



Sample Lab Test Report

Link Test Report:	134446-2
Test Description:	ISO 6310 Road Vehicle Brake Lining Compressibility Test Performed on Coupons
Purpose of Test:	To Determine Characteristics of Brake Material Under Compression
Profile	ISO 6310 Road Vehicle Brake
Platform:	Coupon
Lining Material:	XBP-GF
Test Date:	9/16/2013

Requested By:

INTERNATIONAL MOTOR PRODUCTS, INC.
RODOLFO LOPEZ
11421 N.W. 39TH STREET
MIAMI, FL 33178

Tested By:

Testing Coordination and Facility
North America Laboratory Test Operations
13840 Elmira Ave.
Detroit, MI 48227
www.linkeng.com
Phone: (313) 933-4900
Fax: (313) 933-0710



Test Number
134446-2

Customer Reference
XBP-GF

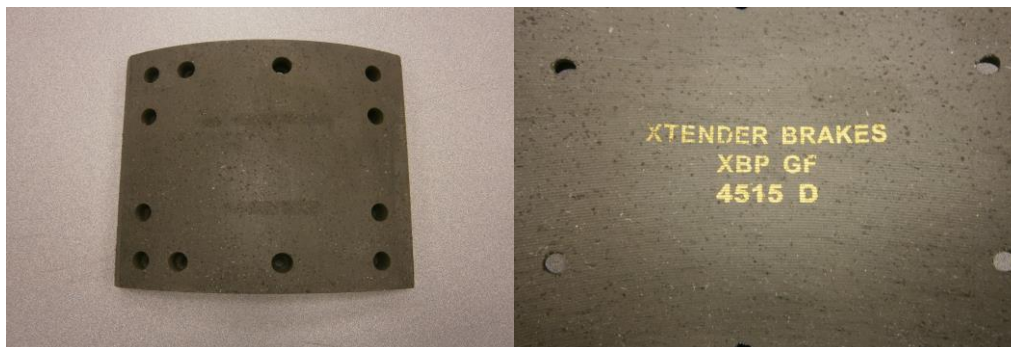
ISO 6310 Road Vehicle Brake Lining Compressibility Test Performed on Coupons

Test Information

Customer Name	International Motor Products, Inc.
Requestor	Rodolfo Lopez
Test Procedure	ISO 6310
Profile Name	ISO 6310
Test Coordinator	Timothy Coleman
Technician	Timothy Coleman
Test System	3271
Parts received, start and end dates	8/14/2013-9/18/2013
Datalogger / Template version	3.11

Setup Details

Sample Material	XBP-GG
Coupon Area	6.4516 cm ²
Coupon Thickness	15.18 mm
Coupon Lot Number	N/A
Test Temperature	20\400 °C
Test Preload	5.0 Bar
Number of Ambient Cycles	3
Number of 400°C Cycles	2
Piston Area	2,828 sq-mm
Piston Diameter	60.0 mm



Comments:

Created by:	Timothy Coleman (313) 625-4000	Title	Lead Technician	Date	9/18/2013
Reviewed by:	Timothy Coleman (313) 625-4000	Title	Lead Technician	Date	9/18/2013

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
134446-2

Customer Reference
XBP-GF

General Information

Customer:	International Motor Products	Coupon ID:	1	Test Section:	1
Specimen Type:	Coupon			134446-2, Section 1, Stops 1 and 3	
Material:	XBP-GF			Operator:	Timothy Coleman
				Remarks:	Ambient 100 Bar

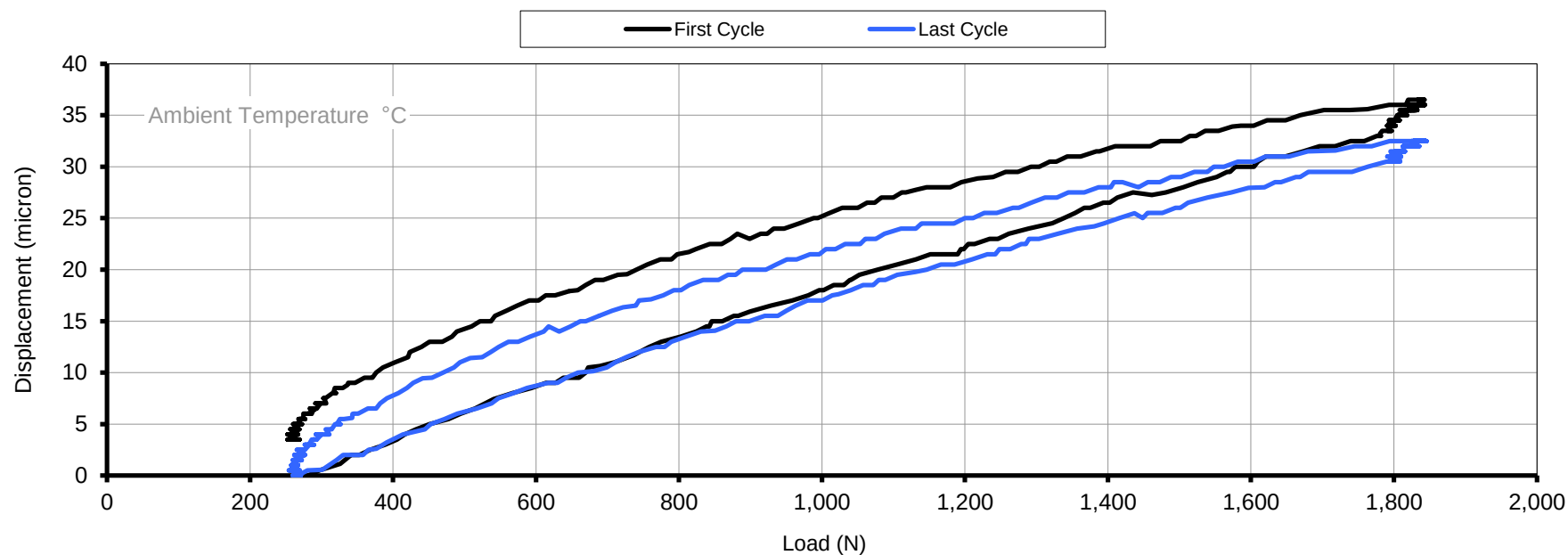
Data Report

Sample Pressure bar	Load N	First Compression Cycle (1)			Last Compression Cycle (3)		
		Displacement micron	Compressive strain %	Specific k micron/10MPa	Displacement micron	Compressive strain %	Specific k micron/10MPa
5	416	4	0.03%	64	2	0.01%	38
10	627	9	0.06%	93	10	0.07%	97
20	1,289	24	0.16%	120	23	0.15%	115
25	1,648	31	0.20%	123	28	0.18%	112
30	1,840	37	0.24%	128	33	0.21%	113

Hysteresis and Energy Absorption

Sample Pressure bar	Load N	Hysteresis (1) micron	Relative Energy Absorption (1)	Hysteresis (3) micron	Relative Energy Absorption (3)
5	416	4	12%	1	2%

Displacement (micron) vs. Load (N)





Test Number
134446-2

Customer Reference
XBP-GF

General Information

Customer:	International Motor Products	Coupon ID:	2	Test Section:	2
Specimen Type:	Coupon				134446-2, Section 2, Stop 1
Material:	XBP-GF			Operator:	Timothy Coleman
				Remarks:	400°C

Data Report

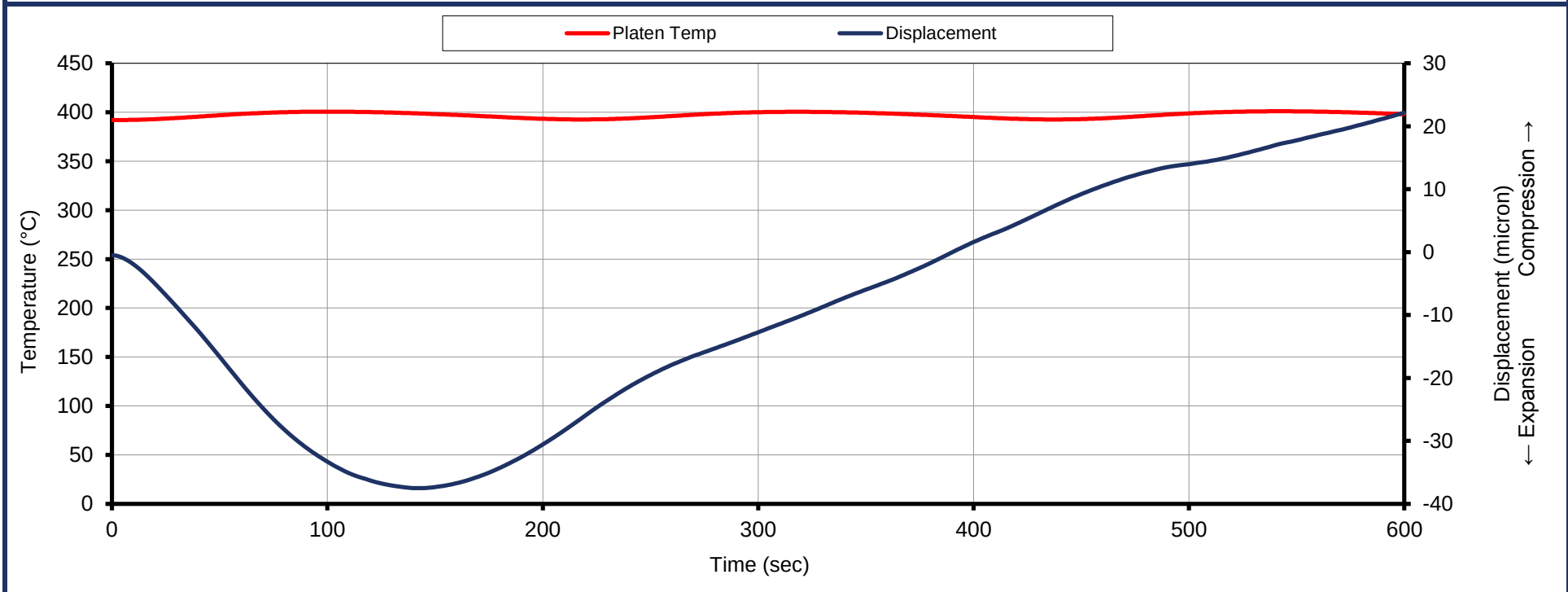
Time sec	Coupon Temp.	Heater Temp. °C	Force N	Displacement micron	Coefficient of Thermal Expansion micron/mm/°C
0		392	264	-1	
150		398	317	-37	
300		400	316	-13	
450		393	331	9	
600		398	324	22	

Emmissivity :

Average Coefficient of Thermal Expansion : 2.3 micron/mm/°C

Swell % of Initial Thickness : 0.15%

Displacement (micron), Coupon Temperature (°C), and Platen Temperature (°C) vs. Time (sec)





Test Number
134446-2

Customer Reference
XBP-GF

General Information

Customer:	International Motor Products	Coupon ID:	2	Test Section:	3
Specimen Type:	Coupon			134446-2, Section 3, Stops 1 and 2	
Material:	XBP-GF			Operator:	Timothy Coleman
				Remarks:	400°C 100 Bar

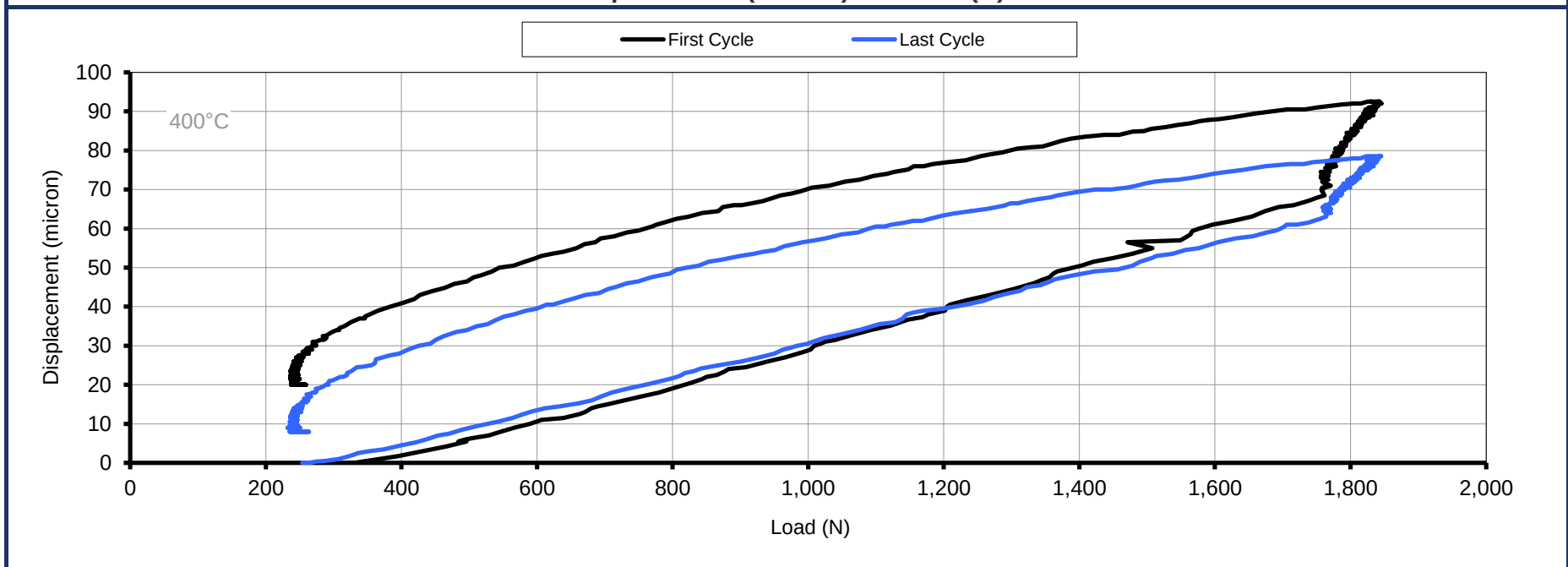
Data Report

Sample Pressure bar	Load N	First Compression Cycle (1)			Last Compression Cycle (2)		
		Displacement micron	Compressive strain %	Specific k micron/10MPa	Displacement micron	Compressive strain %	Specific k micron/10MPa
5	326	0	0.00%	0	2	0.01%	41
10	639	12	0.08%	118	16	0.11%	155
20	1,304	45	0.29%	220	44	0.29%	217
25	1,626	62	0.41%	248	57	0.38%	228
30	1,841	92	0.61%	322	79	0.52%	275

Hysteresis and Energy Absorption

Sample Pressure bar	Load N	Hysteresis (1) micron	Relative Energy Absorption (1)	Hysteresis (2) micron	Relative Energy Absorption (2)
5	326	20	28%	8	11%

Displacement (micron) vs. Load (N)





Sample Lab Test Report

Link Test Report:	134446-3
Test Description:	ISO 6311- Road vehicles - Brake linings - Internal shear strength of lining material - Test procedure
Purpose of Test:	To Determine the internal shear strength of lining material
Platform:	N/A
Lining Material:	XBP-GF
Test Date:	9/10/2013

Requested By:

INTERNATIONAL MOTOR PRODUCTS, INC.
RODOLFO LOPEZ
11421 N.W. 39TH STREET
MIAMI, FL 33178

Tested By:

Testing Coordination and Facility
North America Laboratory Test Operations
13840 Elmira Ave.
Detroit, MI 48227
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Test Number
134446-3

Customer Reference
XBP-GF

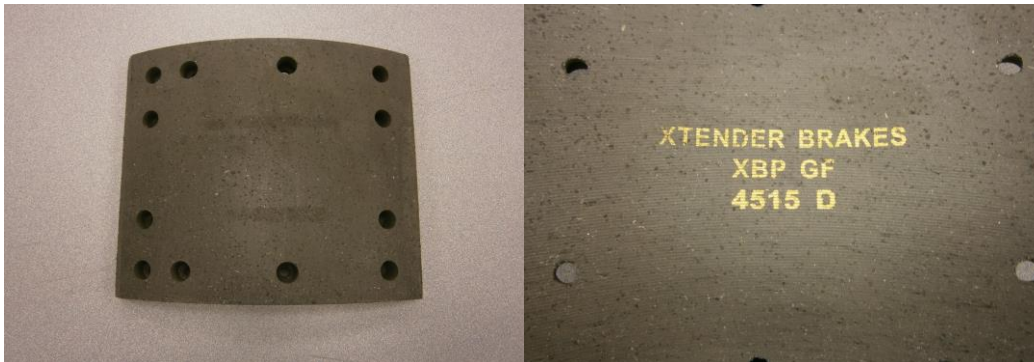
ISO 6311- Road vehicles - Brake linings - Internal shear strength of lining material - Test procedure

Test Information

Customer Name	International Motor Products, Inc.
Requestor	Rodolfo Lopez
Test Procedure	ISO 6311
Profile Name	ISO 6311.csv
Test Coordinator	Timothy Coleman
Technician	Timothy Coleman
Test System	3271
Parts received, start and end dates	8/15/2013-9/11/2013
Datalogger / Template version	3.11

Setup Details

Material	XBP-GF
Sample Area	400 mm ²
Sample Thickness	10 mm
Pad Lot Number	N/A
Test Temperature	23 °C
Test Preload	2 N
Test Ramp Rate	4500 N/sec
Number of Ambient Cycles	1



Comments:

Created by:	Timothy Coleman (313) 625-4000	Title	Lead Technician	Date	9/11/2013
Reviewed by:	Timothy Coleman (313) 625-4000	Title	Lead Technician	Date	9/11/2013

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.

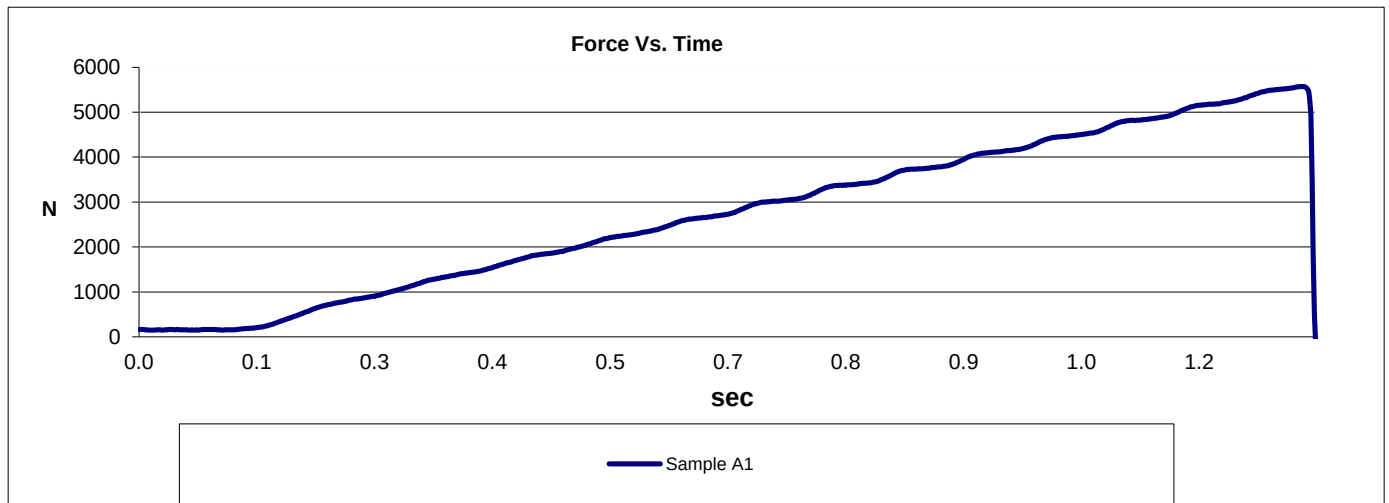


Test Number
134446-3

Customer Reference
XBP-GF

Sample ID	Material	Max Shear Load
		N
A1	XBP-GF	5572

Material	Average Shear Load
	N
XBP-GF	5572





Link Testing Laboratories, Inc.
401 Southfield Road, Dearborn MI 48120
Phone: (313) 625-4000

Link-Swell and Growth Test Report

TEST PROCEDURE: SAE J160
TEST NUMBER: 134446-1
REPORT DATE: October 16, 2013

CUSTOMER: International Motor Products, Inc.
11421 N.W. 39th Street
Miami, FL 33178

IDENTIFICATION: XBP-GF

TEST PURPOSE: This standard specifies a method for testing and measuring the swell, growth, and dimensional stability of friction materials when exposed to elevated temperatures.

Comments including deviations
from, additions to, or exclusions
from the stated test method:

Created By: Timothy Coleman

Data applicable to the materials tested. Valid only if signed. Report can be copied only in full. Bilateral uncertainty of measurements 0.57.1% of F.S. Coverage factor of 2. Confidence of 95%. Details available upon request.



Test Number: 134446-1

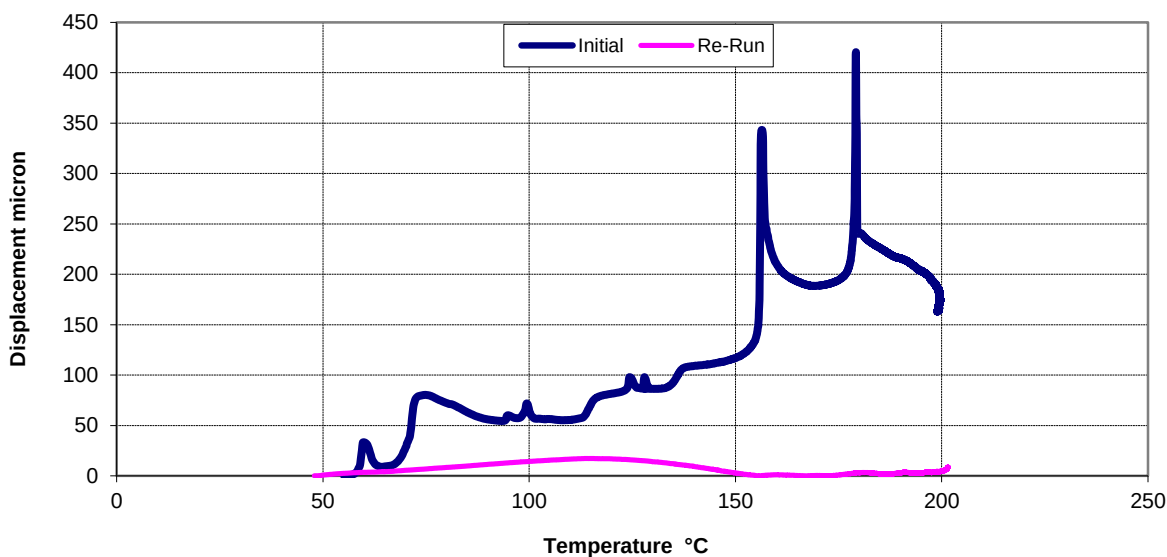
Material Identification

Model Number	N/A
Material	XBP-GF
Identification	Pad#1

SWELL

	Initial	Re-Run
Max Swell	420 micron	17 micron
Time @ Max Swell	418 sec	131 sec
Temperature @ Max Swell	179 °C	113 °C
Max Temperature Reached	200 °C	202 °C
Swell @ Max Temperature	174 micron	8 micron

Initial and Re-Run Temperature vs Swell



GROWTH

Mean thickness at Beginning of Test	12.430 mm
Mean Thickness after Initial Run	12.990 mm
Mean Thickness at End Of Test	12.999 mm

		% Growth
Growth from Beginning to after Initial Run	0.5643 mm	4.54%
Growth from Beginning to End of Test	0.5692 mm	4.58%