



Test Report

Link Test Report: LK120036C
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: Hongyu2209
Test Date(s): 2012-09-12 to 2012-09-20

Requested By

Chongqing Hongyu Friction Products
Mr. WANG Danying
North 2Nd Ring Road, Bicheng Town
Bishan County, Chongqing

P.R.China

Link Testing Laboratory of Korea
14-47, Doung-ri, Docheok-myeon, Gwangju-si
Gyeonggi-do, 464-881, Republic of Korea
Tel.82-31-761-8288
Fax.82-31-763-8804



Test Number
LK120036C

Customer Reference
Hongyu2209

SAE J661 Rev Feb 1997 Brake Lining Quality Test

Test Information

Customer Name	Chongqing Hongyu Friction Products
Requestor	Mr. WANG Danying
Test Procedure	SAE J661
Program Number	J661noinsp.chp
Test Coordinator	B.S.KIM
Test Equipment	Chase Machine
Test Dates	2012-09-12 to 2012-09-20
Datalogger	v1.0.10
Template Version	2.00

Setup Details

Sample Material	Hongyu2209
Sample Size	1" X 1"
Sample Manufacturer	Chongqing Hongyu Friction Products
Test Pressure	150 psi

Sample Test Summary

Normal Friction Coefficient	0.413	Pass
Normal Friction Class	F	
Hot Friction Coefficient	0.399	Pass
Hot Friction Class	F	
Minimum Bold Coefficient	0.350	Pass
Max Variation Below Average	0.038	Pass
Max % Variation for Bold Readings	0%	Pass

Pass / Fail

Pass



Comments:

Created by:	B.S.KIM 82-31-761-8288	Title	Test Engineer	Date	2012-09-21
Reviewed by:	B.S.KIM 82-31-761-8288	Title	Test Engineer	Date	2012-09-21

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
LK120036C

Customer Reference
Hongyu2209

Test Number
Sample 1 Sample 2 Sample 3 Sample 4 Sample 5
 LK120036C LK120036C LK120036C LK120036C LK120036C_5

Manufacturer
Chongqing Hongyu Friction Products
Material
Hongyu2209

Initial Baseline

Application	<u>Sample 1</u>	<u>Sample 2</u>	<u>Sample 3</u>	<u>Sample 4</u>	<u>Sample 5</u>
1	0.358	0.338	0.344	0.381	0.425
20	0.346	0.357	0.377	0.394	0.449

Normal **0.413** **F**

First Fade

Temp (F)	<u>Sample 1</u>	<u>Sample 2</u>	<u>Sample 3</u>	<u>Sample 4</u>	<u>Sample 5</u>
200	0.339	0.349	0.379	0.391	0.442
500	0.349	0.361	0.346	0.367	0.430

(or Temp @ 10min)

Hot **0.399** **F**

First Recovery

Temp (F)	<u>Sample 1</u>	<u>Sample 2</u>	<u>Sample 3</u>	<u>Sample 4</u>	<u>Sample 5</u>	Average	Norm/Hot
500	0.340	0.351	0.334	0.351	0.420	0.359	
400	0.344	0.351	0.358	0.375	0.420	0.370	Hot
300	0.346	0.349	0.366	0.379	0.428	0.374	Hot
200	0.348	0.351	0.355	0.367	0.422	0.369	

Wear

Application	<u>Sample 1</u>	<u>Sample 2</u>	<u>Sample 3</u>	<u>Sample 4</u>	<u>Sample 5</u>
1	0.350	0.355	0.364	0.390	0.424
100	0.409	0.414	0.392	0.421	0.463

Second Fade

Temp (F)	<u>Sample 1</u>	<u>Sample 2</u>	<u>Sample 3</u>	<u>Sample 4</u>	<u>Sample 5</u>	Average	Norm/Hot	% Var
200	0.365	0.365	0.350	0.375	0.409	0.373	0.023	Normal
250	0.398	0.396	0.407	0.422	0.438	0.412	0.016	Normal
300	0.411	0.419	0.414	0.426	0.450	0.424	0.013	Normal
350	0.407	0.435	0.405	0.432	0.447	0.425	0.020	Normal
400	0.427	0.430	0.410	0.424	0.461	0.430	0.020	Normal
450	0.423	0.431	0.407	0.414	0.453	0.426	0.019	Hot
500	0.419	0.428	0.387	0.400	0.442	0.415	0.028	Hot
550	0.408	0.421	0.385	0.396	0.434	0.409	0.024	Hot
600	0.406	0.400	0.365	0.385	0.417	0.395	0.030	Hot
650	0.383	0.373	0.361	0.374	0.400	0.378	0.017	Hot

(or Temp @ 10min)

Second Recovery

Temp (F)	<u>Sample 1</u>	<u>Sample 2</u>	<u>Sample 3</u>	<u>Sample 4</u>	<u>Sample 5</u>	Average	Max Var. < Average	Norm/Hot	% Var
600	0.394	0.403	0.338	0.324	0.397	0.371	0.047		
500	0.395	0.405	0.364	0.381	0.440	0.397	0.033	Hot	
400	0.387	0.403	0.404	0.431	0.458	0.417	0.030	Hot	
300	0.372	0.400	0.398	0.432	0.450	0.410	0.038	Hot	
200	0.362	0.381	0.380	0.421	0.429	0.395	0.033		

Final Baseline

Application	<u>Sample 1</u>	<u>Sample 2</u>	<u>Sample 3</u>	<u>Sample 4</u>	<u>Sample 5</u>
1	0.356	0.383	0.379	0.426	0.433
20	0.407	0.412	0.416	0.435	0.445



Test Number
LK120036C

Customer Reference
Hongyu2209

Manufacturer: Chongqing Hongyu Friction
Material: Hongyu2209
Test Pressure: 150 psi

Normal **0.402**
Hot **0.388**

F
F

9-12-2012
LK120036C_1
Sample 1 of 5

Wear

	Initial	Final	Loss		Specific Wear	
Weight (gr)	10.42	10.25	0.17	2%	1.25E-03	gr/hp-hr
Thickness (in)	0.254	0.247	0.007	3%	5.17E-05	in ³ /hp-hr

Baseline

Event	Initial		Final	
	Force (lb)	μ	Force (lb)	μ
1	54	0.358	54	0.356
5	54	0.357	59	0.389
10	55	0.362	60	0.398
15	53	0.353	61	0.401
20	52	0.346	62	0.407

Wear

Event	Force (lb)	μ
1	53	0.350
10	57	0.383
20	57	0.377
30	59	0.391
40	60	0.398
50	59	0.397
60	58	0.393
70	60	0.401
80	59	0.392
90	60	0.398
100	61	0.409

First Fade

Time (sec)	Force (lb)	μ	Temp (°F)
0	52	0.339	201
30	52	0.346	235
60	50	0.337	278
90	49	0.328	317
120	51	0.339	355
150	51	0.340	390
180	52	0.348	423
210	53	0.356	454
240	52	0.347	483
270	52	0.349	510
300	52	0.347	536
330			
360			
390			
420			
450			
480			
510			
540			
570			
600			

Second Fade

Time (sec)	Force (lb)	μ	Temp (°F)
0	55	0.365	203
30	59	0.390	229
60	62	0.410	271
90	61	0.407	311
120	62	0.412	349
150	61	0.406	384
180	62	0.414	418
210	65	0.438	451
240	64	0.424	482
270	61	0.408	512
300	62	0.412	540
330	61	0.408	565
360	61	0.399	588
390	59	0.393	610
420	58	0.388	629
450			
480			
510			
540			
570			
600			

First Recovery

Event	Force (lb)	μ	Temp (°F)
1	51	0.340	494
2	52	0.344	396
3	52	0.346	299
4	53	0.348	202

Second Recovery

Event	Force (lb)	μ	Temp (°F)
1	59	0.394	591
2	59	0.395	495
3	59	0.387	397
4	56	0.372	300
5	55	0.362	202



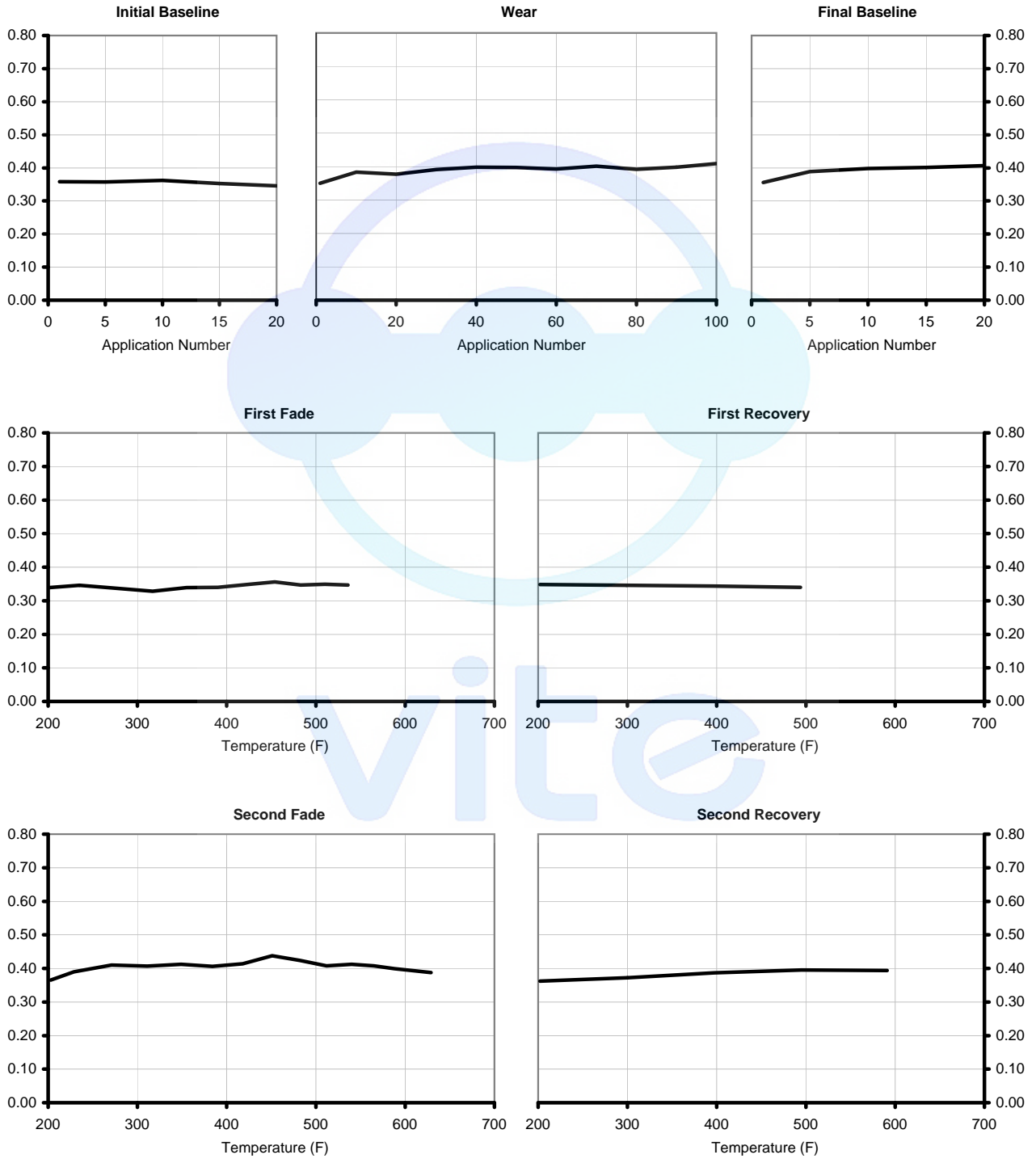
Test Number
LK120036C

Customer Reference
Hongyu2209

Manufacturer: Chongqing Hongyu Friction
Material: Hongyu2209
Test Pressure: 150 psi

9-12-2012
LK120036C_1
Sample 1 of 5

Coefficient of Friction





Test Number
LK120036C

Customer Reference
Hongyu2209

Manufacturer: Chongqing Hongyu Friction
Material: Hongyu2209
Test Pressure: 150 psi

Normal **0.409**
Hot **0.396**

F
F

9-12-2012
LK120036C_2
Sample 2 of 5

Wear

	Initial	Final	Loss	Specific Wear
Weight (gr)	10.59	10.42	0.17	1.22E-03 gr/hp-hr
Thickness (in)	0.254	0.248	0.006	4.32E-05 in ³ /hp-hr

Baseline

Event	Initial		Final	
	Force (lb)	μ	Force (lb)	μ
1	51	0.338	58	0.383
5	52	0.344	61	0.405
10	53	0.349	61	0.405
15	55	0.361	62	0.410
20	54	0.357	62	0.412

Wear

Event	Force (lb)	μ
1	53	0.355
10	58	0.392
20	59	0.391
30	61	0.405
40	61	0.410
50	62	0.415
60	62	0.409
70	62	0.417
80	60	0.405
90	63	0.419
100	62	0.414

First Fade

Time (sec)	Force (lb)	μ	Temp (°F)
0	53	0.349	201
30	53	0.353	235
60	55	0.360	278
90	55	0.367	318
120	56	0.373	356
150	56	0.372	392
180	55	0.366	425
210	56	0.374	457
240	55	0.368	486
270	54	0.361	512
300	53	0.354	537
330			
360			
390			
420			
450			
480			
510			
540			
570			
600			

Second Fade

Time (sec)	Force (lb)	μ	Temp (°F)
0	55	0.365	204
30	59	0.396	232
60	60	0.402	277
90	62	0.408	318
120	62	0.417	357
150	66	0.437	395
180	66	0.437	431
210	65	0.429	465
240	64	0.425	497
270	64	0.427	527
300	63	0.416	555
330	62	0.408	581
360	62	0.412	604
390	60	0.403	625
420	57	0.380	644
450			
480			
510			
540			
570			
600			

First Recovery

Event	Force (lb)	μ	Temp (°F)
1	53	0.351	494
2	53	0.351	396
3	53	0.349	299
4	53	0.351	202

Second Recovery

Event	Force (lb)	μ	Temp (°F)
1	60	0.403	592
2	61	0.405	495
3	61	0.403	398
4	61	0.400	301
5	57	0.381	203



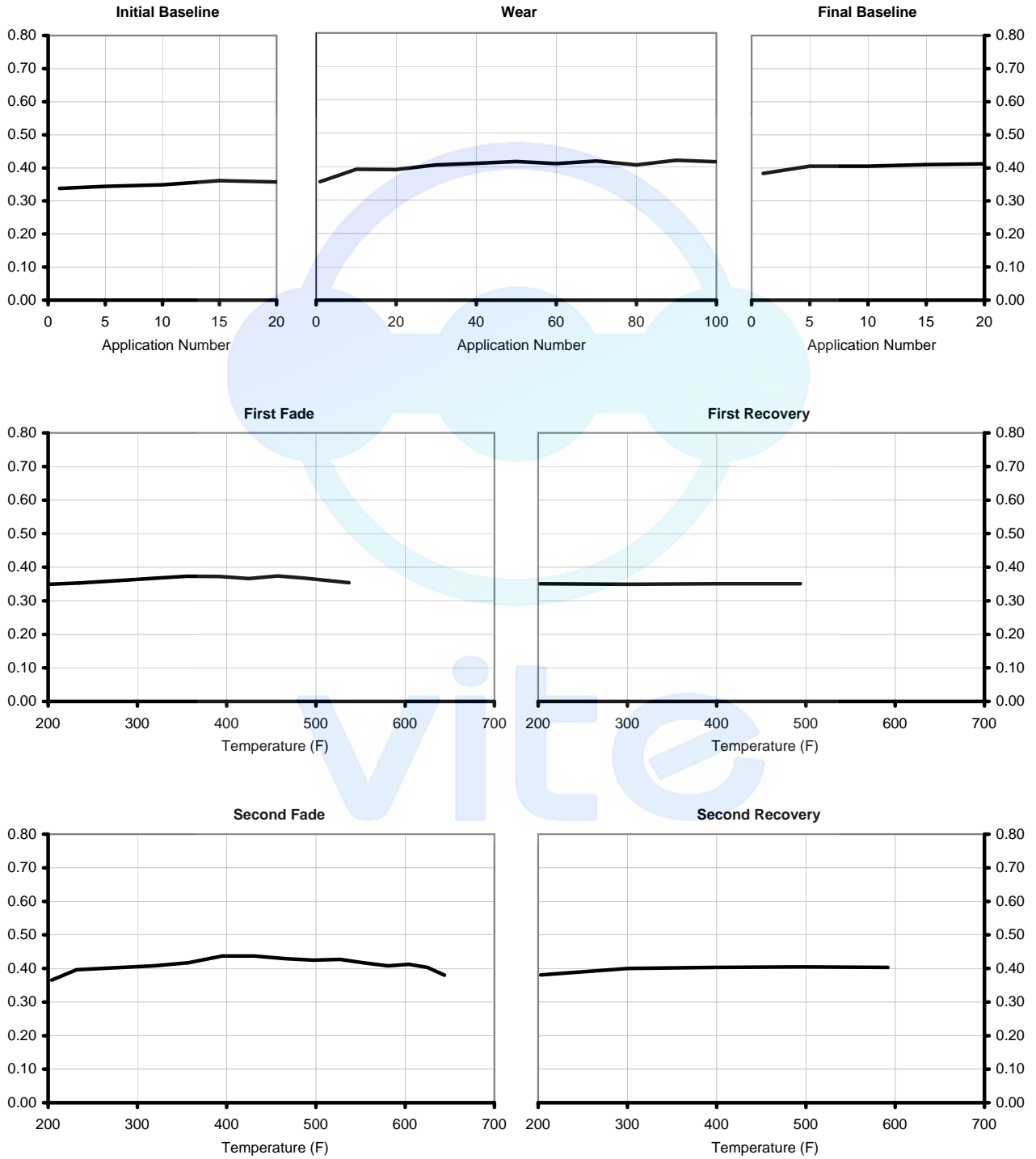
Test Number
LK120036C

Customer Reference
Hongyu2209

Manufacturer: Chongqing Hongyu Friction
Material: Hongyu2209
Test Pressure: 150 psi

9-12-2012
LK120036C_2
Sample 2 of 5

Coefficient of Friction





Test Number
LK120036C

Customer Reference
Hongyu2209

Manufacturer: Chongqing Hongyu Friction
Material: Hongyu2209
Test Pressure: 150 psi

Normal **0.397**
Hot **0.380**

F
F

9-20-2012
LK120036C_3
Sample 3 of 5

Wear

	Initial	Final	Loss		Specific Wear	
Weight (gr)	10.49	10.35	0.14	1%	1.00E-03	gr/hp-hr
Thickness (in)	0.249	0.245	0.004	2%	2.86E-05	in ³ /hp-hr

Baseline

Event	Initial		Final	
	Force (lb)	μ	Force (lb)	μ
1	52	0.344	57	0.379
5	53	0.350	60	0.399
10	55	0.367	61	0.404
15	56	0.369	61	0.406
20	57	0.377	63	0.416

Wear

Event	Force (lb)	μ
1	55	0.364
10	58	0.385
20	58	0.392
30	60	0.400
40	60	0.406
50	61	0.410
60	64	0.421
70	63	0.418
80	63	0.417
90	60	0.401
100	58	0.392

First Fade

Time (sec)	Force (lb)	μ	Temp (°F)
0	57	0.379	202
30	57	0.377	237
60	56	0.369	281
90	56	0.369	321
120	55	0.366	358
150	54	0.359	391
180	54	0.356	422
210	53	0.355	451
240	52	0.346	478
270	52	0.344	502
300	51	0.337	525
330	51	0.336	545
360			
390			
420			
450			
480			
510			
540			
570			
600			

Second Fade

Time (sec)	Force (lb)	μ	Temp (°F)
0	54	0.350	203
30	60	0.400	231
60	62	0.414	276
90	63	0.417	317
120	63	0.419	355
150	61	0.404	390
180	62	0.410	423
210	60	0.401	454
240	58	0.388	483
270	57	0.378	509
300	57	0.382	533
330	57	0.383	555
360	57	0.376	575
390	56	0.373	594
420	55	0.366	611
450	53	0.350	627
480	53	0.350	641
510			
540			
570			
600			

First Recovery

Event	Force (lb)	μ	Temp (°F)
1	50	0.334	493
2	54	0.358	397
3	55	0.366	300
4	53	0.355	202

Second Recovery

Event	Force (lb)	μ	Temp (°F)
1	51	0.338	591
2	55	0.364	494
3	61	0.404	398
4	60	0.398	300
5	57	0.380	203



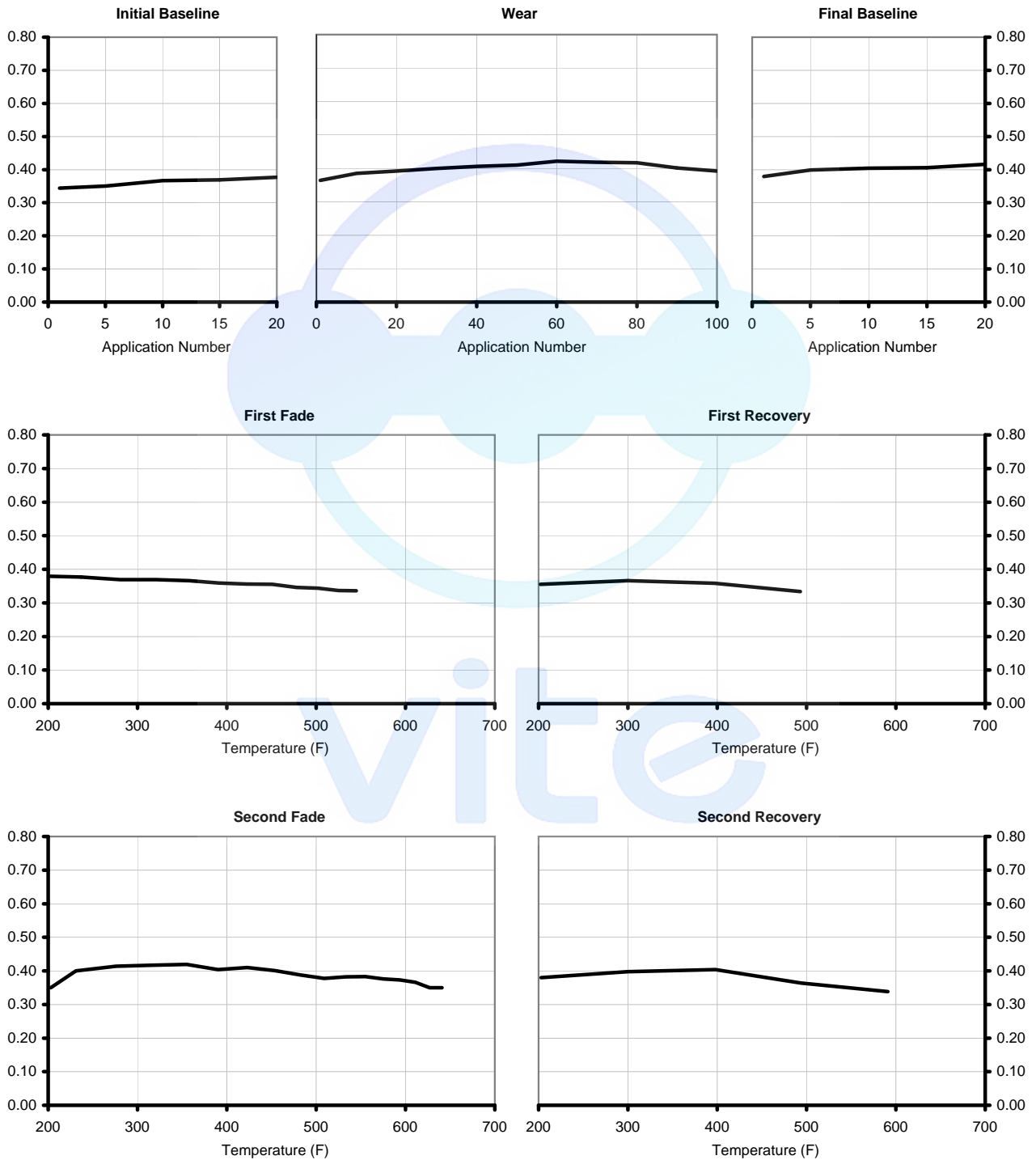
Test Number
LK120036C

Customer Reference
Hongyu2209

Manufacturer: Chongqing Hongyu Friction
Material: Hongyu2209
Test Pressure: 150 psi

9-20-2012
LK120036C_3
Sample 3 of 5

Coefficient of Friction





Test Number
LK120036C

Customer Reference
Hongyu2209

Manufacturer: Chongqing Hongyu Friction
Material: Hongyu2209
Test Pressure: 150 psi

Normal **0.416**
Hot **0.397**

F
F

9-20-2012
LK120036C_4
Sample 4 of 5

Wear

	Initial	Final	Loss		Specific Wear	
Weight (gr)	10.64	10.5	0.14	1%	9.69E-04	gr/hp-hr
Thickness (in)	0.25	0.243	0.007	3%	4.84E-05	in ³ /hp-hr

Baseline

Event	Initial		Final	
	Force (lb)	μ	Force (lb)	μ
1	57	0.381	64	0.426
5	58	0.384	65	0.426
10	59	0.394	66	0.433
15	60	0.394	65	0.431
20	60	0.394	66	0.435

Wear

Event	Force (lb)	μ
1	59	0.390
10	61	0.404
20	62	0.410
30	61	0.412
40	62	0.414
50	62	0.415
60	61	0.404
70	63	0.416
80	60	0.403
90	64	0.425
100	63	0.421

First Fade

Time (sec)	Force (lb)	μ	Temp (°F)
0	59	0.391	202
30	59	0.392	237
60	58	0.388	280
90	58	0.382	319
120	58	0.386	355
150	58	0.384	390
180	58	0.387	422
210	57	0.381	452
240	56	0.372	479
270	56	0.371	504
300	54	0.359	526
330	53	0.356	547
360			
390			
420			
450			
480			
510			
540			
570			
600			

Second Fade

Time (sec)	Force (lb)	μ	Temp (°F)
0	57	0.375	203
30	62	0.415	233
60	65	0.433	279
90	65	0.432	320
120	64	0.426	358
150	63	0.420	394
180	62	0.417	427
210	63	0.417	457
240	62	0.411	486
270	61	0.402	512
300	60	0.398	536
330	59	0.391	559
360	57	0.378	578
390	59	0.388	595
420	57	0.376	612
450	56	0.375	627
480	55	0.367	642
510			
540			
570			
600			

First Recovery

Event	Force (lb)	μ	Temp (°F)
1	53	0.351	494
2	57	0.375	397
3	57	0.379	300
4	56	0.367	203

Second Recovery

Event	Force (lb)	μ	Temp (°F)
1	49	0.324	591
2	57	0.381	495
3	65	0.431	398
4	66	0.432	301
5	64	0.421	203



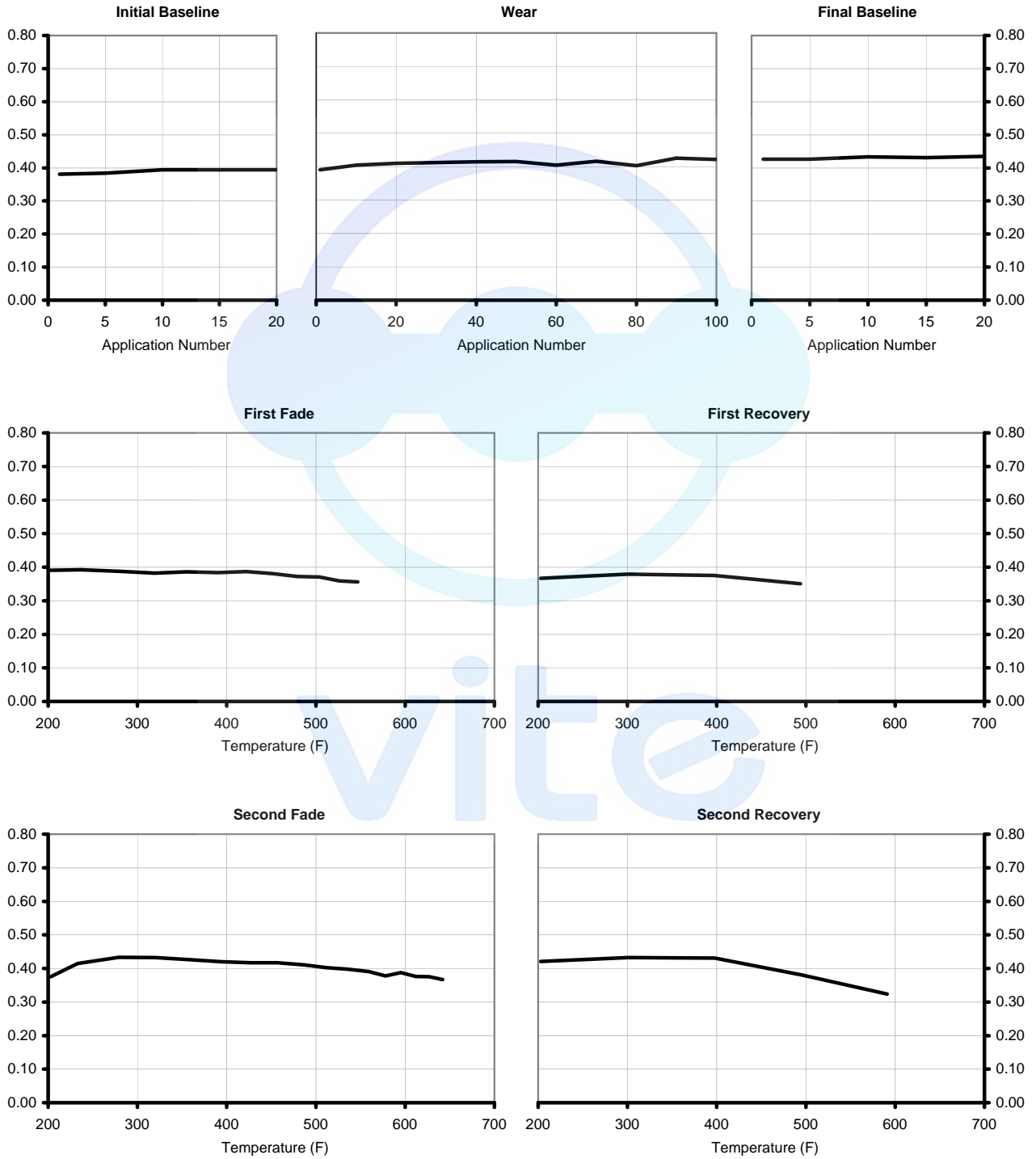
Test Number
LK120036C

Customer Reference
Hongyu2209

Manufacturer: Chongqing Hongyu Friction
Material: Hongyu2209
Test Pressure: 150 psi

9-20-2012
LK120036C_4
Sample 4 of 5

Coefficient of Friction





Test Number
LK120036C

Customer Reference
Hongyu2209

Manufacturer: Chongqing Hongyu Friction
Material: Hongyu2209
Test Pressure: 150 psi

Normal **0.441**
Hot **0.434**

F
F

9-20-2012
LK120036C_5
Sample 5 of 5

Wear

	Initial	Final	Loss		Specific Wear	
Weight (gr)	10.45	10.33	0.12	1%	7.65E-04	gr/hp-hr
Thickness (in)	0.248	0.243	0.005	2%	3.19E-05	in ³ /hp-hr

Baseline

Event	Initial		Final	
	Force (lb)	μ	Force (lb)	μ
1	64	0.425	65	0.433
5	66	0.435	67	0.444
10	66	0.440	68	0.447
15	67	0.445	67	0.443
20	68	0.449	67	0.445

Wear

Event	Force (lb)	μ
1	64	0.424
10	68	0.451
20	66	0.442
30	66	0.440
40	67	0.448
50	67	0.445
60	68	0.455
70	69	0.456
80	67	0.448
90	69	0.457
100	70	0.463

First Fade

Time (sec)	Force (lb)	μ	Temp (°F)
0	67	0.442	201
30	68	0.450	237
60	65	0.438	281
90	66	0.443	321
120	66	0.439	360
150	66	0.436	395
180	66	0.441	428
210	65	0.431	459
240	65	0.435	487
270	64	0.428	514
300	63	0.422	538
330			
360			
390			
420			
450			
480			
510			
540			
570			
600			

Second Fade

Time (sec)	Force (lb)	μ	Temp (°F)
0	62	0.409	203
30	64	0.431	230
60	67	0.440	274
90	68	0.451	314
120	68	0.451	353
150	68	0.455	389
180	68	0.461	425
210	68	0.455	458
240	66	0.437	489
270	64	0.424	517
300	65	0.431	541
330	63	0.420	564
360	64	0.425	585
390	63	0.422	604
420	61	0.406	621
450	61	0.405	636
480			
510			
540			
570			
600			

First Recovery

Event	Force (lb)	μ	Temp (°F)
1	64	0.420	494
2	63	0.420	396
3	64	0.428	299
4	64	0.422	203

Second Recovery

Event	Force (lb)	μ	Temp (°F)
1	60	0.397	591
2	67	0.440	494
3	70	0.458	398
4	68	0.450	301
5	65	0.429	203



Test Number
LK120036C

Customer Reference
Hongyu2209

Manufacturer: Chongqing Hongyu Friction
Material: Hongyu2209
Test Pressure: 150 psi

9-20-2012
LK120036C_5
Sample 5 of 5

Coefficient of Friction

