



Rubber Interlaboratory Testing Program

Summary Report #198- 4th Qtr 2018

[About the Rubber Program, About CTS](#)

[Key for Web Summary Report](#)

Analysis	Analysis Name	Analysis	Analysis Name
605	Tensile Strength: Precured Rubber Samples	691	RPA Rheological Properties: Part A - G'' at 20Hz
606	Ultimate Elongation: Precured Rubber Samples	695	RPA Rheological Properties: Part B - G' at 1.0Hz
607	Stress at 300% Elongation: Precured Samples	696	RPA Rheological Properties: Part B - G'' at 1.0Hz
608	Stress at 100% Elongation: Precured Samples		
620	Hardness (Type A): Precured Rubber Samples		
621	Density: Precured Rubber Samples @ 25C		
625	Hardness (Shore D/Type D)		
630	Tensile Strength: Participant-Cured Rubber		
631	Ultimate Elongation: Participant-Cured Samples		
632	Tensile Stress at 300% Elongation: Lab-Cured		
633	Tensile Stress at 100% Elongation: Lab-Cured		
660	Mooney Viscosity (4-minute readings)		
661	Mooney Viscosity (8-minute butyl readings)		
662	Mooney Stress Relaxation: t80		
663	Mooney Stress Relaxation: X30		
664	Mooney Stress Relaxation: Area under curve		
669	ODR Vulcanization Charac.: Cure Time 10%		
670	ODR Vulcanization Charac.: Scorch Time, Ts1		
671	ODR Vulcanization Charac.: Cure Time 50%		
672	ODR Vulcanization Charac.: Cure Time 90%		
673	ODR Vulcanization Charac.: Minimum Torque		
674	ODR Vulcanization Charac.: Maximum Torque		
684	MDR Vulcanization Charac.: Cure Time 10%		
685	MDR Vulcanization Charac.: Scorch Time, Ts1		
686	MDR Vulcanization Charac.: Cure Time 50%		
687	MDR Vulcanization Charac.: Cure Time 90%		
688	MDR Vulcanization Charac.: Minimum Torque		
689	MDR Vulcanization Charac.: Maximum Torque		
690	RPA Rheological Properties: Part A - G' at 20Hz		

ABOUT THE PROGRAM

The Collaborative Reference Program for RUBBER, which was initiated in 1969, is operated and maintained by Collaborative Testing Services, Inc. (CTS), with technical guidance provided by the Rubber Division of the American Chemical Society. The program allows laboratories to compare periodically the level and uniformity of their testing with that of other participating laboratories. It also provides a realistic assessment of the state of rubber testing proficiency.

For each test there are summary statistics and a graphical representation of the data. Also shown are notes concerning specific laboratory results, as well as significant findings related to instrument types or other testing variations. Please refer to the section KEY TO TABLES AND GRAPHS for an explanation of terms and guidelines to interpreting the results.

ABOUT CTS

Founded in 1971, CTS is a privately-owned company that specializes in interlaboratory tests for a wide variety of industrial sectors, including rubber, plastics, fasteners and metals, containerboard, paper and color, as well as proficiency tests for forensic laboratories. All of the tests are designed to assist organizations in achieving and maintaining quality control objectives. Labs from the U.S., as well as more than 80 countries, currently participate in CTS programs.

If there are any questions on the report or testing program, please contact:

**Collaborative Testing Services, Inc.
21331 Gentry Drive
Sterling, Virginia 20166 USA**

**+1-571-434-1925
FAX #: +1-571-434-1937
rubber@cts-interlab.com**

Office Hours: 8:00 a.m. - 4:30 p.m. ET

WebCode	Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Rubber Report published on the CTS Web site. The WebCode for each analysis can be found in the Performance Analysis Report mailed to each participant.
Lab Mean	Tensile & Hardness: the average of the median values obtained for each sample. All other tests: the average of the test results obtained by the participant.
Grand Mean	The average of the LAB MEANS for all included participants. Laboratories flagged with an X or an M (see DATA FLAG column) are excluded from the GRAND MEAN.
Difference from Grand Mean	The difference of the LAB MEAN from the GRAND MEAN.
Between-Lab Standard Deviation	An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).
Comparative Performance Value	An indication of how well a laboratory's results agree with the other participants. The CPV is a ratio indicating the number of standard deviations from the GRAND MEAN. The closer a laboratory's COMPARATIVE PERFORMANCE VALUE is to zero, the more consistent its results are with the other participants' data (and vice versa). The critical value for each CPV will vary depending on the number of labs participating in a test.
Inst Code	If instruments are tracked in a test, a code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section).
Data Flag	DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

<u>DATA FLAG</u>	<u>STATISTICALLY INCLUDED/EXCLUDED</u>	<u>ACTION REQUIRED</u>
*	INCLUDED	CAUTION - review testing procedure and monitor future results. Results fall outside 95% ellipse but within a 99% ellipse that is calculated but not drawn.
X	EXCLUDED	STOP - immediate review of data and/or testing procedure is required. Results fall outside the 99% ellipse. See specific notes following each table for more information on why the data is excluded.
M	EXCLUDED	PROCEED - lab was unable to report data for at least one sample. However, a lab receiving two of more M flags for a test may need to stop and review its testing procedures.

Graph - For each laboratory, the LAB MEAN for the first sample (x-axis) is plotted against the LAB MEAN for the second sample (y-axis) with each point representing a laboratory. The horizontal and vertical cross-hairs are the GRAND MEANS for each sample. When 20 or more laboratories are in the statistics, an ellipse is also drawn so that 95% of the time a randomly selected laboratory will be included inside the ellipse. Plotted data flags are explained above.

Common Problems Highlighted in Footnotes

1. **Extreme data** - The laboratory's results for one or both samples are so inconsistent with those of the other participants that the lab mean(s) fall outside the plot. (The data usually vary by more than three standard deviations from the grand mean.) The participant is advised to immediately review his data and/or testing procedure.
2. **Systematic bias** - The laboratory's results are either consistently high or low for both samples when compared to the other participants (the plotted point falls near the top or bottom of the ellipse). This indicates that the participant is performing the test with a constant bias. Causes of systematic errors include improper calibration, the particular make/model of equipment or a modification to the testing procedure.
3. **Inconsistency in testing between samples/sample sets** - The laboratory's results indicate that there are differences in the way the two samples tested (the plotted point falls to the side of the ellipse). This type of error may be attributed to the analyst deviating from the procedure when testing one of the samples or a material interaction occurrence with the instrument or room conditions. The inconsistency is reflected in the CPVs for the two samples, such as a +1.5 CPV for sample A and a -2.2 CPV for sample B. CTS also will specify if the laboratory's data for one sample are high/low compared to the other participants. If this inconsistency is slight, the lab's plotted point will be an * that falls on the edge of the ellipse.
4. **Inconsistency in testing within a sample** - The laboratory's within-lab standard deviation for a specified sample is high when compared to the other participants, often causing the lab's plotted point to fall outside of the ellipse.
5. **Data appeared to be off by a factor of # and was corrected by CTS** - In tests that involve computations, the results reported to CTS may be off by a factor. If this factor can easily be determined, CTS may correct the data and flag the participant. Occasionally CTS will correct a laboratory's results even though the data are still high or low when compared to the other participants. This is done so that the laboratory may be alerted to other possible errors in its testing procedure.
6. **Data for two samples (or two tests) appeared to be switched by the lab, and the error was corrected by CTS.**

Labs flagged with an * are not typically included in the footnotes of a data table. These labs may locate their position in the control ellipse and use the definitions above to help identify the type of testing error. An * should serve as a caution flag, a "yellow light", to a lab. If this error is repeated in future rounds, a lab may need to stop and review its testing procedures. The initial data flag is not cause for alarm. Interlaboratory tests conducted at regular intervals permit a lab to recognize trends in testing.



Rubber Interlaboratory Testing Program
Analysis 605
Tensile Strength (psi)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2B22J2	X	3,813.1	524.3	3.65	3,675.3	430.1	2.94
2FT92A		3,178.5	-110.2	-0.77	3,072.6	-172.6	-1.18
2XTGV3		3,505.7	217.0	1.51	3,460.9	215.7	1.47
38XQZ7	*	3,314.1	25.4	0.18	3,082.1	-163.1	-1.11
3BUEET		3,415.5	126.8	0.88	3,341.5	96.3	0.66
42K8EJ		3,333.5	44.8	0.31	3,358.7	113.5	0.78
4AYDR2		3,219.5	-69.2	-0.48	3,111.1	-134.2	-0.92
4H9AJ7		3,149.5	-139.2	-0.97	3,117.0	-128.2	-0.88
4TCXP6		3,328.6	39.9	0.28	3,379.4	134.2	0.92
63RE4A		3,545.5	256.8	1.79	3,515.5	270.3	1.85
6B6Z4K		3,314.1	25.4	0.18	3,306.9	61.7	0.42
6QH94N		3,253.0	-35.7	-0.25	3,134.0	-111.2	-0.76
6YF2CH		3,321.2	32.4	0.23	3,308.5	63.2	0.43
73AH3G		3,456.1	167.3	1.16	3,433.2	187.9	1.28
77BKRJ		3,325.8	37.0	0.26	3,282.9	37.6	0.26
7A937X		3,270.2	-18.5	-0.13	3,235.7	-9.6	-0.07
7CX9MN		3,366.9	78.2	0.54	3,421.3	176.1	1.20
7D6TBN		3,006.5	-282.2	-1.96	3,019.0	-226.2	-1.55
836PUE		3,499.5	210.8	1.47	3,439.5	194.3	1.33
87NCHE		3,326.0	37.3	0.26	3,242.0	-3.2	-0.02
89UW7E		3,372.2	83.4	0.58	3,386.7	141.4	0.97
8JVV38		3,211.5	-77.2	-0.54	3,198.5	-46.7	-0.32
8QPPTX		3,335.5	46.8	0.33	3,281.0	35.8	0.24
93MQ73		3,081.1	-207.7	-1.44	3,106.6	-138.6	-0.95
AK2W2B		3,492.0	203.3	1.41	3,444.5	199.3	1.36
AYWGHY		3,251.0	-37.7	-0.26	3,233.6	-11.6	-0.08
BHP73E		3,247.5	-41.2	-0.29	3,295.5	50.3	0.34
C37BB2		3,263.0	-25.7	-0.18	3,210.0	-35.2	-0.24
C8N4FW		3,488.2	199.5	1.39	3,466.4	221.2	1.51
C8ZZK2	X	2,835.0	-453.7	-3.16	2,928.1	-317.1	-2.17
C9UN2B		3,192.4	-96.4	-0.67	3,168.0	-77.2	-0.53
CHHHFT		3,604.7	316.0	2.20	3,481.5	236.3	1.61
CHLEXW		3,164.0	-124.7	-0.87	3,180.0	-65.2	-0.45
CNQD72		3,441.5	152.8	1.06	3,400.5	155.3	1.06
CRUEKZ		3,320.5	31.8	0.22	3,373.0	127.8	0.87
CV8G7V		3,366.4	77.6	0.54	3,359.8	114.6	0.78
CY7UPE		3,545.0	256.3	1.78	3,521.5	276.3	1.89
DNMDYT		3,138.8	-149.9	-1.04	3,085.1	-160.1	-1.09



Rubber Interlaboratory Testing Program
Analysis 605
Tensile Strength (psi)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
DPZ8C9		3,240.0	-48.7	-0.34	3,272.5	27.3	0.19
DTZTD4		3,401.5	112.8	0.78	3,350.5	105.3	0.72
DXD4GE		3,362.0	73.3	0.51	3,363.5	118.2	0.81
DYQ4M3		3,162.6	-126.2	-0.88	3,238.7	-6.5	-0.04
ED34VC		3,079.0	-209.7	-1.46	2,988.5	-256.7	-1.75
ERFY2F		3,268.5	-20.2	-0.14	3,286.9	41.7	0.28
F2M227		3,341.0	52.3	0.36	3,310.5	65.3	0.45
FDW9NC		3,388.5	99.8	0.69	3,439.0	193.8	1.32
FDWT8R		3,338.4	49.7	0.35	3,207.7	-37.5	-0.26
FZ8W49		3,198.1	-90.6	-0.63	3,082.1	-163.1	-1.11
GNAQW9		3,428.4	139.6	0.97	3,409.7	164.4	1.12
GQYLCA	*	3,339.5	50.8	0.35	3,109.5	-135.7	-0.93
H9DKWX		3,278.5	-10.2	-0.07	3,290.0	44.8	0.31
HFVQT6		3,418.8	130.1	0.90	3,386.5	141.3	0.97
HLJ4GQ		3,299.5	10.8	0.07	3,141.5	-103.7	-0.71
HTLHFU		3,519.9	231.2	1.61	3,549.8	304.5	2.08
JR2TFQ		3,637.5	348.7	2.43	3,563.0	317.8	2.17
JTZ8GK	X	3,203.9	-84.8	-0.59	2,694.1	-551.1	-3.77
KLWMRU		3,207.1	-81.6	-0.57	3,138.7	-106.5	-0.73
KN4ZBG		3,281.0	-7.7	-0.05	3,227.0	-18.2	-0.12
KX8PYQ		3,329.0	40.3	0.28	3,130.0	-115.2	-0.79
LKKAMX		3,322.5	33.8	0.23	3,249.0	3.8	0.03
LMHHFR		3,095.5	-193.2	-1.34	3,051.5	-193.7	-1.32
LPVVH4		3,201.7	-87.0	-0.61	3,212.6	-32.6	-0.22
LRG6HB		3,243.4	-45.3	-0.32	3,182.2	-63.0	-0.43
LRXFYV		3,261.3	-27.4	-0.19	3,282.6	37.4	0.26
LTDH8P		3,171.3	-117.4	-0.82	3,063.2	-182.0	-1.24
M644XX		3,155.5	-133.2	-0.93	3,141.0	-104.2	-0.71
MEN67Y		3,346.0	57.3	0.40	3,362.0	116.8	0.80
MP7JA2		3,245.1	-43.6	-0.30	3,198.3	-47.0	-0.32
N4MYRR		3,101.0	-187.8	-1.31	3,145.8	-99.4	-0.68
N7Q3PZ		3,392.7	104.0	0.72	3,239.5	-5.7	-0.04
NCT4F2		3,081.0	-207.7	-1.44	3,079.5	-165.7	-1.13
NHN7TU		3,299.5	10.8	0.07	3,256.0	10.8	0.07
NXYCXL	*	3,247.8	-40.9	-0.28	3,031.2	-214.0	-1.46
P6V4PT		3,214.0	-74.7	-0.52	3,194.5	-50.7	-0.35
PPYPPY		3,022.8	-265.9	-1.85	3,028.6	-216.6	-1.48



Rubber Interlaboratory Testing Program
Analysis 605
Tensile Strength (psi)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
QBV89J		3,182.5	-106.2	-0.74	3,221.5	-23.7	-0.16
QEYFLM		3,348.0	59.3	0.41	3,301.0	55.8	0.38
QKKYVB		2,936.5	-352.2	-2.45	2,911.5	-333.7	-2.28
QLRHE6		3,484.0	195.2	1.36	3,416.1	170.9	1.17
QUP7BB		3,385.2	96.5	0.67	3,426.5	181.3	1.24
RC2M2M		3,438.0	149.3	1.04	3,310.0	64.8	0.44
REVBKJ		3,323.5	34.8	0.24	3,329.0	83.8	0.57
RQ6FLR	*	3,393.0	104.3	0.73	3,170.0	-75.2	-0.51
RVFQEL		2,959.5	-329.2	-2.29	3,010.5	-234.7	-1.60
RWAEVW		3,210.2	-78.5	-0.55	3,290.3	45.1	0.31
RX2BJQ	*	2,966.0	-322.7	-2.24	3,036.5	-208.7	-1.43
TGUGQV		3,108.9	-179.9	-1.25	2,959.9	-285.3	-1.95
TJGA6B		3,307.5	18.8	0.13	3,210.5	-34.7	-0.24
TXGLKM		3,292.4	3.7	0.03	3,154.6	-90.6	-0.62
U78WKP		3,457.0	168.3	1.17	3,400.5	155.3	1.06
UK87DH		2,994.3	-294.4	-2.05	2,921.8	-323.4	-2.21
UNPZ6W		3,399.0	110.3	0.77	3,280.1	34.8	0.24
URDAGH		3,246.8	-41.9	-0.29	3,082.1	-163.1	-1.11
UT3B8J		3,236.0	-52.7	-0.37	3,251.5	6.3	0.04
WC6ZCC		3,093.0	-195.8	-1.36	3,100.2	-145.0	-0.99
WHW66G	X	3,012.5	-276.2	-1.92	3,207.0	-38.2	-0.26
WLFZ7N	X	2,349.6	-939.1	-6.53	2,501.9	-743.3	-5.08
X2LDUH		3,350.0	61.3	0.43	3,347.0	101.8	0.70
X96G37		3,315.6	26.9	0.19	3,312.7	67.5	0.46
XBUNJW		3,300.0	11.3	0.08	3,236.0	-9.2	-0.06
XFNMXR		3,378.0	89.3	0.62	3,338.5	93.3	0.64
XT8W9G		3,124.5	-164.2	-1.14	3,195.0	-50.2	-0.34
XYWEMF		3,334.8	46.0	0.32	3,214.8	-30.5	-0.21
Y9XRCE		3,304.7	16.0	0.11	3,250.3	5.1	0.03
YGE3PE		3,495.4	206.7	1.44	3,473.7	228.5	1.56
YVCEXJ		3,498.4	209.7	1.46	3,363.2	117.9	0.81
Z42MVE		3,334.6	45.8	0.32	3,256.8	11.6	0.08
Z86TJE		3,117.0	-171.7	-1.19	3,145.0	-100.2	-0.68
ZHGKZF		3,082.1	-206.6	-1.44	2,966.0	-279.2	-1.91
ZHN6XC		3,355.2	66.5	0.46	3,207.3	-37.9	-0.26



Rubber Interlaboratory Testing Program
Analysis 605
Tensile Strength (psi)

Report #198
4th Qtr 2018

		Summary Statistics	
Grand Means	3,288.73 psi		3,245.21 psi
Stnd Dev Btwn Labs	143.76 psi		146.33 psi
Statistics based on 105 of 110 reporting participants			

		Summary Statistics in SI Units	
Grand Means	22.675 MPa		22.37 MPa
Stnd Dev Btwn Labs	0.991 MPa		1.01 MPa
Statistics based on 105 of 110 reporting participants			

Samples D81-D82: Polyisoprene compound, batch #1 & D83-D84: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #605

- 2B22J2 (X) - Data for all samples are high. Possible Systematic Error.
- C8ZZK2 (X) - Data for sample group D81-D82 are low.
- JT8GK (X) - Data for sample group D83-D84 are low. Inconsistent within the determinations of sample group D81-D82.
- WHW66G (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample group D81-D82.
- WLFZ7N (X) - Data for all samples are low. Possible Systematic Error. Inconsistent within the determinations of sample group D83-D84.

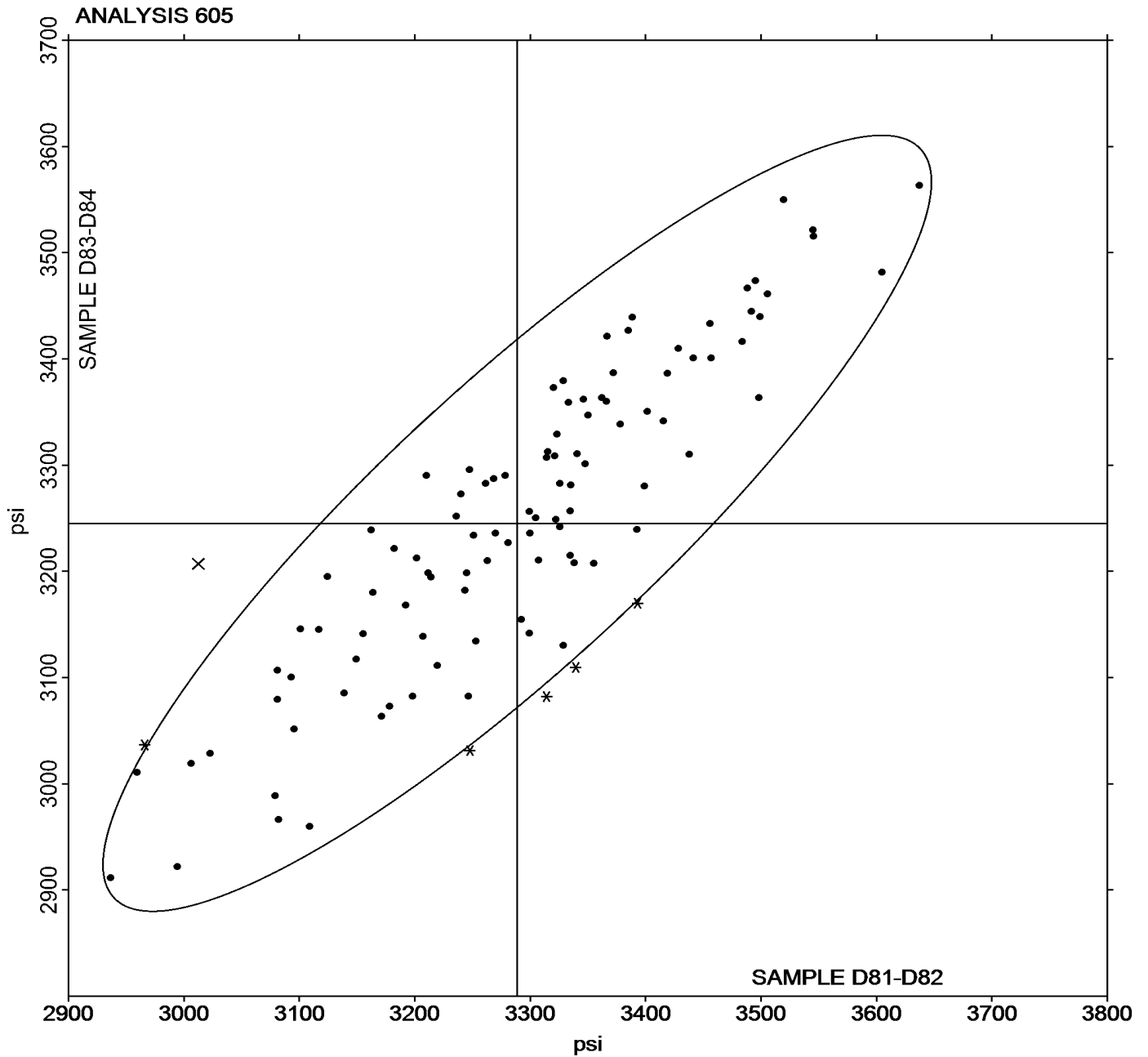


Rubber Interlaboratory Testing Program
Analysis 605
Tensile Strength (psi)

Report #198
4th Qtr 2018

Grand Mean Sample **D81-D82** = 3,288.73 psi

Grand Mean Sample **D83-D84** = 3,245.21 psi





Rubber Interlaboratory Testing Program

Report #198

Analysis 606

4th Qtr 2018

Ultimate Elongation (percent)

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2B22J2		518.0	-68.8	-2.25	508.0	-75.5	-2.40
2FT92A		559.0	-27.9	-0.91	563.8	-19.7	-0.63
2XTGV3	*	577.1	-9.8	-0.32	539.2	-44.3	-1.41
38XQZ7		527.5	-59.3	-1.94	519.5	-64.0	-2.04
3BUEET		605.5	18.7	0.61	598.5	15.0	0.48
42K8EJ		619.4	32.6	1.07	612.3	28.8	0.92
4AYDR2		634.0	47.2	1.54	633.9	50.4	1.61
4H9AJ7		596.9	10.1	0.33	611.3	27.8	0.89
4TCXP6		617.8	30.9	1.01	622.1	38.6	1.23
63RE4A		649.5	62.7	2.05	638.0	54.5	1.74
6B6Z4K		591.2	4.4	0.14	588.4	4.9	0.16
6QH94N		602.5	15.7	0.51	602.0	18.5	0.59
6YF2CH		591.4	4.5	0.15	598.4	14.9	0.47
73AH3G		600.5	13.7	0.45	613.6	30.1	0.96
77BKRJ		618.9	32.1	1.05	632.9	49.4	1.57
7A937X		596.5	9.7	0.32	579.5	-4.0	-0.13
7CX9MN		601.0	14.2	0.46	603.5	20.0	0.64
7D6TBN		548.0	-38.8	-1.27	546.0	-37.5	-1.19
836PUE		626.0	39.2	1.28	599.5	16.0	0.51
87NCHE		555.5	-31.3	-1.03	570.0	-13.5	-0.43
89UW7E		602.5	15.7	0.51	610.0	26.5	0.84
8JVV38		543.7	-43.2	-1.41	531.3	-52.2	-1.66
8QPPTX		620.5	33.7	1.10	601.0	17.5	0.56
93MQ73		611.5	24.7	0.81	616.0	32.5	1.03
AK2W2B		563.0	-23.8	-0.78	561.0	-22.5	-0.72
AYWGHY		583.0	-3.8	-0.13	580.0	-3.5	-0.11
BHP73E		536.5	-50.3	-1.65	535.0	-48.5	-1.54
C37BB2		556.5	-30.3	-0.99	560.5	-23.0	-0.73
C8N4FW		564.5	-22.3	-0.73	555.5	-28.0	-0.89
C8ZZK2		571.3	-15.5	-0.51	555.9	-27.6	-0.88
C9UN2B		554.3	-32.6	-1.07	558.8	-24.7	-0.79
CHHHFT		541.0	-45.8	-1.50	544.5	-39.0	-1.24
CHLEXW		563.0	-23.8	-0.78	565.0	-18.5	-0.59
CNQD72		583.0	-3.8	-0.13	601.5	18.0	0.57
CRUEKZ		561.0	-25.8	-0.85	578.5	-5.0	-0.16
CY7UPE		599.0	12.2	0.40	613.0	29.5	0.94
DNMDYT		620.5	33.7	1.10	604.9	21.4	0.68
DPZ8C9		569.5	-17.3	-0.57	574.5	-9.0	-0.29



Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
DTZTD4		603.0	16.2	0.53	593.5	10.0	0.32
DXD4GE		579.5	-7.3	-0.24	579.0	-4.5	-0.14
DYQ4M3		600.0	13.2	0.43	585.0	1.5	0.05
ED34VC		555.0	-31.8	-1.04	563.0	-20.5	-0.65
ERFY2F		584.2	-2.6	-0.09	586.6	3.1	0.10
F2M227		595.0	8.2	0.27	607.5	24.0	0.76
FDW9NC		604.0	17.2	0.56	608.0	24.5	0.78
FDWT8R		580.3	-6.6	-0.21	549.0	-34.5	-1.10
FZ8W49		531.5	-55.3	-1.81	522.5	-61.0	-1.94
GNAQW9		606.5	19.6	0.64	601.4	17.9	0.57
GQYLCA		625.0	38.2	1.25	610.0	26.5	0.84
H9DKWX		573.5	-13.3	-0.44	565.0	-18.5	-0.59
HFVQT6		573.5	-13.3	-0.44	567.4	-16.1	-0.51
HLJ4GQ		583.5	-3.3	-0.11	559.5	-24.0	-0.76
HTLHFU		605.2	18.3	0.60	604.3	20.8	0.66
JR2TFQ		607.3	20.4	0.67	600.0	16.5	0.53
JTZ8GK		575.0	-11.8	-0.39	542.5	-41.0	-1.31
KLWMRU		609.6	22.7	0.74	594.4	10.9	0.35
KN4ZBG		629.0	42.2	1.38	624.0	40.5	1.29
KX8PYQ		580.5	-6.3	-0.21	566.5	-17.0	-0.54
LKKAMX		589.5	2.7	0.09	583.5	0.0	0.00
LMHHFR		574.5	-12.3	-0.40	576.5	-7.0	-0.22
LPVVH4		586.0	-0.8	-0.03	589.0	5.5	0.18
LRG6HB	X	773.5	186.6	6.10	946.3	362.8	11.55
LRXFYV		595.5	8.7	0.28	592.0	8.5	0.27
LTDH8P		645.5	58.7	1.92	642.0	58.5	1.86
M644XX	*	570.5	-16.3	-0.53	529.0	-54.5	-1.74
MEN67Y		593.4	6.5	0.21	589.1	5.6	0.18
MP7JA2		586.5	-0.3	-0.01	594.0	10.5	0.33
N4MYRR		550.3	-36.5	-1.19	543.7	-39.8	-1.27
N7Q3PZ	*	600.6	13.8	0.45	559.3	-24.2	-0.77
NCT4F2		560.5	-26.3	-0.86	553.5	-30.0	-0.96
NHN7TU		574.5	-12.3	-0.40	558.0	-25.5	-0.81
NXYCXL		565.5	-21.3	-0.70	567.5	-16.0	-0.51
P6V4PT		555.0	-31.8	-1.04	570.0	-13.5	-0.43
PPYPPY		575.0	-11.8	-0.39	585.0	1.5	0.05
QBV89J		548.0	-38.8	-1.27	553.0	-30.5	-0.97



Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
QEYFLM		569.0	-17.8	-0.58	574.5	-9.0	-0.29
QKKYVB	X	719.5	132.7	4.34	558.5	-25.0	-0.80
QLRHE6	*	639.9	53.0	1.73	658.1	74.6	2.38
QUP7BB		592.5	5.6	0.18	607.6	24.1	0.77
RC2M2M		559.5	-27.3	-0.89	556.5	-27.0	-0.86
REVBKJ		586.5	-0.3	-0.01	598.5	15.0	0.48
RQ6FLR		594.5	7.7	0.25	620.5	37.0	1.18
RVFQEL		572.0	-14.8	-0.49	576.5	-7.0	-0.22
RWAEVW		577.5	-9.3	-0.31	587.5	4.0	0.13
RX2BJQ	X	513.0	-73.8	-2.41	574.5	-9.0	-0.29
TGUGQV		562.1	-24.8	-0.81	560.8	-22.7	-0.72
TJGA6B		562.0	-24.8	-0.81	554.5	-29.0	-0.92
TXGLKM		590.5	3.6	0.12	576.8	-6.7	-0.21
U78WKP		592.5	5.7	0.18	596.0	12.5	0.40
UK87DH	*	595.5	8.7	0.28	630.5	47.0	1.50
UNPZ6W		587.0	0.2	0.00	577.0	-6.5	-0.21
URDAGH		522.5	-64.3	-2.10	538.1	-45.4	-1.45
UT3B8J	*	680.5	93.7	3.06	663.5	80.0	2.55
WC6ZCC		601.5	14.7	0.48	593.0	9.5	0.30
WHW66G	X	565.0	-21.8	-0.71	622.5	39.0	1.24
WLFZ7N		578.5	-8.3	-0.27	582.5	-1.0	-0.03
X2LDUH		589.5	2.7	0.09	578.0	-5.5	-0.18
XBUNJW		587.5	0.7	0.02	579.0	-4.5	-0.14
XFNMXR		585.0	-1.8	-0.06	581.5	-2.0	-0.06
XT8W9G		515.5	-71.3	-2.33	525.5	-58.0	-1.85
XYWEMR		609.9	23.0	0.75	603.2	19.7	0.63
Y9XRCE		606.5	19.7	0.64	612.5	29.0	0.92
YGE3PE		594.5	7.7	0.25	558.5	-25.0	-0.80
YVCEXJ	*	668.8	82.0	2.68	651.5	68.0	2.16
Z42MVE		627.4	40.6	1.33	592.0	8.5	0.27
Z86TJE		565.0	-21.8	-0.71	560.5	-23.0	-0.73
ZHGKZF		643.5	56.7	1.85	642.0	58.5	1.86
ZHN6XC		623.0	36.1	1.18	606.0	22.5	0.72



Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #198
4th Qtr 2018

		Summary Statistics	
Grand Means	586.85 percent	583.50 percent	
Stnd Dev Btwn Labs	30.58 percent	31.41 percent	
Statistics based on 104 of 108 reporting participants			

Samples D81-D82: Polyisoprene compound, batch #1 & D83-D84: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #606

- LRG6HB (X) - Extreme Data.
- QKKYVB (X) - Data for sample group D81-D82 are high. Inconsistent within the determinations of sample group D81-D82.
- RX2BJQ (X) - Inconsistent in testing between samples.
- WHW66G (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample group D81-D82.

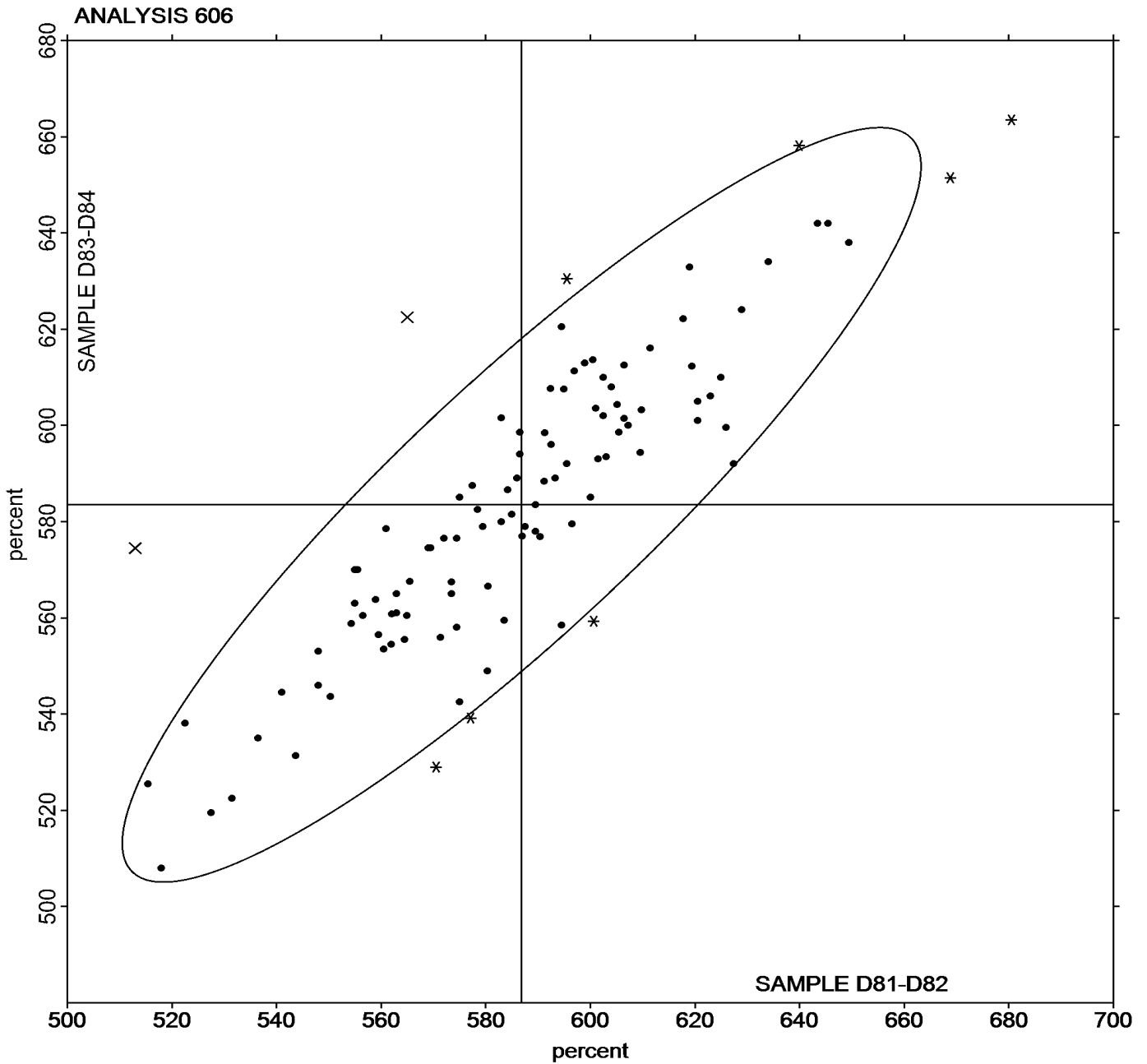


Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #198
4th Qtr 2018

Grand Mean Sample D81-D82 = 586.85 percent

Grand Mean Sample D83-D84 = 583.50 percent





Rubber Interlaboratory Testing Program

Report #198

Analysis 607

4th Qtr 2018

Stress at 300% Elongation (psi)

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2B22J2	X	1,604.1	470.1	6.81	1,591.8	474.3	6.03
2FT92A		1,131.5	-2.5	-0.04	1,054.6	-62.9	-0.80
2XTGV3		1,213.8	79.8	1.16	1,210.4	92.9	1.18
38XQZ7	X	1,370.6	236.6	3.43	1,319.9	202.3	2.57
3BUEET		1,117.0	-17.0	-0.25	1,150.5	33.0	0.42
42K8EJ		1,101.8	-32.2	-0.47	1,110.0	-7.5	-0.09
4AYDR2		1,069.7	-64.3	-0.93	1,065.1	-52.4	-0.67
4H9AJ7		1,079.0	-55.0	-0.80	979.5	-138.0	-1.75
4TCXP6		1,102.3	-31.7	-0.46	1,116.8	-0.7	-0.01
63RE4A		1,061.0	-73.0	-1.06	1,056.5	-61.0	-0.78
6B6Z4K		1,133.5	-0.5	-0.01	1,109.5	-8.0	-0.10
6QH94N		1,133.5	-0.5	-0.01	1,066.0	-51.5	-0.65
6YF2CH		1,130.5	-3.6	-0.05	1,086.3	-31.3	-0.40
73AH3G		1,152.4	18.4	0.27	1,061.2	-56.3	-0.72
77BKRJ		1,077.1	-57.0	-0.83	991.0	-126.5	-1.61
7A937X		1,081.6	-52.5	-0.76	1,117.0	-0.5	-0.01
7CX9MN		1,106.5	-27.5	-0.40	1,089.0	-28.5	-0.36
7D6TBN		1,160.5	26.5	0.38	1,150.5	33.0	0.42
836PUE		1,166.0	32.0	0.46	1,152.0	34.5	0.44
87NCHE	*	1,251.5	117.5	1.70	1,116.0	-1.5	-0.02
89UW7E		1,019.6	-114.4	-1.66	1,039.9	-77.6	-0.99
8JVV38		1,275.1	141.1	2.04	1,307.6	190.1	2.42
8QPPTX		1,063.5	-70.5	-1.02	1,119.0	1.5	0.02
93MQ73		1,015.3	-118.7	-1.72	934.5	-183.0	-2.32
AK2W2B	*	1,325.5	191.5	2.77	1,303.0	185.5	2.36
AYWGHY		1,151.6	17.6	0.26	1,162.5	45.0	0.57
BHP73E	*	1,303.0	169.0	2.45	1,339.0	221.5	2.81
C37BB2		1,224.0	90.0	1.30	1,181.0	63.5	0.81
C8N4FW		1,181.3	47.3	0.69	1,208.2	90.7	1.15
C8ZZK2		1,087.4	-46.6	-0.68	1,131.4	13.9	0.18
C9UN2B		1,178.8	44.8	0.65	1,133.9	16.4	0.21
CHHHFT	X	1,400.0	266.0	3.85	1,360.0	242.5	3.08
CHLEXW		1,163.9	29.9	0.43	1,167.6	50.1	0.64
CNQD72		1,238.5	104.5	1.51	1,206.0	88.5	1.12
CRUEKZ		1,224.5	90.5	1.31	1,142.5	25.0	0.32
CY7UPE		1,139.5	5.5	0.08	1,123.5	6.0	0.08
DNMDYT		1,104.6	-29.5	-0.43	1,120.1	2.5	0.03



Rubber Interlaboratory Testing Program

Report #198

Analysis 607

4th Qtr 2018

Stress at 300% Elongation (psi)

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
DPZ8C9		1,232.0	98.0	1.42	1,216.0	98.5	1.25
DTZTD4		1,139.5	5.5	0.08	1,144.0	26.5	0.34
DXD4GE		1,187.9	53.9	0.78	1,220.5	103.0	1.31
ED34VC		1,122.0	-12.0	-0.17	1,050.0	-67.5	-0.86
ERFY2F		1,132.1	-1.9	-0.03	1,206.9	89.4	1.14
F2M227		1,120.5	-13.5	-0.20	1,077.5	-40.0	-0.51
FDW9NC		1,150.0	16.0	0.23	1,166.5	49.0	0.62
FDWT8R		1,158.6	24.6	0.36	1,214.4	96.9	1.23
FZ8W49		1,190.0	56.0	0.81	1,175.0	57.5	0.73
GNAQW9		1,091.0	-43.0	-0.62	1,100.4	-17.1	-0.22
GQYLCA		1,058.5	-75.5	-1.09	1,066.5	-51.0	-0.65
H9DKWX		1,145.0	11.0	0.16	1,138.5	21.0	0.27
HFVQT6		1,229.1	95.1	1.38	1,260.9	143.4	1.82
HLJ4GQ		1,152.0	18.0	0.26	1,184.0	66.5	0.84
HTLHFU		1,203.6	69.6	1.01	1,178.4	60.9	0.77
JR2TFQ		1,185.0	51.0	0.74	1,170.8	53.3	0.68
JTZ8GK		1,178.4	44.4	0.64	1,113.9	-3.6	-0.05
KLWMRU		1,001.5	-132.5	-1.92	1,033.4	-84.1	-1.07
KN4ZBG		1,018.5	-115.5	-1.67	1,004.5	-113.0	-1.44
KX8PYQ		1,125.5	-8.5	-0.12	1,156.5	39.0	0.50
LKKAMX		1,136.5	2.5	0.04	1,108.5	-9.0	-0.11
LMHHFR		1,133.5	-0.5	-0.01	1,085.5	-32.0	-0.41
LPVVH4		1,124.1	-10.0	-0.14	1,121.2	3.6	0.05
LRG6HB		1,206.2	72.2	1.05	1,095.2	-22.3	-0.28
LRXFYV		1,114.6	-19.5	-0.28	1,093.3	-24.3	-0.31
LTDH8P	*	951.5	-182.5	-2.64	914.5	-203.0	-2.58
M644XX	X	1,181.0	47.0	0.68	1,326.0	208.5	2.65
MEN67Y		1,140.7	6.7	0.10	1,108.8	-8.7	-0.11
MP7JA2		1,093.6	-40.4	-0.59	1,041.9	-75.7	-0.96
N4MYRR		1,176.2	42.2	0.61	1,202.0	84.5	1.07
N7Q3PZ		1,128.5	-5.5	-0.08	1,233.5	116.0	1.47
NCT4F2		1,071.0	-63.0	-0.91	1,082.0	-35.5	-0.45
NHN7TU		1,136.5	2.5	0.04	1,197.5	80.0	1.02
NXYCXL		1,224.4	90.4	1.31	1,136.9	19.4	0.25
PPYPPY		1,035.5	-98.5	-1.43	999.5	-118.0	-1.50
QBV89J	X	1,251.5	117.5	1.70	2,232.5	1,115.0	14.17
QEYFLM		1,250.5	116.5	1.69	1,184.5	67.0	0.85
QKKYVB	X	746.5	-387.5	-5.61	1,086.5	-31.0	-0.39



Rubber Interlaboratory Testing Program

Report #198

Analysis 607

4th Qtr 2018

Stress at 300% Elongation (psi)

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
QLRHE6		1,047.1	-86.9	-1.26	974.5	-143.0	-1.82
RC2M2M		1,198.5	64.4	0.93	1,197.1	79.5	1.01
REVBKJ		1,097.5	-36.5	-0.53	1,055.0	-62.5	-0.79
RQ6FLR	*	1,160.0	26.0	0.38	1,003.5	-114.0	-1.45
RVFQEL		1,065.5	-68.5	-0.99	1,100.0	-17.5	-0.22
RWAEVW		1,117.2	-16.9	-0.24	1,091.6	-25.9	-0.33
RX2BJQ	*	1,192.5	58.5	0.85	1,034.5	-83.0	-1.05
TGUGQV		1,133.5	-0.6	-0.01	1,050.7	-66.8	-0.85
TJGA6B		1,151.5	17.5	0.25	1,153.5	36.0	0.46
TXGLKM		1,119.7	-14.3	-0.21	1,140.0	22.5	0.29
U78WKP		1,183.5	49.5	0.72	1,133.0	15.5	0.20
UK87DH		1,082.0	-52.0	-0.75	969.6	-147.9	-1.88
UNPZ6W		1,058.8	-75.2	-1.09	1,089.2	-28.3	-0.36
URDAGH		1,240.2	106.2	1.54	1,180.9	63.4	0.81
UT3B8J	X	838.5	-295.5	-4.28	898.0	-219.5	-2.79
WC6ZCC		1,013.8	-120.2	-1.74	1,050.1	-67.4	-0.86
WLFZ7N	X	855.0	-279.0	-4.04	940.0	-177.5	-2.26
X2LDUH		1,137.5	3.5	0.05	1,165.5	48.0	0.61
XBUNJW		1,179.0	45.0	0.65	1,162.5	45.0	0.57
XYWEMR		1,091.9	-42.1	-0.61	1,101.3	-16.2	-0.21
Y9XRCE		1,063.1	-70.9	-1.03	1,061.0	-56.5	-0.72
YGE3PE	X	1,158.1	24.1	0.35	1,343.1	225.6	2.87
YVCEXJ		1,029.6	-104.4	-1.51	1,009.5	-108.0	-1.37
Z42MVE		1,078.1	-55.9	-0.81	1,145.8	28.3	0.36
Z86TJE		1,145.0	11.0	0.16	1,148.0	30.5	0.39
ZHGKZF		1,116.1	-17.9	-0.26	1,082.0	-35.5	-0.45
ZHN6XC		1,052.0	-82.0	-1.19	1,044.6	-72.9	-0.93

Summary Statistics	
Grand Means	1,134.01 psi
Std Dev Btwn Labs	69.02 psi
	1,117.51 psi
	78.70 psi
Statistics based on 93 of 102 reporting participants	



Rubber Interlaboratory Testing Program
Analysis 607
Stress at 300% Elongation (psi)

Report #198
4th Qtr 2018

		Summary Statistics in SI Units	
Grand Means	7.8186 MPa	7.70	MPa
Std Dev Btwn Labs	0.4759 MPa	0.54	MPa
Statistics based on 93 of 102 reporting participants			

Samples D81-D82: Polyisoprene compound, batch #1 & D83-D84: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #607

- 2B22J2 (X) - Data for all samples are high. Possible Systematic Error.
- 38XQZ7 (X) - Data for sample group D81-D82 are high.
- CHHHFT (X) - Data for all samples are high. Possible Systematic Error.
- M644XX (X) - Inconsistent in testing between samples.
- QBV89J (X) - Extreme Data for sample group D83-D84.
- QKKYVB (X) - Data for sample group D81-D82 are low. Inconsistent within the determinations of sample group D81-D82.
- UT3B8J (X) - Data for all samples are low. Possible Systematic Error.
- WLFZ7N (X) - Data for sample group D81-D82 are low.
- YGE3PE (X) - Data for sample group D83-D84 are high. Inconsistent within the determinations of sample group D83-D84.



Rubber Interlaboratory Testing Program

Report #198

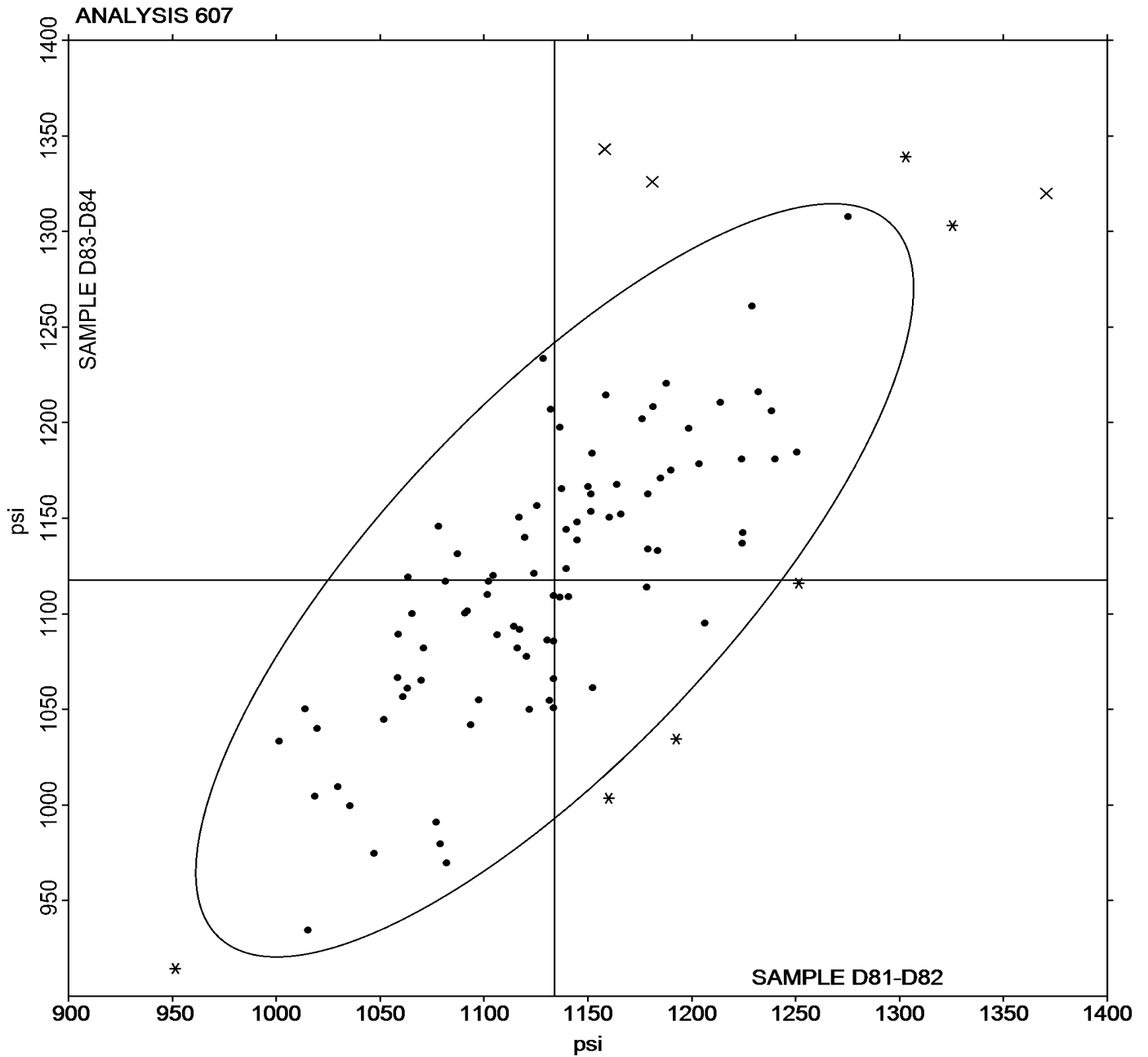
Analysis 607

4th Qtr 2018

Stress at 300% Elongation (psi)

Grand Mean Sample **D81-D82** = 1,134.01 psi

Grand Mean Sample **D83-D84** = 1,117.51 psi





Rubber Interlaboratory Testing Program

Report #198

Analysis 608

4th Qtr 2018

Stress at 100% Elongation (psi)

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2B22J2	X	295.9	51.3	3.35	298.8	55.1	3.70
2FT92A		255.1	10.5	0.69	241.3	-2.4	-0.16
2XTGV3		259.1	14.5	0.95	259.8	16.1	1.08
38XQZ7	*	282.8	38.2	2.50	261.1	17.4	1.17
3BUEET		242.0	-2.6	-0.17	250.0	6.3	0.42
42K8EJ		247.2	2.6	0.17	242.7	-1.0	-0.07
4AYDR2		255.4	10.8	0.70	259.3	15.6	1.05
4H9AJ7		231.0	-13.6	-0.89	217.0	-26.7	-1.79
4TCXP6		232.1	-12.6	-0.82	246.6	2.9	0.19
63RE4A		251.0	6.4	0.42	243.0	-0.7	-0.05
6B6Z4K		231.3	-13.3	-0.87	233.5	-10.2	-0.68
6QH94N		257.5	12.9	0.84	250.5	6.8	0.46
6YF2CH		239.6	-5.0	-0.33	235.8	-7.9	-0.53
73AH3G		244.6	0.0	0.00	228.9	-14.8	-0.99
77BKRJ		239.1	-5.5	-0.36	227.9	-15.8	-1.06
7A937X		218.8	-25.9	-1.69	232.8	-10.9	-0.74
7CX9MN		235.0	-9.6	-0.63	233.0	-10.7	-0.72
7D6TBN		248.0	3.4	0.22	244.5	0.8	0.05
836PUE		229.5	-15.1	-0.99	226.5	-17.2	-1.15
87NCHE	*	264.5	19.9	1.30	236.0	-7.7	-0.52
89UW7E		225.5	-19.1	-1.25	227.0	-16.7	-1.12
8JVV38		252.2	7.5	0.49	258.0	14.3	0.96
8QPPTX		221.5	-23.1	-1.51	232.5	-11.2	-0.75
93MQ73		240.1	-4.5	-0.30	227.3	-16.4	-1.10
AK2W2B		267.5	22.9	1.49	254.5	10.8	0.73
AYWGHY		245.8	1.2	0.08	259.6	15.9	1.07
BHP73E		256.0	11.4	0.74	268.5	24.8	1.67
C37BB2		251.5	6.9	0.45	251.0	7.3	0.49
C8N4FW		245.8	1.2	0.08	252.4	8.7	0.58
C8ZZK2	*	245.7	1.1	0.07	269.7	26.0	1.75
C9UN2B		263.9	19.3	1.26	251.8	8.1	0.54
CHHHFT		274.5	29.9	1.95	268.0	24.3	1.63
CHLEXW		248.7	4.1	0.27	250.9	7.2	0.48
CNQD72	*	285.5	40.9	2.67	283.5	39.8	2.67
CRUEKZ		267.5	22.9	1.49	247.5	3.8	0.26
CY7UPE		245.0	0.4	0.02	250.5	6.8	0.46
DNMDYT	*	275.2	30.6	2.00	281.7	38.0	2.55
DPZ8C9		266.5	21.9	1.43	264.5	20.8	1.40



Rubber Interlaboratory Testing Program

Report #198

Analysis 608

4th Qtr 2018

Stress at 100% Elongation (psi)

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
DTZTD4		236.0	-8.6	-0.56	245.5	1.8	0.12
DXD4GE		261.8	17.2	1.12	272.7	29.0	1.95
ED34VC		241.0	-3.6	-0.24	228.0	-15.7	-1.05
ERFY2F		239.2	-5.4	-0.35	257.3	13.6	0.91
F2M227		246.5	1.9	0.12	246.0	2.3	0.15
FDW9NC		248.5	3.9	0.25	260.0	16.3	1.09
FDWT8R		245.2	0.6	0.04	242.0	-1.7	-0.12
FZ8W49		246.0	1.4	0.09	241.0	-2.7	-0.18
GNAQW9		236.5	-8.1	-0.53	242.7	-1.0	-0.06
GQYLCA		236.0	-8.6	-0.56	231.5	-12.2	-0.82
H9DKWX		211.5	-33.1	-2.16	216.5	-27.2	-1.83
HFVQT6		256.5	11.9	0.78	262.3	18.6	1.25
HLJ4GQ		248.0	3.4	0.22	243.5	-0.2	-0.01
HTLHFU		259.2	14.6	0.95	257.1	13.4	0.90
JR2TFQ		256.8	12.1	0.79	254.2	10.5	0.71
JTZ8GK	X	250.2	5.6	0.36	215.4	-28.3	-1.90
KLWMRU		217.6	-27.1	-1.77	224.1	-19.6	-1.32
KN4ZBG		227.0	-17.6	-1.15	227.5	-16.2	-1.09
KX8PYQ		234.0	-10.6	-0.69	239.0	-4.7	-0.32
LKKAMX		247.5	2.9	0.19	241.0	-2.7	-0.18
LMHHFR		249.5	4.9	0.32	236.5	-7.2	-0.48
LPVVH4		241.5	-3.1	-0.21	238.6	-5.1	-0.34
LRG6HB		235.0	-9.7	-0.63	223.5	-20.2	-1.36
LRXFYV		244.2	-0.4	-0.03	244.0	0.3	0.02
LTDH8P		226.3	-18.4	-1.20	227.7	-16.0	-1.07
M644XX	X	259.0	14.4	0.94	292.0	48.3	3.24
MEN67Y		236.4	-8.2	-0.54	232.8	-10.9	-0.73
MP7JA2		228.5	-16.1	-1.05	223.0	-20.7	-1.39
N4MYRR		250.2	5.6	0.37	255.0	11.3	0.76
N7Q3PZ		236.3	-8.3	-0.54	260.3	16.6	1.12
NCT4F2		231.0	-13.6	-0.89	234.5	-9.2	-0.62
NHN7TU		242.0	-2.6	-0.17	248.0	4.3	0.29
NXYCXL		262.7	18.1	1.18	248.9	5.2	0.35
PPYPPY		217.5	-27.1	-1.77	220.0	-23.7	-1.59
QBV89J		269.0	24.4	1.59	253.5	9.8	0.66
QEYFLM		257.0	12.4	0.81	244.5	0.8	0.05
QKKYVB		220.5	-24.1	-1.58	238.0	-5.7	-0.38



Rubber Interlaboratory Testing Program

Report #198

Analysis 608

4th Qtr 2018

Stress at 100% Elongation (psi)

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
QLRHE6		237.8	-6.9	-0.45	229.1	-14.6	-0.98
RC2M2M		246.6	1.9	0.13	249.3	5.6	0.38
REVBKJ		239.0	-5.6	-0.37	232.0	-11.7	-0.79
RQ6FLR		248.0	3.4	0.22	236.5	-7.2	-0.48
RVFQEL		241.0	-3.6	-0.24	244.5	0.8	0.05
RWAEVW		234.0	-10.6	-0.69	231.1	-12.6	-0.85
RX2BJQ		241.0	-3.6	-0.24	221.5	-22.2	-1.49
TGUGQV		235.9	-8.8	-0.57	215.4	-28.3	-1.90
TJGA6B		234.5	-10.1	-0.66	239.0	-4.7	-0.32
TXGLKM		241.5	-3.1	-0.21	248.0	4.3	0.29
U78WKP		250.5	5.9	0.38	239.5	-4.2	-0.28
UK87DH		235.0	-9.7	-0.63	216.8	-26.9	-1.80
UNPZ6W		220.5	-24.2	-1.58	224.8	-18.9	-1.27
URDAGH		255.4	10.8	0.71	252.8	9.1	0.61
UT3B8J	X	187.0	-57.6	-3.77	196.5	-47.2	-3.17
WC6ZCC		224.1	-20.5	-1.34	230.6	-13.1	-0.88
WLFZ7N	X	198.0	-46.6	-3.05	227.5	-16.2	-1.09
X2LDUH		243.5	-1.1	-0.07	245.5	1.8	0.12
XBUNJW		258.0	13.4	0.87	252.5	8.8	0.59
XFNMXR		245.5	0.9	0.06	243.5	-0.2	-0.01
XYWEMR		224.3	-20.4	-1.33	236.7	-7.0	-0.47
Y9XRCE		237.1	-7.5	-0.49	245.8	2.1	0.14
YGE3PE		238.6	-6.0	-0.39	256.7	13.0	0.87
YVCEXJ		261.7	17.1	1.12	256.7	13.0	0.87
Z42MVE		233.2	-11.4	-0.74	252.9	9.2	0.62
Z86TJE		242.0	-2.6	-0.17	244.5	0.8	0.05
ZHGKZF	*	291.5	46.9	3.06	280.7	37.0	2.48
ZHN6XC		229.0	-15.6	-1.02	226.6	-17.1	-1.15

		Summary Statistics	
Grand Means	244.63 psi	243.70 psi	
Std Dev Btwn Labs	15.30 psi	14.89 psi	
Statistics based on 98 of 103 reporting participants			



Rubber Interlaboratory Testing Program
Analysis 608
Stress at 100% Elongation (psi)

Report #198
4th Qtr 2018

		Summary Statistics in SI Units	
Grand Means	1.6866 MPa	1.68	MPa
Stnd Dev Btwn Labs	0.1055 MPa	0.10	MPa
Statistics based on 98 of 103 reporting participants			

Samples D81-D82: Polyisoprene compound, batch #1 & D83-D84: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #608

- 2B22J2 (X) - Data for all samples are high. Possible Systematic Error.
- JTZ8GK (X) - Inconsistent in testing between samples.
- M644XX (X) - Data for sample group D83-D84 are high.
- UT3B8J (X) - Data for all samples are low. Possible Systematic Error.
- WLFZ7N (X) - Data for sample group D81-D82 are low. Inconsistent within the determinations of sample group D81-D82.



Rubber Interlaboratory Testing Program

Analysis 608

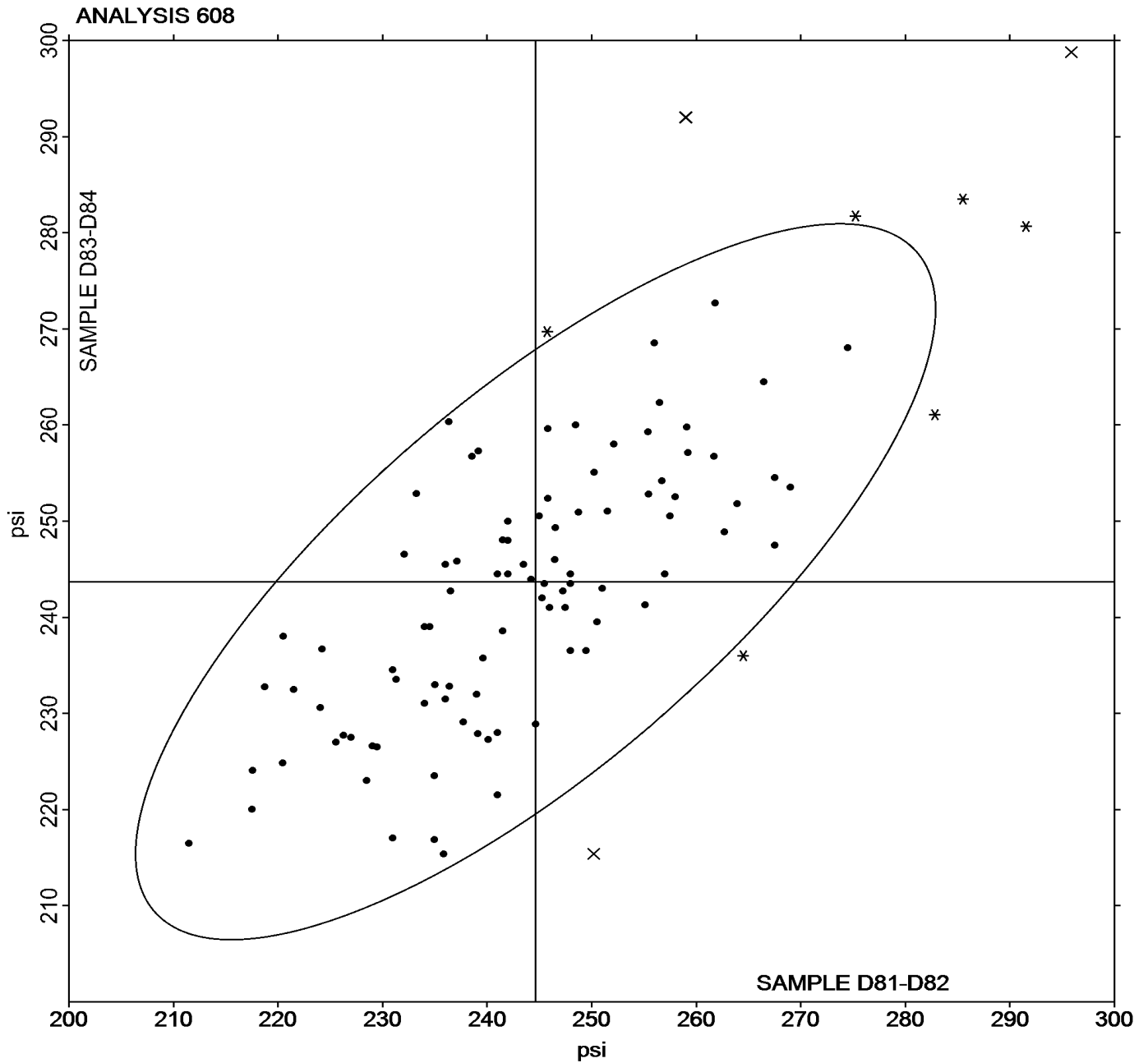
Stress at 100% Elongation (psi)

Report #198

4th Qtr 2018

Grand Mean Sample **D81-D82** = 244.63 psi

Grand Mean Sample **D83-D84** = 243.70 psi





Rubber Interlaboratory Testing Program
Analysis 620
Hardness (Shore A/Type A)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample D81-D82			Sample D83-D84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2B22J2		51.00	-0.02	-0.01	50.00	-1.07	-0.62	HH
2FT92A		53.35	2.33	1.39	53.20	2.13	1.22	HH
2XTGV3		49.50	-1.52	-0.91	49.70	-1.37	-0.79	BT
38XQZ7		49.10	-1.92	-1.15	48.80	-2.27	-1.30	BT
3BUEET		52.70	1.68	1.00	53.40	2.33	1.34	BT
42K8EJ		51.45	0.43	0.26	51.35	0.28	0.16	BT
4AYDR2		54.65	3.63	2.17	54.25	3.18	1.82	BT
4F8G2N		51.00	-0.02	-0.01	50.50	-0.57	-0.33	BT
4H9AJ7		47.00	-4.02	-2.41	47.00	-4.07	-2.34	BT
4TCXP6		51.00	-0.02	-0.01	50.25	-0.82	-0.47	XX
63RE4A		50.00	-1.02	-0.61	51.00	-0.07	-0.04	HH
6B6Z4K		53.00	1.98	1.18	54.15	3.08	1.77	BT
6QH94N		53.15	2.13	1.27	53.10	2.03	1.16	HH
6YF2CH		49.00	-2.02	-1.21	48.50	-2.57	-1.48	BT
73AH3G	*	47.75	-3.27	-1.96	46.65	-4.42	-2.54	BT
77BKRJ		50.00	-1.02	-0.61	49.50	-1.57	-0.90	BT
7A937X		49.70	-1.32	-0.79	49.95	-1.12	-0.64	BT
7CX9MN		53.00	1.98	1.18	53.00	1.93	1.11	HH
7D6TBN		50.50	-0.52	-0.31	50.00	-1.07	-0.62	BT
836PUE		53.75	2.73	1.63	53.00	1.93	1.11	HH
83PYVY		50.50	-0.52	-0.31	51.50	0.43	0.25	HH
87NCHE	*	53.00	1.98	1.18	51.50	0.43	0.25	BT
89UW7E		50.35	-0.67	-0.40	49.40	-1.67	-0.96	BT
8JVV38	X	57.00	5.98	3.58	57.50	6.43	3.69	BT
8QPPTX		52.00	0.98	0.58	51.00	-0.07	-0.04	BT
93MQ73		48.25	-2.77	-1.66	48.00	-3.07	-1.76	BT
9GFHNH		53.50	2.48	1.48	53.50	2.43	1.39	BT
A3E7TJ		50.15	-0.87	-0.52	49.85	-1.22	-0.70	BT
AK2W2B		50.00	-1.02	-0.61	50.00	-1.07	-0.62	BT
AYWGHY		50.70	-0.32	-0.19	50.50	-0.57	-0.33	BT
BHP73E		50.80	-0.22	-0.13	50.70	-0.37	-0.21	BT
C37BB2		52.15	1.13	0.67	52.15	1.08	0.62	BT
C8N4FW		51.00	-0.02	-0.01	51.50	0.43	0.25	BT
C8ZZK2		50.25	-0.77	-0.46	51.25	0.18	0.10	HH
C9UN2B		52.00	0.98	0.58	52.50	1.43	0.82	HH
CHHHFT		50.00	-1.02	-0.61	49.00	-2.07	-1.19	BT
CHLEXW		51.50	0.48	0.29	52.00	0.93	0.53	BT



Rubber Interlaboratory Testing Program
Analysis 620
Hardness (Shore A/Type A)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample D81-D82			Sample D83-D84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
CK8NVJ		50.00	-1.02	-0.61	50.00	-1.07	-0.62	XX
CNQD72		52.00	0.98	0.58	52.00	0.93	0.53	BT
CRUEKZ		54.85	3.83	2.29	54.75	3.68	2.11	XX
CV8G7V		49.75	-1.27	-0.76	50.25	-0.82	-0.47	BT
DN4WG6		50.45	-0.57	-0.34	50.20	-0.87	-0.50	BT
DNMDYT		54.30	3.28	1.96	54.80	3.73	2.14	BT
DPZ8C9		50.10	-0.92	-0.55	49.85	-1.22	-0.70	XX
DTZTD4		49.50	-1.52	-0.91	51.00	-0.07	-0.04	BT
DXD4GE		51.00	-0.02	-0.01	50.80	-0.27	-0.16	BT
DYQ4M3		53.00	1.98	1.18	52.50	1.43	0.82	HH
EC86A7		50.50	-0.52	-0.31	50.00	-1.07	-0.62	BT
ED34VC		50.00	-1.02	-0.61	49.50	-1.57	-0.90	HH
ERFY2F		49.00	-2.02	-1.21	50.50	-0.57	-0.33	HH
F2M227		53.70	2.68	1.60	53.45	2.38	1.36	BT
FDW9NC		53.35	2.33	1.39	53.75	2.68	1.54	BT
FDWT8R		51.60	0.58	0.35	51.30	0.23	0.13	BT
FWB9PM		50.40	-0.62	-0.37	51.40	0.33	0.19	BT
FZ8W49		49.30	-1.72	-1.03	49.65	-1.42	-0.82	BT
GNAQW9		51.90	0.88	0.53	52.15	1.08	0.62	BT
GQYLCA		50.50	-0.52	-0.31	50.00	-1.07	-0.62	HH
H9DKWX		49.40	-1.62	-0.97	49.00	-2.07	-1.19	HH
HFVQT6		53.45	2.43	1.45	54.35	3.28	1.88	BT
HLJ4GQ		48.05	-2.97	-1.78	48.25	-2.82	-1.62	BT
HTLHFU		53.50	2.48	1.48	52.50	1.43	0.82	HH
HVBUEY		52.00	0.98	0.58	52.00	0.93	0.53	XX
JR2TFQ		53.00	1.98	1.18	52.50	1.43	0.82	HH
JTZ8GK		53.50	2.48	1.48	54.50	3.43	1.97	HH
KLWMRU		50.20	-0.82	-0.49	49.70	-1.37	-0.79	BT
KN4ZBG		51.60	0.58	0.35	52.00	0.93	0.53	BT
KX8PYQ		49.50	-1.52	-0.91	51.00	-0.07	-0.04	HH
LKKAMX		50.80	-0.22	-0.13	50.85	-0.22	-0.13	BT
LMHHFR		51.85	0.83	0.50	51.95	0.88	0.50	BT
LPVVH4		50.85	-0.17	-0.10	50.65	-0.42	-0.24	BT
LRG6HB		50.20	-0.82	-0.49	50.10	-0.97	-0.56	BT
LRXFYV		51.00	-0.02	-0.01	50.50	-0.57	-0.33	BT
LTDH8P		50.00	-1.02	-0.61	51.00	-0.07	-0.04	HH
M644XX		50.50	-0.52	-0.31	51.50	0.43	0.25	HH
MEN67Y		49.75	-1.27	-0.76	49.50	-1.57	-0.90	BT



Rubber Interlaboratory Testing Program
Analysis 620
Hardness (Shore A/Type A)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample D81-D82			Sample D83-D84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
MP7JA2		51.05	0.03	0.02	51.90	0.83	0.47	BT
N4MYRR		49.75	-1.27	-0.76	49.15	-1.92	-1.10	BT
N7Q3PZ		51.60	0.58	0.35	51.45	0.38	0.22	BT
NCT4F2		51.00	-0.02	-0.01	51.00	-0.07	-0.04	HH
NHN7TU		50.00	-1.02	-0.61	50.00	-1.07	-0.62	BT
NXYCXL	X	61.00	9.98	5.98	61.00	9.93	5.69	BT
P6V4PT		48.50	-2.52	-1.51	49.00	-2.07	-1.19	BT
PPYPPY		50.45	-0.57	-0.34	50.95	-0.12	-0.07	BT
QBV89J		53.50	2.48	1.48	53.50	2.43	1.39	HH
QEYFLM		52.00	0.98	0.58	53.00	1.93	1.11	HH
QKKYVB		49.50	-1.52	-0.91	48.50	-2.57	-1.48	HH
QLRHE6		53.15	2.13	1.27	52.80	1.73	0.99	BT
QUP7BB		52.00	0.98	0.58	51.50	0.43	0.25	BT
R4RMJT		50.00	-1.02	-0.61	50.50	-0.57	-0.33	BT
RC2M2M		52.30	1.28	0.76	52.35	1.28	0.73	BT
REVBKJ		53.00	1.98	1.18	53.00	1.93	1.11	HH
RQ6FLR		52.00	0.98	0.58	51.00	-0.07	-0.04	BT
RVFQEL		52.00	0.98	0.58	52.50	1.43	0.82	HH
RWAEVW		51.30	0.28	0.17	51.20	0.13	0.07	BT
RX2BJQ		48.00	-3.02	-1.81	49.00	-2.07	-1.19	BT
T4884Q		51.25	0.23	0.14	50.30	-0.77	-0.44	BT
TGUGQV		48.50	-2.52	-1.51	48.00	-3.07	-1.76	BT
TJGA6B		48.00	-3.02	-1.81	49.00	-2.07	-1.19	BT
TXGLKM		51.00	-0.02	-0.01	50.00	-1.07	-0.62	HH
U78WKP		50.25	-0.77	-0.46	49.60	-1.47	-0.84	BT
UK87DH	*	54.50	3.48	2.08	55.50	4.43	2.54	HH
UNPZ6W		49.00	-2.02	-1.21	49.90	-1.17	-0.67	BT
URDAGH		51.50	0.48	0.29	50.75	-0.32	-0.18	BT
UT3B8J		52.50	1.48	0.88	52.00	0.93	0.53	BT
WC6ZCC		50.50	-0.52	-0.31	50.50	-0.57	-0.33	BT
WHW66G		51.00	-0.02	-0.01	51.00	-0.07	-0.04	BT
WLFZ7N		50.75	-0.27	-0.16	52.25	1.18	0.68	BT
X2LDUH		53.50	2.48	1.48	54.50	3.43	1.97	HH
X96G37		48.50	-2.52	-1.51	48.00	-3.07	-1.76	BT
XBUNJW		52.50	1.48	0.88	52.50	1.43	0.82	HH
XFNMXR		52.00	0.98	0.58	53.00	1.93	1.11	BT
XT8W9G		53.50	2.48	1.48	53.00	1.93	1.11	HH



Rubber Interlaboratory Testing Program
Analysis 620
Hardness (Shore A/Type A)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample D81-D82			Sample D83-D84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
XYWEMR		51.65	0.63	0.38	51.75	0.68	0.39	BT
Y9XRCE		50.50	-0.52	-0.31	51.50	0.43	0.25	BT
YGE3PE		49.50	-1.52	-0.91	49.95	-1.12	-0.64	BT
YVCEXJ	*	48.00	-3.02	-1.81	49.50	-1.57	-0.90	BT
Z42MVE		50.50	-0.52	-0.31	51.00	-0.07	-0.04	BT
Z86TJE		49.00	-2.02	-1.21	49.00	-2.07	-1.19	BT
ZHGKZF		50.40	-0.62	-0.37	50.80	-0.27	-0.16	BT
ZHN6XC		50.30	-0.72	-0.43	49.60	-1.47	-0.84	BT

Grand Means		Summary Statistics	
	51.024 Type A		51.072 Type A
Std Dev Btwn Labs	1.669 Type A		1.743 Type A
Statistics based on 118 of 120 reporting participants			

Samples D81-D82: Polyisoprene compound, batch #1 & D83-D84: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #620

- 8JV38 (X) - Data for all samples are high. Possible Systematic Error.
- NXYCXL (X) - Data for all samples are high. Possible Systematic Error.

Key to Instrument Codes Reported by Participants

- BT Benchtop
- HH Handheld
- XX Specify Benchtop or Handheld Instrument

Results by Reading Time (as reported by laboratory)

Reading Time	Sample D81-D82 <i>Polyisoprene compound, batch #1</i>			Sample D83-D84 <i>Polyisoprene compound, batch #2</i>			Labs Incl / Rpt	
	Group Mean	Btwn Lab STD	Diff from GM	Group Mean	Btwn Lab STD	Diff from GM		
Select from list below	54.85	0.00	3.83	54.75	0.00	3.68	1	1
Readings taken within 0 - 5 seconds	51.29	1.50	0.26	51.33	1.55	0.26	82	85
Readings taken at 5 seconds	50.12	1.31	-0.90	50.19	1.54	-0.88	18	19
Readings taken after 5+ seconds	50.42	1.67	-0.60	49.93	1.72	-1.14	5	6
Maximum hardness indicator used	50.35	1.93	-0.67	50.83	1.93	-0.25	8	9

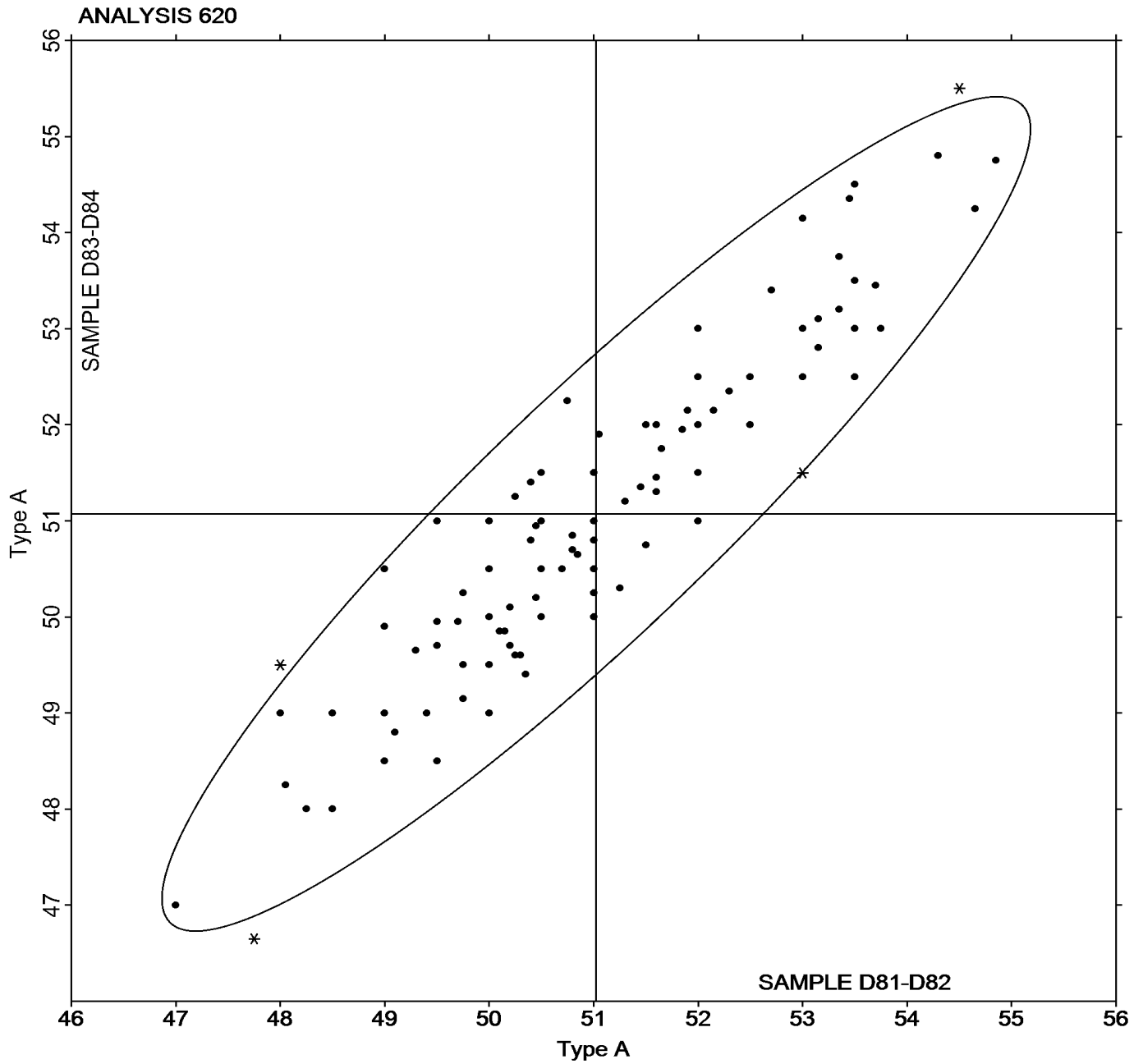


Rubber Interlaboratory Testing Program
Analysis 620
Hardness (Shore A/Type A)

Report #198
4th Qtr 2018

Grand Mean Sample **D81-D82** = 51.024 Type A

Grand Mean Sample **D83-D84** = 51.072 Type A





Rubber Interlaboratory Testing Program
Analysis 621
Density

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2FT92A		1.137	0.000	-0.14	1.136	-0.001	-0.30
2XTGV3		1.136	-0.001	-0.29	1.137	0.000	-0.14
3BUEET		1.138	0.001	0.24	1.138	0.001	0.35
42K8EJ		1.134	-0.003	-0.88	1.135	-0.002	-0.60
4AYDR2	X	1.124	-0.013	-3.95	1.127	-0.010	-3.19
4H9AJ7		1.138	0.001	0.33	1.139	0.002	0.49
4TCXP6		1.136	-0.001	-0.42	1.136	-0.001	-0.38
63RE4A		1.139	0.002	0.49	1.139	0.002	0.65
6QH94N		1.140	0.003	0.86	1.140	0.003	0.99
6YF2CH		1.136	-0.001	-0.29	1.135	-0.002	-0.77
73AH3G	X	1.129	-0.008	-2.62	1.127	-0.010	-3.29
77BKRJ		1.135	-0.001	-0.46	1.138	0.001	0.19
7A937X		1.140	0.003	0.80	1.140	0.003	0.80
7CX9MN		1.139	0.002	0.49	1.139	0.002	0.49
7D6TBN		1.137	0.000	0.02	1.138	0.001	0.33
83PYYV		1.135	-0.002	-0.60	1.138	0.001	0.33
89UW7E		1.135	-0.002	-0.76	1.136	-0.001	-0.30
8JVV38		1.131	-0.006	-1.74	1.132	-0.005	-1.63
8QPPTX		1.143	0.006	1.73	1.144	0.007	2.06
93MQ73		1.139	0.002	0.63	1.137	0.000	0.06
9GFHNH		1.139	0.002	0.52	1.136	-0.001	-0.35
AK2W2B		1.139	0.002	0.49	1.139	0.002	0.65
AYWGHY		1.135	-0.002	-0.60	1.136	-0.001	-0.30
C37BB2	X	1.134	-0.003	-1.07	1.138	0.001	0.33
C9UN2B	X	1.143	0.006	1.96	1.147	0.010	3.16
CHHHFT		1.135	-0.001	-0.46	1.134	-0.003	-1.08
CHLEXW	X	1.129	-0.008	-2.47	1.125	-0.012	-3.92
CNQD72		1.137	0.000	0.05	1.137	0.000	-0.14
CRUEKZ		1.138	0.001	0.33	1.139	0.002	0.65
CV8G7V		1.137	0.000	-0.07	1.137	0.000	0.00
CY7UPE		1.137	0.000	0.07	1.137	0.000	-0.12
DN4WG6		1.138	0.001	0.44	1.138	0.001	0.39
DNMDYT	X	1.129	-0.008	-2.55	1.125	-0.012	-3.66
DXD4GE		1.133	-0.004	-1.24	1.134	-0.003	-0.82
DYQ4M3	*	1.132	-0.005	-1.61	1.129	-0.008	-2.47
ED34VC		1.140	0.003	0.95	1.139	0.002	0.65
ERFY2F	*	1.128	-0.009	-2.78	1.130	-0.007	-2.34



Rubber Interlaboratory Testing Program
Analysis 621
Density

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
F2M227		1.137	0.000	0.13	1.138	0.001	0.38
FDWT8R		1.135	-0.002	-0.73	1.135	-0.002	-0.57
GNAQW9		1.135	-0.002	-0.74	1.136	-0.001	-0.39
GQYLCA		1.139	0.002	0.64	1.139	0.002	0.65
HFVQT6		1.133	-0.004	-1.19	1.133	-0.004	-1.16
HTLHFU	*	1.129	-0.008	-2.47	1.129	-0.008	-2.66
KLWMRU		1.141	0.004	1.11	1.140	0.003	0.93
KN4ZBG		1.137	0.000	0.02	1.138	0.001	0.33
KX8PYQ		1.138	0.001	0.42	1.138	0.001	0.25
LKKAMX		1.138	0.001	0.36	1.138	0.001	0.35
LMHHFR		1.139	0.002	0.49	1.140	0.003	0.80
LRG6HB		1.136	-0.001	-0.45	1.137	0.001	0.16
LRXFYV	*	1.138	0.001	0.18	1.135	-0.002	-0.77
M644XX		1.137	0.000	0.13	1.138	0.001	0.17
MEN67Y		1.137	0.000	0.02	1.137	0.000	0.02
MP7JA2		1.143	0.006	1.92	1.143	0.006	1.81
N4MYRR		1.136	-0.001	-0.43	1.136	-0.001	-0.22
N7Q3PZ		1.140	0.003	0.95	1.140	0.003	0.96
NCT4F2		1.142	0.005	1.56	1.142	0.005	1.54
NHN7TU		1.140	0.003	0.95	1.138	0.001	0.33
NXYCXL		1.132	-0.005	-1.53	1.131	-0.006	-2.03
P6V4PT		1.140	0.003	0.80	1.140	0.003	0.96
PPYPPY		1.135	-0.002	-0.71	1.135	-0.002	-0.66
QBV89J		1.139	0.002	0.64	1.138	0.001	0.17
QEYFLM		1.138	0.001	0.33	1.137	0.000	0.02
QKKYVB		1.138	0.001	0.33	1.139	0.002	0.49
QLRHE6		1.133	-0.004	-1.22	1.134	-0.003	-0.99
QUP7BB		1.140	0.003	0.95	1.138	0.001	0.33
RC2M2M	*	1.128	-0.009	-2.83	1.128	-0.009	-2.72
REVBKJ		1.132	-0.005	-1.53	1.132	-0.005	-1.56
RQ6FLR		1.139	0.002	0.77	1.140	0.003	0.90
RVFQEL		1.131	-0.006	-1.83	1.131	-0.006	-1.82
RWAEVW		1.141	0.004	1.17	1.141	0.004	1.18
RX2BJQ	X	1.144	0.007	2.04	1.139	0.002	0.65
T4884Q		1.139	0.002	0.75	1.139	0.002	0.76
TJGA6B		1.131	-0.006	-1.85	1.133	-0.004	-1.24
U78WKP		1.139	0.002	0.53	1.140	0.003	1.01
URDAGH	X	1.150	0.013	4.06	1.150	0.013	4.11



Rubber Interlaboratory Testing Program
Analysis 621
Density

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample D81-D82			Sample D83-D84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
UT3B8J		1.138	0.001	0.18	1.138	0.001	0.17
WHW66G		1.137	0.000	-0.14	1.136	-0.001	-0.46
WLFZ7N		1.138	0.002	0.47	1.140	0.003	0.80
X2LDUH		1.138	0.001	0.33	1.138	0.001	0.17
XBUNJW		1.142	0.005	1.58	1.141	0.004	1.27
XFNMXR		1.142	0.005	1.52	1.143	0.006	1.89
XYWEMR		1.141	0.004	1.31	1.140	0.003	0.91
Y9XRCE		1.138	0.001	0.44	1.139	0.002	0.61
YGE3PE		1.136	0.000	-0.15	1.136	-0.001	-0.22
YVCEXJ		1.138	0.001	0.18	1.139	0.002	0.49
Z42MVE		1.137	0.000	-0.07	1.136	-0.001	-0.28
ZHGKZF	X	1.126	-0.011	-3.46	1.125	-0.012	-3.66
ZHN6XC	*	1.139	0.002	0.61	1.136	-0.001	-0.42

Summary Statistics			
Grand Means	1.1369	g/cm ³ (Mg/m ³)	1.1369 g/cm ³ (Mg/m ³)
Stnd Dev Btwn Labs	0.0032	g/cm ³ (Mg/m ³)	0.0032 g/cm ³ (Mg/m ³)
Statistics based on 79 of 88 reporting participants			

Samples D81-D82: Polyisoprene compound, batch #1 & D83-D84: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #621

- 4AYDR2 (X) - Data for all samples are low. Possible Systematic Error. Inconsistent within the determinations of sample group D81-D82.
- 73AH3G (X) - Data for sample group D83-D84 are low. Inconsistent within the determinations of sample group D81-D82.
- C37BB2 (X) - Inconsistent in testing between samples.
- C9UN2B (X) - Data for sample group D83-D84 are high.
- CHLEXW (X) - Data for sample group D83-D84 are low.
- DNMDYT (X) - Data for sample group D83-D84 are low.
- RX2BJQ (X) - Inconsistent in testing between samples.
- URDAGH (X) - Data for all samples are high. Possible Systematic Error.
- ZHGKZF (X) - Data for all samples are low. Possible Systematic Error. Inconsistent within the determinations of sample group D83-D84.

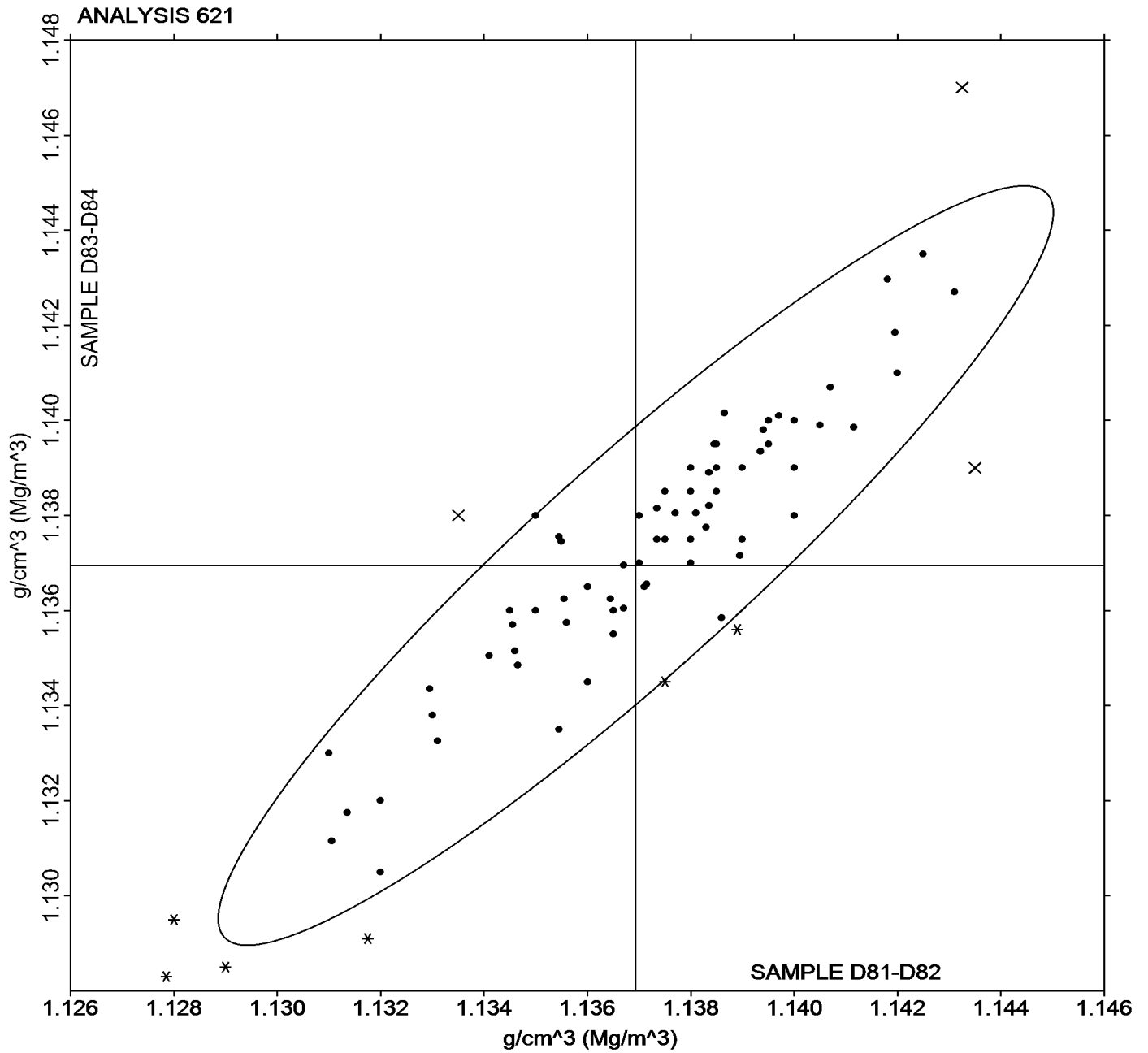


Rubber Interlaboratory Testing Program
Analysis 621
Density

Report #198
4th Qtr 2018

Grand Mean Sample **D81-D82** = 1.1369 g/cm³
(Mg/m³)

Grand Mean Sample **D83-D84** = 1.1369 g/cm³
(Mg/m³)





Rubber Interlaboratory Testing Program
Analysis 625
Hardness (Shore D/Type D)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample HD81-HD82			Sample HD83-HD84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
38XQZ7		72.10	-3.27	-1.49	80.80	-2.92	-1.35	BT
4Z9PXY		73.75	-1.62	-0.74	82.75	-0.97	-0.45	BT
6B6Z4K		74.50	-0.87	-0.39	83.00	-0.72	-0.33	BT
8BDJP8		78.50	3.13	1.43	87.00	3.28	1.51	BT
A3E7TJ		73.45	-1.92	-0.87	83.45	-0.27	-0.13	BT
AEAG4B		74.30	-1.07	-0.49	82.45	-1.27	-0.59	BT
B4MFLF		73.05	-2.32	-1.06	81.60	-2.12	-0.98	BT
CVRXKD		76.60	1.23	0.56	84.30	0.58	0.27	HH
DKM8H2		77.50	2.13	0.97	83.50	-0.22	-0.10	BT
GQYLCA		76.00	0.63	0.29	84.00	0.28	0.13	HH
L7F9PM		74.10	-1.27	-0.58	82.73	-1.00	-0.46	BT
L7FJRX		75.00	-0.37	-0.17	83.50	-0.22	-0.10	BT
LJZQF7		75.00	-0.37	-0.17	82.00	-1.72	-0.79	BT
NEKZ6V		77.00	1.63	0.75	86.00	2.28	1.05	XX
WEED8F		80.50	5.13	2.34	89.50	5.78	2.66	BT
WLFZ7N		74.50	-0.87	-0.39	83.00	-0.72	-0.33	BT

Grand Means		Summary Statistics	
	75.366 Type D		83.723 Type D
Std Dev Btwn Labs	2.193 Type D		2.168 Type D
Statistics based on 16 of 16 reporting participants			

Samples HD81-HD82: Hardness Disc, batch #1 & HD83-HD84: Hardness Disc, batch #2

Key to Instrument Codes Reported by Participants

- BT Benchtop
- HH Handheld
- XX Specify Benchtop or Handheld Instrument

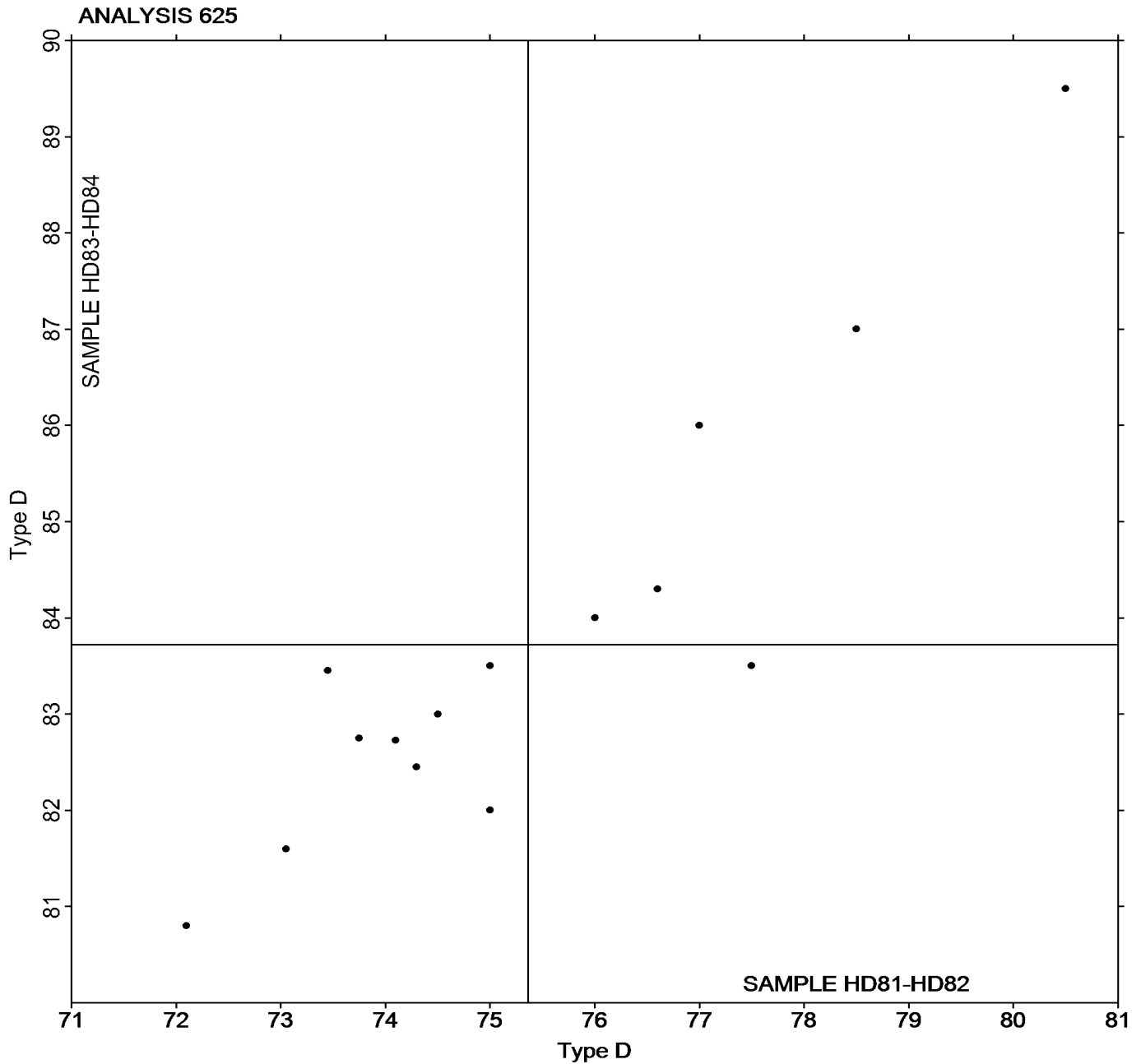


Rubber Interlaboratory Testing Program
Analysis 625
Hardness (Shore D/Type D)

Report #198
4th Qtr 2018

Grand Mean Sample **HD81-HD82** = 75.366 Type D

Grand Mean Sample **HD83-HD84** = 83.723 Type D



If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.



Rubber Interlaboratory Testing Program

Report #198

Analysis 630

4th Qtr 2018

Tensile Strength: Precured vs. Lab-Cured Samples (psi)

WebCode	Data Flag	Sample D81-D82			Sample M81-M82		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2FT92A	*	3,178.5	-92.9	-0.61	1,855.0	-821.3	-3.01
42K8EJ	*	3,333.5	62.2	0.41	1,835.6	-840.8	-3.09
4TCXP6		3,328.6	57.3	0.38	2,501.9	-174.4	-0.64
6B6Z4K		3,314.1	42.8	0.28	2,763.0	86.7	0.32
6QH94N		3,253.0	-18.4	-0.12	2,758.0	81.7	0.30
6YF2CH		3,321.2	49.8	0.33	2,767.9	91.6	0.34
7CX9MN		3,366.9	95.5	0.63	2,716.7	40.4	0.15
7D6TBN		3,006.5	-264.9	-1.75	2,618.0	-58.3	-0.21
87NCHE		3,326.0	54.6	0.36	2,856.0	179.7	0.66
89UW7E		3,372.2	100.8	0.67	2,995.1	318.7	1.17
93MQ73		3,081.1	-190.3	-1.26	2,615.0	-61.3	-0.22
AYWGHY		3,251.0	-20.3	-0.13	2,679.6	3.3	0.01
BHP73E		3,247.5	-23.9	-0.16	2,858.0	181.7	0.67
C9UN2B		3,192.4	-79.0	-0.52	2,819.6	143.2	0.53
CRUEKZ		3,320.5	49.1	0.32	2,618.5	-57.8	-0.21
DPZ8C9		3,240.0	-31.4	-0.21	2,906.0	229.7	0.84
ED34VC		3,079.0	-192.4	-1.27	2,600.0	-76.3	-0.28
ERFY2F		3,268.5	-2.9	-0.02	2,764.9	88.6	0.32
F2M227		3,341.0	69.6	0.46	3,043.0	366.7	1.35
FDWT8R		3,338.4	67.1	0.44	2,732.7	56.4	0.21
GNAQW9		3,428.4	157.0	1.04	2,825.4	149.0	0.55
HFVQT6	X	3,418.8	147.4	0.97	1,623.0	-1,053.4	-3.87
HTLHFU		3,519.9	248.5	1.64	3,093.4	417.0	1.53
JR2TFQ	*	3,637.5	366.1	2.42	2,553.0	-123.4	-0.45
KN4ZBG		3,281.0	9.6	0.06	2,520.5	-155.8	-0.57
LMHHFR		3,095.5	-175.9	-1.16	2,733.5	57.2	0.21
LTDH8P		3,171.3	-100.1	-0.66	2,486.0	-190.4	-0.70
MP7JA2		3,245.1	-26.3	-0.17	2,857.2	180.8	0.66
QKKYVB		2,936.5	-334.9	-2.21	2,527.5	-148.8	-0.55
QLRHE6		3,484.0	212.6	1.40	2,854.2	177.8	0.65
REVBKJ		3,323.5	52.1	0.34	2,486.0	-190.3	-0.70
RWAEVW		3,210.2	-61.2	-0.40	2,856.4	180.0	0.66
RX2BJQ		2,966.0	-305.4	-2.02	2,547.0	-129.3	-0.47
TJGA6B		3,307.5	36.1	0.24	2,859.3	182.9	0.67
UK87DH		2,994.3	-277.0	-1.83	2,844.2	167.9	0.62
XBUNJW		3,300.0	28.6	0.19	2,748.0	71.7	0.26
XYWEMF		3,334.8	63.4	0.42	2,599.5	-76.9	-0.28
YVCEXJ		3,498.4	227.0	1.50	3,005.2	328.9	1.21



Rubber Interlaboratory Testing Program

Report #198

Analysis 630

4th Qtr 2018

Tensile Strength: Precured vs. Lab-Cured Samples (psi)

WebCode	Data Flag	Sample D81-D82			Sample M81-M82		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
Z42MVE		3,334.6	63.2	0.42	2,085.3	-591.1	-2.17
ZHN6XC		3,355.2	83.8	0.55	2,591.5	-84.9	-0.31

		Summary Statistics	
Grand Means		3,271.37 psi	2,676.34 psi
Std Dev Btwn Labs		151.37 psi	272.53 psi
Statistics based on 39 of 40 reporting participants			

		Summary Statistics in SI Units	
Grand Means		22.555 MPa	18.45 MPa
Std Dev Btwn Labs		1.044 MPa	1.88 MPa
Statistics based on 39 of 40 reporting participants			

Samples D81-D82: Polyisoprene compound, batch #1 & M81-M82: Polyisoprene compound, batch #1

Comments on Assigned Data Flags for Test #630

HFVQT6 (X) - Data for sample group M81-M82 are low.



Rubber Interlaboratory Testing Program

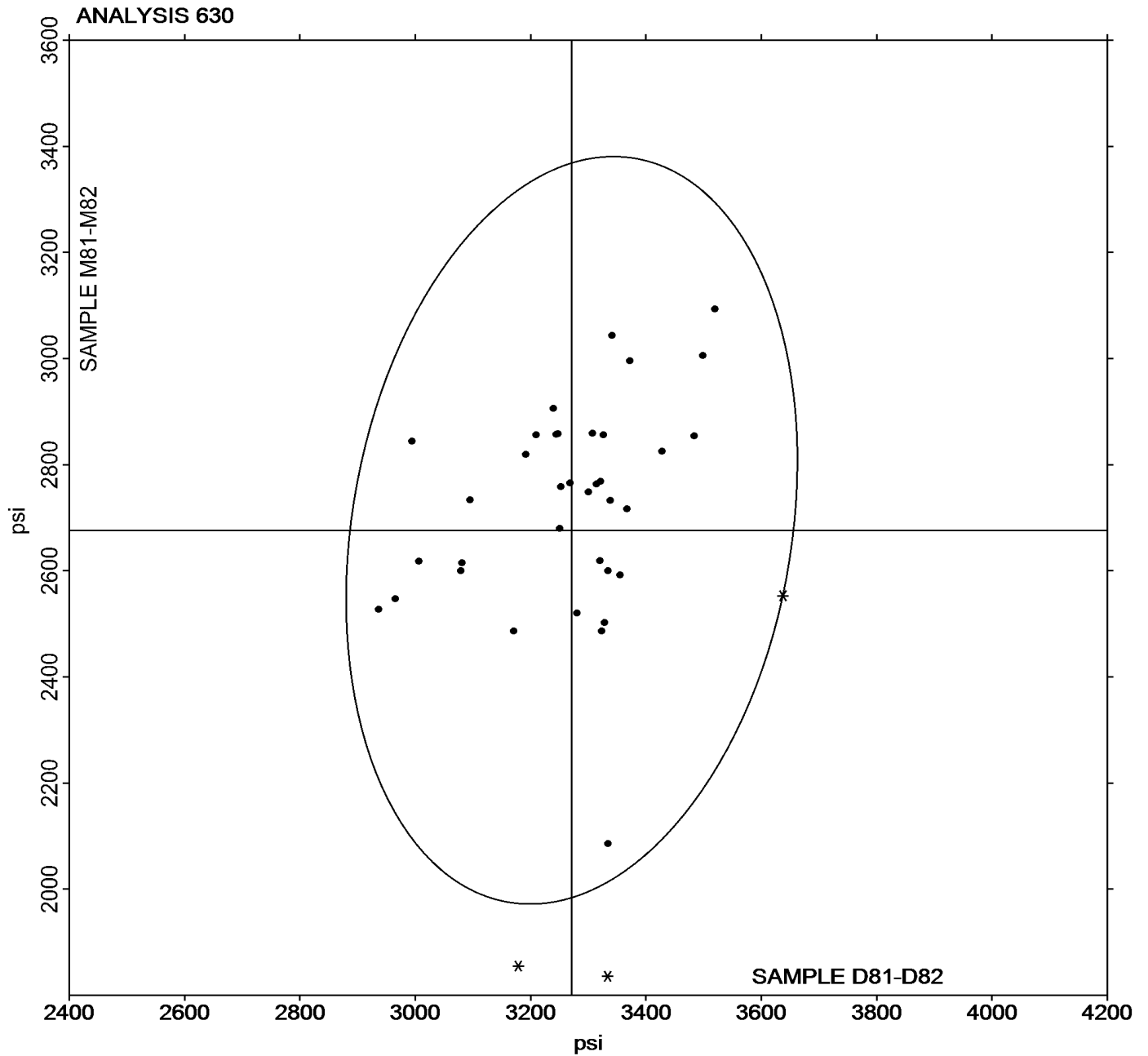
Analysis 630

Tensile Strength: Precured vs. Lab-Cured Samples (psi)

Report #198
4th Qtr 2018

Grand Mean Sample **D81-D82** = 3,271.37 psi

Grand Mean Sample **M81-M82** = 2,676.34 psi





Rubber Interlaboratory Testing Program

Report #198

Analysis 631

4th Qtr 2018

Ultimate Elongation: Precured vs. Lab-Cured Samples (percent)

WebCode	Data Flag	Sample D81-D82			Sample M81-M82		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2FT92A		559.0	-31.7	-1.01	457.4	-72.8	-1.69
42K8EJ	*	619.4	28.7	0.91	436.6	-93.6	-2.17
4TCXP6		617.8	27.0	0.86	520.5	-9.8	-0.23
6B6Z4K		591.2	0.5	0.02	535.1	4.8	0.11
6QH94N		602.5	11.8	0.37	582.5	52.3	1.21
6YF2CH		591.4	0.6	0.02	559.2	29.0	0.67
7CX9MN		601.0	10.3	0.33	522.0	-8.2	-0.19
7D6TBN		548.0	-42.7	-1.36	510.0	-20.2	-0.47
87NCHE		555.5	-35.2	-1.12	533.0	2.8	0.06
89UW7E		602.5	11.8	0.37	557.0	26.8	0.62
93MQ73		611.5	20.8	0.66	573.0	42.8	0.99
AYWGHY		583.0	-7.7	-0.24	517.0	-13.2	-0.31
BHP73E		536.5	-54.2	-1.72	490.0	-40.2	-0.93
C9UN2B		554.3	-36.4	-1.16	530.9	0.7	0.02
CRUEKZ		561.0	-29.7	-0.94	513.0	-17.2	-0.40
DPZ8C9		569.5	-21.2	-0.67	543.0	12.8	0.30
ED34VC		555.0	-35.7	-1.13	512.5	-17.7	-0.41
ERFY2F		584.2	-6.5	-0.21	531.7	1.5	0.03
F2M227		595.0	4.3	0.14	581.5	51.3	1.19
FDWT8R		580.3	-10.4	-0.33	481.3	-48.9	-1.14
GNAQW9		606.5	15.8	0.50	540.2	10.0	0.23
HFVQT6	*	573.5	-17.2	-0.55	414.6	-115.6	-2.68
HTLHFU		605.2	14.5	0.46	578.8	48.6	1.13
JR2TFQ		607.3	16.6	0.53	514.2	-16.0	-0.37
KN4ZBG		629.0	38.3	1.22	532.5	2.3	0.05
LMHHFR		574.5	-16.2	-0.51	530.0	-0.2	0.00
LTDH8P		645.5	54.8	1.74	577.5	47.3	1.10
MP7JA2		586.5	-4.2	-0.13	537.0	6.8	0.16
QKKYVB	X	719.5	128.8	4.09	642.5	112.3	2.61
QLRHE6		639.9	49.2	1.56	584.8	54.6	1.27
REVBKJ		586.5	-4.2	-0.13	502.0	-28.2	-0.66
RWAEVW		577.5	-13.2	-0.42	533.0	2.8	0.06
RX2BJQ		513.0	-77.7	-2.47	508.5	-21.7	-0.50
TJGA6B		562.0	-28.7	-0.91	524.5	-5.7	-0.13
UK87DH		595.5	4.8	0.15	545.5	15.3	0.36
XBUNJW		587.5	-3.2	-0.10	602.5	72.3	1.68
XYWEMF		609.9	19.1	0.61	512.7	-17.5	-0.41
YVCEXJ	*	668.8	78.1	2.48	641.1	110.9	2.58



Rubber Interlaboratory Testing Program

Report #198

Analysis 631

4th Qtr 2018

Ultimate Elongation: Precured vs. Lab-Cured Samples (percent)

WebCode	Data Flag	Sample D81-D82			Sample M81-M82		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
Z42MVE		627.4	36.7	1.17	496.5	-33.7	-0.78
ZHN6XC		623.0	32.3	1.02	515.0	-15.2	-0.35

Summary Statistics	
Grand Means	
	590.70 percent
	530.21 percent
Stnd Dev Btwn Labs	
	31.49 percent
	43.06 percent
Statistics based on 39 of 40 reporting participants	

Samples D81-D82: Polyisoprene compound, batch #1 & M81-M82: Polyisoprene compound, batch #1

Comments on Assigned Data Flags for Test #631

QKKYVB (X) - Data for sample group D81-D82 are high. Inconsistent within the determinations of both sample groups.



Rubber Interlaboratory Testing Program

Analysis 631

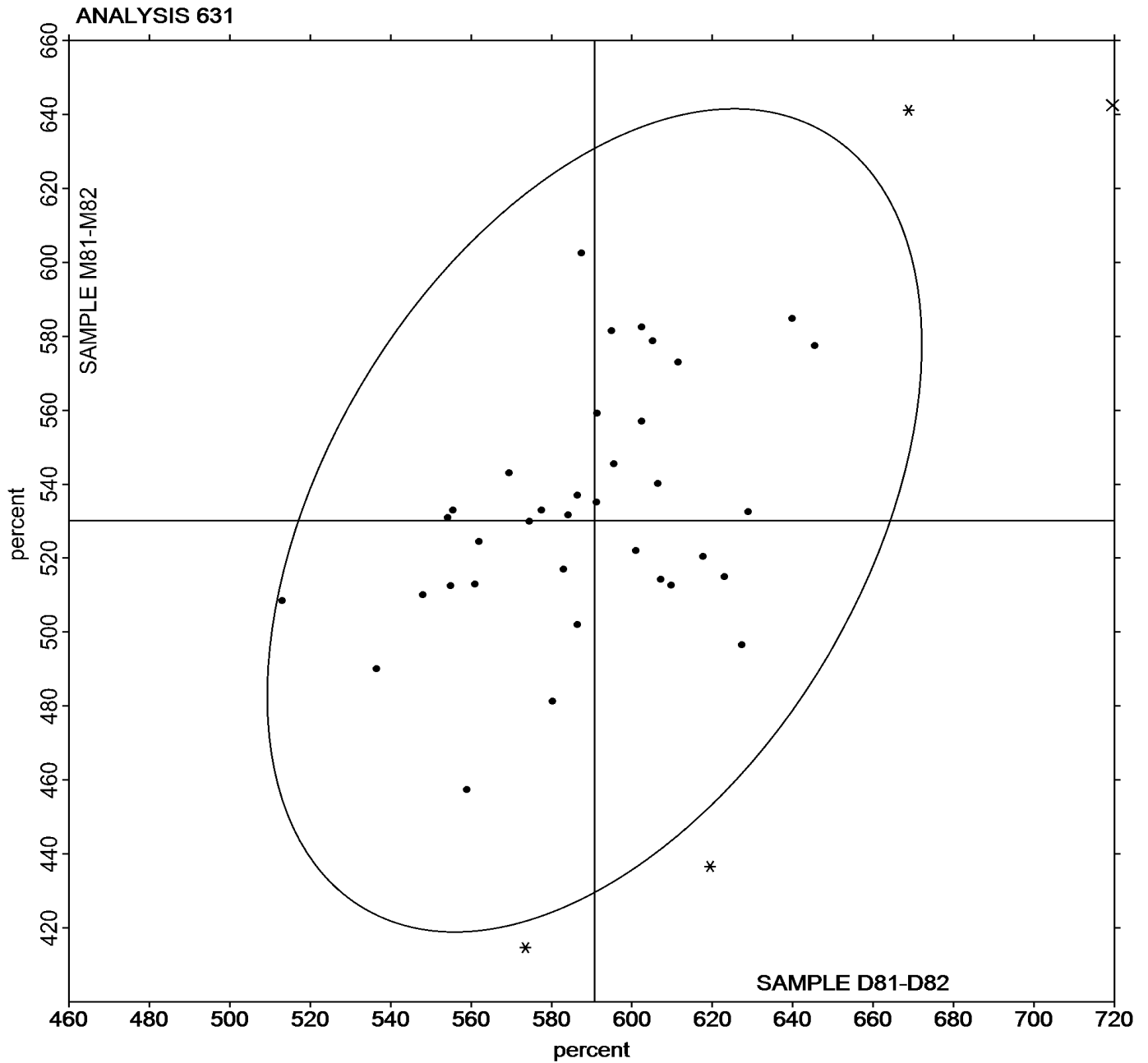
Report #198

4th Qtr 2018

Ultimate Elongation: Precured vs. Lab-Cured Samples (percent)

Grand Mean Sample **D81-D82** = 590.70 percent

Grand Mean Sample **M81-M82** = 530.21 percent





Rubber Interlaboratory Testing Program

Report #198

Analysis 632

4th Qtr 2018

Stress at 300% Elongation: Precured vs. Lab-Cured Samples (psi)

WebCode	Data Flag	Sample D81-D82			Sample M81-M82		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2FT92A		1,131.5	5.0	0.07	900.5	-164.9	-1.67
42K8EJ		1,101.8	-24.7	-0.34	1,054.0	-11.4	-0.11
4TCXP6		1,102.3	-24.2	-0.33	1,095.0	29.7	0.30
6B6Z4K		1,133.5	7.0	0.10	1,101.6	36.2	0.37
6QH94N		1,133.5	7.0	0.10	1,037.5	-27.9	-0.28
6YF2CH		1,130.5	3.9	0.05	987.0	-78.4	-0.79
7CX9MN		1,106.5	-20.0	-0.28	1,123.0	57.6	0.58
7D6TBN		1,160.5	34.0	0.47	1,085.0	19.6	0.20
87NCHE		1,251.5	125.0	1.73	1,103.0	37.6	0.38
89UW7E		1,019.6	-106.9	-1.48	1,118.3	52.9	0.53
93MQ73		1,015.3	-111.2	-1.54	959.6	-105.7	-1.07
AYWGHY		1,151.6	25.1	0.35	1,149.4	84.1	0.85
BHP73E	*	1,303.0	176.5	2.44	1,343.0	277.6	2.81
C9UN2B		1,178.8	52.3	0.72	1,122.5	57.2	0.58
CRUEKZ		1,224.5	98.0	1.36	1,054.5	-10.9	-0.11
DPZ8C9		1,232.0	105.5	1.46	1,164.5	99.1	1.00
ED34VC		1,122.0	-4.5	-0.06	1,110.5	45.1	0.46
ERFY2F		1,132.1	5.6	0.08	1,049.8	-15.5	-0.16
F2M227		1,120.5	-6.0	-0.08	1,043.5	-21.9	-0.22
FDWT8R		1,158.6	32.1	0.44	1,272.4	207.1	2.09
GNAQW9		1,091.0	-35.5	-0.49	1,059.2	-6.1	-0.06
HFVQT6		1,229.1	102.6	1.42	949.8	-115.5	-1.17
HTLHFU		1,203.6	77.1	1.07	1,080.7	15.3	0.15
JR2TFQ		1,185.0	58.5	0.81	1,120.0	54.7	0.55
KN4ZBG		1,018.5	-108.0	-1.49	1,012.0	-53.4	-0.54
LMHHFR		1,133.5	7.0	0.10	1,142.5	77.1	0.78
LTDH8P	*	951.5	-175.0	-2.42	842.7	-222.7	-2.25
MP7JA2		1,093.6	-32.9	-0.45	1,095.0	29.6	0.30
QKKYVB	X	746.5	-380.0	-5.26	895.0	-170.4	-1.72
QLRHE6		1,047.1	-79.4	-1.10	1,014.9	-50.4	-0.51
REVBKJ		1,097.5	-29.0	-0.40	1,077.5	12.1	0.12
RWAEVW		1,117.2	-9.4	-0.13	1,116.9	51.5	0.52
RX2BJQ		1,192.5	66.0	0.91	1,058.5	-6.9	-0.07
TJGA6B		1,151.5	25.0	0.35	1,100.0	34.6	0.35
UK87DH		1,082.0	-44.5	-0.62	1,061.7	-3.7	-0.04
XBUNJW	*	1,179.0	52.5	0.73	841.5	-223.9	-2.26
XYWEMF		1,091.9	-34.6	-0.48	1,114.4	49.0	0.50
YVCEXJ		1,029.6	-96.9	-1.34	934.5	-130.9	-1.32



Rubber Interlaboratory Testing Program

Report #198

Analysis 632

4th Qtr 2018

Stress at 300% Elongation: Precured vs. Lab-Cured Samples (psi)

WebCode	Data Flag	Sample D81-D82			Sample M81-M82		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
Z42MVE		1,078.1	-48.4	-0.67	930.1	-135.3	-1.37
ZHN6XC		1,052.0	-74.5	-1.03	1,122.3	57.0	0.58

Summary Statistics	
Grand Means	
	1,126.50 psi
Std Dev Btwn Labs	
	72.31 psi
	1,065.35 psi
	98.97 psi
	Statistics based on 39 of 40 reporting participants

Summary Statistics in SI Units	
Grand Means	
	7.7669 MPa
Std Dev Btwn Labs	
	0.4986 MPa
	7.35 MPa
	0.68 MPa
	Statistics based on 39 of 40 reporting participants

Samples D81-D82: Polyisoprene compound, batch #1 & M81-M82: Polyisoprene compound, batch #1

Comments on Assigned Data Flags for Test #632

QKKYVB (X) - Data for sample group D81-D82 are low. Inconsistent within the determinations of sample group D81-D82.



Rubber Interlaboratory Testing Program

Report #198

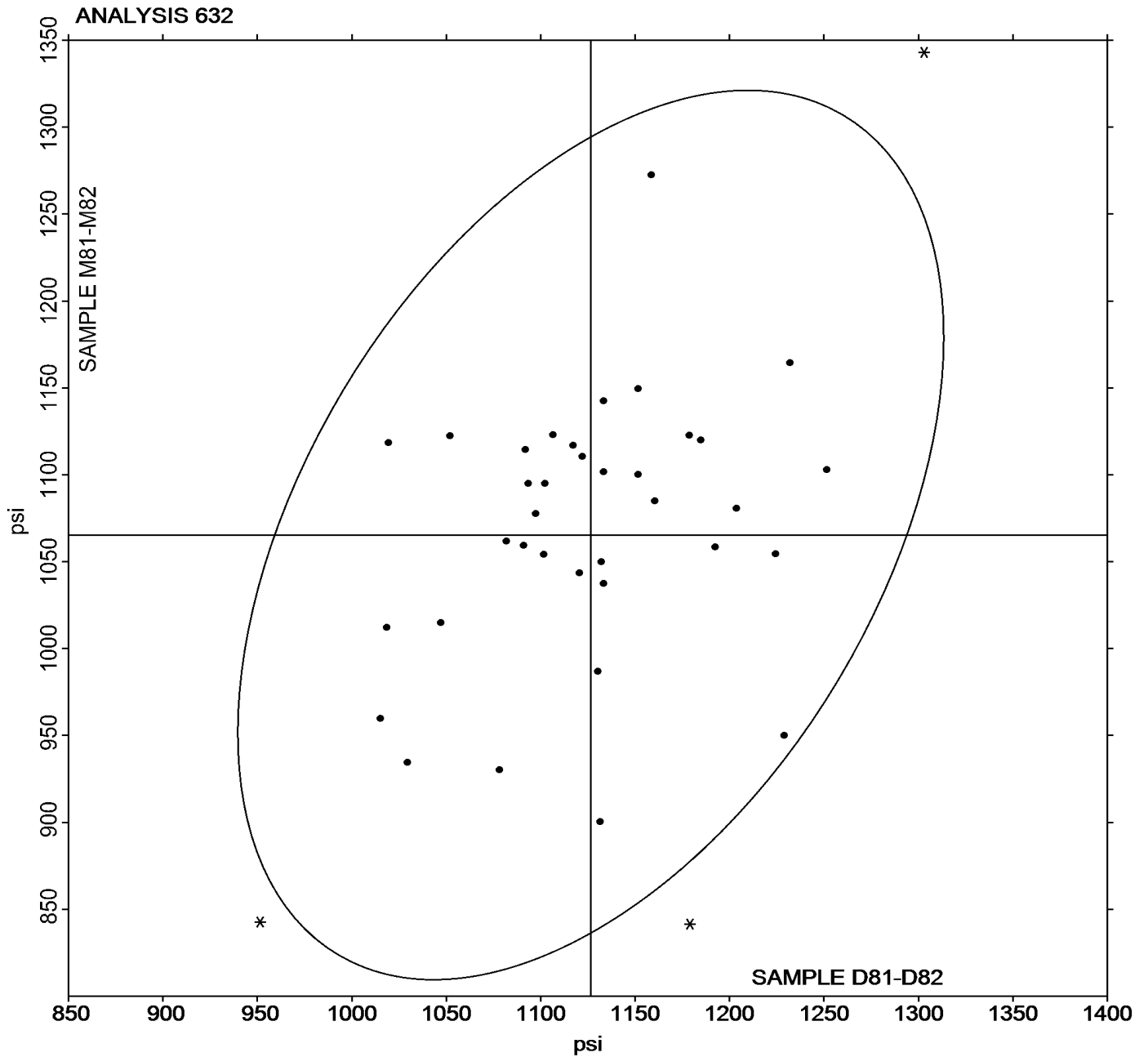
Analysis 632

4th Qtr 2018

Stress at 300% Elongation: Precured vs. Lab-Cured Samples (psi)

Grand Mean Sample **D81-D82** = 1,126.50 psi

Grand Mean Sample **M81-M82** = 1,065.35 psi





Rubber Interlaboratory Testing Program

Report #198

Analysis 633

4th Qtr 2018

Stress at 100% Elongation: Precured vs. Lab-Cured Samples (psi)

WebCode	Data Flag	Sample D81-D82			Sample M81-M82		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2FT92A	*	255.1	11.7	0.89	194.8	-33.3	-2.18
42K8EJ		247.2	3.8	0.29	223.2	-4.8	-0.31
4TCXP6		232.1	-11.3	-0.86	239.3	11.3	0.74
6B6Z4K		231.3	-12.1	-0.92	227.0	-1.0	-0.07
6QH94N		257.5	14.1	1.07	226.5	-1.5	-0.10
6YF2CH		239.6	-3.8	-0.29	205.3	-22.8	-1.49
7CX9MN		235.0	-8.4	-0.64	231.5	3.5	0.23
7D6TBN		248.0	4.6	0.35	230.0	2.0	0.13
87NCHE		264.5	21.1	1.60	234.5	6.5	0.42
89UW7E		225.5	-17.9	-1.36	248.0	20.0	1.31
93MQ73		240.1	-3.3	-0.25	234.3	6.3	0.41
AYWGHY		245.8	2.4	0.19	243.7	15.6	1.02
BHP73E		256.0	12.6	0.96	256.5	28.5	1.87
C9UN2B		263.9	20.5	1.56	244.9	16.8	1.10
CRUEKZ		267.5	24.1	1.83	232.5	4.5	0.29
DPZ8C9		266.5	23.1	1.76	255.0	27.0	1.77
ED34VC		241.0	-2.4	-0.18	229.5	1.5	0.10
ERFY2F		239.2	-4.2	-0.32	219.3	-8.8	-0.57
F2M227		246.5	3.1	0.24	230.0	2.0	0.13
FDWT8R		245.2	1.8	0.14	242.7	14.7	0.96
GNAQW9		236.5	-6.9	-0.52	230.1	2.1	0.13
HFVQT6	*	256.5	13.1	1.00	191.1	-36.9	-2.42
HTLHFU		259.2	15.8	1.20	236.8	8.7	0.57
JR2TFQ		256.8	13.4	1.01	229.2	1.1	0.07
KN4ZBG		227.0	-16.4	-1.25	222.0	-6.0	-0.40
LMHHFR		249.5	6.1	0.46	246.5	18.5	1.21
LTDH8P		226.3	-17.1	-1.30	206.0	-22.1	-1.45
MP7JA2		228.5	-14.9	-1.13	216.1	-12.0	-0.79
QKKYVB		220.5	-22.9	-1.74	203.0	-25.0	-1.64
QLRHE6		237.8	-5.6	-0.43	232.7	4.7	0.31
REVBKJ		239.0	-4.4	-0.33	225.0	-3.0	-0.20
RWAEVW		234.0	-9.4	-0.71	231.3	3.3	0.21
RX2BJQ		241.0	-2.4	-0.18	225.5	-2.5	-0.17
TJGA6B		234.5	-8.9	-0.68	224.0	-4.0	-0.26
UK87DH		235.0	-8.4	-0.64	225.5	-2.5	-0.16
XBUNJW		258.0	14.6	1.11	217.0	-11.0	-0.72
XYWEMF		224.3	-19.1	-1.45	228.5	0.4	0.03
YVCEXJ		261.7	18.3	1.39	247.2	19.2	1.26



Rubber Interlaboratory Testing Program

Report #198

Analysis 633

4th Qtr 2018

Stress at 100% Elongation: Precured vs. Lab-Cured Samples (psi)

WebCode	Data Flag	Sample D81-D82			Sample M81-M82		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
Z42MVE		233.2	-10.2	-0.77	200.8	-27.2	-1.78
ZHN6XC		229.0	-14.4	-1.09	234.7	6.7	0.44

		Summary Statistics	
Grand Means		243.40 psi	228.03 psi
Std Dev Btwn Labs		13.16 psi	15.26 psi
Statistics based on 40 of 40 reporting participants			

		Summary Statistics in SI Units	
Grand Means		1.6781 MPa	1.57 MPa
Std Dev Btwn Labs		0.0908 MPa	0.11 MPa
Statistics based on 40 of 40 reporting participants			

Samples D81-D82: Polyisoprene compound, batch #1 & M81-M82: Polyisoprene compound, batch #1



Rubber Interlaboratory Testing Program

Report #198

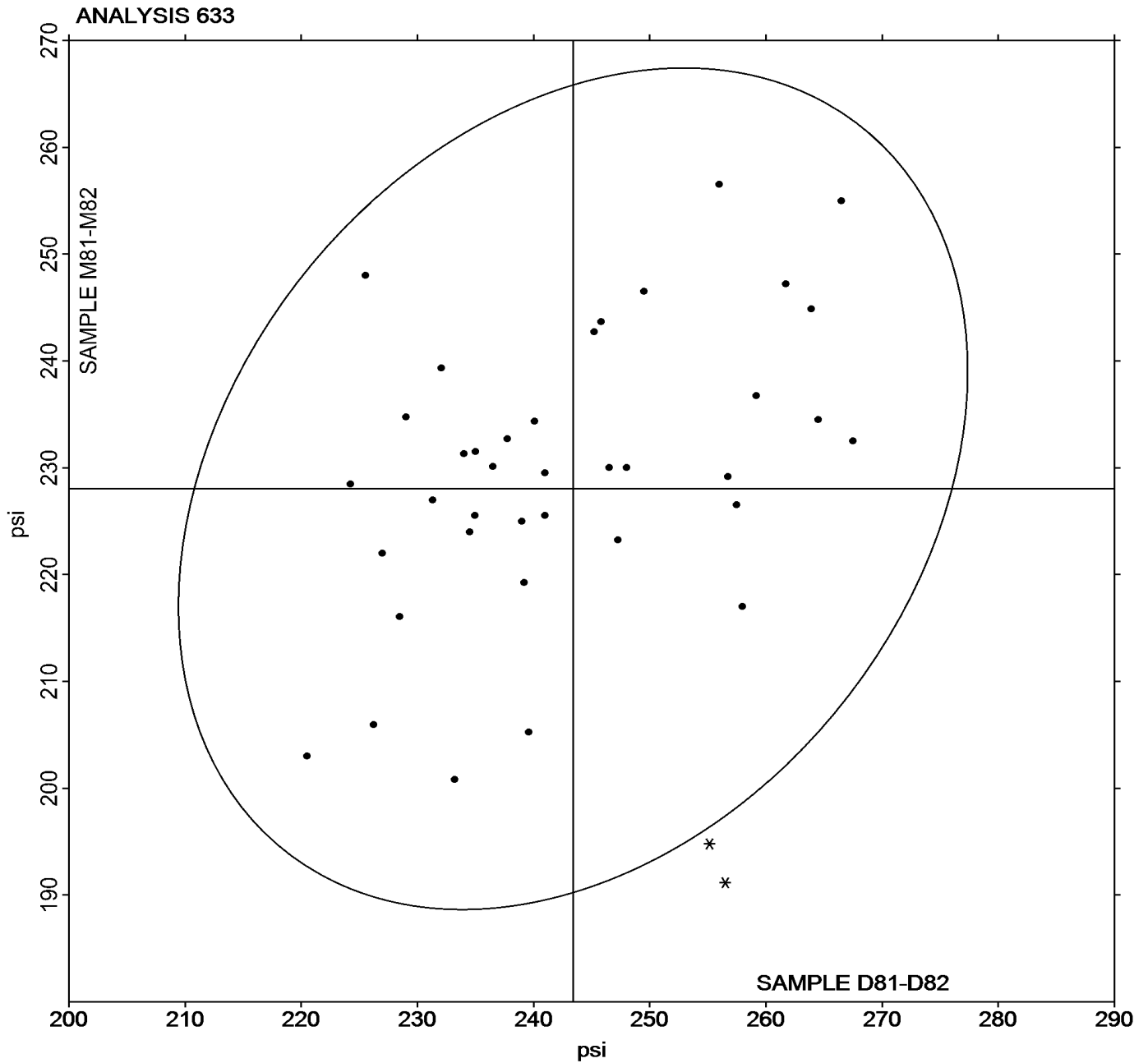
Analysis 633

4th Qtr 2018

Stress at 100% Elongation: Precured vs. Lab-Cured Samples (psi)

Grand Mean Sample **D81-D82** = 243.40 psi

Grand Mean Sample **M81-M82** = 228.03 psi





Rubber Interlaboratory Testing Program

Report #198

Analysis 660

4th Qtr 2018

Mooney Viscosity: 4-minute readings (ML 1 + 4)

WebCode	Data Flag	Sample V81-V82			Sample V83-V84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FT92A	M	45.30	-2.89	-2.46	No data reported for this sample			MR
4Q7D26		48.65	0.45	0.38	58.00	0.36	0.27	MR
6B6Z4K		47.25	-0.95	-0.81	56.68	-0.96	-0.74	MR
77BKRJ		48.59	0.39	0.33	59.11	1.46	1.13	MR
7CX9MN		47.90	-0.30	-0.25	57.83	0.19	0.15	MR
82RLC3		49.20	1.00	0.85	59.08	1.44	1.11	MR
83PYYV	*	49.42	1.22	1.04	56.97	-0.68	-0.52	MR
87NCHE		48.67	0.47	0.40	57.48	-0.16	-0.12	MR
8PFKDN		47.29	-0.90	-0.77	56.95	-0.70	-0.54	MV
93MQ73		47.87	-0.33	-0.28	56.57	-1.07	-0.83	MV
9R3RKJ		47.37	-0.83	-0.71	56.77	-0.88	-0.68	MR
AYWGHY		49.05	0.85	0.72	57.78	0.14	0.11	MR
C9UN2B	*	47.64	-0.56	-0.48	58.99	1.34	1.04	TA
CNQD72		48.47	0.27	0.23	56.85	-0.79	-0.61	MR
CRUEKZ		47.00	-1.20	-1.02	56.62	-1.03	-0.79	XX
DYQ4M3		45.99	-2.20	-1.87	55.33	-2.31	-1.78	XX
ED34VC	*	47.48	-0.71	-0.61	55.08	-2.56	-1.97	MR
F2M227		49.52	1.32	1.12	58.23	0.59	0.45	MR
FDW9NC		47.09	-1.11	-0.94	56.27	-1.38	-1.06	MR
FDWT8R		47.64	-0.56	-0.47	57.66	0.02	0.01	MV
GNAQW9		48.35	0.15	0.13	57.16	-0.49	-0.38	MR
HTLHFU		46.34	-1.86	-1.58	55.67	-1.98	-1.52	MV
KN4ZBG		48.21	0.02	0.01	58.02	0.38	0.29	MV
LMHHFR		47.30	-0.90	-0.76	56.48	-1.16	-0.89	MR
LRXFYV		47.51	-0.68	-0.58	56.78	-0.87	-0.67	MR
LTDH8P		48.75	0.56	0.47	58.92	1.27	0.98	MV
MP7JA2		49.08	0.89	0.75	58.47	0.82	0.63	MR
QEYFLM		48.62	0.42	0.36	58.30	0.66	0.51	MR
QKKYVB		50.83	2.64	2.24	60.00	2.36	1.82	MV
QLRHE6		48.90	0.70	0.60	58.75	1.11	0.85	MR
RX2BJQ		47.42	-0.78	-0.66	57.52	-0.13	-0.10	ML
T2LMXL		49.12	0.92	0.78	58.53	0.89	0.69	MR
UK87DH		48.07	-0.13	-0.11	57.64	-0.01	-0.01	MR
VJP7KZ		48.40	0.20	0.17	58.17	0.52	0.40	MR
W9PXJ9		46.47	-1.73	-1.47	57.37	-0.28	-0.21	MR
YGE3PE		49.59	1.39	1.18	59.53	1.88	1.45	TA
YRD2BT		48.90	0.70	0.60	57.78	0.14	0.11	MR
YVCEXJ		48.58	0.39	0.33	58.10	0.46	0.35	MR



Rubber Interlaboratory Testing Program

Report #198

Analysis 660

4th Qtr 2018

Mooney Viscosity: 4-minute readings (ML 1 + 4)

WebCode	Data Flag	Sample V81-V82			Sample V83-V84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
Z42MVE	*	51.74	3.54	3.01	61.60	3.95	3.05	TV
ZARAXT		47.13	-1.06	-0.91	56.60	-1.04	-0.80	MR
ZHN6XC		46.52	-1.68	-1.43	56.15	-1.50	-1.16	MV

Grand Means		Summary Statistics	
	48.198 ML 1 + 4		57.644 ML 1 + 4
Stnd Dev Btwn Labs	1.176 ML 1 + 4		1.297 ML 1 + 4
Statistics based on 40 of 41 reporting participants			

Samples V81-V82: SBR & V83-V84: Butyl

Comments on Assigned Data Flags for Test #660

2FT92A (M) - Participant did not submit data for sample group .

Key to Instrument Codes Reported by Participants

ML	Alpha Technologies/Monsanto model not specified	MR	Alpha Technologies Model MV2000/MV2000E
MV	MonTech	TA	TA Instruments (any model)
TV	Tech Pro Visc Tech (any model)	XX	Instrument make/model not specified by lab



Rubber Interlaboratory Testing Program

Report #198

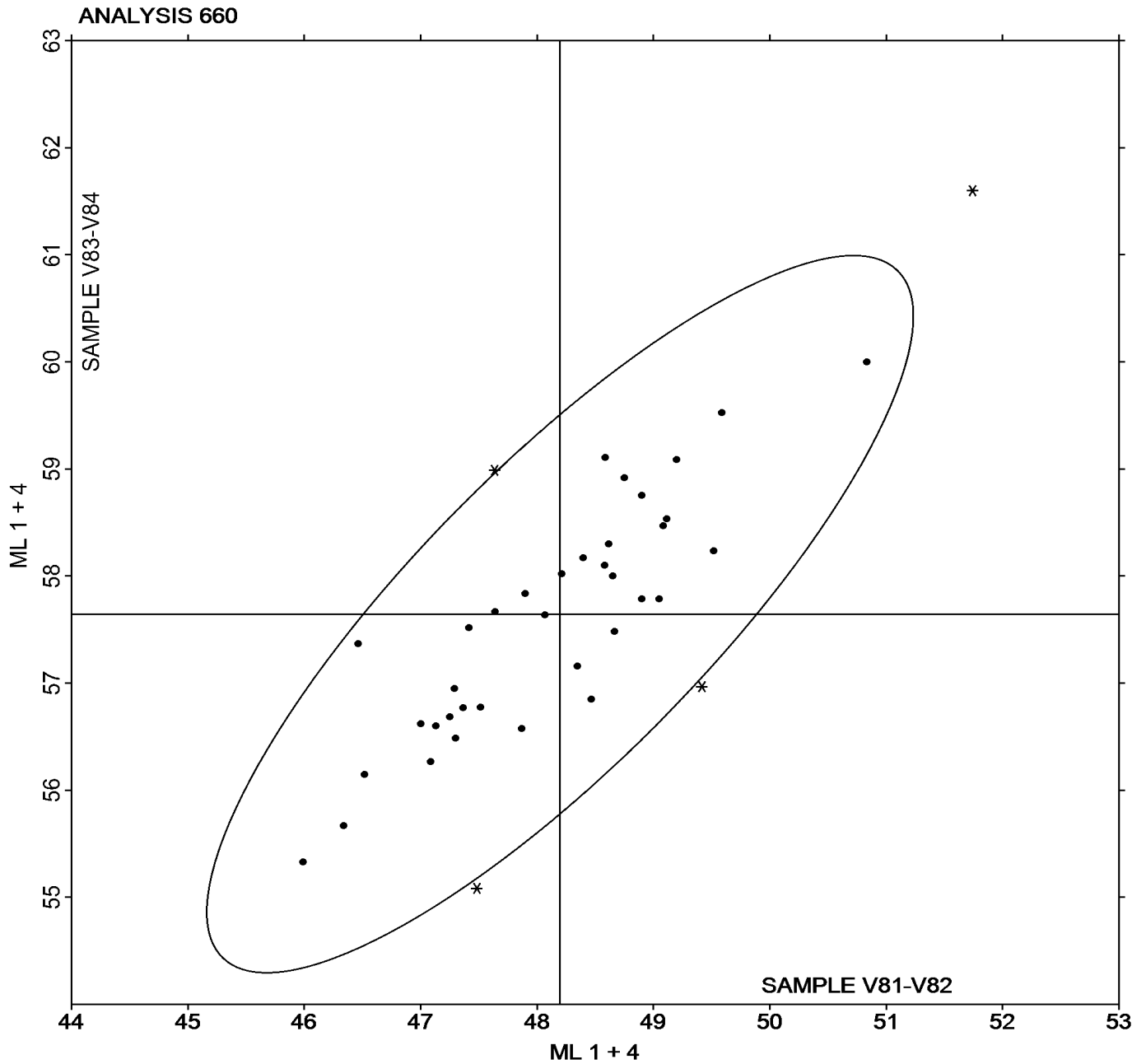
Analysis 660

4th Qtr 2018

Mooney Viscosity: 4-minute readings (ML 1 + 4)

Grand Mean Sample **V81-V82** = 48.198 ML 1 + 4

Grand Mean Sample **V83-V84** = 57.644 ML 1 + 4





Rubber Interlaboratory Testing Program

Report #198

Analysis 661

4th Qtr 2018

Mooney Viscosity: 4-min NBR/SBR & 8-min butyl readings (ML)

WebCode	Data Flag	Sample V81-V82			Sample V83-V84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FT92A	X	45.30	-2.87	-2.51	55.61	0.62	0.50	MR
4Q7D26		48.65	0.47	0.42	55.50	0.51	0.41	MR
6B6Z4K		47.25	-0.93	-0.81	54.32	-0.67	-0.54	MR
77BKRJ		48.59	0.41	0.36	56.70	1.71	1.39	MR
7CX9MN		47.90	-0.28	-0.24	55.42	0.43	0.35	MR
82RLC3		49.20	1.02	0.90	56.17	1.18	0.95	MR
83PYYV		49.42	1.24	1.09	54.50	-0.49	-0.40	MR
87NCHE		48.67	0.49	0.43	54.87	-0.12	-0.10	MR
8PFKDN		47.29	-0.88	-0.77	55.29	0.30	0.24	MV
93MQ73		47.87	-0.31	-0.27	54.40	-0.59	-0.48	MV
9R3RKJ		47.37	-0.81	-0.71	54.33	-0.66	-0.53	MR
AYWGHY		49.05	0.87	0.76	54.87	-0.12	-0.10	MR
C9UN2B		47.64	-0.54	-0.47	56.40	1.41	1.14	TA
CNQD72		48.47	0.29	0.25	54.02	-0.97	-0.79	MR
CRUEKZ		47.00	-1.18	-1.03	53.82	-1.17	-0.95	XX
ED34VC		47.48	-0.69	-0.60	52.60	-2.39	-1.93	MP
F2M227		49.52	1.34	1.17	54.80	-0.19	-0.15	MR
FDW9NC		47.09	-1.09	-0.95	53.88	-1.11	-0.90	MR
FDWT8R		47.64	-0.54	-0.47	54.74	-0.25	-0.20	MV
GNAQW9		48.35	0.17	0.15	54.46	-0.53	-0.43	MR
HTLHFU		46.34	-1.84	-1.61	52.93	-2.06	-1.67	MV
KN4ZBG		48.21	0.04	0.03	55.69	0.70	0.57	MV
LMHHFR		47.30	-0.88	-0.77	54.42	-0.57	-0.46	MR
LRXFYV		47.51	-0.66	-0.58	53.75	-1.24	-1.01	MR
LTDH8P		48.75	0.58	0.51	56.81	1.82	1.48	MV
MP7JA2		49.08	0.91	0.79	56.12	1.13	0.91	MR
QEYFLM		48.62	0.44	0.39	55.75	0.76	0.62	MR
QKKYVB		50.83	2.66	2.32	56.84	1.85	1.50	MV
QLRHE6		48.90	0.72	0.63	56.52	1.53	1.24	MR
RX2BJQ		47.42	-0.76	-0.66	53.20	-1.79	-1.45	ML
UK87DH		48.07	-0.11	-0.09	54.60	-0.39	-0.31	MR
VJP7KZ		48.40	0.22	0.20	55.15	0.16	0.13	MR
W9PXJ9		46.47	-1.71	-1.49	54.77	-0.22	-0.18	MR
YVCEXJ		48.58	0.41	0.36	56.43	1.44	1.17	MR
Z42MVE	*	51.74	3.57	3.12	58.03	3.04	2.46	TV
ZARAXT		47.13	-1.04	-0.91	54.00	-0.99	-0.80	MR
ZHN6XC		46.52	-1.66	-1.45	53.54	-1.45	-1.18	MV



Rubber Interlaboratory Testing Program

Report #198

Analysis 661

4th Qtr 2018

Mooney Viscosity: 4-min NBR/SBR & 8-min butyl readings (ML)

		Summary Statistics	
Grand Means	48.175 ML 1 + 8	54.989 ML 1 + 8	
Stnd Dev Btwn Labs	1.144 ML 1 + 8	1.235 ML 1 + 8	
Statistics based on 36 of 37 reporting participants			

Samples V81-V82: SBR & V83-V84: Butyl

Comments on Assigned Data Flags for Test #661

2FT92A (X) - Inconsistent in testing between samples.

Key to Instrument Codes Reported by Participants

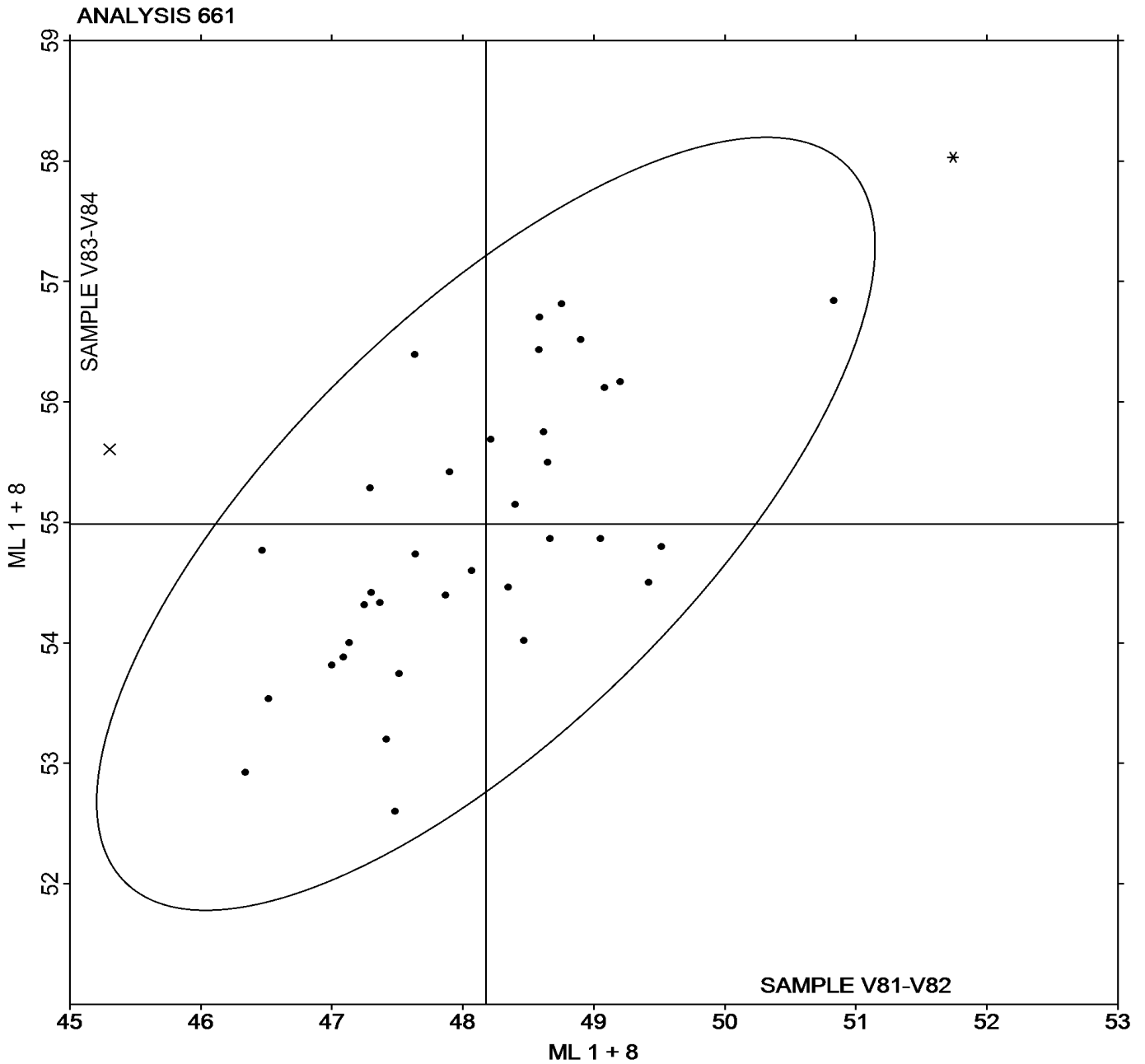
ML	Alpha Technologies/Monsanto model not specified	MP	Monsanto Compact Mooney Viscometer
MR	Alpha Technologies Model MV2000/MV2000E	MV	Montech
TA	TA Instruments (any model)	TV	Tech Pro Visc Tech (any model)
XX	Instrument make/model not specified by lab		



Mooney Viscosity: 4-min NBR/SBR & 8-min butyl readings (ML)

Grand Mean Sample V81-V82 = 48.175 ML 1 + 8

Grand Mean Sample V83-V84 = 54.989 ML 1 + 8





Rubber Interlaboratory Testing Program

Report #198

Analysis 662

4th Qtr 2018

Mooney Stress Relaxation: t80 (seconds)

WebCode	Data Flag	Sample V81-V82			Sample V83-V84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FT92A		6.6	-106.8	-0.52	8.6	-101.9	-0.49	MR
4Q7D26		8.3	-105.1	-0.51	9.1	-101.4	-0.49	MR
6B6Z4K		13.7	-99.8	-0.48	8.9	-101.7	-0.49	MR
7CX9MN		14.0	-99.4	-0.48	9.0	-101.6	-0.49	MR
82RLC3		15.1	-98.3	-0.48	9.3	-101.3	-0.49	MR
83PYYV		14.8	-98.7	-0.48	8.6	-101.9	-0.49	MR
87NCHE		13.8	-99.6	-0.48	8.7	-101.8	-0.49	MR
93MQ73		12.7	-100.8	-0.49	8.8	-101.7	-0.49	MV
AYWGHY		14.3	-99.1	-0.48	8.5	-102.0	-0.49	MR
C9UN2B		310.9	197.5	0.95	309.3	198.8	0.95	TA
CRUEKZ		8.9	-104.5	-0.51	9.1	-101.5	-0.49	XX
F2M227		16.1	-97.3	-0.47	8.8	-101.8	-0.49	MR
FDWT8R		12.0	-101.4	-0.49	7.9	-102.6	-0.49	MV
HTLHFU		545.7	432.3	2.09	546.9	436.4	2.09	MV
KN4ZBG		11.0	-102.4	-0.50	7.5	-103.0	-0.49	MV
LTDH8P		12.6	-100.8	-0.49	8.8	-101.7	-0.49	MV
QKKYVB		547.5	434.1	2.10	547.6	437.1	2.10	MZ
QLRHE6		12.6	-100.9	-0.49	9.0	-101.6	-0.49	MR
YGE3PE		13.4	-100.0	-0.48	11.6	-99.0	-0.47	TA
YRD2BT		13.7	-99.7	-0.48	9.7	-100.8	-0.48	MR
Z42MVE		666.6	553.2	2.67	668.4	557.9	2.68	TV
ZARAXT		15.1	-98.3	-0.48	10.4	-100.1	-0.48	MR
ZHN6XC		309.5	196.1	0.95	308.1	197.6	0.95	MV

Grand Means		Summary Statistics	
	113.44 seconds		110.55 seconds
Std Dev Btwn Labs			
	206.87 seconds		208.53 seconds
Statistics based on 23 of 23 reporting participants			

Samples V81-V82: SBR & V83-V84: Butyl

Key to Instrument Codes Reported by Participants

MR	Alpha Technologies Model MV2000/MV2000E	MV	MonTech
MZ	Rebuilt Monsanto Mooney Viscometer	TA	TA Instruments (any model)
TV	Tech Pro Visc Tech (any model)	XX	Instrument make/model not specified by lab

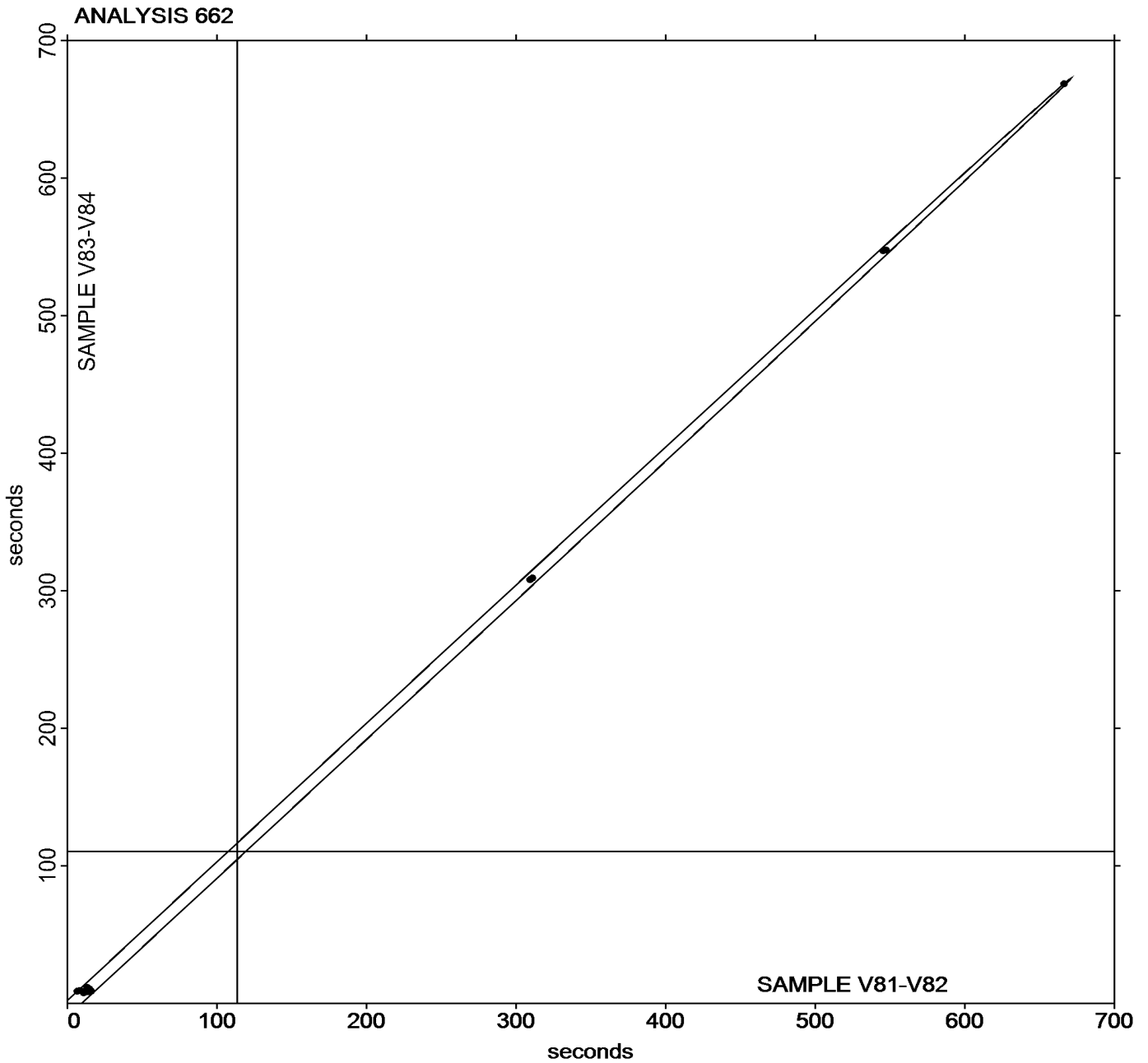


Rubber Interlaboratory Testing Program
Analysis 662
Mooney Stress Relaxation: t80 (seconds)

Report #198
4th Qtr 2018

Grand Mean Sample **V81-V82** = 113.44 seconds

Grand Mean Sample **V83-V84** = 110.55 seconds





Rubber Interlaboratory Testing Program

Report #198

Analysis 663

4th Qtr 2018

Mooney Stress Relaxation: X30 (percent)

WebCode	Data Flag	Sample V81-V82			Sample V83-V84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FT92A		89.03	15.87	0.54	88.36	12.30	0.38	MR
4Q7D26		11.88	-61.27	-2.10	9.68	-66.37	-2.07	MR
6B6Z4K		85.40	12.24	0.42	90.86	14.81	0.46	MR
7CX9MN		14.89	-58.27	-2.00	9.72	-66.34	-2.07	MR
82RLC3		84.50	11.34	0.39	90.06	14.01	0.44	MR
83PYYV		84.86	11.71	0.40	90.90	14.84	0.46	MR
87NCHE		85.16	12.00	0.41	90.56	14.51	0.45	MR
93MQ73		85.84	12.68	0.43	90.73	14.67	0.46	MV
AYWGHY		84.91	11.76	0.40	90.81	14.76	0.46	MR
C9UN2B		12.46	-60.70	-2.08	8.88	-67.17	-2.09	TA
CRUEKZ		12.30	-60.86	-2.09	9.82	-66.24	-2.06	XX
F2M227		84.03	10.87	0.37	90.58	14.53	0.45	MR
FDWT8R		86.10	12.94	0.44	91.35	15.30	0.48	MV
HTLHFU		92.08	18.92	0.65	93.85	17.80	0.55	MV
KN4ZBG		86.93	13.77	0.47	92.27	16.22	0.50	MV
LTDH8P		86.00	12.84	0.44	91.00	14.95	0.47	MV
QKKYVB		88.75	15.59	0.53	91.22	15.17	0.47	MZ
QLRHE6		85.86	12.70	0.44	90.42	14.36	0.45	MR
YGE3PE		85.81	12.65	0.43	89.05	13.00	0.40	TA
Z42MVE		89.96	16.80	0.58	91.46	15.40	0.48	TV
ZARAXT		84.70	11.54	0.40	89.50	13.45	0.42	MR
ZHN6XC		88.01	14.85	0.51	92.11	16.05	0.50	MV

Summary Statistics	
Grand Means	73.156 percent
Std Dev Btwn Labs	29.152 percent
	76.053 percent
	32.120 percent
Statistics based on 22 of 22 reporting participants	

Samples V81-V82: SBR & V83-V84: Butyl

Key to Instrument Codes Reported by Participants

MR	Alpha Technologies Model MV2000/MV2000E	MV	Montech
MZ	Rebuilt Monsanto Mooney Viscometer	TA	TA Instruments (any model)
TV	Tech Pro Visc Tech (any model)	XX	Instrument make/model not specified by lab

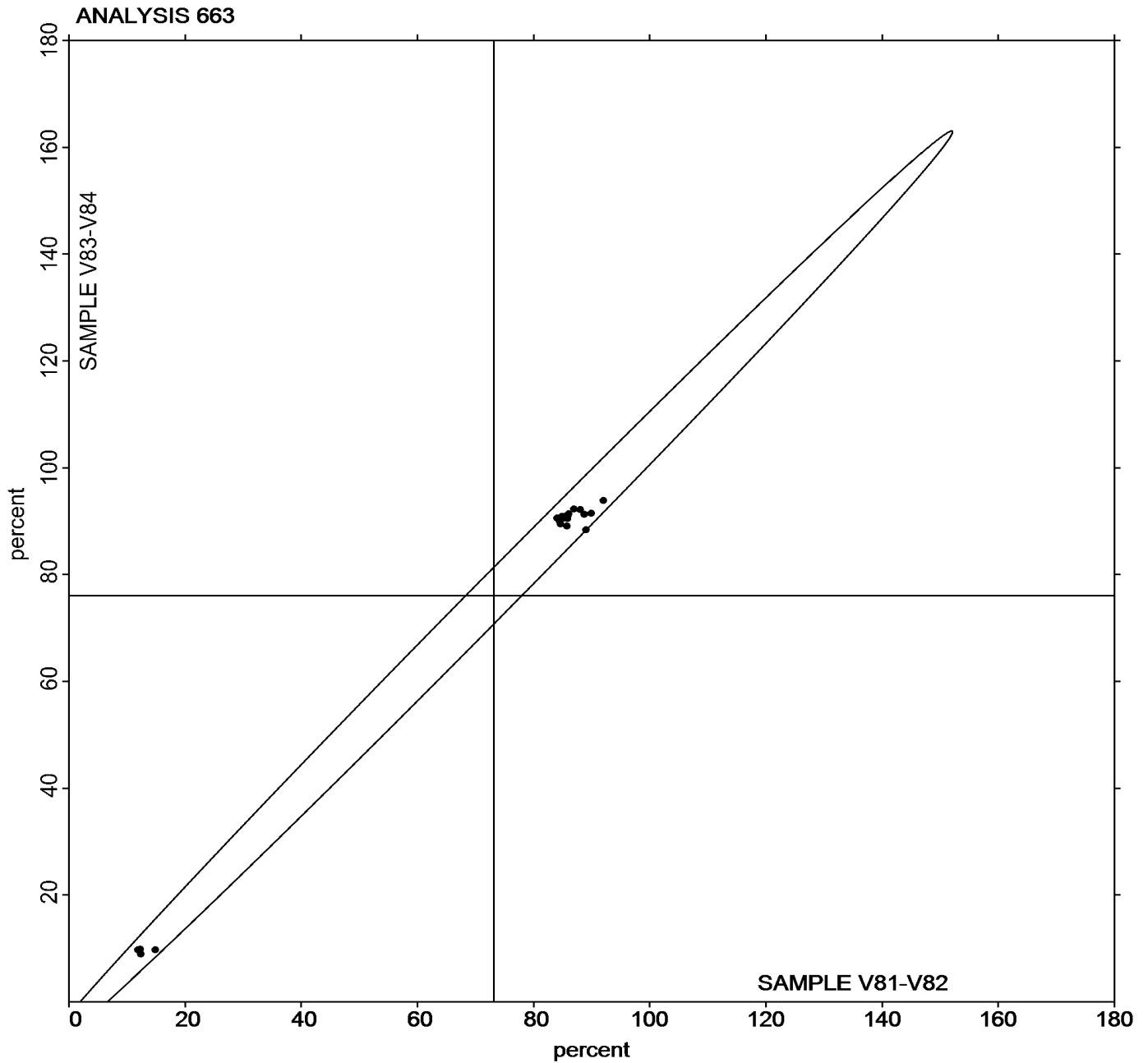


Rubber Interlaboratory Testing Program
Analysis 663
Mooney Stress Relaxation: X30 (percent)

Report #198
4th Qtr 2018

Grand Mean Sample **V81-V82** = 73.156 percent

Grand Mean Sample **V83-V84** = 76.053 percent





Rubber Interlaboratory Testing Program

Report #198

Analysis 664

4th Qtr 2018

Mooney Stress Relaxation: Area under curve (M-s)

WebCode	Data Flag	Sample V81-V82			Sample V83-V84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FT92A		384.9	-266.2	-1.83	569.6	14.4	0.21	MR
4Q7D26		519.0	-132.0	-0.91	663.0	107.9	1.59	MR
6B6Z4K		741.2	90.2	0.62	553.0	-2.1	-0.03	XX
7CX9MN		768.5	117.5	0.81	593.3	38.2	0.56	MR
82RLC3		823.2	172.1	1.18	620.1	65.0	0.96	MR
87NCHE		777.8	126.8	0.87	574.8	19.7	0.29	MR
93MQ73		732.5	81.5	0.56	565.1	9.9	0.15	MV
AYWGHY		798.5	147.5	1.01	558.7	3.6	0.05	MR
C9UN2B		621.1	-29.9	-0.21	555.8	0.7	0.01	TA
CRUEKZ		554.0	-97.0	-0.67	587.3	32.1	0.47	XX
F2M227		854.1	203.1	1.40	577.3	22.2	0.33	MR
FDWT8R		707.1	56.0	0.39	519.3	-35.8	-0.53	MV
HTLHFU	*	335.5	-315.5	-2.17	347.0	-208.2	-3.08	MV
KN4ZBG		664.5	13.4	0.09	461.9	-93.2	-1.38	MV
LTDH8P		717.2	66.2	0.46	558.7	3.6	0.05	MV
QKKYVB		549.6	-101.4	-0.70	543.1	-12.1	-0.18	MZ
QLRHE6		742.0	91.0	0.63	600.3	45.1	0.67	MR
YGE3PE		544.9	-106.1	-0.73	551.7	-3.4	-0.05	TA
Z42MVE		477.7	-173.3	-1.19	540.2	-15.0	-0.22	TV
ZARAXT		774.3	123.3	0.85	649.2	94.0	1.39	MR
ZHN6XC		583.7	-67.3	-0.46	468.5	-86.6	-1.28	MV

Grand Means		Summary Statistics	
	651.01 M-s		555.14 M-s
Std Dev Btwn Labs	145.38 M-s		67.69 M-s
Statistics based on 21 of 21 reporting participants			

Samples V81-V82: SBR & V83-V84: Butyl

Key to Instrument Codes Reported by Participants

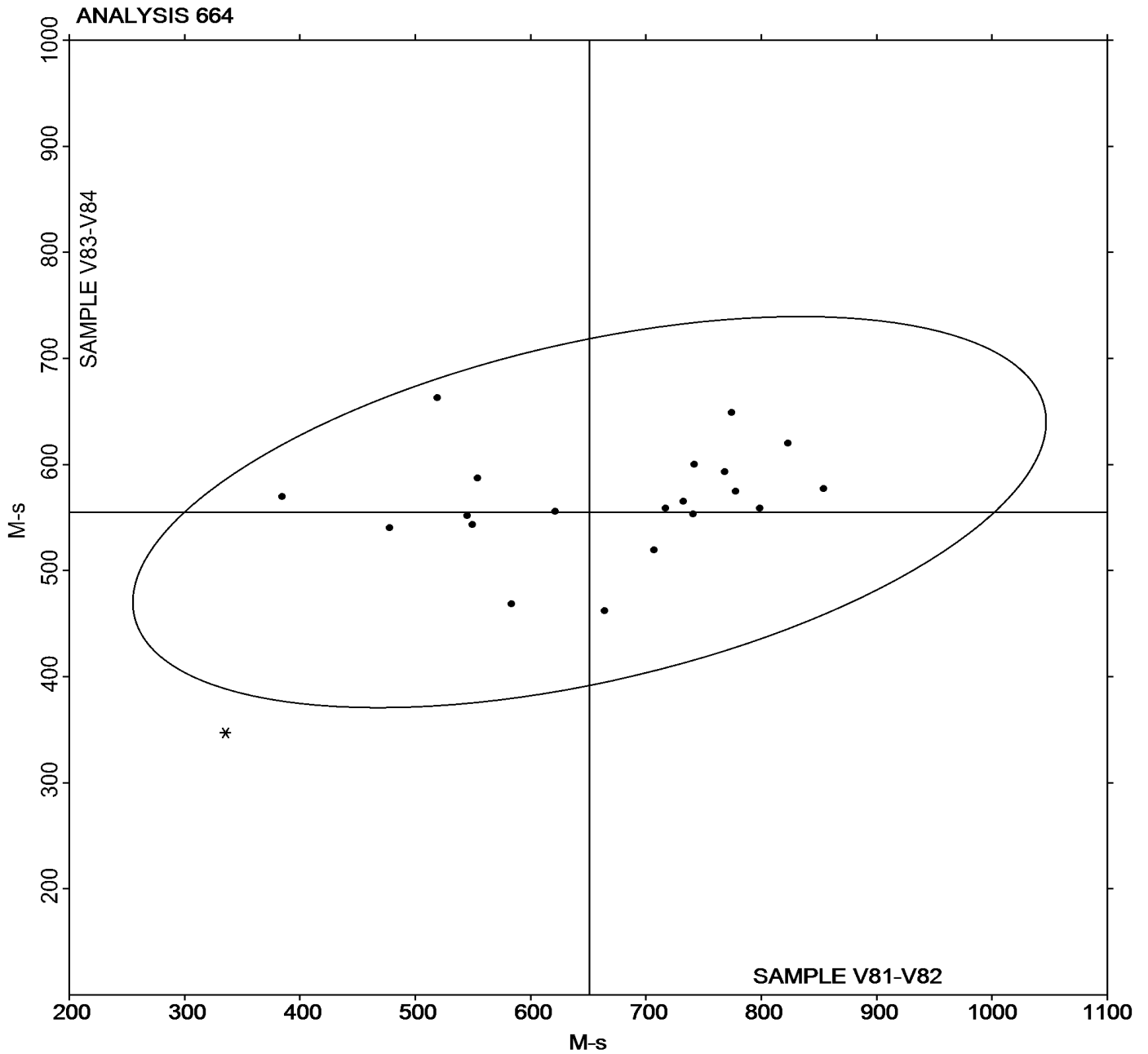
MR	Alpha Technologies Model MV2000/MV2000E	MV	MonTech
MZ	Rebuilt Mooney Viscometer	TA	TA Instruments (any model)
TV	Tech Pro Visc Tech (any model)	XX	Instrument make/model not specified by lab



Mooney Stress Relaxation: Area under curve (M-s)

Grand Mean Sample V81-V82 = 651.01 M-s

Grand Mean Sample V83-V84 = 555.14 M-s





Rubber Interlaboratory Testing Program
Analysis 669
ODR Vulcanization-Cure Time 10% (minutes)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample Z81-Z82			Sample Z83-Z84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
77BKRJ		1.508	-0.156	-0.91	2.322	-0.214	-0.82
ED34VC		1.997	0.332	1.94	3.048	0.513	1.96
FDW9NC		1.845	0.181	1.05	2.802	0.266	1.01
FDWT8R		1.747	0.082	0.48	2.678	0.143	0.54
JR2TFQ		1.543	-0.121	-0.70	2.337	-0.199	-0.76
LMHHFR		1.525	-0.139	-0.81	2.380	-0.156	-0.59
LRXFYV		1.592	-0.073	-0.42	2.345	-0.191	-0.73
UK87DH		1.702	0.037	0.22	2.590	0.054	0.21
Z42MVE		1.520	-0.144	-0.84	2.320	-0.216	-0.82

		Summary Statistics	
Grand Means	1.6643 minutes	2.5357 minutes	
Stnd Dev Btwn Labs	0.1717 minutes	0.2621 minutes	
Statistics based on 9 of 9 reporting participants			

Samples Z81-Z82: EPDM compound #1 & Z83-Z84: EPDM compound #2

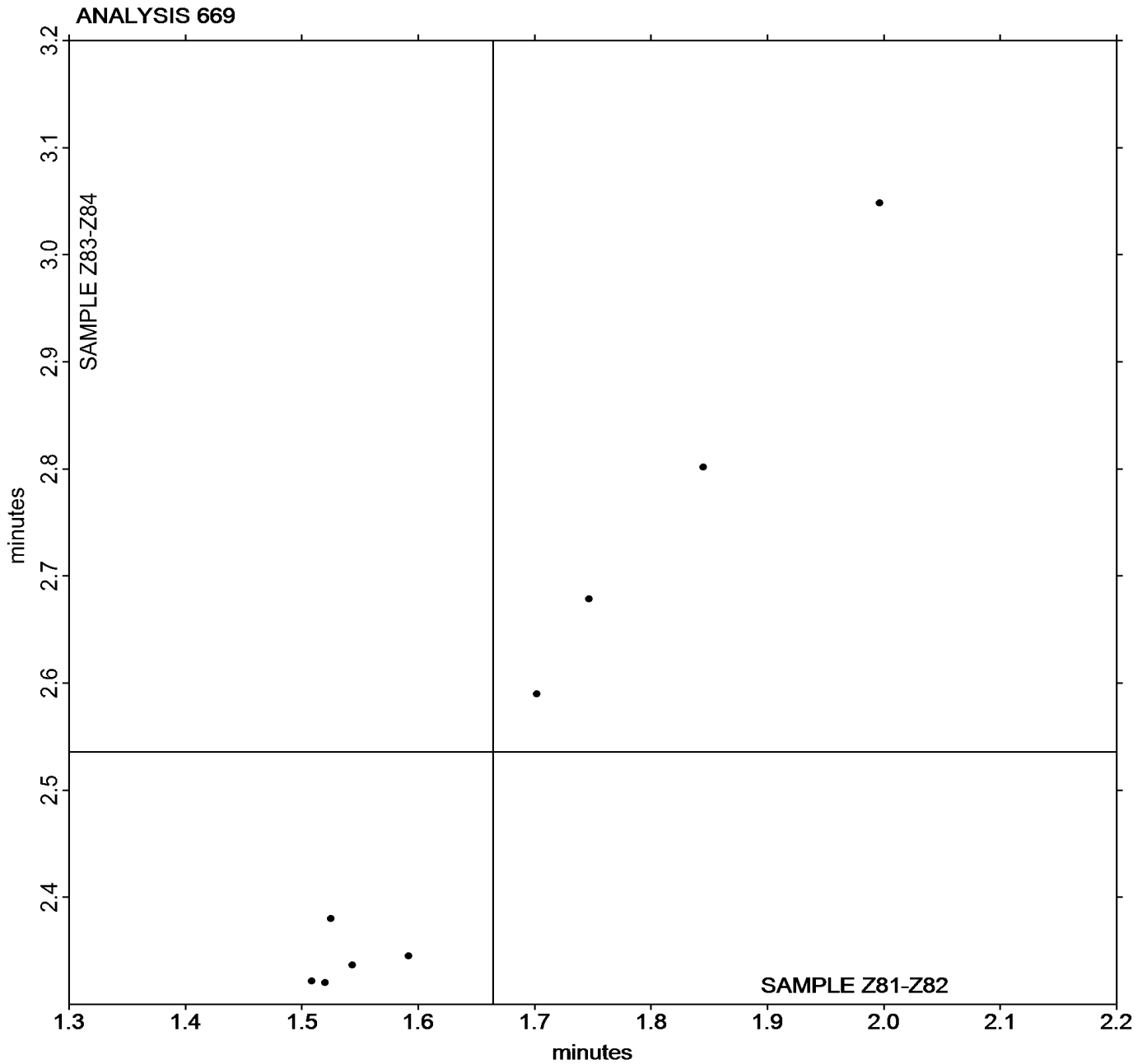


Rubber Interlaboratory Testing Program
Analysis 669
ODR Vulcanization-Cure Time 10% (minutes)

Report #198
4th Qtr 2018

Grand Mean Sample **Z81-Z82** = 1.6643 minutes

Grand Mean Sample **Z83-Z84** = 2.5357 minutes



If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.



Rubber Interlaboratory Testing Program
Analysis 670
ODR Vulcanization-Scorch Time, Ts1 (minutes)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample Z81-Z82			Sample Z83-Z84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
77BKRJ		1.078	-0.121	-0.90	1.585	-0.227	-1.16
ED34VC		1.438	0.239	1.78	2.160	0.348	1.79
FDW9NC		1.398	0.199	1.48	2.078	0.267	1.37
FDWT8R		1.233	0.034	0.25	1.892	0.080	0.41
JR2TFQ		1.105	-0.095	-0.71	1.670	-0.142	-0.73
LMHHFR		1.090	-0.110	-0.82	1.663	-0.148	-0.76
LRXFYV		1.133	-0.066	-0.49	1.720	-0.092	-0.47
UK87DH		1.198	-0.001	-0.01	1.777	-0.035	-0.18
Z42MVE		1.122	-0.078	-0.58	1.760	-0.052	-0.26

		Summary Statistics	
Grand Means	1.1996 minutes	1.8117 minutes	
Stnd Dev Btwn Labs	0.1341 minutes	0.1951 minutes	
Statistics based on 9 of 9 reporting participants			

Samples Z81-Z82: EPDM compound #1 & Z83-Z84: EPDM compound #2

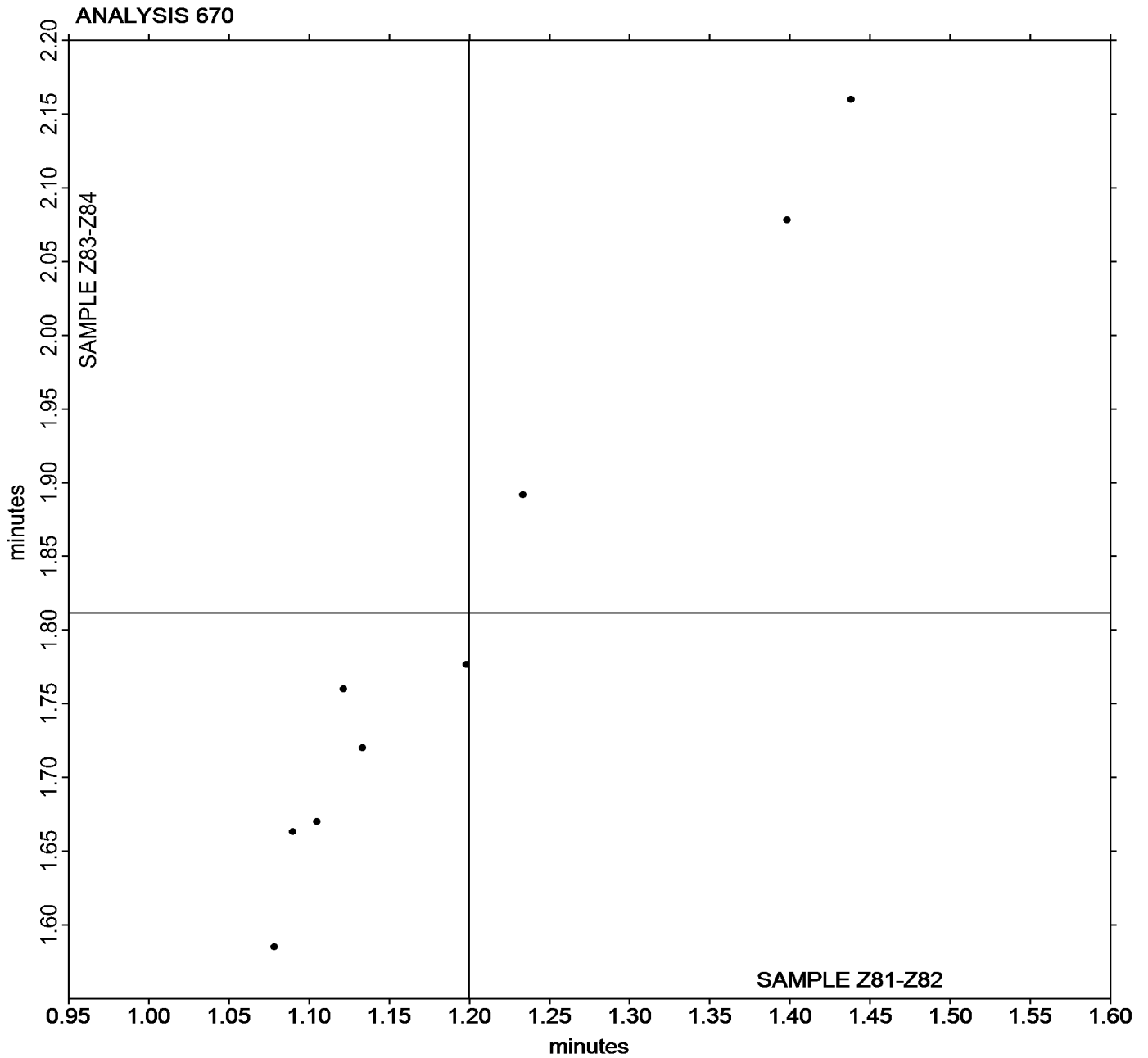


Rubber Interlaboratory Testing Program
Analysis 670
ODR Vulcanization-Scorch Time, Ts1 (minutes)

Report #198
4th Qtr 2018

Grand Mean Sample **Z81-Z82** = 1.1996 minutes

Grand Mean Sample **Z83-Z84** = 1.8117 minutes



If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.



Rubber Interlaboratory Testing Program
Analysis 671
ODR Vulcanization-Cure Time 50% (minutes)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample Z81-Z82			Sample Z83-Z84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
77BKRJ		2.878	-0.319	-1.01	4.353	-0.271	-0.62
ED34VC		3.793	0.596	1.90	5.583	0.959	2.21
FDW9NC		3.402	0.205	0.65	4.880	0.256	0.59
FDWT8R		3.363	0.166	0.53	4.777	0.153	0.35
JR2TFQ		2.905	-0.292	-0.93	4.363	-0.261	-0.60
LMHHFR		2.982	-0.215	-0.68	4.473	-0.151	-0.35
LRXFYV		3.077	-0.120	-0.38	4.290	-0.334	-0.77
UK87DH		3.430	0.233	0.74	4.727	0.103	0.24
Z42MVE		2.943	-0.254	-0.81	4.168	-0.456	-1.05

		Summary Statistics	
Grand Means	3.1970 minutes	4.6239 minutes	
Std Dev Btwn Labs	0.3145 minutes	0.4334 minutes	
Statistics based on 9 of 9 reporting participants			

Samples Z81-Z82: EPDM compound #1 & Z83-Z84: EPDM compound #2

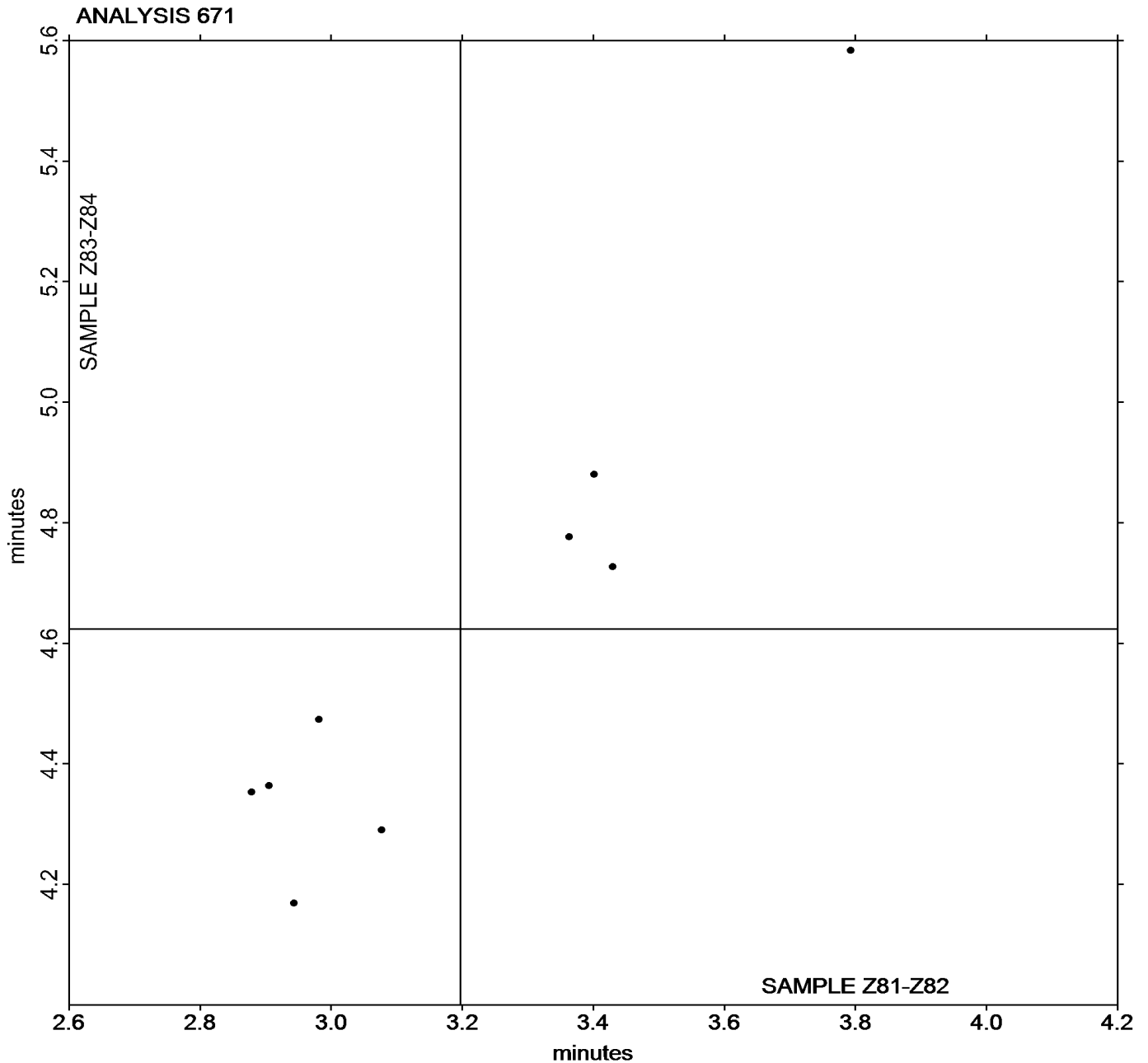


Rubber Interlaboratory Testing Program
Analysis 671
ODR Vulcanization-Cure Time 50% (minutes)

Report #198
4th Qtr 2018

Grand Mean Sample Z81-Z82 = 3.1970 minutes

Grand Mean Sample Z83-Z84 = 4.6239 minutes



If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.



Rubber Interlaboratory Testing Program
Analysis 672
ODR Vulcanization-Cure Time 90% (minutes)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample Z81-Z82			Sample Z83-Z84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
77BKRJ		13.14	-0.68	-0.65	9.658	-0.320	-0.28
ED34VC		15.18	1.36	1.30	11.155	1.177	1.03
FDW9NC		13.79	-0.03	-0.02	11.302	1.324	1.15
FDWT8R		13.46	-0.36	-0.34	8.680	-1.298	-1.13
JR2TFQ		11.90	-1.91	-1.83	8.662	-1.316	-1.15
LMHHFR		13.98	0.17	0.16	11.300	1.322	1.15
LRXFYV		13.39	-0.42	-0.40	8.968	-1.010	-0.88
UK87DH		15.35	1.54	1.47	9.302	-0.676	-0.59
Z42MVE		14.13	0.32	0.30	10.777	0.799	0.70

		Summary Statistics	
Grand Means		13.811 minutes	9.9781 minutes
Std Dev Btwn Labs		1.047 minutes	1.1467 minutes
Statistics based on 9 of 9 reporting participants			

Samples Z81-Z82: EPDM compound #1 & Z83-Z84: EPDM compound #2

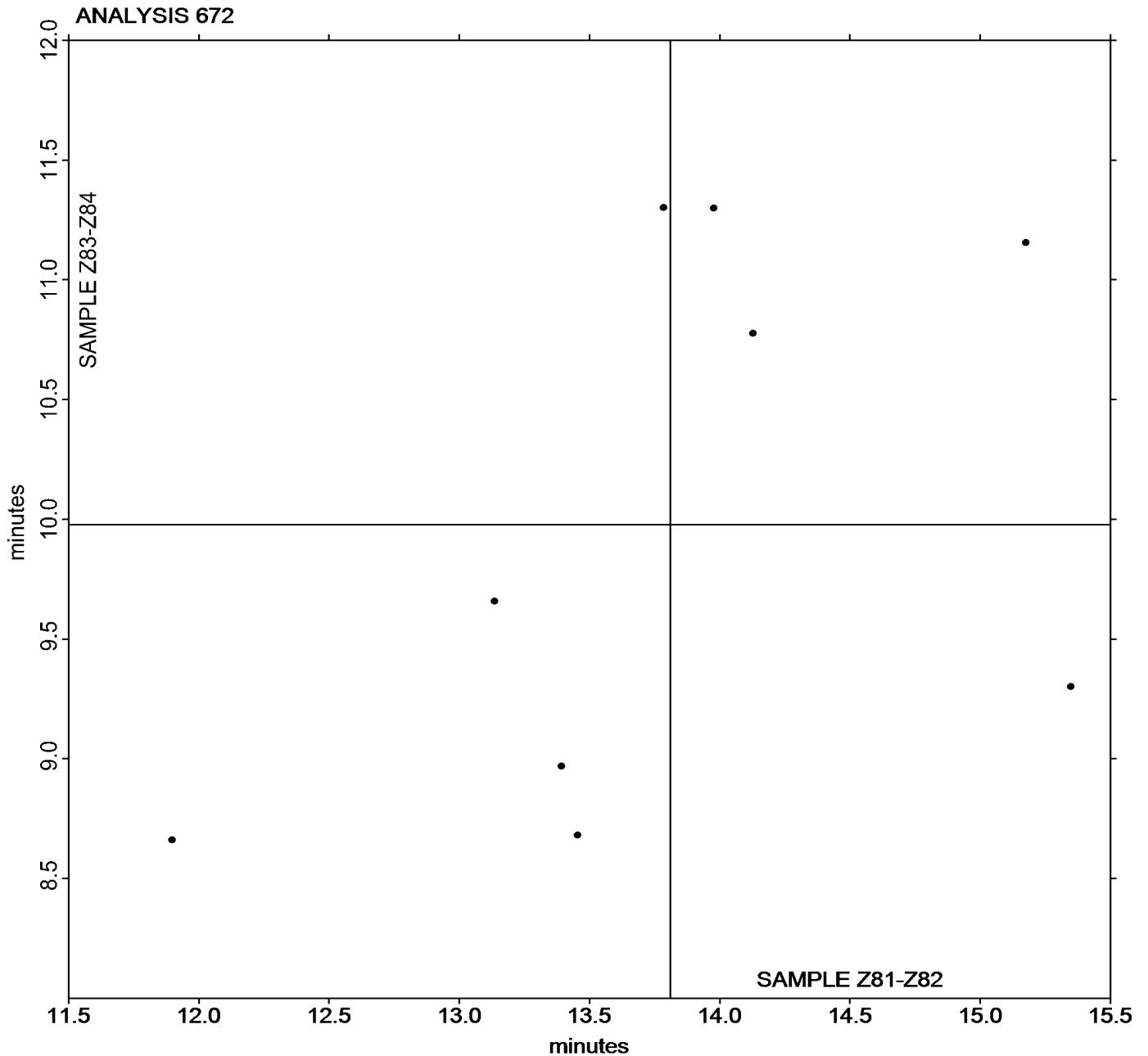


Rubber Interlaboratory Testing Program
Analysis 672
ODR Vulcanization-Cure Time 90% (minutes)

Report #198
4th Qtr 2018

Grand Mean Sample Z81-Z82 = 13.811 minutes

Grand Mean Sample Z83-Z84 = 9.9781 minutes



If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.



Rubber Interlaboratory Testing Program
Analysis 673
ODR Vulcanization: Minimum Torque (lbf.in)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample Z81-Z82			Sample Z83-Z84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
77BKRJ		7.768	-0.503	-0.67	5.673	-0.995	-0.84
ED34VC		9.033	0.762	1.02	6.697	0.028	0.02
FDW9NC		9.573	1.302	1.74	7.190	0.522	0.44
FDWT8R		8.793	0.522	0.70	6.367	-0.302	-0.26
JR2TFQ		8.197	-0.074	-0.10	6.110	-0.558	-0.47
LMHHFR		7.242	-1.029	-1.38	5.360	-1.308	-1.11
LRXFYV		8.045	-0.226	-0.30	8.732	2.063	1.74
UK87DH		7.530	-0.741	-0.99	5.638	-1.030	-0.87
Z42MVE		8.257	-0.014	-0.02	8.248	1.580	1.34

		Summary Statistics	
Grand Means		8.2709 lbf.in	6.6683 lbf.in
Std Dev Btwn Labs		0.7473 lbf.in	1.1828 lbf.in
Statistics based on 9 of 9 reporting participants			

		Summary Statistics in SI Units	
Grand Means		9.3449 dN.m	7.5342 dN.m
Std Dev Btwn Labs		0.8444 dN.m	1.3364 dN.m
Statistics based on 9 of 9 reporting participants			

Samples Z81-Z82: EPDM compound #1 & Z83-Z84: EPDM compound #2

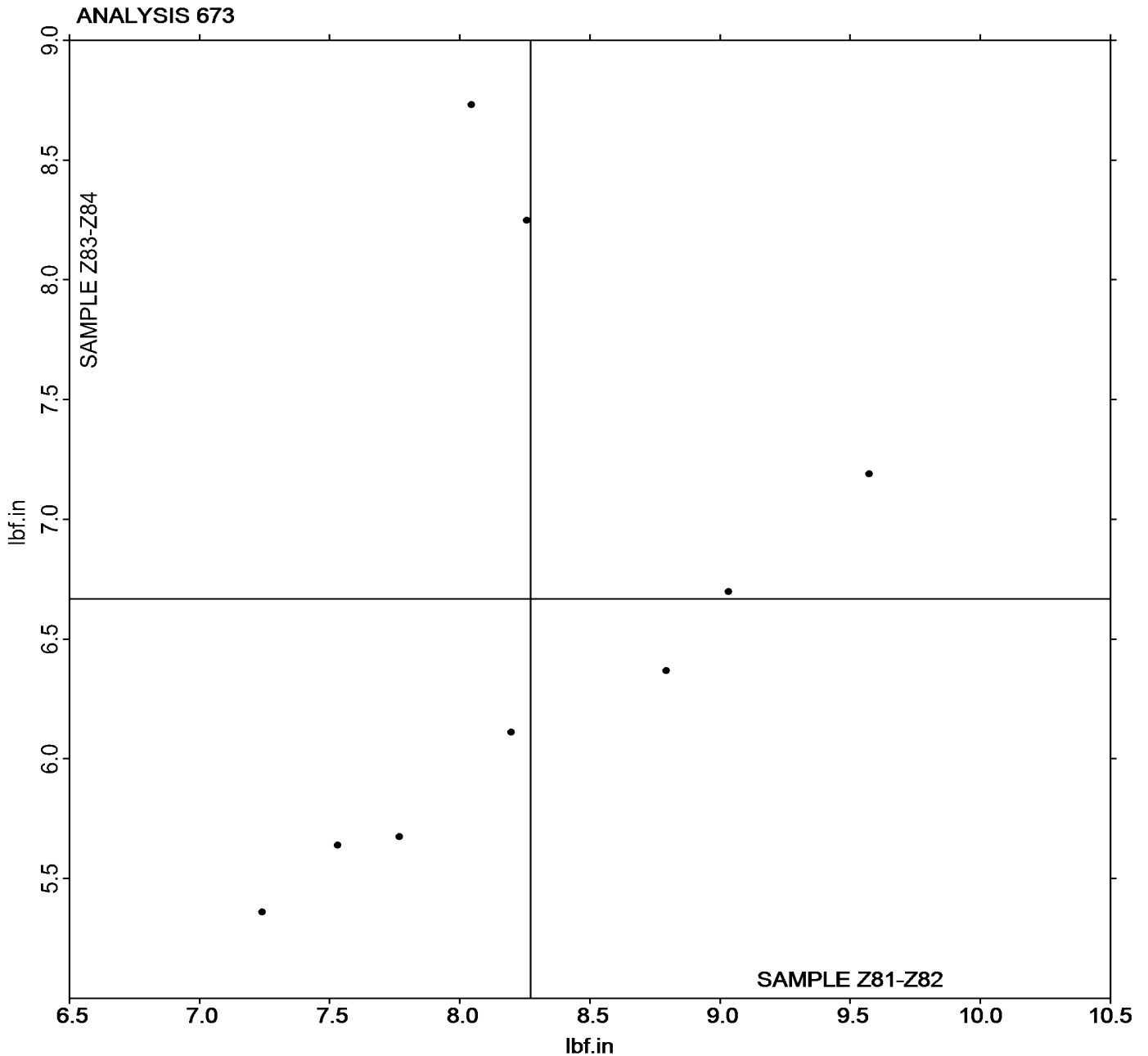


Rubber Interlaboratory Testing Program
Analysis 673
ODR Vulcanization: Minimum Torque (lbf.in)

Report #198
4th Qtr 2018

Grand Mean Sample Z81-Z82 = 8.2709 lbf.in

Grand Mean Sample Z83-Z84 = 6.6683 lbf.in



If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.



Rubber Interlaboratory Testing Program
Analysis 674
ODR Vulcanization: Maximum Torque (lbf.in)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample Z81-Z82			Sample Z83-Z84		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
77BKRJ		47.68	1.74	0.57	38.69	1.19	0.86
ED34VC		45.34	-0.60	-0.20	37.33	-0.17	-0.13
FDW9NC		42.01	-3.93	-1.30	35.88	-1.63	-1.18
FDWT8R		49.32	3.38	1.12	38.65	1.14	0.83
JR2TFQ		43.93	-2.01	-0.66	35.77	-1.74	-1.26
LMHHFR		46.17	0.23	0.08	37.55	0.04	0.03
LRXFYV		44.66	-1.28	-0.42	37.45	-0.05	-0.04
UK87DH		51.32	5.38	1.78	39.86	2.35	1.70
Z42MVE		43.04	-2.90	-0.96	36.38	-1.13	-0.82

		Summary Statistics	
Grand Means		45.939 lbf.in	37.505 lbf.in
Std Dev Btwn Labs		3.028 lbf.in	1.379 lbf.in
Statistics based on 9 of 9 reporting participants			

		Summary Statistics in SI Units	
Grand Means		51.905 dN.m	42.375 dN.m
Std Dev Btwn Labs		3.421 dN.m	1.558 dN.m
Statistics based on 9 of 9 reporting participants			

Samples Z81-Z82: EPDM compound #1 & Z83-Z84: EPDM compound #2

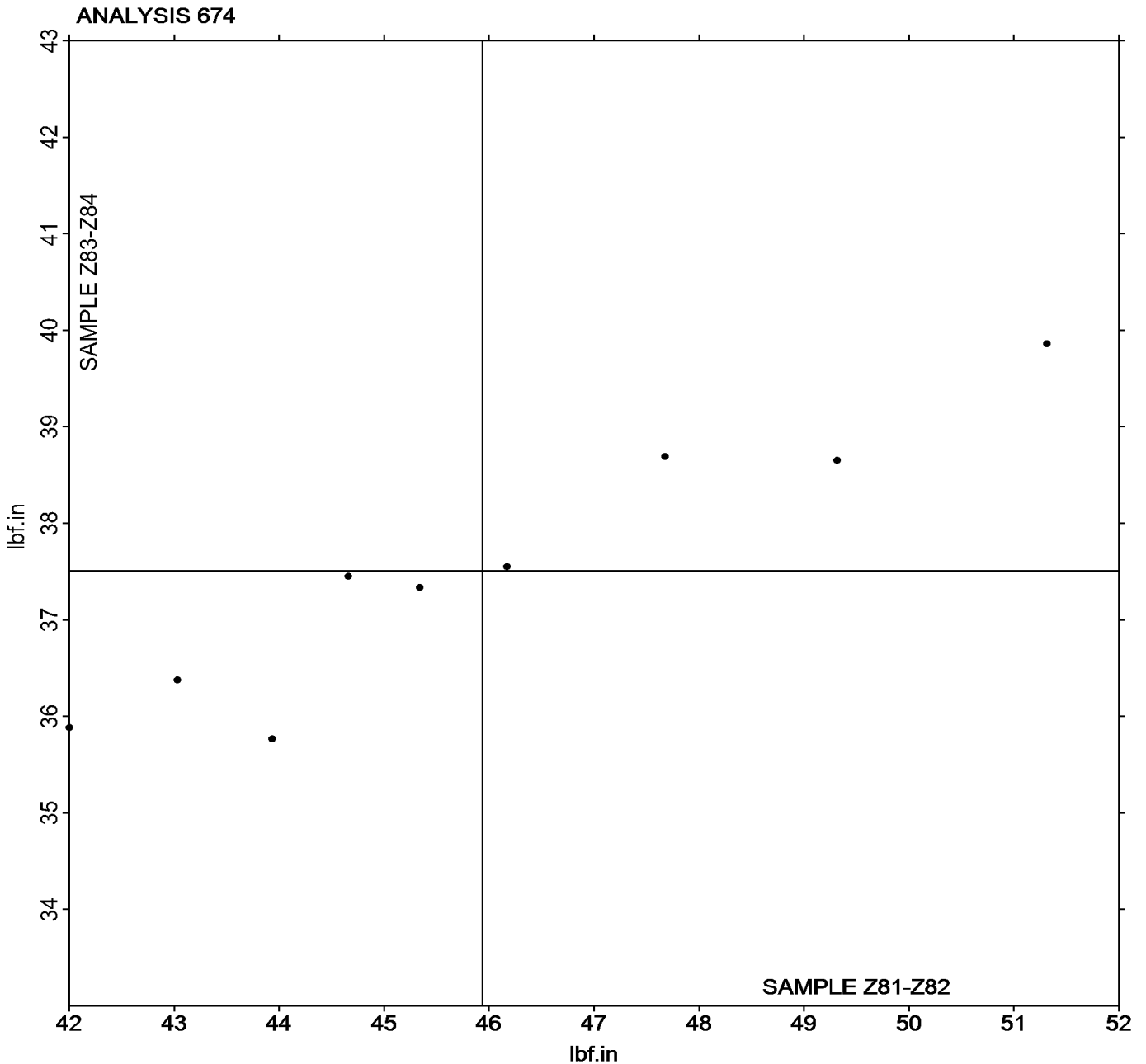


Rubber Interlaboratory Testing Program
Analysis 674
ODR Vulcanization: Maximum Torque (lbf.in)

Report #198
4th Qtr 2018

Grand Mean Sample Z81-Z82 = 45.939 lbf.in

Grand Mean Sample Z83-Z84 = 37.505 lbf.in



If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.



Rubber Interlaboratory Testing Program

Report #198

Analysis 684

4th Qtr 2018

MDR Vulcanization-Cure Time 10% (minutes)

WebCode	Data Flag	Sample Z85-Z86			Sample Z87-Z88			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FT92A		1.333	-0.208	-1.54	1.810	-0.189	-1.35	MC
42K8EJ		1.522	-0.019	-0.14	1.968	-0.031	-0.22	ME
77BKRJ		1.680	0.139	1.03	2.228	0.229	1.63	MC
7CX9MN		1.528	-0.013	-0.09	1.988	-0.011	-0.08	MM
7D6TBN		1.539	-0.002	-0.01	1.944	-0.055	-0.39	MC
82RLC3	*	1.293	-0.248	-1.84	1.983	-0.016	-0.11	MD
83PYYV		1.215	-0.326	-2.42	1.695	-0.304	-2.17	MC
87NCHE		1.287	-0.254	-1.89	1.812	-0.188	-1.34	MC
89UW7E		1.739	0.198	1.47	2.267	0.267	1.91	MC
8PFKDN		1.362	-0.179	-1.33	1.700	-0.299	-2.14	MC
93MQ73		1.418	-0.123	-0.91	1.802	-0.198	-1.41	MC
AYWGHY		1.642	0.101	0.75	2.035	0.036	0.25	MC
CNQD72		1.367	-0.174	-1.29	1.930	-0.069	-0.49	MC
CRUEKZ		1.592	0.051	0.38	2.007	0.007	0.05	XX
DPZ8C9		1.722	0.181	1.34	2.217	0.217	1.55	MC
DXD4GE		1.573	0.032	0.24	2.110	0.111	0.79	MC
F2M227		1.498	-0.043	-0.32	1.975	-0.024	-0.17	MC
FDW9NC		1.563	0.022	0.17	1.948	-0.051	-0.36	MC
FDWT8R		1.685	0.144	1.07	2.223	0.224	1.60	MD
GNAQW9		1.498	-0.043	-0.32	1.978	-0.021	-0.15	MC
HFVQT6		1.542	0.001	0.01	1.960	-0.039	-0.28	MC
HTLHFU		1.767	0.226	1.68	2.137	0.137	0.98	MM
JPGP79		1.372	-0.169	-1.26	1.855	-0.144	-1.03	MC
KN4ZBG		1.625	0.084	0.62	2.035	0.036	0.25	MM
LP8PX4		1.530	-0.011	-0.08	1.990	-0.009	-0.07	ME
LRG6HB		1.550	0.009	0.07	2.073	0.074	0.53	MC
LRXFYV		1.543	0.002	0.02	1.890	-0.109	-0.78	MC
LTDH8P		1.528	-0.013	-0.09	1.950	-0.049	-0.35	MC
NHN7TU		1.592	0.051	0.38	1.993	-0.006	-0.04	MC
QEYFLM		1.578	0.037	0.28	1.975	-0.024	-0.17	MC
QKKYVB	*	1.737	0.196	1.45	2.372	0.372	2.66	MX
QLRHE6		1.562	0.021	0.15	1.912	-0.088	-0.63	MD
REVBKJ		1.690	0.149	1.11	2.093	0.094	0.67	ME
RWAEVW		1.588	0.047	0.35	2.093	0.094	0.67	MC
RX2BJQ		1.495	-0.046	-0.34	1.995	-0.004	-0.03	MC
T2LMXL	X	0.775	-0.766	-5.68	0.963	-1.036	-7.39	MP
TJGA6B		1.570	0.029	0.22	2.042	0.042	0.30	MC
XBUNJW		1.592	0.051	0.38	2.080	0.081	0.58	TP



Rubber Interlaboratory Testing Program
Analysis 684
MDR Vulcanization-Cure Time 10% (minutes)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample Z85-Z86			Sample Z87-Z88			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
XYWEMR		1.572	0.031	0.23	1.988	-0.011	-0.08	MC
YGE3PE		1.393	-0.148	-1.10	1.922	-0.078	-0.55	MD
YVCEXJ		1.512	-0.029	-0.22	1.953	-0.046	-0.33	MC
ZHN6XC	*	1.785	0.244	1.81	2.042	0.042	0.30	MM

Grand Means		Summary Statistics	
	1.5409 minutes		1.9993 minutes
Std Dev Btwn Labs	0.1347 minutes		0.1401 minutes
Statistics based on 41 of 42 reporting participants			

Samples Z85-Z86: EPDM compound, batch #1 & Z87-Z88: EPDM compound, batch #2

Comments on Assigned Data Flags for Test #684

T2LMXL (X) - Data for all samples are low. Possible Systematic Error.

Key to Instrument Codes Reported by Participants

MC	Alpha Technologies [Monsanto] MDR 2000 or 2000E	MD	Alpha Tech. Rubber Process Analyzer (RPA 2000)
ME	Alpha Tech. MDR Premiere	MM	MonTech MDR 3000
MP	Alpha Technologies [Monsanto] MDR 2000P	MX	Rebuilt MonTech Alpha
TP	Tech Pro MDR model MDPT	XX	Instrument model not specified by lab

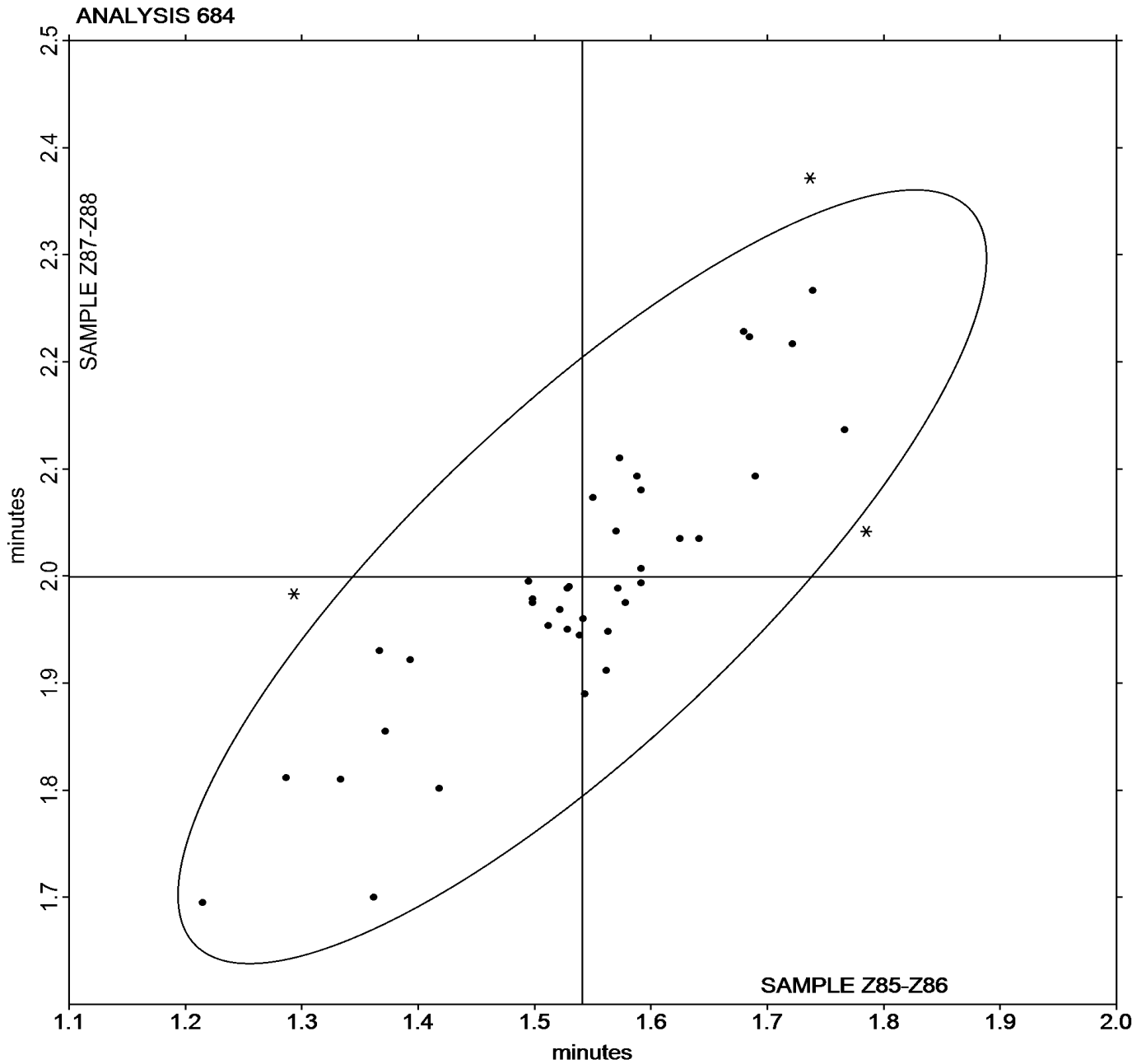


Rubber Interlaboratory Testing Program
Analysis 684
MDR Vulcanization-Cure Time 10% (minutes)

Report #198
4th Qtr 2018

Grand Mean Sample Z85-Z86 = 1.5409 minutes

Grand Mean Sample Z87-Z88 = 1.9993 minutes





Rubber Interlaboratory Testing Program

Report #198

Analysis 685

4th Qtr 2018

MDR Vulcanization-Scorch Time, Ts1 (minutes)

WebCode	Data Flag	Sample Z85-Z86			Sample Z87-Z88			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FT92A		1.277	-0.177	-1.52	1.667	-0.163	-1.18	MC
42K8EJ		1.448	-0.005	-0.04	1.850	0.021	0.15	ME
6B6Z4K		1.330	-0.123	-1.06	1.601	-0.228	-1.65	MC
77BKRJ		1.608	0.155	1.33	2.112	0.282	2.05	MC
7CX9MN		1.435	-0.018	-0.16	1.845	0.016	0.11	MM
7D6TBN		1.456	0.002	0.02	1.756	-0.074	-0.53	MC
82RLC3	*	1.198	-0.255	-2.19	1.813	-0.016	-0.11	MD
83PYYV		1.217	-0.237	-2.04	1.682	-0.148	-1.07	MC
87NCHE		1.258	-0.195	-1.68	1.763	-0.066	-0.48	MC
89UW7E	*	1.706	0.252	2.17	2.206	0.376	2.73	MC
8PFKDN	*	1.262	-0.192	-1.65	1.462	-0.368	-2.67	MC
93MQ73	X	0.877	-0.577	-4.96	0.967	-0.863	-6.26	MC
AYWGHY		1.487	0.033	0.29	1.760	-0.069	-0.50	MC
CNQD72		1.315	-0.138	-1.19	1.798	-0.031	-0.22	MC
CRUEKZ		1.450	-0.003	-0.03	1.825	-0.004	-0.03	XX
DPZ8C9		1.655	0.201	1.73	2.000	0.171	1.24	MC
DXD4GE		1.450	-0.003	-0.03	1.945	0.116	0.84	MC
F2M227		1.482	0.028	0.24	1.878	0.049	0.36	MC
FDW9NC		1.498	0.045	0.39	1.792	-0.038	-0.27	MC
FDWT8R		1.545	0.092	0.79	2.002	0.172	1.25	MD
GNAQW9		1.463	0.010	0.09	1.740	-0.089	-0.65	MC
HFVQT6		1.402	-0.052	-0.44	1.702	-0.128	-0.92	MC
HTLHFU		1.687	0.233	2.01	1.998	0.169	1.23	MM
JPGP79		1.365	-0.088	-0.76	1.790	-0.039	-0.28	MC
KN4ZBG		1.497	0.043	0.37	1.768	-0.061	-0.44	MM
LP8PX4		1.473	0.020	0.17	1.760	-0.069	-0.50	ME
LRG6HB		1.455	0.002	0.01	1.907	0.077	0.56	MC
LRXFYV		1.460	0.007	0.06	1.748	-0.081	-0.59	MC
LTDH8P		1.440	-0.013	-0.11	1.772	-0.058	-0.42	MC
NHN7TU		1.495	0.042	0.36	1.787	-0.043	-0.31	MC
QEYFLM		1.485	0.032	0.27	1.775	-0.054	-0.39	MC
QKKYVB	X	1.503	0.050	0.43	2.402	0.572	4.15	MX
QLRHE6		1.517	0.063	0.55	1.805	-0.024	-0.18	MD
REVBKJ		1.568	0.115	0.99	1.910	0.081	0.59	ME
RWAEVW		1.493	0.040	0.34	1.947	0.117	0.85	MC
RX2BJQ		1.462	0.008	0.07	1.918	0.089	0.65	MC
T2LMXL	X	0.728	-0.725	-6.24	0.878	-0.951	-6.90	MP
TJGA6B		1.455	0.002	0.01	1.868	0.039	0.28	MC



Rubber Interlaboratory Testing Program
Analysis 685
MDR Vulcanization-Scorch Time, Ts1 (minutes)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample Z85-Z86			Sample Z87-Z88			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
XBUNJW		1.607	0.153	1.32	2.050	0.221	1.60	TP
XYWEMR		1.442	-0.012	-0.10	1.787	-0.043	-0.31	MC
YGE3PE		1.305	-0.148	-1.28	1.747	-0.083	-0.60	MD
YRD2BT		1.507	0.053	0.46	1.963	0.134	0.97	MC
YVCEXJ		1.462	0.008	0.07	1.815	-0.014	-0.10	MC
ZHN6XC		1.472	0.018	0.16	1.683	-0.146	-1.06	MM

Grand Means		Summary Statistics	
	1.4533 minutes		1.8292 minutes
Stnd Dev Btwn Labs	0.1162 minutes		0.1379 minutes
Statistics based on 41 of 44 reporting participants			

Samples Z85-Z86: EPDM compound, batch #1 & Z87-Z88: EPDM compound, batch #2

Comments on Assigned Data Flags for Test #685

- 93MQ73 (X) - Data for all samples are low.
- QKKYVB (X) - Data for sample group Z87-Z88 are high. Inconsistent within the determinations of sample group Z87-Z88.
- T2LMXL (X) - Data for all samples are low.

Key to Instrument Codes Reported by Participants

MC Alpha Technologies [Monsanto] MDR 2000 or 2000E	MD Alpha Tech. Rubber Process Analyzer (RPA 2000)
ME Alpha Tech. MDR Premiere	MM MonTech MDR 3000
MP Alpha Technologies [Monsanto] MDR 2000P	MX Rebuilt MonTech Alpha
TP Tech Pro MDR model MDPT	XX Instrument model not specified by lab

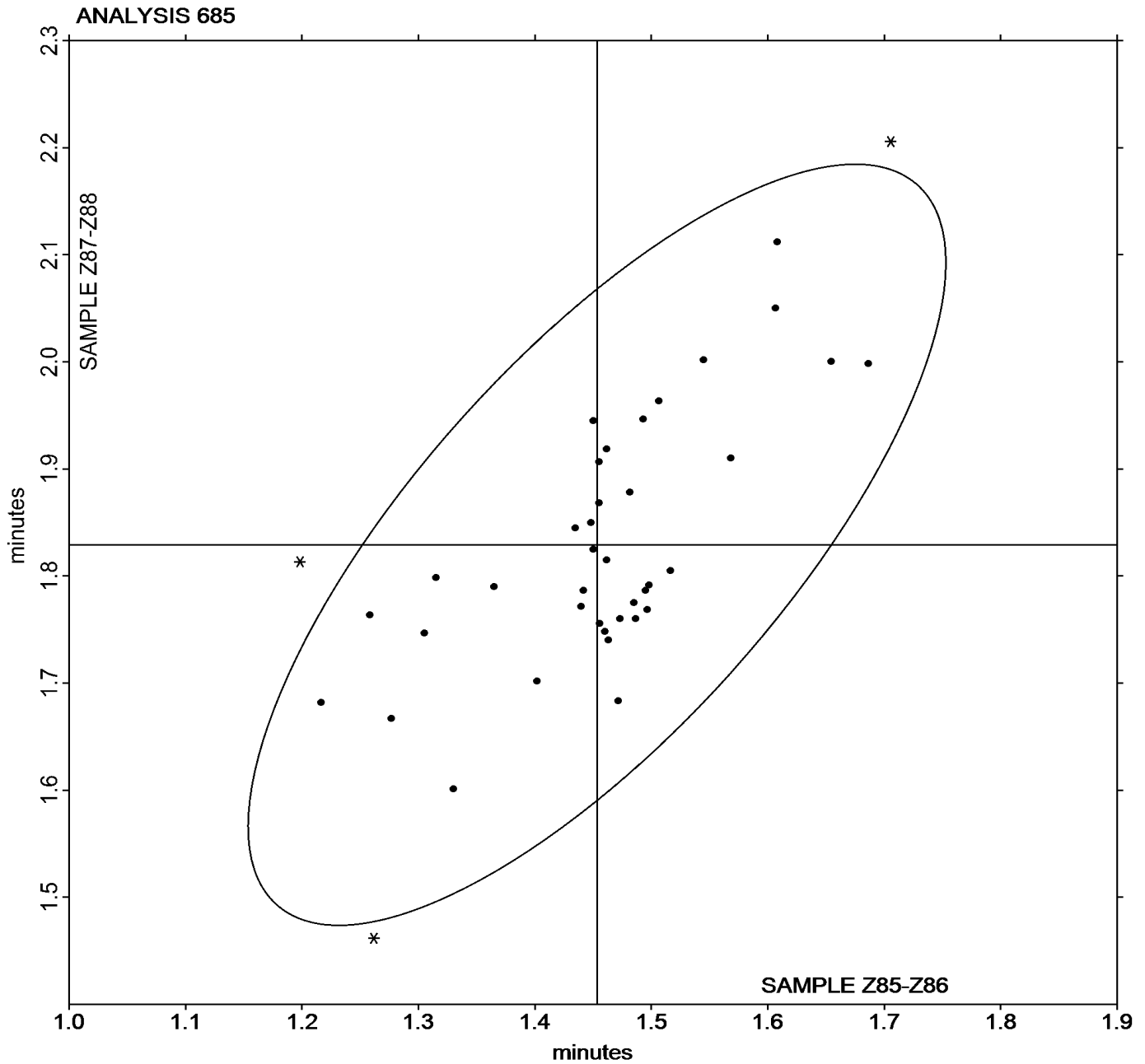


Rubber Interlaboratory Testing Program
Analysis 685
MDR Vulcanization-Scorch Time, Ts1 (minutes)

Report #198
4th Qtr 2018

Grand Mean Sample **Z85-Z86** = 1.4533 minutes

Grand Mean Sample **Z87-Z88** = 1.8292 minutes





Rubber Interlaboratory Testing Program

Report #198

Analysis 686

4th Qtr 2018

MDR Vulcanization-Cure Time 50% (minutes)

WebCode	Data Flag	Sample Z85-Z86			Sample Z87-Z88			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FT92A	*	3.128	-0.448	-2.21	3.848	-0.656	-2.74	MC
42K8EJ		3.495	-0.081	-0.40	4.387	-0.118	-0.49	ME
6B6Z4K		3.475	-0.101	-0.50	4.659	0.155	0.65	MC
77BKRJ		3.820	0.244	1.20	4.420	-0.085	-0.35	MC
7CX9MN		3.455	-0.121	-0.60	4.260	-0.245	-1.02	MM
7D6TBN		3.617	0.040	0.20	4.650	0.146	0.61	MC
82RLC3		3.142	-0.435	-2.15	4.332	-0.173	-0.72	MD
83PYYV	X	2.745	-0.831	-4.10	3.807	-0.698	-2.91	MC
87NCHE		3.088	-0.488	-2.41	4.080	-0.425	-1.77	MC
89UW7E		3.947	0.371	1.83	4.558	0.054	0.22	MC
8PFKDN		3.400	-0.176	-0.87	4.327	-0.178	-0.74	MC
93MQ73		3.313	-0.263	-1.30	4.225	-0.280	-1.17	MC
AYWGHY		3.742	0.165	0.82	4.867	0.362	1.51	MC
CNQD72		3.270	-0.306	-1.51	4.053	-0.451	-1.88	MC
CRUEKZ		3.613	0.037	0.18	4.598	0.094	0.39	XX
DPZ8C9		3.617	0.040	0.20	4.270	-0.235	-0.98	MC
DXD4GE		3.605	0.029	0.14	4.090	-0.415	-1.73	MC
F2M227		3.507	-0.070	-0.34	4.627	0.122	0.51	MC
FDW9NC		3.680	0.104	0.51	4.803	0.299	1.25	MC
FDWT8R		3.785	0.209	1.03	4.345	-0.160	-0.67	XX
GNAQW9		3.517	-0.060	-0.29	4.663	0.159	0.66	MC
HFVQT6		3.563	-0.013	-0.06	4.615	0.110	0.46	MC
HTLHFU		3.758	0.182	0.90	4.797	0.292	1.22	MM
JPGP79		3.285	-0.291	-1.44	4.300	-0.205	-0.85	MC
KN4ZBG		3.712	0.135	0.67	4.745	0.240	1.00	MM
LP8PX4		3.580	0.004	0.02	4.620	0.115	0.48	ME
LRG6HB		3.650	0.074	0.36	4.373	-0.131	-0.55	MC
LRXFYV		3.633	0.057	0.28	4.517	0.012	0.05	MC
LTDH8P		3.643	0.067	0.33	4.695	0.190	0.79	MC
NHN7TU		3.633	0.057	0.28	4.763	0.259	1.08	MC
QEYFLM		3.720	0.144	0.71	4.745	0.240	1.00	MC
QKKYVB		3.778	0.202	1.00	4.563	0.059	0.25	MX
QLRHE6		3.528	-0.048	-0.24	4.522	0.017	0.07	MD
REVBKJ		3.795	0.219	1.08	4.845	0.340	1.42	ME
RWAEVW		3.810	0.234	1.15	4.428	-0.076	-0.32	MC
RX2BJQ		3.550	-0.026	-0.13	4.640	0.135	0.57	MC
T2LMXL	X	1.475	-2.101	-10.37	1.807	-2.698	-11.26	MC
TJGA6B		3.637	0.060	0.30	4.532	0.027	0.11	MC



Rubber Interlaboratory Testing Program
Analysis 686
MDR Vulcanization-Cure Time 50% (minutes)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample Z85-Z86			Sample Z87-Z88			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
XBUNJW		3.628	0.052	0.26	4.733	0.229	0.95	TP
XYWEMR		3.703	0.127	0.63	4.700	0.195	0.82	MC
YGE3PE		3.338	-0.238	-1.17	4.455	-0.050	-0.21	MD
YRD2BT		3.743	0.167	0.82	4.293	-0.211	-0.88	MC
YVCEXJ		3.425	-0.151	-0.75	4.467	-0.038	-0.16	MC
ZHN6XC		3.872	0.295	1.46	4.782	0.277	1.16	MM

Summary Statistics	
Grand Means	
3.5762 minutes	4.5046 minutes
Std Dev Btwn Labs	
0.2026 minutes	0.2396 minutes
Statistics based on 42 of 44 reporting participants	

Samples Z85-Z86: EPDM compound, batch #1 & Z87-Z88: EPDM compound, batch #2

Comments on Assigned Data Flags for Test #686

83PYYV (X) - Data for all samples are low.

T2LMXL (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

MC	Alpha Technologies [Monsanto] MDR 2000 or 2000E	MD	Alpha Tech. Rubber Process Analyzer (RPA 2000)
ME	Alpha Tech. MDR Premiere	MM	MonTech MDR 3000
MX	Rebuilt MonTech Alpha	TP	Tech Pro MDR model MDPT
XX	Instrument model not specified by lab		

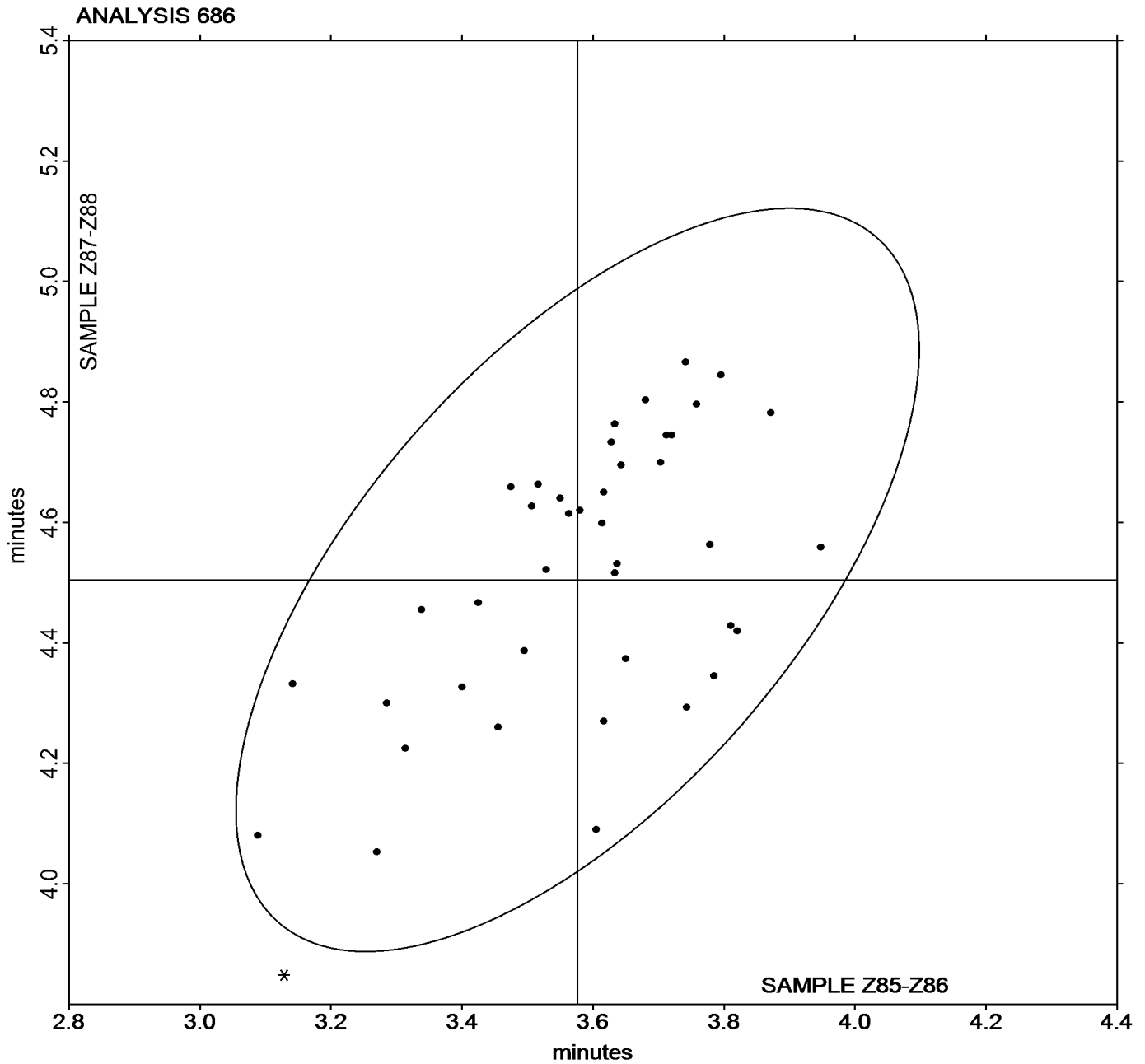


Rubber Interlaboratory Testing Program
Analysis 686
MDR Vulcanization-Cure Time 50% (minutes)

Report #198
4th Qtr 2018

Grand Mean Sample **Z85-Z86** = 3.5762 minutes

Grand Mean Sample **Z87-Z88** = 4.5046 minutes





Rubber Interlaboratory Testing Program

Report #198

Analysis 687

4th Qtr 2018

MDR Vulcanization-Cure Time 90% (minutes)

WebCode	Data Flag	Sample Z85-Z86			Sample Z87-Z88			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FT92A		5.408	-0.770	-2.28	6.732	-1.234	-2.22	MC
42K8EJ		6.217	0.038	0.11	7.420	-0.546	-0.98	ME
6B6Z4K		5.873	-0.305	-0.90	8.498	0.532	0.96	MC
77BKRJ		6.567	0.388	1.15	7.450	-0.516	-0.93	MC
7CX9MN		5.945	-0.233	-0.69	7.773	-0.192	-0.35	MM
7D6TBN		6.467	0.288	0.85	8.450	0.485	0.87	MC
82RLC3		6.032	-0.147	-0.43	8.492	0.526	0.95	MD
83PYYV		5.515	-0.663	-1.96	7.367	-0.599	-1.08	MC
87NCHE		6.145	-0.033	-0.10	7.647	-0.319	-0.57	MC
89UW7E		6.708	0.530	1.57	7.995	0.029	0.05	MC
8PFKDN		6.087	-0.092	-0.27	7.620	-0.346	-0.62	MC
93MQ73		5.505	-0.673	-1.99	7.497	-0.469	-0.84	MC
AYWGHY		6.375	0.197	0.58	8.513	0.548	0.99	MC
CNQD72		5.748	-0.430	-1.27	7.160	-0.806	-1.45	MC
CRUEKZ		6.542	0.363	1.07	8.475	0.509	0.92	XX
DPZ8C9		5.938	-0.240	-0.71	7.253	-0.712	-1.28	MC
DXD4GE		6.090	-0.088	-0.26	7.070	-0.896	-1.61	MC
F2M227		6.032	-0.147	-0.43	8.332	0.366	0.66	MC
FDW9NC		6.317	0.138	0.41	8.333	0.368	0.66	MC
FDWT8R		6.520	0.342	1.01	7.657	-0.309	-0.56	XX
GNAQW9		5.905	-0.273	-0.81	8.158	0.193	0.35	MC
HFVQT6		6.158	-0.020	-0.06	7.982	0.016	0.03	MC
HTLHFU		6.495	0.317	0.94	8.527	0.561	1.01	MM
JPGP79		5.640	-0.538	-1.59	7.405	-0.561	-1.01	MC
KN4ZBG		6.258	0.080	0.24	8.992	1.026	1.85	MM
LP8PX4		5.987	-0.192	-0.57	8.295	0.329	0.59	ME
LRG6HB		6.130	-0.048	-0.14	7.262	-0.704	-1.27	MC
LRXFYV		6.280	0.102	0.30	7.757	-0.209	-0.38	MC
LTDH8P		6.577	0.398	1.18	8.617	0.651	1.17	MC
NHN7TU		6.325	0.147	0.43	8.597	0.631	1.14	MC
QEYFLM		6.363	0.185	0.55	8.685	0.719	1.30	MC
QKKYVB		7.013	0.835	2.47	8.508	0.543	0.98	MX
QLRHE6		6.238	0.060	0.18	7.995	0.029	0.05	MD
REVBKJ		6.593	0.415	1.23	8.903	0.938	1.69	ME
RWAEVW		5.930	-0.248	-0.73	7.230	-0.736	-1.32	MC
RX2BJQ		5.987	-0.192	-0.57	7.718	-0.247	-0.45	MC
T2LMXL	X	2.385	-3.793	-11.22	3.035	-4.931	-8.88	MP
TJGA6B		6.253	0.075	0.22	7.657	-0.309	-0.56	MC



Rubber Interlaboratory Testing Program
Analysis 687
MDR Vulcanization-Cure Time 90% (minutes)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample Z85-Z86			Sample Z87-Z88			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
XBUNJW		6.240	0.062	0.18	8.247	0.281	0.51	TP
XYWEMR		6.342	0.163	0.48	8.382	0.416	0.75	MC
YGE3PE		6.210	0.032	0.09	8.227	0.261	0.47	MD
YRD2BT		6.555	0.377	1.11	7.610	-0.356	-0.64	MC
YVCEXJ		5.980	-0.198	-0.59	8.068	0.103	0.19	MC
ZHN6XC	X	7.958	1.780	5.27	9.285	1.319	2.38	MM

Summary Statistics	
Grand Means	
	6.1783 minutes 7.9655 minutes
Std Dev Btwn Labs	
	0.3380 minutes 0.5552 minutes
Statistics based on 42 of 44 reporting participants	

Samples Z85-Z86: EPDM compound, batch #1 & Z87-Z88: EPDM compound, batch #2

Comments on Assigned Data Flags for Test #687

T2LMXL (X) - Extreme Data.

ZHN6XC (X) - Data for sample group Z85-Z86 are high.

Key to Instrument Codes Reported by Participants

MC	Alpha Technologies [Monsanto] MDR 2000 or 2000E	MD	Alpha Tech. Rubber Process Analyzer (RPA 2000)
ME	Alpha Tech. MDR Premiere	MM	MonTech MDR 3000
MP	Alpha Technologies [Monsanto] MDR 2000P	MX	Rebuilt MonTech Alpha
TP	Tech Pro MDR model MDPT	XX	Instrument model not specified by lab

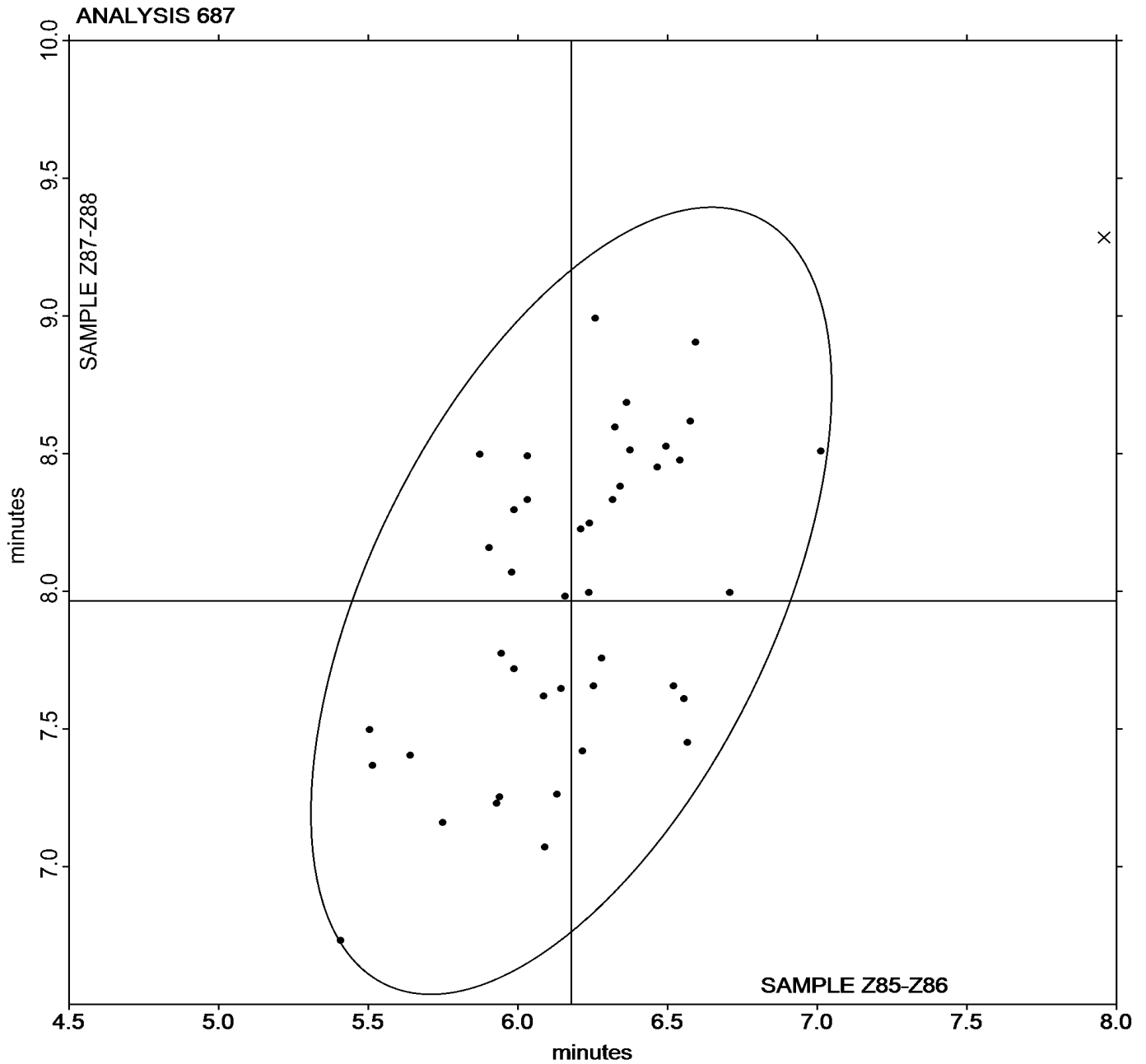


Rubber Interlaboratory Testing Program
Analysis 687
MDR Vulcanization-Cure Time 90% (minutes)

Report #198
4th Qtr 2018

Grand Mean Sample Z85-Z86 = 6.1783 minutes

Grand Mean Sample Z87-Z88 = 7.9655 minutes





Rubber Interlaboratory Testing Program

Report #198

Analysis 688

4th Qtr 2018

MDR Vulcanization: Minimum Torque (lbf.in)

WebCode	Data Flag	Sample Z85-Z86			Sample Z87-Z88			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FT92A		1.957	0.267	1.09	2.278	0.301	1.15	MC
42K8EJ		1.575	-0.115	-0.47	1.935	-0.043	-0.16	ME
6B6Z4K		1.658	-0.032	-0.13	1.878	-0.100	-0.38	MC
77BKRJ		1.498	-0.192	-0.79	1.897	-0.081	-0.31	MC
7CX9MN	*	1.845	0.155	0.64	2.432	0.454	1.73	MM
7D6TBN		1.568	-0.122	-0.50	1.877	-0.101	-0.39	MC
82RLC3	X	3.533	1.843	7.57	3.635	1.657	6.33	MD
83PYYV	*	2.267	0.577	2.37	2.392	0.414	1.58	MC
87NCHE	X	3.013	1.323	5.43	3.130	1.152	4.40	MC
89UW7E	X	2.753	1.063	4.36	3.103	1.126	4.30	MC
8PFKDN		1.665	-0.025	-0.10	2.017	0.039	0.15	MC
93MQ73		1.830	0.140	0.57	2.065	0.087	0.33	MC
AYWGHY		1.416	-0.274	-1.12	1.662	-0.315	-1.20	MC
CNQD72	*	2.447	0.757	3.11	2.755	0.777	2.97	MC
CRUEKZ		1.883	0.193	0.79	2.107	0.129	0.49	XX
DPZ8C9		1.757	0.067	0.27	2.198	0.220	0.84	MC
DXD4GE		1.639	-0.051	-0.21	2.099	0.121	0.46	MC
F2M227		1.720	0.030	0.12	1.932	-0.046	-0.18	MC
FDW9NC		1.607	-0.083	-0.34	1.842	-0.136	-0.52	MC
FDWT8R		1.393	-0.298	-1.22	1.696	-0.281	-1.07	XX
GNAQW9		1.562	-0.128	-0.53	1.797	-0.181	-0.69	MC
HFVQT6		1.698	0.008	0.03	1.901	-0.076	-0.29	MC
HTLHFU		1.338	-0.352	-1.44	1.495	-0.483	-1.84	MM
JPGP79	*	2.353	0.663	2.72	2.532	0.554	2.12	MC
KN4ZBG		1.670	-0.020	-0.08	1.995	0.017	0.07	MM
LP8PX4		1.517	-0.173	-0.71	1.765	-0.213	-0.81	ME
LRG6HB		1.630	-0.060	-0.25	1.993	0.015	0.06	MC
LRXFYV		1.698	0.008	0.03	1.945	-0.033	-0.12	MC
LTDH8P		1.738	0.048	0.20	1.920	-0.058	-0.22	MC
NHN7TU		1.600	-0.090	-0.37	1.815	-0.163	-0.62	MC
QEYFLM		1.565	-0.125	-0.51	1.765	-0.213	-0.81	MC
QKKYVB		1.468	-0.222	-0.91	1.973	-0.004	-0.02	MX
QLRHE6		1.520	-0.170	-0.70	1.757	-0.221	-0.84	MD
REVBKJ		1.515	-0.175	-0.72	1.728	-0.249	-0.95	ME
RWAEVW		1.830	0.140	0.57	2.235	0.257	0.98	MC
RX2BJQ		1.721	0.031	0.13	1.962	-0.016	-0.06	MC
T2LMXL		1.423	-0.267	-1.09	1.748	-0.230	-0.88	MP



Rubber Interlaboratory Testing Program
Analysis 688
MDR Vulcanization: Minimum Torque (lbf.in)

Report #198
4th Qtr 2018

WebCode	Data Flag	Sample Z85-Z86			Sample Z87-Z88			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
TJGA6B		1.573	-0.117	-0.48	1.952	-0.026	-0.10	MC
XBUNJW		1.843	0.153	0.63	1.992	0.014	0.05	TP
XYWEMR		1.652	-0.038	-0.16	1.875	-0.103	-0.39	MC
YRD2BT	*	1.738	0.048	0.20	2.348	0.371	1.42	MC
YVCEXJ		1.855	0.165	0.68	2.028	0.051	0.19	MC
ZHN6XC		1.368	-0.322	-1.32	1.527	-0.451	-1.72	MM

Summary Statistics	
Grand Means	1.6900 lbf.in
Std Dev Btwn Labs	0.2436 lbf.in
	1.9777 lbf.in
	0.2618 lbf.in
Statistics based on 40 of 43 reporting participants	

Summary Statistics in SI Units	
Grand Means	1.9095 dN.m
Std Dev Btwn Labs	0.2752 dN.m
	2.2345 dN.m
	0.2958 dN.m
Statistics based on 40 of 43 reporting participants	

Samples Z85-Z86: EPDM compound, batch #1 & Z87-Z88: EPDM compound, batch #2

Comments on Assigned Data Flags for Test #688

- 82RLC3 (X) - Data for all samples are high. Possible Systematic Error. Inconsistent within the determinations of sample group Z85-Z86.
- 87NCHE (X) - Data for all samples are high. Possible Systematic Error.
- 89UW7E (X) - Data for all samples are high. Possible Systematic Error. Inconsistent within the determinations of sample group Z87-Z88.

Key to Instrument Codes Reported by Participants

MC Alpha Technologies [Monsanto] MDR 2000 or 2000E	MD Alpha Tech. Rubber Process Analyzer (RPA 2000)
ME Alpha Tech. MDR Premiere	MM MonTech MDR 3000
MP Alpha Technologies [Monsanto] MDR 2000P	MX Rebuilt MonTech Alpha
TP Tech Pro MDR model MDPT	XX Instrument model not specified by lab

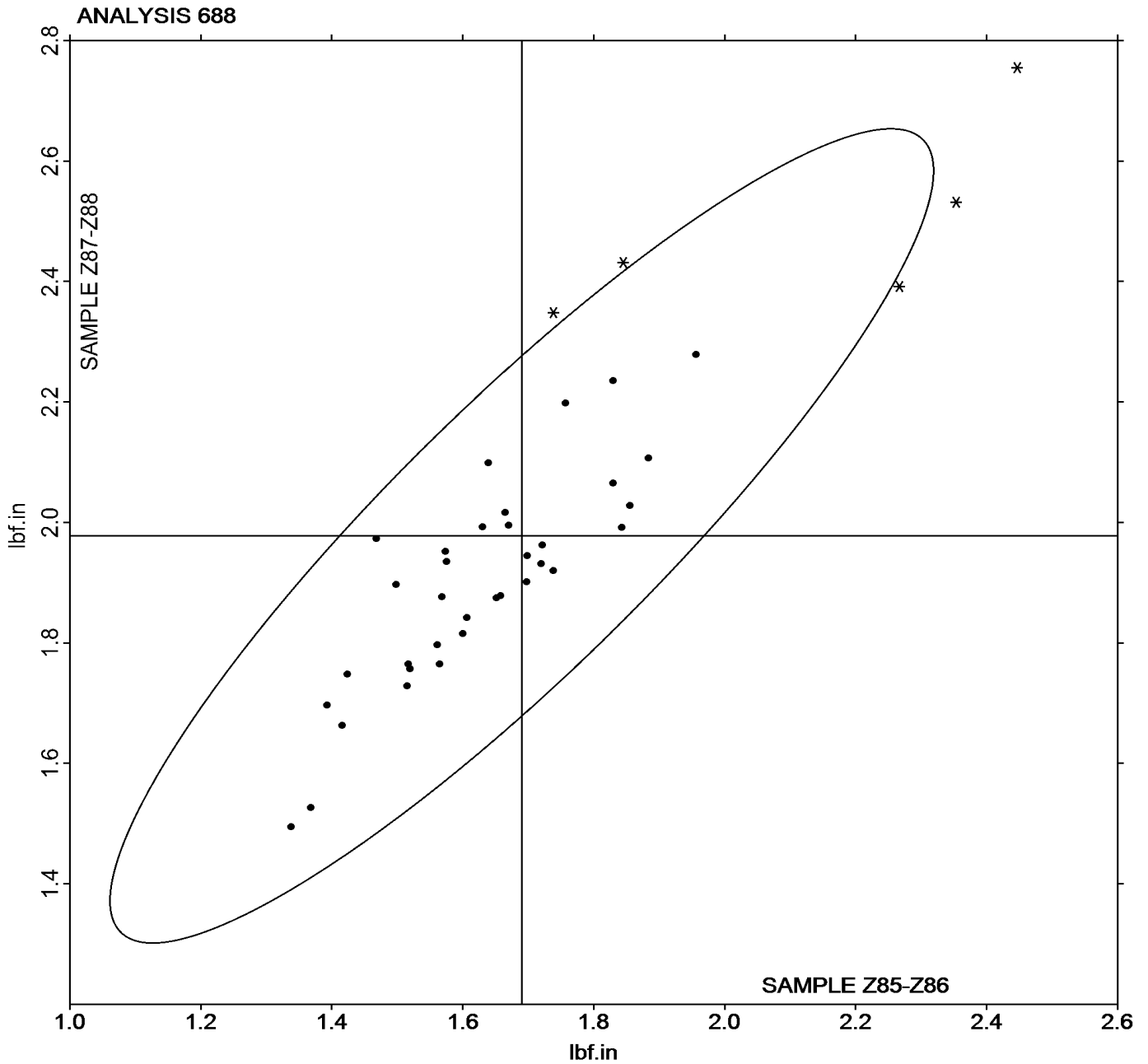


Rubber Interlaboratory Testing Program
Analysis 688
MDR Vulcanization: Minimum Torque (lbf.in)

Report #198
4th Qtr 2018

Grand Mean Sample **Z85-Z86** = 1.6900 lbf.in

Grand Mean Sample **Z87-Z88** = 1.9777 lbf.in





Rubber Interlaboratory Testing Program

Report #198

Analysis 689

4th Qtr 2018

MDR Vulcanization: Maximum Torque (lbf.in)

WebCode	Data Flag	Sample Z85-Z86			Sample Z87-Z88			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FT92A		12.86	0.19	0.26	14.19	0.62	0.83	MC
42K8EJ		12.59	-0.08	-0.11	13.24	-0.32	-0.44	ME
6B6Z4K		12.40	-0.28	-0.39	14.06	0.50	0.67	MC
77BKRJ		12.45	-0.23	-0.32	13.37	-0.20	-0.26	MC
7CX9MN		13.32	0.65	0.92	14.31	0.74	1.00	MM
7D6TBN		12.67	0.00	0.00	13.73	0.17	0.22	MC
82RLC3		13.90	1.23	1.74	14.53	0.96	1.29	MD
83PYYV		12.17	-0.50	-0.71	12.66	-0.90	-1.22	MC
87NCHE		13.50	0.83	1.17	13.75	0.19	0.25	MC
89UW7E		13.22	0.55	0.78	13.84	0.27	0.36	MC
8PFKDN		13.22	0.55	0.77	14.62	1.05	1.41	MC
93MQ73		13.61	0.93	1.32	14.72	1.15	1.55	MC
AYWGHY		12.33	-0.34	-0.48	13.10	-0.47	-0.63	MC
CNQD72		13.35	0.68	0.96	14.48	0.91	1.23	MC
CRUEKZ		13.96	1.29	1.82	14.06	0.49	0.66	XX
DPZ8C9		11.54	-1.13	-1.59	13.42	-0.15	-0.20	MC
DXD4GE		12.94	0.27	0.38	13.89	0.32	0.43	MC
F2M227		11.96	-0.71	-1.00	12.89	-0.68	-0.92	MC
FDW9NC		12.42	-0.25	-0.35	13.32	-0.25	-0.34	MC
FDWT8R		12.03	-0.65	-0.91	13.05	-0.52	-0.70	XX
GNAQW9	*	12.02	-0.65	-0.92	14.08	0.51	0.69	MC
HFVQT6		12.42	-0.25	-0.36	13.31	-0.25	-0.34	MC
HTLHFU	*	11.26	-1.41	-2.00	11.62	-1.95	-2.62	MM
JPGP79		12.44	-0.23	-0.33	13.21	-0.36	-0.48	MC
KN4ZBG		13.57	0.90	1.27	14.85	1.28	1.73	MM
LP8PX4		12.28	-0.39	-0.56	14.08	0.51	0.69	ME
LRG6HB		11.77	-0.90	-1.28	12.61	-0.96	-1.29	MC
LRXFYV		12.91	0.24	0.34	13.44	-0.13	-0.17	MC
LTDH8P		12.99	0.31	0.44	13.64	0.07	0.09	MC
NHN7TU		12.90	0.23	0.32	13.71	0.14	0.19	MC
QEYFLM		12.83	0.16	0.23	13.71	0.14	0.19	MC
QKKYVB		13.69	1.02	1.44	14.29	0.72	0.97	MX
QLRHE6		12.12	-0.55	-0.78	12.86	-0.70	-0.95	MD
REVBKJ		13.11	0.44	0.63	13.43	-0.14	-0.18	ME
RWAEVW		13.14	0.47	0.66	13.98	0.41	0.55	MC
RX2BJQ	*	11.05	-1.62	-2.29	11.46	-2.10	-2.83	MC
T2LMXL		11.84	-0.83	-1.18	13.16	-0.40	-0.54	MC
TJGA6B		13.12	0.45	0.63	13.86	0.29	0.39	MC



Rubber Interlaboratory Testing Program

Report #198

Analysis 689

4th Qtr 2018

MDR Vulcanization: Maximum Torque (lbf.in)

WebCode	Data Flag	Sample Z85-Z86			Sample Z87-Z88			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
XBUNJW		11.64	-1.03	-1.46	12.27	-1.30	-1.75	TP
XYWEMR		13.40	0.72	1.02	13.86	0.29	0.39	MC
YRD2BT		12.68	0.01	0.01	13.64	0.07	0.09	MC
YVCEXJ		12.60	-0.07	-0.10	13.53	-0.04	-0.05	MC
ZHN6XC	X	16.17	3.50	4.94	15.41	1.85	2.49	MM

Grand Means		Summary Statistics	
	12.671 lbf.in		13.567 lbf.in
Stnd Dev Btwn Labs	0.707 lbf.in		0.743 lbf.in
Statistics based on 42 of 43 reporting participants			

Grand Means		Summary Statistics in SI Units	
	14.316 dN.m		15.328 dN.m
Stnd Dev Btwn Labs	0.799 dN.m		0.840 dN.m
Statistics based on 42 of 43 reporting participants			

Samples Z85-Z86: EPDM compound, batch #1 & Z87-Z88: EPDM compound, batch #2

Comments on Assigned Data Flags for Test #689

ZHN6XC (X) - Data for sample group Z85-Z86 are high.

Key to Instrument Codes Reported by Participants

MC	Alpha Technologies [Monsanto] MDR 2000 or 2000E	MD	Alpha Tech. Rubber Process Analyzer (RPA 2000)
ME	Alpha Tech. MDR Premiere	MM	MonTech MDR 3000
MX	Rebuilt MonTech Alpha	TP	Tech Pro MDR model MDPT
XX	Instrument model not specified by lab		

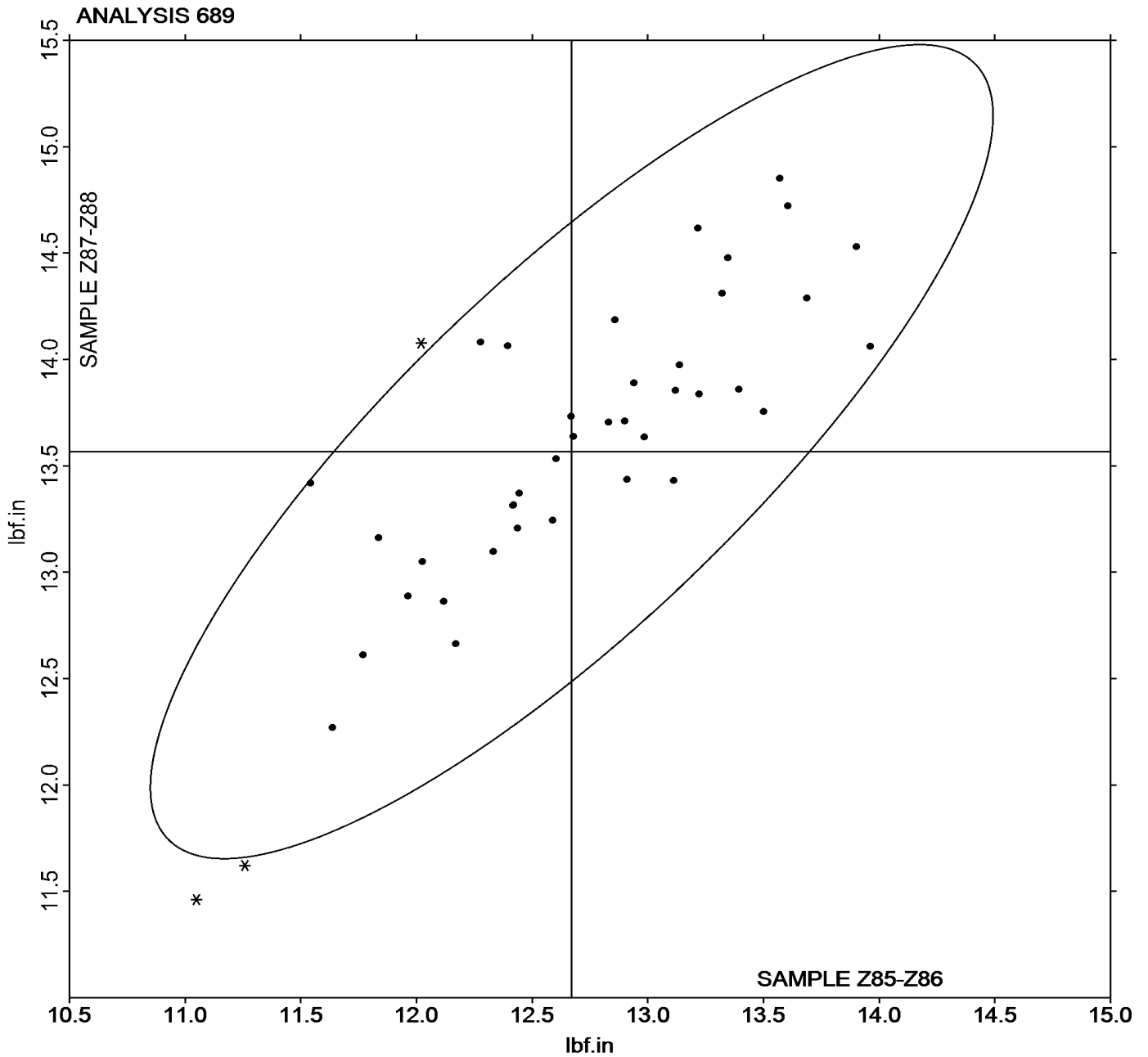


Rubber Interlaboratory Testing Program
Analysis 689
MDR Vulcanization: Maximum Torque (lbf.in)

Report #198
4th Qtr 2018

Grand Mean Sample Z85-Z86 = 12.671 lbf.in

Grand Mean Sample Z87-Z88 = 13.567 lbf.in





Rubber Interlaboratory Testing Program

Report #198

Analysis 690

4th Qtr 2018

RPA Rheological Properties: Part A - G' at 20Hz (kPa)

WebCode	Data Flag	Sample H81-H82			Sample H83-H84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
6B6Z4K		445.8	-53.5	-0.93	459.7	-38.2	-0.73	RP
7CX9MN		566.4	67.1	1.16	553.6	55.7	1.07	XX
DPZ8C9		466.3	-33.0	-0.57	470.8	-27.0	-0.52	XX
F2M227		471.1	-28.2	-0.49	495.4	-2.5	-0.05	PP
FDWT8R		457.5	-41.8	-0.72	441.6	-56.3	-1.08	RP
HTLHFU		572.9	73.6	1.27	562.2	64.4	1.23	XX
QKKYVB		565.9	66.5	1.15	556.8	59.0	1.13	XX
XBUNJW		448.7	-50.7	-0.88	442.8	-55.0	-1.05	XX

Grand Means		Summary Statistics	
	499.34 kPa		497.88 kPa
Std Dev Btwn Labs	57.83 kPa		52.25 kPa
Statistics based on 8 of 8 reporting participants			

Samples H81-H82: EPDM compound, batch #1 & H83-H84: EPDM compound, batch #2

Key to Instrument Codes Reported by Participants

- PP PPA 2000
- XX Instrument model not specified by lab
- RP RPA 2000

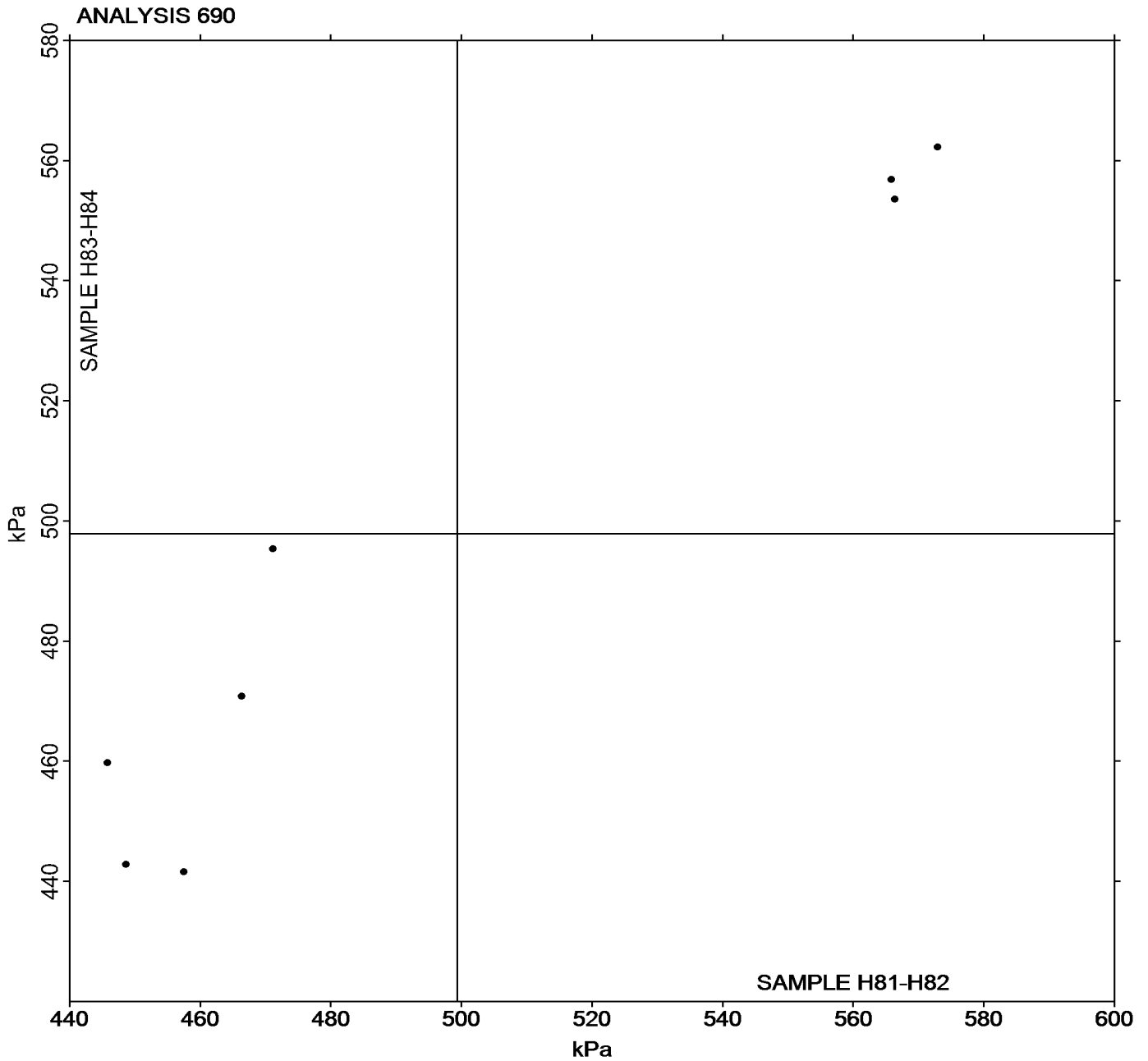


Rubber Interlaboratory Testing Program
Analysis 690
RPA Rheological Properties: Part A - G' at 20Hz (kPa)

Report #198
4th Qtr 2018

Grand Mean Sample H81-H82 = 499.34 kPa

Grand Mean Sample H83-H84 = 497.88 kPa



If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.



Rubber Interlaboratory Testing Program

Report #198

Analysis 691

4th Qtr 2018

RPA Rheological Properties: Part A - G'' at 20Hz (kPa)

WebCode	Data Flag	Sample H81-H82			Sample H83-H84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
6B6Z4K		198.5	7.3	0.22	198.8	13.3	0.41	RP
7CX9MN		168.4	-22.8	-0.69	168.7	-16.8	-0.52	XX
DPZ8C9		209.3	18.1	0.55	202.8	17.2	0.53	XX
F2M227		208.1	16.9	0.51	211.0	25.4	0.78	PP
FDWT8R		190.7	-0.5	-0.02	182.7	-2.8	-0.09	RP
HTLHFU		225.2	34.0	1.03	209.2	23.7	0.73	XX
QKKYVB		208.5	17.4	0.53	198.3	12.8	0.39	XX
XBUNJW		120.8	-70.3	-2.14	112.8	-72.7	-2.23	XX

Grand Means		Summary Statistics	
	191.18 kPa		185.56 kPa
Std Dev Btwn Labs	32.93 kPa		32.56 kPa
Statistics based on 8 of 8 reporting participants			

Samples H81-H82: EPDM compound, batch #1 & H83-H84: EPDM compound, batch #2

Key to Instrument Codes Reported by Participants

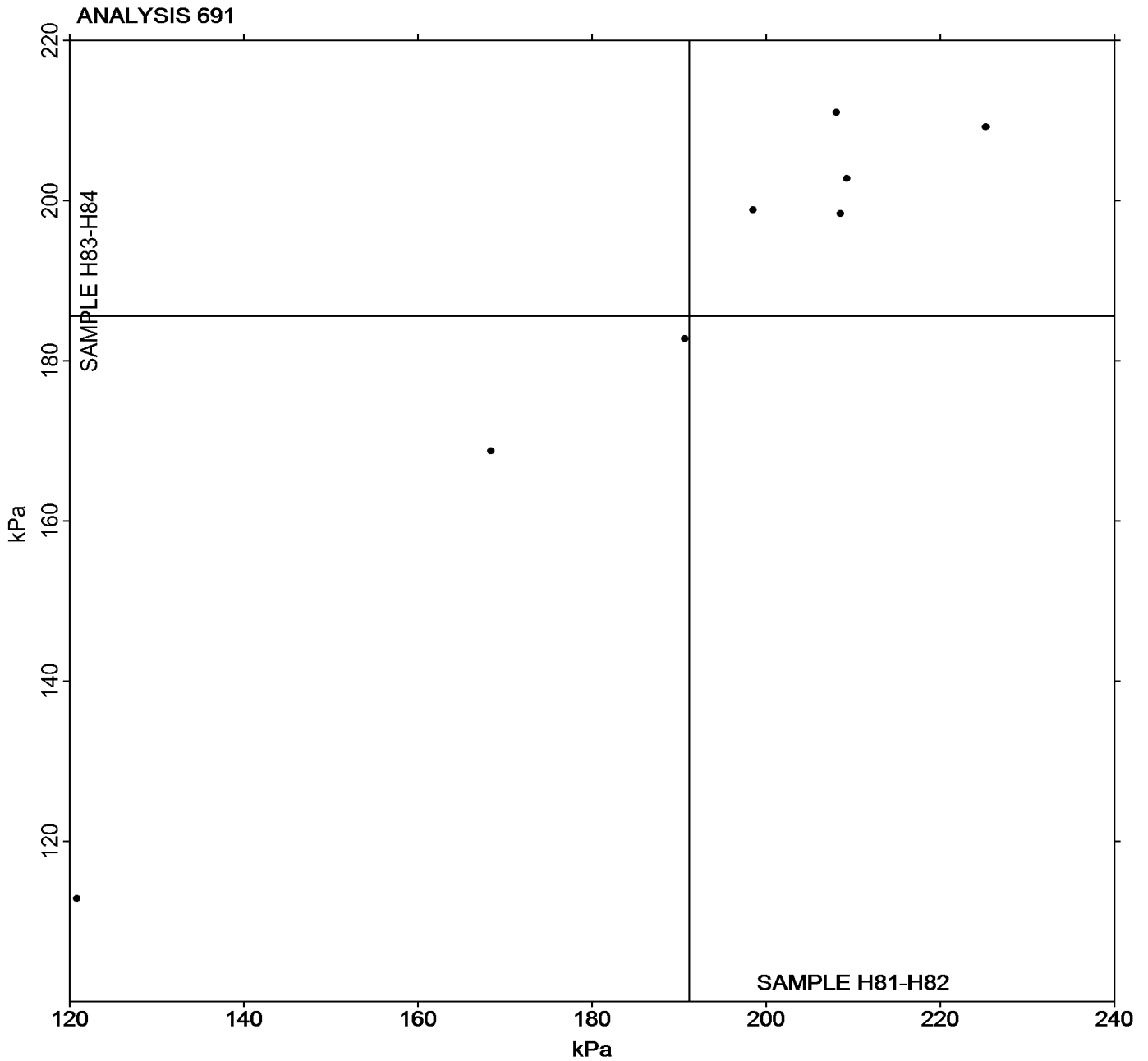
- PP PPA 2000
- XX Instrument model not specified by lab
- RP RPA 2000



RPA Rheological Properties: Part A - G'' at 20Hz (kPa)

Grand Mean Sample H81-H82 = 191.18 kPa

Grand Mean Sample H83-H84 = 185.56 kPa



If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.



Rubber Interlaboratory Testing Program

Report #198

Analysis 695

4th Qtr 2018

RPA Rheological Properties: Part B - G' at 1.0Hz (kPa)

WebCode	Data Flag	Sample H81-H82			Sample H83-H84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
6B6Z4K		62.53	-28.08	-1.38	68.93	-20.06	-1.39	RP
7CX9MN		117.01	26.40	1.30	103.61	14.62	1.01	XX
DPZ8C9		74.40	-16.21	-0.80	79.78	-9.21	-0.64	XX
F2M227		79.19	-11.42	-0.56	82.01	-6.99	-0.48	PR
FDWT8R		88.44	-2.17	-0.11	81.91	-7.08	-0.49	RP
HTLHFU		113.29	22.68	1.12	107.60	18.61	1.29	XX
QKKYVB		99.42	8.81	0.43	99.12	10.13	0.70	XX

Grand Means		Summary Statistics	
	90.611 kPa		88.993 kPa
Std Dev Btwn Labs	20.312 kPa		14.428 kPa
Statistics based on 7 of 7 reporting participants			

Samples H81-H82: EPDM compound, batch #1 & H83-H84: EPDM compound, batch #2

Key to Instrument Codes Reported by Participants

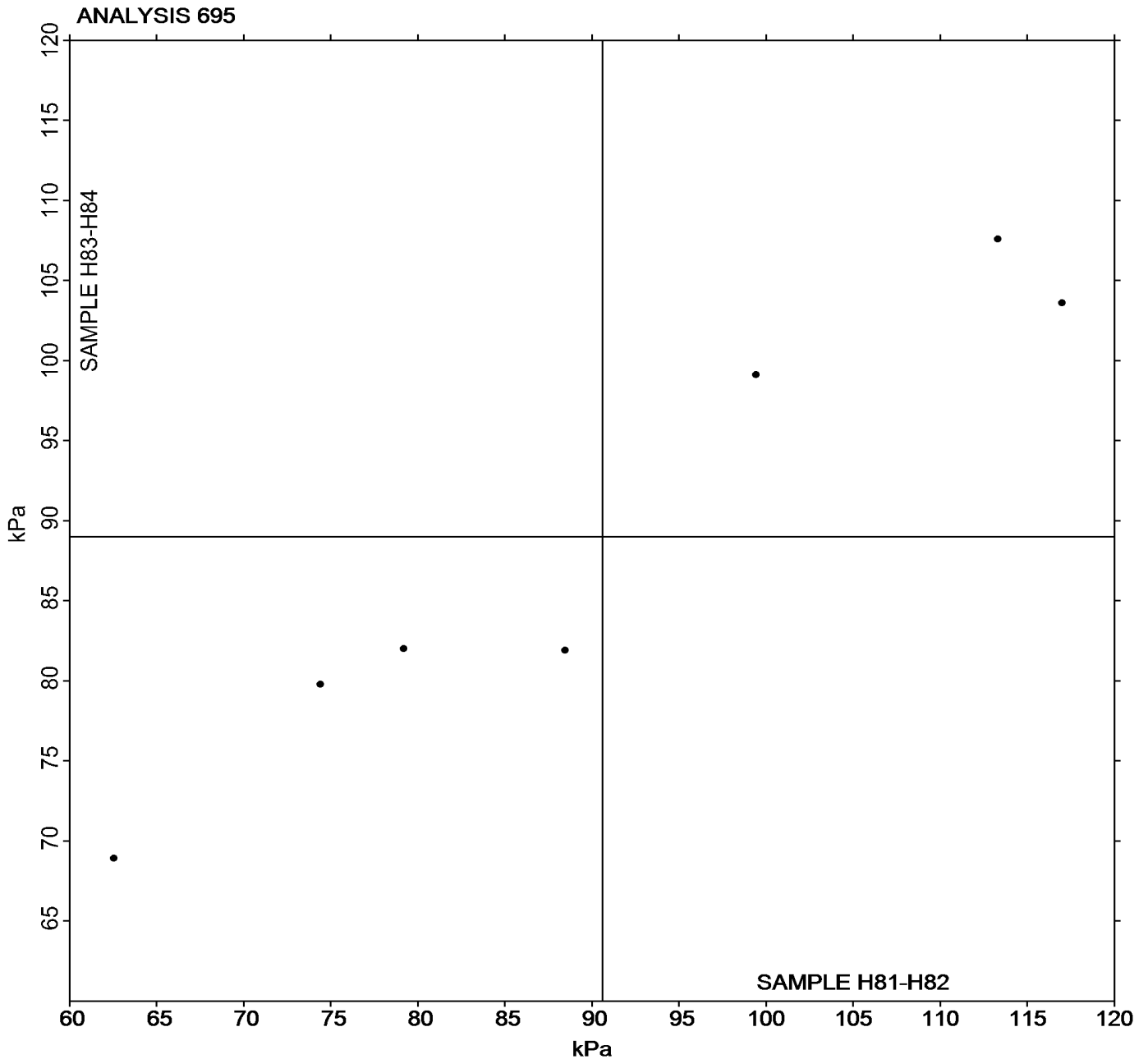
- PR PRPA 2000
- XX Instrument model not specified by lab
- RP RPA 2000



RPA Rheological Properties: Part B - G' at 1.0Hz (kPa)

Grand Mean Sample H81-H82 = 90.611 kPa

Grand Mean Sample H83-H84 = 88.993 kPa



If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.



Rubber Interlaboratory Testing Program

Report #198

Analysis 696

4th Qtr 2018

RPA Rheological Properties: Part B - G'' at 1.0Hz (kPa)

WebCode	Data Flag	Sample H81-H82			Sample H83-H84			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
6B6Z4K		63.38	-8.69	-1.26	64.53	-4.04	-0.81	RP
7CX9MN		79.34	7.27	1.06	73.33	4.76	0.95	XX
DPZ8C9		71.43	-0.64	-0.09	69.74	1.16	0.23	XX
F2M227		67.78	-4.30	-0.62	67.68	-0.90	-0.18	PP
FDWT8R		65.12	-6.95	-1.01	59.78	-8.80	-1.75	RP
HTLHFU		78.79	6.71	0.98	71.55	2.97	0.59	XX
QKKYVB		78.66	6.59	0.96	73.43	4.85	0.97	XX

Summary Statistics			
Grand Means			
	72.070 kPa		68.575 kPa
Std Dev Btwn Labs			
	6.880 kPa		5.016 kPa
Statistics based on 7 of 7 reporting participants			

Samples H81-H82: EPDM compound, batch #1 & H83-H84: EPDM compound, batch #2

Key to Instrument Codes Reported by Participants

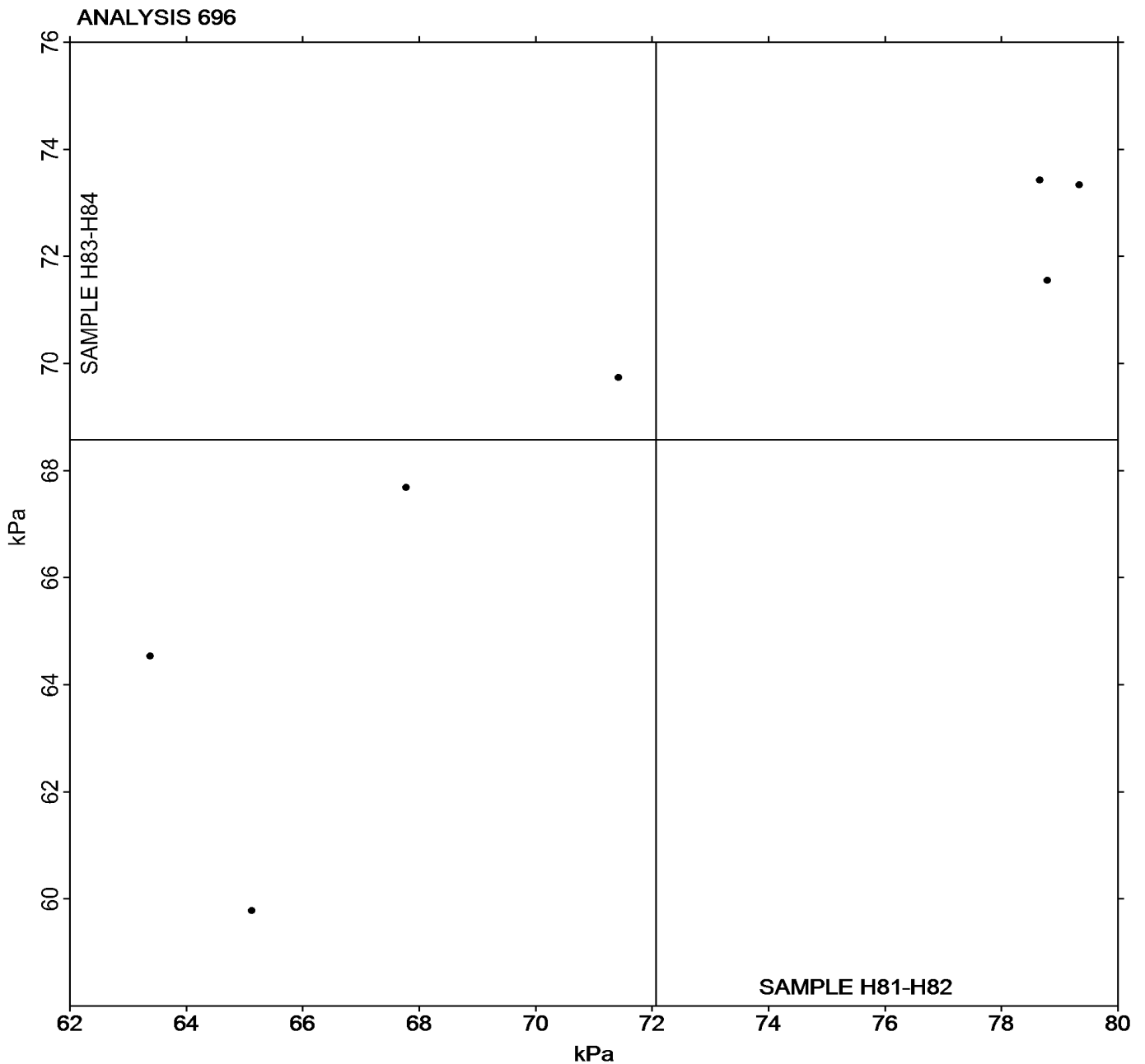
- PP PPA 2000
- RP RPA 2000
- XX Instrument model not specified by lab



RPA Rheological Properties: Part B - G'' at 1.0Hz (kPa)

Grand Mean Sample H81-H82 = 72.070 kPa

Grand Mean Sample H83-H84 = 68.575 kPa



If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.

-End of Report-