version	2.06

Setup Details

Sample Material	D1363
Sample Size	1" X 1"
Sample Manufacturer	Royal Brakes Canada
Test Pressure	150 psi

Sample Test Summary

Normal Friction Coefficient	0.426	Pass
Normal Friction Class	F	
Hot Friction Coefficient	0.472	Pass
Hot Friction Class	G	
Minimum Bold Coefficient	0.328	Pass
Max Variation Below Avg for Bold readings	0.000	Pass
Max % Variation for Bold Readings	0%	Pass

Pass / Fail **Pass**

Comments:

Created by:	Chris Arquette (313) 625-4000	**Title**	Test Engineer	**Date**	12/21/2020
Reviewed by:	Radoslaw Markiewicz (313) 625-4000	**Title**	Supervising Engineer	**Date**	12/21/2020

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.

Test Number
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Customer Reference
D1363

Test Number

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
	105146-1-1				

Manufacturer
Royal Brakes Canada

Initial Baseline

Application	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
1	0.362				
20	0.404				

Material
D1363

Normal **0.426** **F**

First Fade

Temp (°F)	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
200.0	0.440				
500.0	0.457				
(or Temp @ 10min)					

Hot **0.472** **G**

First Recovery

Temp (°F)	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Average	Norm/Hot
500.0	0.437					0.437	
400.0	0.474					0.474	Hot
300.0	0.446					0.446	Hot
200.0	0.388					0.388	

Wear

Application	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
1	0.438				
100	0.526				

Second Fade

Temp (°F)	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Average	Max Var. < Average	Norm/Hot	% Var
200.0	**0.328**					**0.328**	**0.000**	**Normal**	**0%**
250.0	**0.391**					**0.391**	**0.000**	**Normal**	**0%**
300.0	**0.464**					**0.464**	**0.000**	**Normal**	**0%**
350.0	**0.498**					**0.498**	**0.000**	-	0%
400.0	**0.522**					**0.522**	**0.000**	**Normal**	**0%**
450.0	**0.523**					**0.523**	**0.000**	**Hot**	**0%**
500.0	**0.546**					**0.546**	**0.000**	**Hot**	**0%**
550.0	**0.525**					**0.525**	**0.000**	**Hot**	**0%**
600.0	0.489					0.489	0.000	Hot	0%
650.0	0.437					0.437	0.000	Hot	0%
(or Temp @ 10min)									

Second Recovery

Temp (°F)	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Average	Max Var. < Average	Norm/Hot	% Var
600.0	0.476					0.476	0.000	-	
500.0	0.440					0.440	0.000	Hot	
400.0	0.433					0.433	0.000	Hot	
300.0	**0.410**					**0.410**	**0.000**	**Hot**	
200.0	**0.357**					**0.357**	**0.000**	**-**	

Final Baseline

Application	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
1	0.349				
20	0.450				

Test Number
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Customer Reference
D1363

Manufacturer: Royal Brakes Canada
Material: D1363
Test Pressure: 150 psi

Normal **0.426** **F**

Hot **0.472** **G**

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Wear

	Initial	Final	Loss	Loss / %	Specific Wear	
Weight (gr)	9.2510	8.7150	0.5360	5.79%	2.05E-01	gr/hp-hr
Thickness (inch)	0.2510	0.2370	0.0140	5.58%	5.36E-03	in³/hp-hr

Baseline

	Initial		Final	
Event	Force (lb)	μ	Force (lb)	μ
1	55	0.362	52	0.349
5	59	0.387	61	0.403
10	61	0.400	60	0.408
15	63	0.413	63	0.419
20	61	0.404	68	0.450

Wear

Event	Force (lb)	μ
1	66	0.438
10	78	0.518
20	79	0.534
30	73	0.484
40	74	0.493
50	73	0.493
60	71	0.475
70	73	0.499
80	72	0.479
90	73	0.491
100	79	0.526

First Fade

Time (sec)	Force (lb)	μ	Temp (°F)
0	66	0.440	233
30	68	0.446	274
60	64	0.430	320
90	65	0.429	360
120	65	0.434	403
150	65	0.436	447
180	69	0.457	488
210	64	0.433	524
240			
270			
300			
330			
360			
390			
420			
450			
480			
510			
540			
570			
600			

Second Fade

Time (sec)	Force (lb)	μ	Temp (°F)
0	61	0.408	235
30	70	0.464	282
60	76	0.504	332
90	78	0.518	384
120	82	0.539	436
150	80	0.540	483
180	75	0.503	529
210	76	0.502	571
240	70	0.467	604
270	67	0.451	636
300			
330			
360			
390			
420			
450			
480			
510			
540			
570			
600			

First Recovery

Event	Force (lb)	μ	Temp (°F)
1	66	0.437	510
2	71	0.474	412
3	68	0.446	312
4	58	0.388	220

Second Recovery

Event	Force (lb)	μ	Temp (°F)
1	71	0.476	603
2	67	0.440	513
3	65	0.433	415
4	62	0.410	314
5	54	0.357	215

Manufacturer: Royal Brakes Canada
Material: D1363
Test Pressure: 150 psi

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Coefficient of Friction