

Rubber Interlaboratory Testing Program

Summary Report #190- 4th Qtr 2016

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

[Key for Web Summary Report](#)

<u>Analysis</u>	<u>Analysis Name</u>
605	Tensile Strength: Precured Rubber Samples
606	Ultimate Elongation: Precured Rubber Samples
607	Stress at 300% Elongation: Precured Samples
608	Stress at 100% Elongation: Precured Samples
620	Hardness (Type A): Precured Rubber Samples
621	Density: Precured Rubber Samples @ 25C
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

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:

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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)

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WebCode	Data Flag	Sample D61-D62			Sample D63-D64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2LPLV6		3,065.5	-157.4	-0.91	3,117.0	-134.8	-0.80
2NU67J		2,973.5	-249.4	-1.44	3,072.5	-179.3	-1.06
2T66E4	*	2,764.5	-458.3	-2.65	2,741.6	-510.2	-3.01
3B3XN9		3,217.0	-5.9	-0.03	3,235.0	-16.8	-0.10
3FH7C9		3,595.0	372.2	2.15	3,575.1	323.4	1.91
3KPUMP		3,216.2	-6.6	-0.04	3,190.9	-60.9	-0.36
3QEC4L		3,067.1	-155.8	-0.90	3,075.4	-176.4	-1.04
4KBRGG		3,088.6	-134.3	-0.78	3,153.2	-98.6	-0.58
4XD343		3,364.9	142.0	0.82	3,437.4	185.7	1.10
6CQV8Z		3,049.7	-173.1	-1.00	3,042.9	-208.9	-1.23
6CUBLL	*	3,670.5	447.6	2.58	3,719.5	467.7	2.76
6KFNBj		3,214.0	-8.8	-0.05	3,299.6	47.9	0.28
6MT9C7		3,161.0	-61.9	-0.36	3,378.5	126.7	0.75
6WEJBZ		3,344.6	121.7	0.70	3,341.0	89.2	0.53
7AGCG3		3,200.5	-22.4	-0.13	3,199.0	-52.8	-0.31
7L92BG		3,460.6	237.8	1.37	3,388.8	137.1	0.81
7Y29K6		3,357.5	134.6	0.78	3,392.5	140.7	0.83
86MLXC		3,344.0	121.1	0.70	3,451.5	199.7	1.18
8AGHKH		2,955.0	-267.9	-1.55	3,040.0	-211.8	-1.25
8C2JE6		3,103.1	-119.8	-0.69	3,219.9	-31.9	-0.19
8L8CWC		3,169.1	-53.8	-0.31	3,125.6	-126.2	-0.75
92D8FW		3,129.3	-93.6	-0.54	3,195.0	-56.8	-0.34
96CFQY		2,979.0	-243.9	-1.41	2,964.0	-287.8	-1.70
96FYXA		3,003.0	-219.9	-1.27	3,030.0	-221.8	-1.31
9A8C8D		3,130.5	-92.4	-0.53	3,066.0	-185.8	-1.10
ACU2HH		3,020.0	-202.9	-1.17	3,060.0	-191.8	-1.13
AHEBGE		3,037.1	-185.8	-1.07	3,060.3	-191.4	-1.13
ARL4RU		3,099.5	-123.4	-0.71	3,071.0	-180.8	-1.07
AWGXPV	M	No data reported for this sample			3,364.9	113.2	0.67
B4QQBB		3,154.6	-68.3	-0.39	3,271.4	19.6	0.12
BHB7GV	*	3,414.0	191.1	1.10	3,216.5	-35.3	-0.21
BLHEW8		3,481.0	258.1	1.49	3,383.5	131.7	0.78
BRY3HW		3,366.5	143.6	0.83	3,290.5	38.7	0.23
BU8APW		3,231.5	8.6	0.05	3,303.0	51.2	0.30
BUVACA		3,488.2	265.3	1.53	3,437.4	185.7	1.10
BWFF9C		3,243.5	20.6	0.12	3,208.5	-43.3	-0.26
CDZ79B		3,229.7	6.8	0.04	3,178.5	-73.3	-0.43
CG2AXC		3,235.0	12.1	0.07	3,211.5	-40.3	-0.24



Rubber Interlaboratory Testing Program
Analysis 605
Tensile Strength (psi)

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4th Qtr 2016

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		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
CRZ8KC		3,153.2	-69.6	-0.40	3,186.9	-64.9	-0.38
D23M7B		3,312.5	89.6	0.52	3,330.0	78.2	0.46
DKCVWA	*	3,292.4	69.5	0.40	3,540.0	288.3	1.70
DKVNX8		3,319.0	96.1	0.56	3,313.5	61.7	0.36
E7AVM7		3,536.2	313.3	1.81	3,460.7	208.9	1.23
EDDEAB		3,605.7	382.8	2.21	3,616.5	364.8	2.16
EFFFA8		3,190.9	-32.0	-0.18	3,227.1	-24.6	-0.15
EN6CNU	*	3,387.3	164.4	0.95	3,214.9	-36.9	-0.22
EZK84T	X	981.0	-2,241.9	-12.94	901.5	-2,350.3	-13.89
F7BP7C		3,193.8	-29.1	-0.17	3,266.3	14.5	0.09
FDBA98		3,334.3	111.4	0.64	3,335.7	83.9	0.50
FFWXLTL		3,053.1	-169.8	-0.98	3,042.9	-208.8	-1.23
FNZEQ4		3,335.2	112.3	0.65	3,440.8	189.0	1.12
G3ZF46		3,376.5	153.6	0.89	3,379.5	127.7	0.75
G6QMDU		3,192.0	-30.9	-0.18	3,230.5	-21.3	-0.13
GA8V2T	*	3,050.0	-172.9	-1.00	3,280.0	28.2	0.17
GD4GRB		3,260.5	37.6	0.22	3,385.5	133.7	0.79
GLDXCP		3,381.5	158.6	0.92	3,364.5	112.7	0.67
GN427W		3,174.7	-48.2	-0.28	3,233.2	-18.5	-0.11
H66JBL		3,398.7	175.8	1.02	3,456.9	205.1	1.21
H9RVH4		3,069.8	-153.1	-0.88	3,048.0	-203.8	-1.20
HKKC86		3,334.0	111.1	0.64	3,304.0	52.2	0.31
HLCDB8		2,970.0	-252.9	-1.46	3,030.0	-221.8	-1.31
HNHYY8		2,900.0	-322.9	-1.86	3,050.0	-201.8	-1.19
JYATL2		3,244.5	21.7	0.13	3,244.5	-7.2	-0.04
K6YTFM		3,318.8	96.0	0.55	3,267.8	16.1	0.09
KBKLQM		3,159.5	-63.4	-0.37	3,130.0	-121.8	-0.72
KH2ELJ	*	2,872.5	-350.4	-2.02	2,809.5	-442.3	-2.61
KHYR3J		3,140.1	-82.8	-0.48	3,147.3	-104.4	-0.62
LGRKNX		3,192.0	-30.9	-0.18	3,185.1	-66.7	-0.39
LGRMD3		3,003.8	-219.1	-1.27	2,993.6	-258.1	-1.53
LL3PBQ		3,365.0	142.1	0.82	3,383.5	131.7	0.78
LNQA63		3,199.5	-23.4	-0.13	3,149.4	-102.4	-0.61
LPH9JZ		3,367.5	144.6	0.84	3,322.5	70.7	0.42
LT4WWL		3,127.0	-95.9	-0.55	3,203.7	-48.1	-0.28
M34ZJU		3,443.0	220.1	1.27	3,345.5	93.7	0.55
MF7DVL		3,150.5	-72.4	-0.42	3,234.5	-17.3	-0.10



Rubber Interlaboratory Testing Program
Analysis 605
Tensile Strength (psi)

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		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
MGLPHW		3,556.1	333.2	1.92	3,442.1	190.3	1.12
NBTYKZ		3,214.8	-8.1	-0.05	3,169.4	-82.4	-0.49
NRKU3H		3,172.0	-50.9	-0.29	3,192.5	-59.3	-0.35
NZRMEX		3,234.5	11.6	0.07	3,170.5	-81.3	-0.48
PAD8W2		3,085.7	-137.2	-0.79	3,171.3	-80.5	-0.48
PGDGFM		3,370.9	148.0	0.85	3,474.7	223.0	1.32
PJZ8PR	*	3,633.5	410.6	2.37	3,681.0	429.2	2.54
PZPCVZ		3,094.4	-128.5	-0.74	3,190.9	-60.9	-0.36
QGA3UZ		3,020.0	-202.9	-1.17	3,130.0	-121.8	-0.72
QH4ZWE		3,285.1	62.3	0.36	3,285.1	33.4	0.20
RWX2TC		3,448.8	225.9	1.30	3,435.6	183.8	1.09
T2NN8H		3,195.0	-27.9	-0.16	3,176.0	-75.8	-0.45
TBG26W		3,017.6	-205.3	-1.19	3,125.7	-126.1	-0.74
TEEDEB	*	3,196.0	-26.9	-0.16	3,437.0	185.2	1.09
THYDHX		3,397.5	174.6	1.01	3,427.5	175.7	1.04
TUQYNT		3,353.5	130.6	0.75	3,472.5	220.7	1.30
TVHA9U		3,155.5	-67.4	-0.39	3,125.5	-126.3	-0.75
U7XFMA		3,466.4	243.6	1.41	3,582.5	330.7	1.95
UAYE39		3,398.0	175.1	1.01	3,387.5	135.7	0.80
UC6X7W		3,429.5	206.6	1.19	3,438.5	186.7	1.10
URC2JA		3,167.7	-55.2	-0.32	3,179.3	-72.5	-0.43
UREN3A		3,178.0	-44.9	-0.26	3,196.0	-55.8	-0.33
V6J7EA		3,023.0	-199.9	-1.15	3,236.0	-15.8	-0.09
V9ZLPM		3,277.9	55.0	0.32	3,401.2	149.4	0.88
VMYFEA		3,282.0	59.1	0.34	3,402.0	150.2	0.89
VNDXFU		3,181.5	-41.4	-0.24	3,247.0	-4.8	-0.03
VQHQAT		3,174.8	-48.1	-0.28	3,228.8	-23.0	-0.14
VX6BHF	X	3,665.0	442.1	2.55	3,750.0	498.2	2.94
WJD7MN		3,261.6	38.7	0.22	3,396.6	144.8	0.86
WTLMC9		3,246.1	23.2	0.13	3,236.0	-15.8	-0.09
XMHYGM		3,149.5	-73.4	-0.42	3,222.0	-29.8	-0.18
XTK6WP		3,361.5	138.6	0.80	3,359.5	107.7	0.64
Y98W9A		2,933.5	-289.4	-1.67	3,103.5	-148.3	-0.88
YM67PN		3,081.0	-141.9	-0.82	3,254.5	2.7	0.02
YZFGJ7		3,100.9	-121.9	-0.70	3,053.8	-198.0	-1.17
ZTCRE7		2,989.0	-233.9	-1.35	2,971.5	-280.3	-1.66
ZVXPTP		3,131.0	-91.9	-0.53	3,140.0	-111.8	-0.66



Rubber Interlaboratory Testing Program
Analysis 605
Tensile Strength (psi)

Report #190
4th Qtr 2016

		Summary Statistics	
Grand Means	3,222.87 psi		3,251.75 psi
Stnd Dev Btwn Labs	173.19 psi		169.25 psi
Statistics based on 109 of 112 reporting participants			

		Summary Statistics in SI Units	
Grand Means	22.221 MPa		22.42 MPa
Stnd Dev Btwn Labs	1.194 MPa		1.17 MPa
Statistics based on 109 of 112 reporting participants			

Samples D61-D62: Polyisoprene compound, batch #1 & D63-D64: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #605

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

EZK84T (X) - Extreme Data.

VX6BHF (X) - Data appear to be off by a factor of .1. Data corrected by CTS (x10)



Rubber Interlaboratory Testing Program

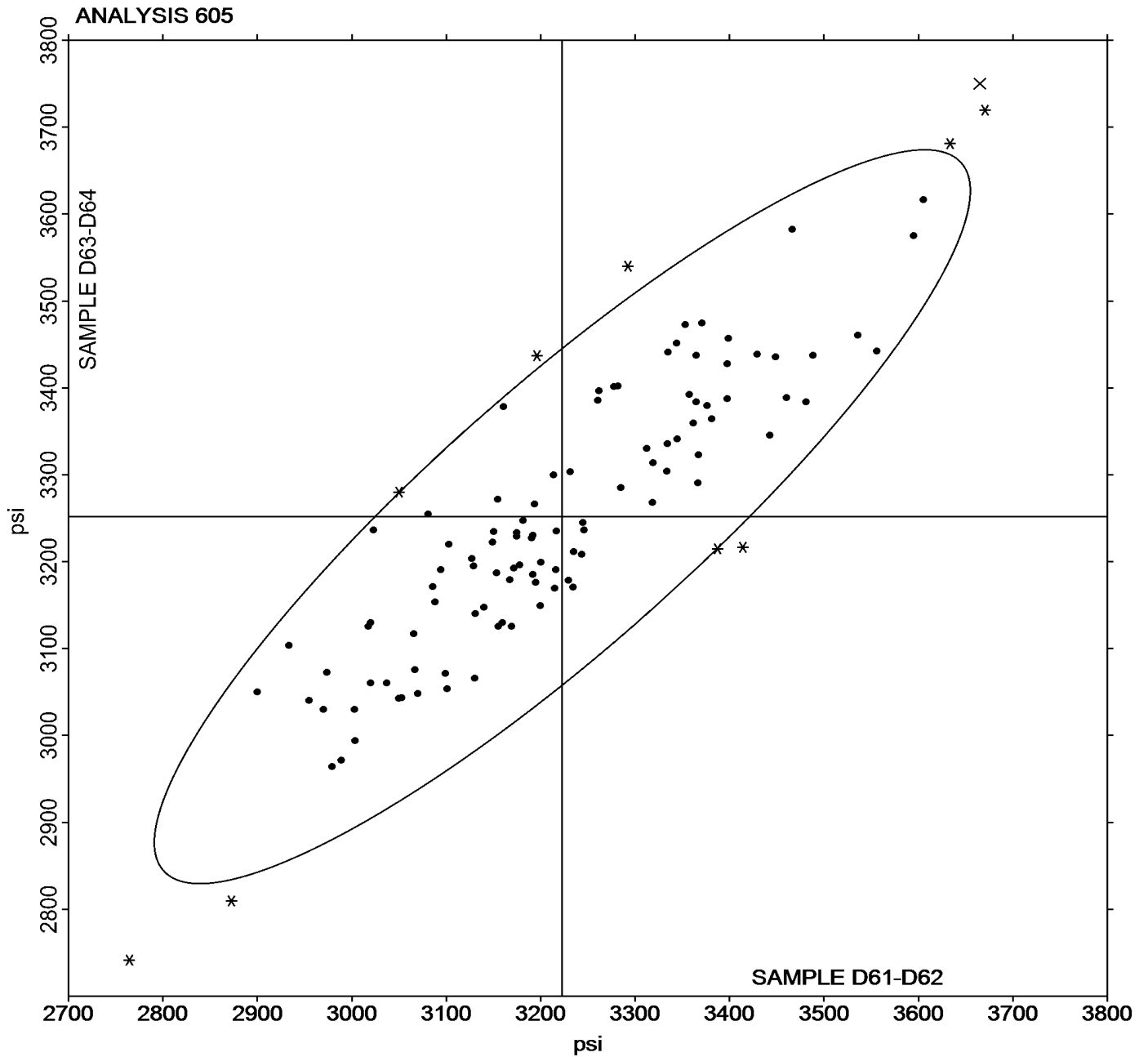
Analysis 605

Tensile Strength (psi)

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Grand Mean Sample **D61-D62** = 3,222.87 psi

Grand Mean Sample **D63-D64** = 3,251.75 psi





Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample D61-D62			Sample D63-D64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2LPLV6		617.5	22.5	0.82	614.5	17.2	0.59
2NU67J		596.5	1.5	0.06	609.5	12.2	0.42
2T66E4		541.7	-53.3	-1.93	536.8	-60.6	-2.07
3B3XN9		617.0	22.0	0.80	618.5	21.2	0.72
3FH7C9		633.0	38.1	1.38	638.5	41.2	1.41
3KPUMP		598.2	3.2	0.12	603.6	6.2	0.21
3QEC4L		580.0	-15.0	-0.54	580.0	-17.3	-0.59
4KBRGG		572.0	-23.0	-0.83	570.0	-27.3	-0.93
4XD343		569.2	-25.8	-0.93	577.0	-20.4	-0.70
6CQV8Z		582.2	-12.8	-0.46	571.3	-26.0	-0.89
6CUBLL		550.5	-44.5	-1.61	546.5	-50.8	-1.74
6KFNBj		624.0	29.0	1.05	626.0	28.7	0.98
6MT9C7		619.5	24.5	0.89	630.5	33.2	1.13
6WEJBZ		618.5	23.5	0.85	620.0	22.7	0.77
7AGCG3		560.0	-35.0	-1.27	559.5	-37.8	-1.29
7L92BG	X	1,620.0	1,025.0	37.12	1,565.0	967.7	33.06
7Y29K6		616.6	21.6	0.78	634.4	37.1	1.27
86MLXC		620.0	25.0	0.91	632.0	34.7	1.18
8AGHKH		541.5	-53.5	-1.94	549.5	-47.8	-1.63
8C2JE6		568.0	-27.0	-0.98	562.0	-35.3	-1.21
8L8CWC	X	726.0	131.0	4.75	708.0	110.7	3.78
92D8FW		601.9	6.9	0.25	617.7	20.4	0.70
96CFQY		564.0	-31.0	-1.12	560.0	-37.3	-1.28
96FYXA		572.5	-22.5	-0.81	574.0	-23.3	-0.80
9A8C8D		613.0	18.0	0.65	607.5	10.2	0.35
ACU2HH		567.5	-27.5	-0.99	576.5	-20.8	-0.71
AHEBGE		561.3	-33.7	-1.22	547.4	-49.9	-1.71
ARL4RU		599.0	4.0	0.15	596.5	-0.8	-0.03
AWGXPV	M	No data reported for this sample			579.0	-18.3	-0.63
B4QQBB		622.5	27.5	1.00	632.5	35.2	1.20
BHB7GV		641.5	46.5	1.69	638.5	41.2	1.41
BLHEW8		589.5	-5.5	-0.20	570.5	-26.8	-0.92
BRY3HW		611.5	16.5	0.60	598.5	1.2	0.04
BU8APW		599.5	4.5	0.16	605.3	7.9	0.27
BUVACA	*	672.5	77.5	2.81	677.0	79.7	2.72
BWFF9C		554.0	-41.0	-1.48	563.5	-33.8	-1.16
CDZ79B		612.2	17.3	0.63	608.6	11.2	0.38
CG2AXC		594.0	-1.0	-0.03	588.0	-9.3	-0.32



Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample D61-D62			Sample D63-D64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
CRZ8KC		611.0	16.0	0.58	593.5	-3.8	-0.13
D23M7B		654.0	59.0	2.14	642.0	44.7	1.53
DKCVWA		591.5	-3.5	-0.12	621.4	24.0	0.82
DKVNX8		617.0	22.0	0.80	617.0	19.7	0.67
E7AVM7		638.8	43.8	1.59	630.2	32.9	1.12
EDDEAB		595.0	0.0	0.00	597.0	-0.3	-0.01
EFFFA8		595.0	0.0	0.00	601.5	4.1	0.14
EN6CNU		623.5	28.5	1.03	620.9	23.5	0.80
EZK84T	X	438.5	-156.5	-5.66	435.0	-162.3	-5.55
F7BP7C	X	693.0	98.0	3.55	681.5	84.2	2.88
FDBA98		629.3	34.3	1.24	618.8	21.4	0.73
FFWXLTL		596.5	1.5	0.06	596.5	-0.8	-0.03
FNZEQ4		577.9	-17.1	-0.62	581.0	-16.3	-0.56
G3ZF46		612.5	17.5	0.64	593.5	-3.8	-0.13
G6QMDU		531.0	-64.0	-2.32	537.5	-59.8	-2.04
GA8V2T		578.5	-16.5	-0.60	598.5	1.2	0.04
GD4GRB		585.0	-10.0	-0.36	603.5	6.2	0.21
GLDXCP		582.0	-13.0	-0.47	573.0	-24.3	-0.83
GN427W		595.8	0.8	0.03	613.5	16.2	0.55
H66JBL		603.0	8.0	0.29	601.5	4.2	0.14
H9RVH4		625.3	30.3	1.10	632.0	34.7	1.18
HKKC86		575.0	-20.0	-0.72	566.0	-31.3	-1.07
HLCDB8	*	519.5	-75.5	-2.73	536.5	-60.8	-2.08
HNHYY8		549.0	-46.0	-1.66	541.5	-55.8	-1.91
K6YTFM		576.4	-18.6	-0.67	569.7	-27.6	-0.94
KBKLQM		590.0	-5.0	-0.18	581.0	-16.3	-0.56
KHYR3J	*	584.3	-10.7	-0.39	616.3	19.0	0.65
LGRKNX		597.3	2.4	0.09	584.0	-13.3	-0.46
LGRMD3		590.0	-5.0	-0.18	583.0	-14.3	-0.49
LL3PBQ		604.0	9.0	0.33	623.0	25.7	0.88
LNQA63		604.3	9.3	0.34	600.2	2.9	0.10
LPH9JZ		575.5	-19.5	-0.70	591.0	-6.3	-0.22
LT4WWL		594.8	-0.2	-0.01	612.8	15.5	0.53
M34ZJU	*	661.0	66.0	2.39	645.0	47.7	1.63
MF7DVL		604.5	9.5	0.35	597.5	0.2	0.01
MGLPHW		561.0	-34.0	-1.23	552.5	-44.8	-1.53
NRKU3H		617.5	22.5	0.82	628.5	31.2	1.06



Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample D61-D62			Sample D63-D64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
NZRMEX	*	618.5	23.5	0.85	589.5	-7.8	-0.27
PAD8W2		595.0	0.0	0.00	609.5	12.2	0.42
PGDGM		621.5	26.6	0.96	629.6	32.3	1.10
PJZ8PR		615.0	20.0	0.73	631.5	34.2	1.17
PZPCVZ	X	630.0	35.0	1.27	584.0	-13.3	-0.46
QGA3UZ		570.5	-24.5	-0.89	559.5	-37.8	-1.29
QH4ZWE		598.2	3.2	0.12	603.6	6.2	0.21
RWX2TC		601.4	6.4	0.23	604.7	7.3	0.25
T2NN8H	X	508.5	-86.5	-3.13	531.0	-66.3	-2.27
TBG26W		602.8	7.8	0.28	613.5	16.1	0.55
TEEDEB		587.5	-7.5	-0.27	582.5	-14.8	-0.51
THYDHX		598.0	3.0	0.11	595.0	-2.3	-0.08
TUQYNT		617.0	22.0	0.80	626.0	28.7	0.98
TVHA9U		614.5	19.5	0.71	619.0	21.7	0.74
U7XFMA		626.5	31.5	1.14	632.0	34.7	1.18
UAYE39		568.0	-27.0	-0.98	574.0	-23.3	-0.80
UC6X7W		628.5	33.5	1.21	638.0	40.7	1.39
URC2JA		589.5	-5.5	-0.20	572.5	-24.8	-0.85
UREN3A		578.5	-16.5	-0.60	578.5	-18.8	-0.64
V6J7EA		579.5	-15.5	-0.56	595.5	-1.8	-0.06
V9ZLPM		584.0	-11.0	-0.40	601.5	4.2	0.14
VMYFEA		630.5	35.5	1.29	646.0	48.7	1.66
VNDXFU		549.5	-45.5	-1.65	540.5	-56.8	-1.94
VQHQAT		550.3	-44.6	-1.62	570.2	-27.2	-0.93
VX6BHF		583.0	-12.0	-0.43	600.5	3.2	0.11
WJD7MN		600.6	5.6	0.20	609.3	12.0	0.41
WTLMC9	X	674.2	79.2	2.87	650.7	53.3	1.82
XMHYGM		601.0	6.0	0.22	603.0	5.7	0.19
XTK6WP		623.0	28.0	1.02	648.5	51.2	1.75
Y98W9A		593.5	-1.5	-0.05	590.5	-6.8	-0.23
YM67PN		578.5	-16.5	-0.60	588.0	-9.3	-0.32
YZFGJ7		596.0	1.0	0.04	597.5	0.2	0.01
ZTCRE7		580.5	-14.5	-0.52	573.5	-23.8	-0.81
ZVXPTP		560.5	-34.5	-1.25	564.0	-33.3	-1.14



Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #190
4th Qtr 2016

		Summary Statistics	
Grand Means	594.95 percent	597.33 percent	
Std Dev Btwn Labs	27.62 percent	29.27 percent	
Statistics based on 101 of 109 reporting participants			

Samples D61-D62: Polyisoprene compound, batch #1 & D63-D64: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #606

- 7L92BG (X) - Extreme Data.
- 8L8CWC (X) - Data for all samples are high. Possible Systematic Error.
- AWGXPV (M) - Data not reported for Sample group D61-D62.
- EZK84T (X) - Data for all samples are low. Possible Systematic Error.
- F7BP7C (X) - Data for all samples are high. Possible Systematic Error.
- PZPCVZ (X) - Inconsistency in testing between Sample groups.
- T2NN8H (X) - Inconsistency in testing between Sample groups. Data for sample group D61-D62 are low.
- WTLMC9 (X) - Inconsistency in testing between Sample groups. Data for sample group D61-D62 are high.

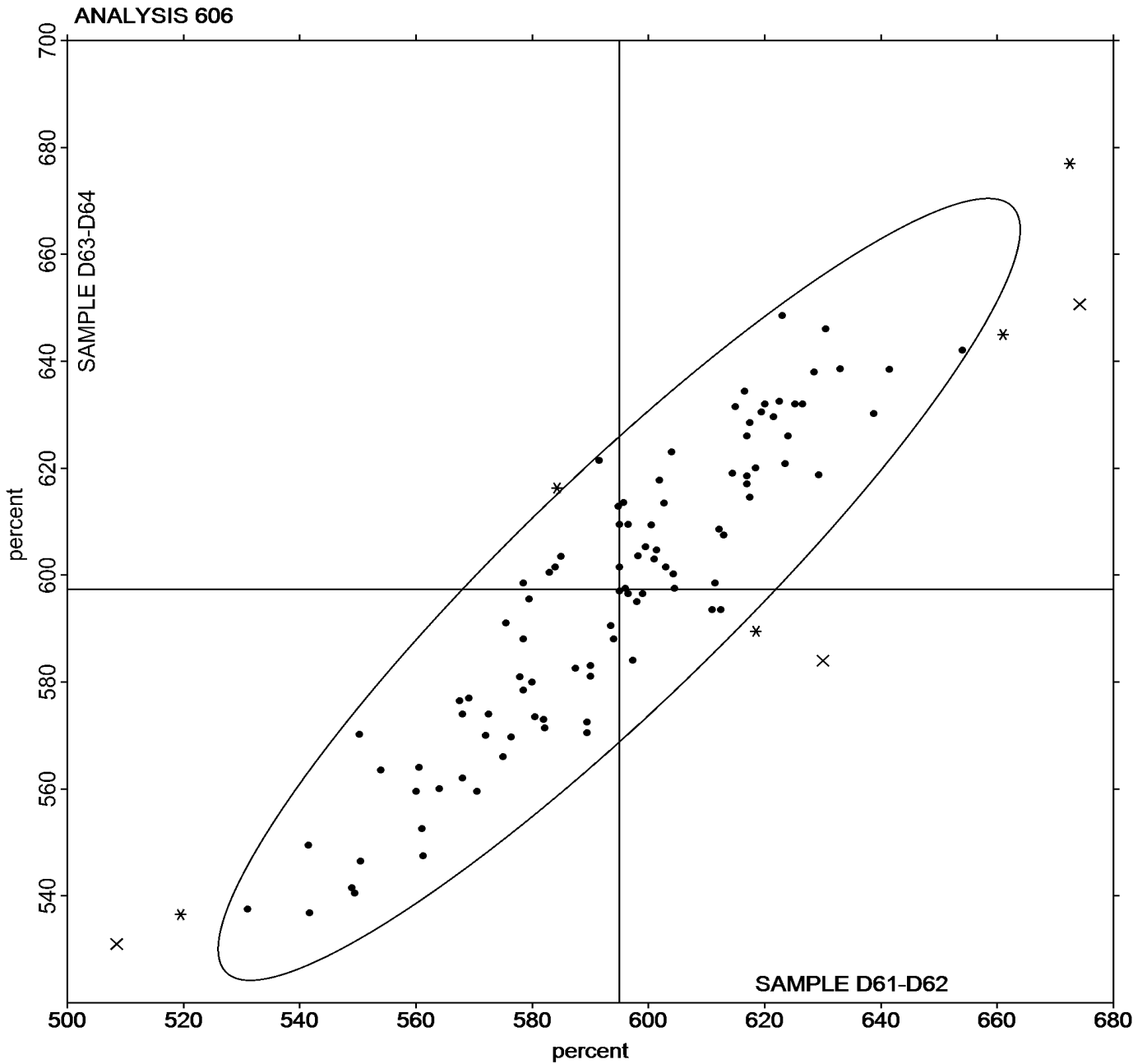


Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #190
4th Qtr 2016

Grand Mean Sample D61-D62 = 594.95 percent

Grand Mean Sample D63-D64 = 597.33 percent





Rubber Interlaboratory Testing Program

Report #190

Analysis 607

4th Qtr 2016

Stress at 300% Elongation (psi)

WebCode	Data Flag	Sample D61-D62			Sample D63-D64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2LPLV6		932.0	-123.5	-1.67	983.5	-85.9	-1.09
2NU67J		990.0	-65.5	-0.89	1,004.0	-65.4	-0.83
2T66E4		1,050.5	-5.1	-0.07	1,069.2	-0.2	0.00
3FH7C9		1,085.7	30.2	0.41	1,054.6	-14.8	-0.19
3KPUMP		1,049.4	-6.2	-0.08	1,079.1	9.7	0.12
3QEC4L		1,005.0	-50.5	-0.68	1,057.5	-11.9	-0.15
4KBRGG		1,092.8	37.3	0.51	1,109.5	40.1	0.51
4XD343		1,196.6	141.0	1.91	1,182.1	112.7	1.43
6CQV8Z		1,052.2	-3.4	-0.05	1,105.7	36.3	0.46
6CUBLL	X	1,281.5	226.0	3.06	1,435.5	366.1	4.64
6MT9C7		1,029.0	-26.5	-0.36	1,059.0	-10.4	-0.13
6WEJBZ		1,055.2	-0.4	-0.01	1,047.9	-21.5	-0.27
7AGCG3		1,092.5	37.0	0.50	1,117.0	47.6	0.60
7L92BG	X	330.0	-725.6	-9.83	341.6	-727.8	-9.22
7Y29K6		1,110.9	55.3	0.75	1,061.0	-8.4	-0.11
86MLXC		1,041.0	-14.5	-0.20	1,030.5	-38.9	-0.49
8AGHKH		1,205.0	149.5	2.03	1,190.0	120.6	1.53
8C2JE6		1,119.7	64.2	0.87	1,157.4	88.0	1.12
92D8FW		1,026.8	-28.8	-0.39	1,014.4	-55.0	-0.70
96CFQY		1,045.5	-10.0	-0.14	1,055.0	-14.4	-0.18
96FYXA		1,030.5	-25.0	-0.34	1,046.0	-23.4	-0.30
9A8C8D		990.5	-65.0	-0.88	997.5	-71.9	-0.91
ACU2HH		1,080.0	24.5	0.33	1,085.0	15.6	0.20
AHEBGE		1,094.3	38.8	0.53	1,136.4	67.0	0.85
ARL4RU		1,019.0	-36.5	-0.50	1,012.5	-56.9	-0.72
AWGXPV	M	No data reported for this sample			1,095.8	26.4	0.33
B4QQBB		976.5	-79.1	-1.07	1,040.1	-29.2	-0.37
BHB7GV		1,016.5	-39.0	-0.53	1,013.0	-56.4	-0.71
BLHEW8		1,173.5	118.0	1.60	1,196.5	127.1	1.61
BRY3HW		1,095.0	39.5	0.53	1,117.5	48.1	0.61
BU8APW		1,020.5	-35.0	-0.47	1,057.0	-12.4	-0.16
BUVACA	*	899.2	-156.3	-2.12	863.0	-206.4	-2.61
BWFF9C		1,194.0	138.5	1.88	1,139.0	69.6	0.88
CDZ79B		1,043.5	-12.0	-0.16	1,022.0	-47.4	-0.60
CG2AXC		1,017.0	-38.5	-0.52	1,058.0	-11.4	-0.14
CRZ8KC		986.4	-69.1	-0.94	1,082.2	12.8	0.16
D23M7B		998.0	-57.5	-0.78	992.5	-76.9	-0.97
DKCVWA		1,111.7	56.2	0.76	1,104.5	35.1	0.44



Rubber Interlaboratory Testing Program

Report #190

Analysis 607

4th Qtr 2016

Stress at 300% Elongation (psi)

WebCode	Data Flag	Sample D61-D62			Sample D63-D64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
DKVNX8		1,022.0	-33.5	-0.45	1,026.5	-42.9	-0.54
E7AVM7		1,043.3	-12.2	-0.17	1,043.3	-26.1	-0.33
EDDEAB		1,131.3	75.8	1.03	1,172.6	103.3	1.31
EFFFA8		1,079.1	23.6	0.32	1,038.5	-30.9	-0.39
EN6CNU		1,000.0	-55.6	-0.75	950.2	-119.2	-1.51
EZK84T	X	565.0	-490.5	-6.65	540.0	-529.4	-6.71
F7BP7C		947.1	-108.4	-1.47	978.3	-91.1	-1.15
FD8A98		1,005.0	-50.5	-0.68	1,105.2	35.8	0.45
FFWXL7		1,007.3	-48.2	-0.65	1,010.2	-59.2	-0.75
FNZEQ4		1,152.1	96.5	1.31	1,174.6	105.3	1.33
G3ZF46		944.0	-111.5	-1.51	1,006.0	-63.4	-0.80
G6QMDU	X	1,321.0	265.5	3.60	1,346.3	276.9	3.51
GA8V2T		1,014.5	-41.0	-0.56	1,044.0	-25.4	-0.32
GD4GRB		1,093.0	37.5	0.51	1,078.5	9.1	0.12
GLDXCP		1,127.5	72.0	0.98	1,163.0	93.6	1.19
GN427W		1,042.1	-13.4	-0.18	977.6	-91.8	-1.16
H66JBL		1,097.0	41.5	0.56	1,132.0	62.6	0.79
H9RVH4	*	951.1	-104.4	-1.42	874.2	-195.2	-2.47
HKKC86		1,170.0	114.5	1.55	1,146.5	77.1	0.98
HLCDB8	*	1,280.0	224.5	3.04	1,255.0	185.6	2.35
HNHYY8	*	1,155.0	99.5	1.35	1,260.0	190.6	2.41
K6YTFM		1,142.1	86.6	1.17	1,186.9	117.5	1.49
KBKLQM		1,033.5	-22.0	-0.30	1,056.5	-12.9	-0.16
LGRKNX		1,088.3	32.8	0.44	1,101.2	31.8	0.40
LGRMD3		998.6	-56.9	-0.77	989.9	-79.5	-1.01
LL3PBQ		1,080.5	25.0	0.34	1,030.0	-39.4	-0.50
LNQA63		1,004.8	-50.7	-0.69	1,022.4	-47.0	-0.60
LPH9JZ		1,059.5	4.0	0.05	1,009.5	-59.9	-0.76
LT4WWL		1,086.5	31.0	0.42	1,049.6	-19.8	-0.25
M34ZJU		956.5	-99.0	-1.34	967.0	-102.4	-1.30
MF7DVL		1,018.5	-37.0	-0.50	1,072.5	3.1	0.04
MGLPHW		1,034.6	-20.9	-0.28	1,079.1	9.7	0.12
NRKU3H		990.0	-65.5	-0.89	952.0	-117.4	-1.49
NZRMEX		1,013.5	-42.0	-0.57	1,087.5	18.1	0.23
PAD8W2		1,047.2	-8.4	-0.11	983.4	-86.0	-1.09
PGDGFM		1,008.2	-47.4	-0.64	1,039.8	-29.6	-0.38
PJZ8PR		1,080.5	25.0	0.34	1,065.5	-3.9	-0.05



Rubber Interlaboratory Testing Program

Report #190

Analysis 607

4th Qtr 2016

Stress at 300% Elongation (psi)

WebCode	Data Flag	Sample D61-D62			Sample D63-D64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
QGA3UZ		1,070.0	14.5	0.20	1,145.0	75.6	0.96
QH4ZWE		1,084.9	29.4	0.40	1,080.5	11.2	0.14
RWX2TC		1,072.0	16.4	0.22	1,072.5	3.1	0.04
T2NN8H	*	1,269.5	214.0	2.90	1,217.0	147.6	1.87
TBG26W		905.5	-150.0	-2.03	937.1	-132.3	-1.68
TEEDEB		1,039.5	-16.0	-0.22	1,144.5	75.1	0.95
THYDHX		1,088.0	32.5	0.44	1,112.5	43.1	0.55
TVHA9U		984.0	-71.5	-0.97	981.0	-88.4	-1.12
U7XFMA		1,139.3	83.7	1.13	1,182.1	112.7	1.43
UAYE39		1,171.5	116.0	1.57	1,184.0	114.6	1.45
UC6X7W		1,037.5	-18.0	-0.24	1,059.5	-9.9	-0.13
URC2JA		1,062.4	6.9	0.09	1,167.6	98.2	1.24
UREN3A		1,094.5	39.0	0.53	1,125.5	56.1	0.71
V6J7EA		1,098.5	43.0	0.58	1,085.0	15.6	0.20
V9ZLPM		1,029.8	-25.8	-0.35	1,037.0	-32.4	-0.41
VMYFEA		993.0	-62.5	-0.85	988.5	-80.9	-1.02
VNDXFU	*	1,190.0	134.5	1.82	1,271.0	201.6	2.55
VQHQAT		1,068.4	12.8	0.17	1,075.0	5.6	0.07
VX6BHF	X	1,195.0	139.5	1.89	1,185.0	115.6	1.46
WJD7MN		1,057.6	2.0	0.03	1,105.1	35.7	0.45
WTLMC9	*	870.3	-185.2	-2.51	948.9	-120.5	-1.53
XMHYGM		1,021.0	-34.5	-0.47	1,055.5	-13.9	-0.18
XTK6WP	*	1,058.0	2.5	0.03	956.0	-113.4	-1.44
Y98W9A		969.5	-86.0	-1.17	1,074.5	5.1	0.06
YM67PN		1,069.0	13.5	0.18	1,092.0	22.6	0.29
YZFGJ7		993.5	-62.0	-0.84	996.4	-73.0	-0.92
ZTCRE7		1,006.5	-49.0	-0.66	1,017.0	-52.4	-0.66
ZVXPTP		1,113.5	58.0	0.79	1,150.5	81.1	1.03

Grand Means		Summary Statistics	
	1,055.54 psi		1,069.38 psi
Stnd Dev Btwn Labs	73.79 psi		78.93 psi
Statistics based on 97 of 103 reporting participants			



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

Report #190
4th Qtr 2016

Summary Statistics in SI Units			
Grand Means	7.2776 MPa	7.37 MPa	
Std Dev Btwn Labs	0.5088 MPa	0.54 MPa	
Statistics based on 97 of 103 reporting participants			

Samples D61-D62: Polyisoprene compound, batch #1 & D63-D64: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #607

- 6CUBLL (X) - Data for all samples are high. Possible Systematic Error.
- 7L92BG (X) - Extreme Data.
- AWGXPV (M) - Data not reported for Sample group D61-D62.
- EZK84T (X) - Data for all samples are low. Possible Systematic Error.
- G6QMDU (X) - Data for all samples are high. Possible Systematic Error.
- VX6BHF (X) - Data appear to be off by a factor of .1. Data corrected by CTS (x10)

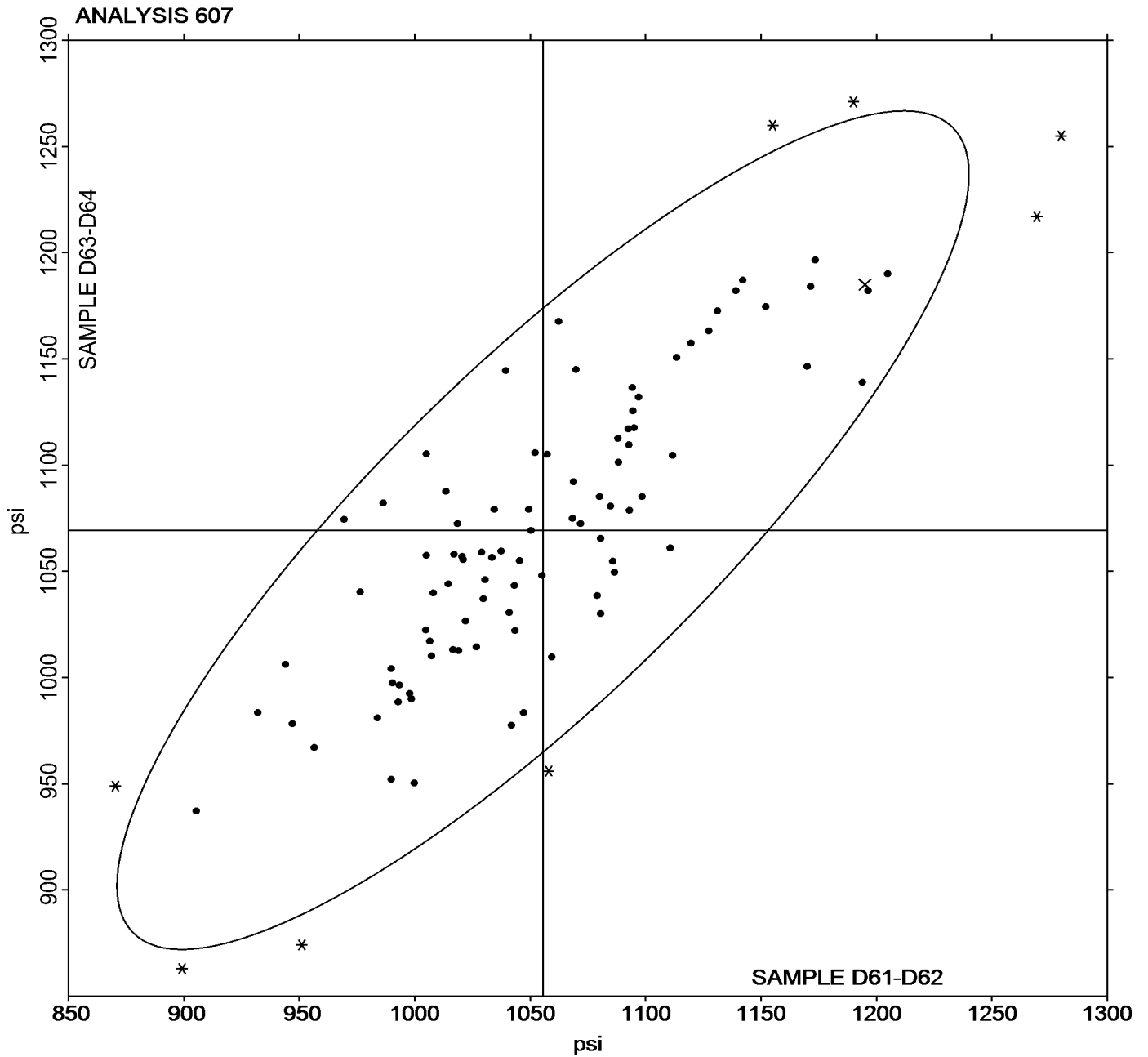


Rubber Interlaboratory Testing Program
Analysis 607
Stress at 300% Elongation (psi)

Report #190
4th Qtr 2016

Grand Mean Sample **D61-D62** = 1,055.54 psi

Grand Mean Sample **D63-D64** = 1,069.38 psi





Rubber Interlaboratory Testing Program

Report #190

Analysis 608

4th Qtr 2016

Stress at 100% Elongation (psi)

WebCode	Data Flag	Sample D61-D62			Sample D63-D64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2LPLV6		210.5	-17.4	-1.40	220.0	-10.9	-0.87
2NU67J		215.0	-12.9	-1.04	218.5	-12.4	-0.98
2T66E4		232.6	4.7	0.38	235.8	4.9	0.39
3FH7C9		236.9	9.0	0.72	231.1	0.3	0.02
3KPUMP		224.1	-3.8	-0.31	233.5	2.7	0.21
3QEC4L		210.0	-17.9	-1.44	227.5	-3.4	-0.27
4KBRGG		239.1	11.2	0.90	243.2	12.3	0.98
4XD343		239.3	11.4	0.92	232.1	1.2	0.10
6CQV8Z		226.1	-1.8	-0.15	231.8	1.0	0.08
6CUBLL	X	269.0	41.1	3.30	294.0	63.1	5.03
6MT9C7		209.5	-18.4	-1.48	221.0	-9.9	-0.79
6WEJBZ		232.8	4.9	0.39	232.8	1.9	0.15
7AGCG3		226.0	-1.9	-0.15	230.0	-0.9	-0.07
7L92BG	X	132.7	-95.2	-7.65	132.7	-98.2	-7.82
7Y29K6		247.4	19.5	1.56	234.1	3.2	0.26
86MLXC		227.5	-0.4	-0.03	230.5	-0.4	-0.03
8AGHKH	X	320.0	92.1	7.41	319.0	88.1	7.02
8C2JE6		252.4	24.5	1.97	249.5	18.6	1.48
92D8FW		215.5	-12.4	-0.99	217.6	-13.3	-1.06
96CFQY		223.5	-4.4	-0.35	227.5	-3.4	-0.27
96FYXA		226.5	-1.4	-0.11	234.0	3.1	0.25
9A8C8D		210.5	-17.4	-1.40	219.0	-11.9	-0.95
ACU2HH		249.5	21.6	1.74	246.5	15.6	1.25
AHEBGE		225.5	-2.4	-0.19	235.0	4.1	0.33
ARL4RU		225.5	-2.4	-0.19	224.5	-6.4	-0.51
AWGXPV	M	No data reported for this sample			228.4	-2.4	-0.19
B4QQBB	*	201.0	-26.9	-2.16	221.6	-9.2	-0.74
BHB7GV		240.5	12.6	1.01	237.0	6.1	0.49
BLHEW8		242.0	14.1	1.13	246.0	15.1	1.21
BRY3HW		250.5	22.6	1.82	258.5	27.6	2.20
BU8APW		226.0	-1.9	-0.15	236.0	5.1	0.41
BUVACA		210.3	-17.6	-1.41	210.3	-20.6	-1.64
BWFF9C		240.5	12.6	1.01	233.0	2.1	0.17
CDZ79B		219.0	-8.9	-0.72	216.3	-14.6	-1.16
CG2AXC		218.5	-9.4	-0.76	228.5	-2.4	-0.19
CRZ8KC	*	220.3	-7.6	-0.61	246.3	15.5	1.23
D23M7B		227.5	-0.4	-0.03	214.5	-16.4	-1.30



Rubber Interlaboratory Testing Program

Report #190

Analysis 608

4th Qtr 2016

Stress at 100% Elongation (psi)

WebCode	Data Flag	Sample D61-D62			Sample D63-D64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
DKCVWA		235.7	7.8	0.63	229.2	-1.7	-0.14
DKVNX8		219.0	-8.9	-0.72	223.0	-7.9	-0.63
E7AVM7		225.6	-2.3	-0.18	229.2	-1.7	-0.13
EDDEAB		243.7	15.8	1.27	250.9	20.1	1.60
EFFFA8		227.0	-0.9	-0.07	216.8	-14.0	-1.12
EN6CNU		217.7	-10.2	-0.82	214.5	-16.4	-1.30
EZK84T	X	136.0	-91.9	-7.39	130.5	-100.4	-8.00
F7BP7C		235.7	7.8	0.63	223.4	-7.5	-0.60
FDBA98	X	273.5	45.6	3.67	304.4	73.5	5.85
FFWXLT		232.8	4.9	0.39	241.5	10.6	0.85
FNZEQ4		247.6	19.7	1.58	246.3	15.4	1.23
G3ZF46	*	194.0	-33.9	-2.73	204.0	-26.9	-2.14
G6QMDU	X	275.0	47.1	3.79	288.3	57.4	4.57
GA8V2T		218.0	-9.9	-0.80	220.5	-10.4	-0.83
GD4GRB		227.0	-0.9	-0.07	229.0	-1.9	-0.15
GLDXCP		230.0	2.1	0.17	241.5	10.6	0.85
GN427W		224.1	-3.8	-0.31	214.7	-16.2	-1.29
H66JBL		236.5	8.6	0.69	250.0	19.1	1.52
H9RVH4	*	218.7	-9.2	-0.74	203.1	-27.8	-2.22
HKKC86		241.5	13.6	1.09	229.0	-1.9	-0.15
HLCDB8	X	317.5	89.6	7.20	311.0	80.1	6.38
HNHYY8	X	288.5	60.6	4.87	316.5	85.6	6.82
K6YTFM		238.5	10.6	0.86	248.5	17.6	1.40
KBKLQM		221.0	-6.9	-0.55	226.5	-4.4	-0.35
LGRKNX	*	257.7	29.8	2.40	260.6	29.7	2.37
LGRMD3		219.7	-8.2	-0.66	217.6	-13.3	-1.06
LL3PBQ		231.0	3.1	0.25	231.0	0.1	0.01
LNQA63		222.5	-5.4	-0.43	229.7	-1.1	-0.09
LPH9JZ		229.5	1.6	0.13	222.0	-8.9	-0.71
LT4WWL		244.8	16.9	1.36	237.4	6.5	0.52
M34ZJU		220.0	-7.9	-0.64	226.5	-4.4	-0.35
MF7DVL		248.5	20.6	1.66	259.0	28.1	2.24
MGLPHW		223.9	-4.0	-0.33	234.0	3.1	0.25
NBTYKZ	X	553.4	325.5	26.17	605.1	374.3	29.82
NRKU3H		226.0	-1.9	-0.15	213.0	-17.9	-1.42
NZRMEX		218.5	-9.4	-0.76	237.0	6.1	0.49
PAD8W2		232.8	4.9	0.39	218.3	-12.6	-1.00
PGDGFM		229.1	1.2	0.10	239.9	9.1	0.72



Rubber Interlaboratory Testing Program

Report #190

Analysis 608

4th Qtr 2016

Stress at 100% Elongation (psi)

WebCode	Data Flag	Sample D61-D62			Sample D63-D64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
PJZ8PR		233.5	5.6	0.45	236.0	5.1	0.41
QGA3UZ	X	222.5	-5.4	-0.43	257.5	26.6	2.12
QH4ZWE		235.0	7.1	0.57	230.6	-0.3	-0.02
RWX2TC		229.0	1.1	0.09	229.5	-1.4	-0.11
T2NN8H	X	277.0	49.1	3.95	257.0	26.1	2.08
TBG26W		204.7	-23.2	-1.87	208.8	-22.1	-1.76
TEEDEB	X	223.0	-4.9	-0.39	255.0	24.1	1.92
THYDHX		236.0	8.1	0.65	244.0	13.1	1.05
TUQYNT		217.0	-10.9	-0.88	223.5	-7.4	-0.59
TVHA9U		217.5	-10.4	-0.84	218.5	-12.4	-0.98
U7XFMA	X	361.9	134.0	10.77	367.7	136.8	10.90
UAYE39		247.0	19.1	1.54	252.0	21.1	1.68
UC6X7W		235.0	7.1	0.57	240.0	9.1	0.73
URC2JA	X	295.9	68.0	5.47	317.6	86.8	6.91
UREN3A		230.0	2.1	0.17	239.0	8.1	0.65
V6J7EA		230.5	2.6	0.21	232.0	1.1	0.09
V9ZLPM		211.8	-16.1	-1.30	221.9	-9.0	-0.71
VMYFEA		223.0	-4.9	-0.39	226.5	-4.4	-0.35
VNDXFU		232.0	4.1	0.33	223.5	-7.4	-0.59
VQHQAT		235.4	7.5	0.60	236.5	5.6	0.45
VX6BHF	X	255.0	27.1	2.18	250.0	19.1	1.52
WJD7MN		243.3	15.4	1.24	253.5	22.6	1.80
WTLMC9		207.7	-20.2	-1.62	228.8	-2.1	-0.17
XMHYGM		225.5	-2.4	-0.19	230.5	-0.4	-0.03
XTK6WP		241.5	13.6	1.09	225.0	-5.9	-0.47
Y98W9A		219.0	-8.9	-0.72	236.0	5.1	0.41
YM67PN		230.0	2.1	0.17	241.0	10.1	0.81
YZFGJ7		206.0	-21.9	-1.76	206.0	-24.9	-1.98
ZTCRE7		219.0	-8.9	-0.72	223.5	-7.4	-0.59
ZVXPTP		234.0	6.1	0.49	249.5	18.6	1.48

Summary Statistics

Grand Means

227.90 psi

230.86 psi

Std Dev Btwn Labs

12.44 psi

12.55 psi

Statistics based on 89 of 105 reporting participants



		Summary Statistics in SI Units	
Grand Means	1.5713 MPa	1.59	MPa
Stnd Dev Btwn Labs	0.0857 MPa	0.09	MPa
Statistics based on 89 of 105 reporting participants			

Samples D61-D62: Polyisoprene compound, batch #1 & D63-D64: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #608

- 6CUBLL (X) - Data for all samples are high. Possible Systematic Error.
- 7L92BG (X) - Data for all samples are low. Possible Systematic Error.
- 8AGHKH (X) - Data for all samples are high. Possible Systematic Error.
- AWGXPV (M) - Data not reported for Sample group D61-D62.
- EZK84T (X) - Data for all samples are low. Possible Systematic Error.
- FDBA98 (X) - Data for all samples are high. Possible Systematic Error.
- G6QMDU (X) - Data for all samples are high. Possible Systematic Error.
- HLCDB8 (X) - Data for all samples are high. Possible Systematic Error.
- HNHYY8 (X) - Data for all samples are high. Possible Systematic Error.
- NBTYKZ (X) - Extreme Data.
- QGA3UZ (X) - Inconsistent in testing between Sample groups. Inconsistent within the determinations of sample group D63-D64.
- T2NN8H (X) - Data for sample group D61-D62 are high.
- TEEDEB (X) - Inconsistency in testing between Sample groups.
- U7XFMA (X) - Extreme Data.
- URC2JA (X) - Data for all samples are high. Possible Systematic Error.
- VX6BHF (X) - Data appear to be off by a factor of .1. Data corrected by CTS (x10)



Rubber Interlaboratory Testing Program

Analysis 608

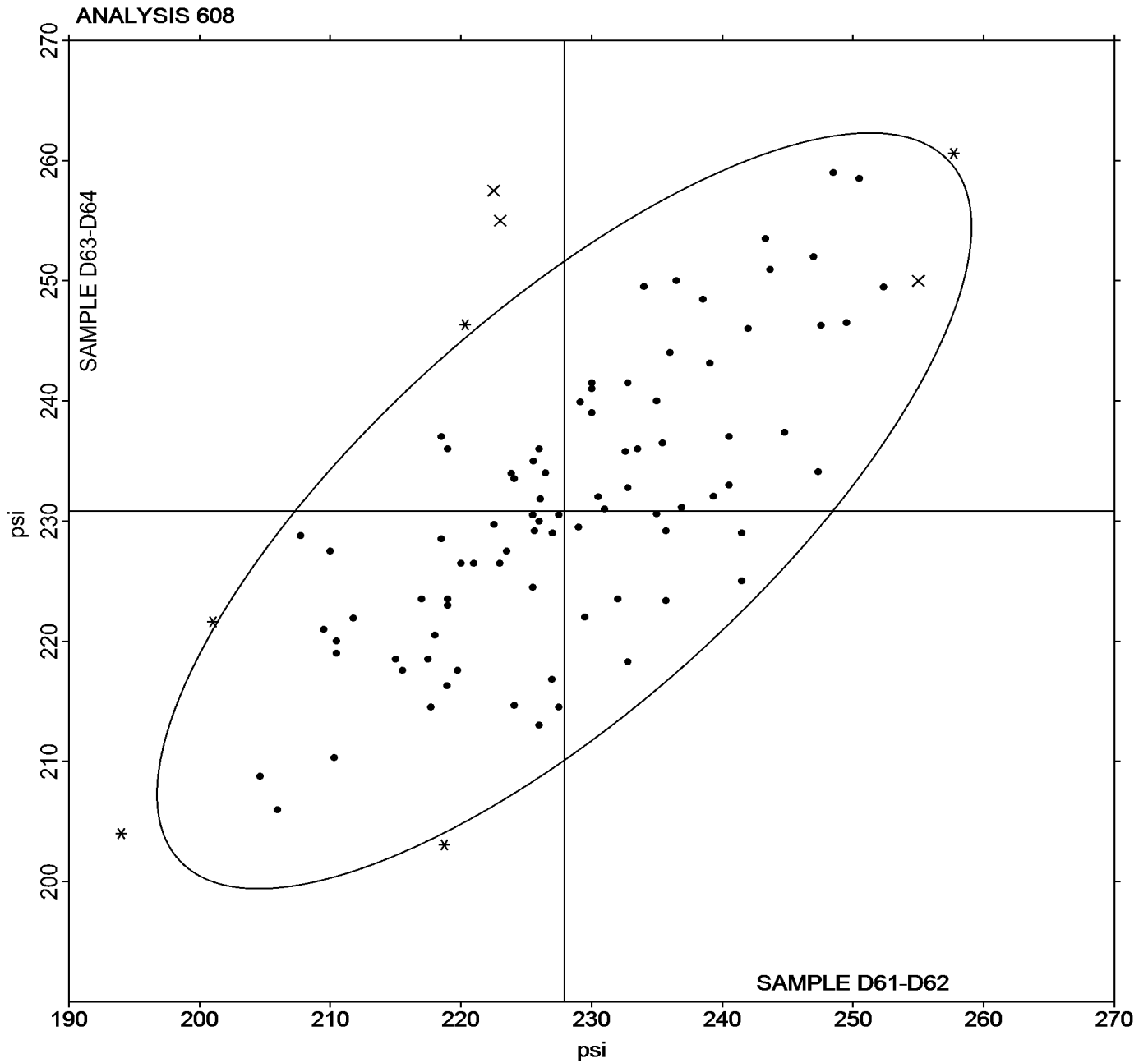
Stress at 100% Elongation (psi)

Report #190

4th Qtr 2016

Grand Mean Sample **D61-D62** = 227.90 psi

Grand Mean Sample **D63-D64** = 230.86 psi





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

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample D61-D62			Sample D63-D64			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2LPLV6		51.50	0.59	0.39	52.00	0.88	0.58	BT
2NU67J		48.50	-2.41	-1.60	48.75	-2.37	-1.56	BT
2T66E4		50.75	-0.16	-0.10	49.75	-1.37	-0.90	HH
3B3XN9		51.40	0.49	0.33	51.40	0.28	0.19	HH
3FH7C9		52.95	2.04	1.35	52.90	1.78	1.18	BT
3KPUMP		52.00	1.09	0.72	53.00	1.88	1.24	HH
3QEC4L		52.40	1.49	0.99	52.05	0.93	0.62	BT
4XD343		52.00	1.09	0.72	51.70	0.58	0.38	XX
6CQV8Z		51.50	0.59	0.39	52.50	1.38	0.91	BT
6CUBLL		52.00	1.09	0.72	52.00	0.88	0.58	HH
6KFNB		48.50	-2.41	-1.60	50.00	-1.12	-0.74	BT
6MT9C7		51.50	0.59	0.39	52.50	1.38	0.91	HH
6WEJBZ		51.50	0.59	0.39	50.50	-0.62	-0.41	BT
7AGCG3		50.00	-0.91	-0.60	50.00	-1.12	-0.74	HH
7L92BG		49.00	-1.91	-1.26	48.50	-2.62	-1.72	BT
7Y29K6		51.65	0.74	0.49	51.85	0.73	0.48	BT
86MLXC		53.65	2.74	1.82	52.65	1.53	1.01	BT
8AGHKH		53.00	2.09	1.39	52.50	1.38	0.91	HH
8C2JE6		49.60	-1.31	-0.87	50.30	-0.82	-0.54	BT
8L8CWC		50.50	-0.41	-0.27	50.00	-1.12	-0.74	HH
92D8FW		48.75	-2.16	-1.43	50.50	-0.62	-0.41	BT
96CFQY		50.00	-0.91	-0.60	50.00	-1.12	-0.74	HH
96FYXA		48.00	-2.91	-1.93	48.50	-2.62	-1.72	BT
9A8C8D		50.50	-0.41	-0.27	52.50	1.38	0.91	BT
9DABNW		51.50	0.59	0.39	51.50	0.38	0.25	BT
ACU2HH		50.00	-0.91	-0.60	50.75	-0.37	-0.24	HH
AHEBGE		52.00	1.09	0.72	52.00	0.88	0.58	BT
ARL4RU		50.05	-0.86	-0.57	50.65	-0.47	-0.31	BT
AWGXPV		50.60	-0.31	-0.20	50.70	-0.42	-0.27	BT
B4QQBB	*	53.00	2.09	1.39	54.65	3.53	2.33	BT
BHB7GV		51.00	0.09	0.06	49.50	-1.62	-1.07	XX
BLHEW8		49.45	-1.46	-0.97	49.60	-1.52	-1.00	BT
BRY3HW		48.55	-2.36	-1.56	50.35	-0.77	-0.51	XX
BU8APW		50.00	-0.91	-0.60	50.00	-1.12	-0.74	HH
BUVACA		50.00	-0.91	-0.60	50.00	-1.12	-0.74	XX
BWFF9C		50.00	-0.91	-0.60	49.50	-1.62	-1.07	BT
CDZ79B		52.00	1.09	0.72	52.00	0.88	0.58	XX



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

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample D61-D62			Sample D63-D64			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
CG2AXC		53.50	2.59	1.72	53.00	1.88	1.24	BT
CRZ8KC		50.00	-0.91	-0.60	52.00	0.88	0.58	HH
D23M7B		50.50	-0.41	-0.27	50.00	-1.12	-0.74	HH
DAXPB8		49.20	-1.71	-1.13	50.75	-0.37	-0.24	BT
DKVNX8		53.00	2.09	1.39	52.50	1.38	0.91	HH
E7AVM7		50.75	-0.16	-0.10	51.65	0.53	0.35	BT
EDDEAB		51.35	0.44	0.29	50.95	-0.17	-0.11	BT
EFFFA8		51.45	0.54	0.36	51.45	0.33	0.22	BT
EN6CNU		53.50	2.59	1.72	53.50	2.38	1.57	BT
EZK84T		50.00	-0.91	-0.60	50.00	-1.12	-0.74	HH
F7BP7C		51.15	0.24	0.16	51.25	0.13	0.09	BT
FDBA98	*	48.00	-2.91	-1.93	50.50	-0.62	-0.41	BT
FFWXLTL		50.90	-0.01	-0.01	51.70	0.58	0.38	BT
FNZEQ4		51.10	0.19	0.13	51.05	-0.07	-0.04	BT
G3ZF46		49.50	-1.41	-0.93	50.00	-1.12	-0.74	BT
G6QMDU		52.50	1.59	1.06	53.25	2.13	1.41	BT
GA8V2T		50.00	-0.91	-0.60	50.00	-1.12	-0.74	HH
GD4GRB		51.00	0.09	0.06	50.00	-1.12	-0.74	BT
GLDXCP		51.35	0.44	0.29	51.45	0.33	0.22	BT
GN427W		50.90	-0.01	-0.01	50.40	-0.72	-0.47	BT
H66JBL		52.00	1.09	0.72	52.50	1.38	0.91	HH
H9RVH4		50.55	-0.36	-0.24	49.55	-1.57	-1.03	BT
HKKC86	*	51.50	0.59	0.39	49.50	-1.62	-1.07	HH
HLCDB8		53.00	2.09	1.39	52.00	0.88	0.58	HH
HNHYY8		50.50	-0.41	-0.27	50.25	-0.87	-0.57	HH
JYATL2		48.50	-2.41	-1.60	48.00	-3.12	-2.05	BT
K6YTFLM		48.50	-2.41	-1.60	49.50	-1.62	-1.07	BT
KBKLQM		52.00	1.09	0.72	51.50	0.38	0.25	BT
KH2ELJ		50.50	-0.41	-0.27	50.50	-0.62	-0.41	BT
KHYR3J		51.00	0.09	0.06	51.00	-0.12	-0.08	HH
LGRKNX		51.50	0.59	0.39	53.00	1.88	1.24	BT
LGRMD3		53.00	2.09	1.39	52.00	0.88	0.58	BT
LL3PBQ		50.75	-0.16	-0.10	51.50	0.38	0.25	HH
LNQA63		52.00	1.09	0.72	53.00	1.88	1.24	BT
LPH9JZ		53.00	2.09	1.39	52.50	1.38	0.91	HH
LT4WWL		51.70	0.79	0.53	52.55	1.43	0.94	BT
M34ZJU		51.00	0.09	0.06	52.00	0.88	0.58	BT
MF7DVL		50.65	-0.26	-0.17	51.50	0.38	0.25	HH



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

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample D61-D62			Sample D63-D64			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
MGLPHW		50.35	-0.56	-0.37	51.05	-0.07	-0.04	BT
NBTYKZ		52.10	1.19	0.79	52.05	0.93	0.62	XX
NRKU3H		50.00	-0.91	-0.60	50.00	-1.12	-0.74	BT
NZRMEX		49.80	-1.11	-0.73	51.80	0.68	0.45	BT
PAD8W2	*	53.25	2.34	1.55	51.00	-0.12	-0.08	BT
PGDGFM		48.50	-2.41	-1.60	50.00	-1.12	-0.74	BT
PJZ8PR		52.80	1.89	1.25	53.15	2.03	1.34	BT
PLLZCU		54.00	3.09	2.05	54.30	3.18	2.10	BT
PZPCVZ		54.00	3.09	2.05	54.00	2.88	1.90	HH
QGA3UZ		50.25	-0.66	-0.44	50.25	-0.87	-0.57	HH
QH4ZWE		50.05	-0.86	-0.57	49.05	-2.07	-1.36	BT
RWX2TC	*	47.00	-3.91	-2.59	47.00	-4.12	-2.71	BT
T2NN8H		49.00	-1.91	-1.26	49.00	-2.12	-1.39	HH
TBG26W		49.80	-1.11	-0.73	50.55	-0.57	-0.37	BT
TEEDEB		51.00	0.09	0.06	52.50	1.38	0.91	BT
THYDHX		50.25	-0.66	-0.44	50.85	-0.27	-0.18	BT
TUQYNT		49.45	-1.46	-0.97	50.45	-0.67	-0.44	XX
TVHA9U		52.95	2.04	1.35	53.95	2.83	1.87	BT
U7XFMA		51.45	0.54	0.36	52.75	1.63	1.08	BT
UAYE39		50.00	-0.91	-0.60	51.00	-0.12	-0.08	BT
UC6X7W		50.75	-0.16	-0.10	51.25	0.13	0.09	HH
URC2JA	*	55.40	4.49	2.98	55.25	4.13	2.72	HH
UREN3A		51.00	0.09	0.06	50.50	-0.62	-0.41	HH
V6J7EA		49.20	-1.71	-1.13	49.60	-1.52	-1.00	BT
VMYFEA		49.00	-1.91	-1.26	48.25	-2.87	-1.89	BT
VNDXFU		49.50	-1.41	-0.93	49.00	-2.12	-1.39	BT
VQHQAT		50.00	-0.91	-0.60	50.00	-1.12	-0.74	BT
VX6BHF	X	56.00	5.09	3.38	56.00	4.88	3.22	BT
WJD7MN		51.50	0.59	0.39	52.00	0.88	0.58	HH
WTLMC9		53.20	2.29	1.52	53.10	1.98	1.31	BT
X6Y33E	X	47.50	-3.41	-2.26	46.00	-5.12	-3.37	HH
XMHYGM		51.15	0.24	0.16	50.80	-0.32	-0.21	BT
XTK6WP	*	48.50	-2.41	-1.60	47.00	-4.12	-2.71	XX
Y98W9A		51.55	0.64	0.43	51.55	0.43	0.29	BT
YM67PN		50.75	-0.16	-0.10	51.25	0.13	0.09	BT
YXVFNJ		51.00	0.09	0.06	52.00	0.88	0.58	BT
YZFGJ7		50.75	-0.16	-0.10	51.25	0.13	0.09	BT



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

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample D61-D62			Sample D63-D64			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
ZTCRE7		51.85	0.94	0.62	51.75	0.63	0.42	BT
ZVXPTP		50.00	-0.91	-0.60	50.50	-0.62	-0.41	BT

Grand Means		Summary Statistics	
	50.908 Type A		51.117 Type A
Std Dev Btwn Labs	1.508 Type A		1.517 Type A
Statistics based on 112 of 114 reporting participants			

Samples D61-D62: Polyisoprene compound, batch #1 & D63-D64: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #620

VX6BHF (X) - Data for all samples are high. Possible Systematic Error.

X6Y33E (X) - Inconsistency in testing between Sample groups. Data for sample group D63-D64 are low.

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 D61-D62 <i>Polyisoprene compound, batch #1</i>			Sample D63-D64 <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		
Readings taken within 0 - 5 seconds	51.00	1.26	0.09	51.28	1.20	0.17	81	85
Readings taken at 5 seconds	49.94	1.14	-0.97	50.02	1.02	-1.10	13	14
Readings taken after 5+ seconds	50.94	2.28	0.03	51.13	2.18	0.01	4	4
Maximum hardness indicator used	51.61	1.71	0.70	51.64	2.11	0.52	7	11

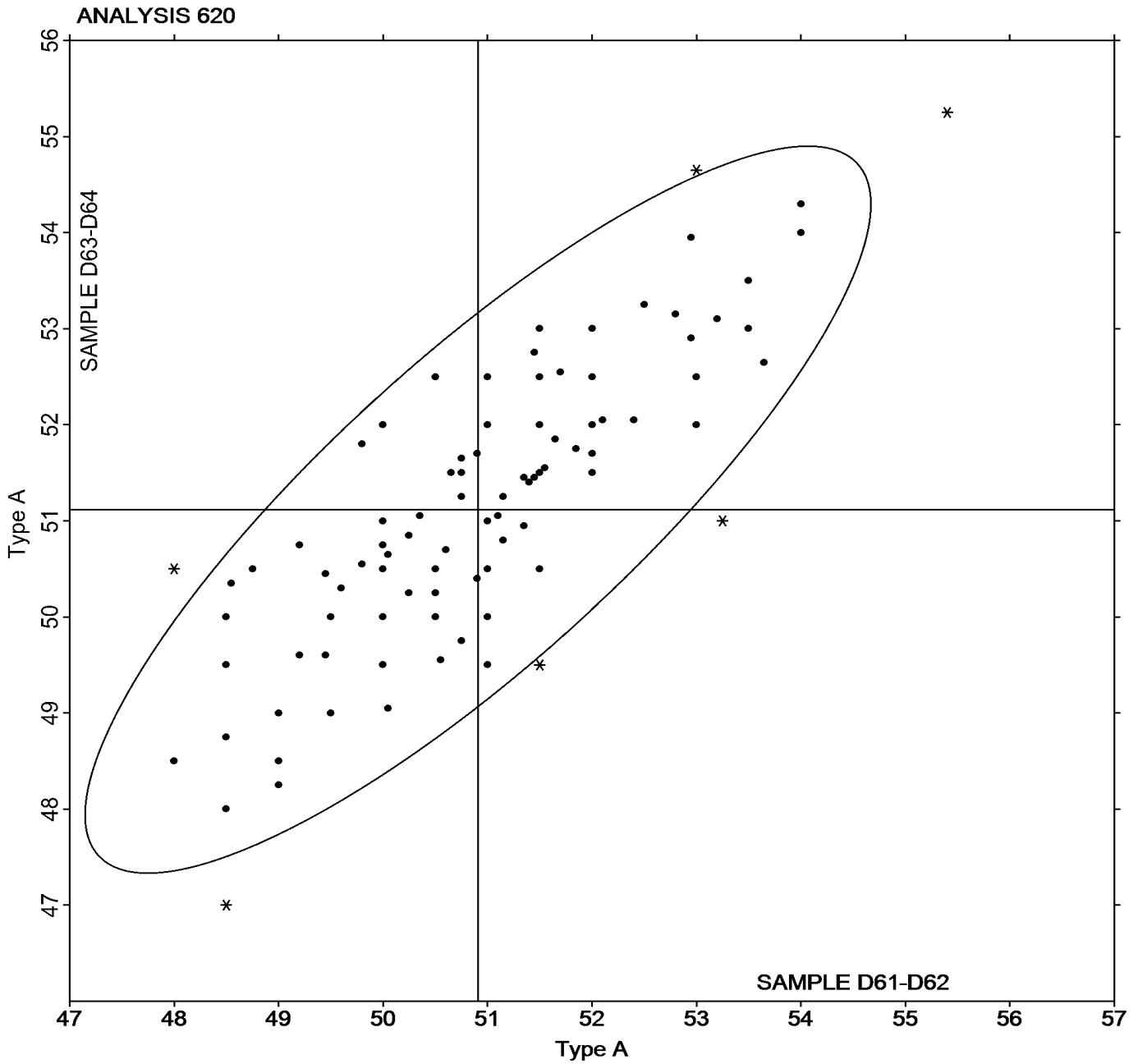


Rubber Interlaboratory Testing Program
Analysis 620
Hardness (Shore A/Type A)

Report #190
4th Qtr 2016

Grand Mean Sample D61-D62 = 50.908 Type A

Grand Mean Sample D63-D64 = 51.117 Type A





Rubber Interlaboratory Testing Program
Analysis 621
Density

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample D61-D62			Sample D63-D64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2LPLV6		1.140	0.001	0.30	1.139	0.001	0.22
2NU67J		1.132	-0.007	-2.44	1.133	-0.006	-2.38
2Z7JZ7		1.140	0.001	0.34	1.140	0.001	0.50
3B3XN9		1.141	0.002	0.81	1.140	0.001	0.46
3FH7C9		1.140	0.001	0.45	1.140	0.001	0.46
3QEC4L		1.136	-0.003	-1.03	1.137	-0.002	-0.90
4XD343	X	1.150	0.011	4.14	1.149	0.010	4.10
6CUBLL		1.140	0.001	0.45	1.140	0.001	0.46
6KFNBj		1.142	0.003	1.17	1.142	0.003	1.07
6WEJBZ		1.140	0.001	0.41	1.141	0.002	0.78
7AGCG3	*	1.131	-0.008	-2.84	1.132	-0.006	-2.62
7Y29K6		1.142	0.004	1.33	1.142	0.003	1.31
8C2JE6	X	1.127	-0.012	-4.37	1.137	-0.002	-0.90
92D8FW		1.140	0.001	0.45	1.140	0.001	0.46
9A8C8D		1.143	0.004	1.53	1.142	0.003	1.07
ARL4RU		1.137	-0.001	-0.53	1.138	-0.001	-0.29
B4QQBB		1.141	0.003	0.97	1.142	0.003	1.25
BHB7GV		1.141	0.002	0.63	1.140	0.001	0.46
BLHEW8		1.139	0.000	0.09	1.140	0.001	0.46
BU8APW		1.139	0.000	-0.09	1.137	-0.002	-0.96
CRZ8KC		1.139	0.000	0.01	1.139	0.000	0.01
D23M7B		1.134	-0.005	-1.72	1.135	-0.004	-1.77
EN6CNU		1.137	-0.002	-0.80	1.136	-0.003	-1.34
F7BP7C		1.138	-0.001	-0.45	1.139	0.000	-0.15
FDBA98		1.139	0.000	-0.09	1.140	0.001	0.34
FFWXLT		1.139	0.000	-0.09	1.139	0.000	0.01
FNZEQ4	X	1.133	-0.006	-2.08	1.131	-0.008	-3.39
G3ZF46		1.139	0.000	0.09	1.139	0.000	-0.15
G6QMDU		1.137	-0.002	-0.64	1.138	-0.001	-0.35
GA8V2T		1.142	0.003	1.17	1.142	0.003	1.07
GLDXCP		1.139	0.000	-0.04	1.139	0.001	0.24
GN427W		1.139	0.001	0.19	1.138	0.000	-0.17
H66JBL		1.134	-0.005	-1.63	1.134	-0.005	-2.03
HKKC86		1.139	0.001	0.23	1.140	0.001	0.50
K6YTFM		1.138	-0.001	-0.45	1.139	0.000	0.05
KBKLQM	*	1.139	0.000	-0.09	1.141	0.002	0.90
KHYR3J	X	1.134	-0.005	-1.72	1.128	-0.011	-4.40



Rubber Interlaboratory Testing Program
Analysis 621
Density

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample D61-D62			Sample D63-D64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
LGRKNX		1.141	0.002	0.83	1.140	0.001	0.44
LL3PBQ		1.140	0.001	0.48	1.140	0.001	0.48
LNQA63		1.135	-0.004	-1.34	1.137	-0.002	-0.64
LPH9JZ		1.141	0.002	0.77	1.141	0.002	0.78
LT4WWL		1.137	-0.001	-0.49	1.136	-0.003	-1.03
M34ZJU	X	1.142	0.003	1.22	1.146	0.007	3.01
MF7DVL		1.139	0.000	0.05	1.138	-0.001	-0.43
MGLPHW		1.145	0.006	2.25	1.145	0.006	2.28
NBTYKZ	X	1.130	-0.009	-3.16	1.136	-0.003	-1.16
NRKU3H		1.140	0.001	0.43	1.139	0.000	0.19
PAD8W2	X	1.137	-0.002	-0.64	1.133	-0.006	-2.58
PGDGFM		1.135	-0.004	-1.36	1.137	-0.002	-0.64
PJZ8PR		1.143	0.004	1.35	1.143	0.004	1.79
PZPCVZ		1.140	0.001	0.37	1.141	0.002	0.70
QH4ZWE		1.137	-0.002	-0.58	1.137	-0.002	-0.80
RWX2TC		1.138	-0.001	-0.45	1.137	-0.002	-0.96
T2NN8H		1.139	0.000	0.14	1.138	0.000	-0.19
TBG26W		1.139	0.000	0.07	1.137	-0.001	-0.57
TUQYNT		1.142	0.003	1.17	1.141	0.002	0.86
TVHA9U		1.139	0.000	0.09	1.139	0.000	-0.15
U7XFMA		1.140	0.001	0.27	1.140	0.001	0.26
UAYE39		1.139	0.000	0.09	1.141	0.002	0.66
URC2JA		1.137	-0.002	-0.64	1.138	-0.001	-0.35
VMYFEA		1.140	0.001	0.27	1.140	0.001	0.44
VNDXFU		1.136	-0.003	-1.00	1.136	-0.003	-1.36
VQHQAT	X	1.138	-0.001	-0.45	1.134	-0.005	-1.97
VX6BHF		1.141	0.002	0.63	1.141	0.002	0.66
WJD7MN	*	1.147	0.008	2.86	1.144	0.005	2.18
WTLMC9	*	1.137	-0.002	-0.54	1.135	-0.004	-1.47
XMHYGM		1.139	0.000	0.00	1.140	0.001	0.32
XTK6WP		1.136	-0.003	-1.18	1.135	-0.004	-1.57
Y98W9A		1.140	0.001	0.37	1.140	0.001	0.42
YM67PN	*	1.133	-0.006	-2.11	1.136	-0.003	-1.32
YXVFNJ		1.140	0.001	0.47	1.141	0.002	0.74
YZFGJ7		1.137	-0.002	-0.64	1.137	-0.002	-0.76
ZTCRE7		1.138	-0.001	-0.29	1.139	0.000	0.09



Rubber Interlaboratory Testing Program
Analysis 621
Density

Report #190
4th Qtr 2016

		Summary Statistics	
Grand Means	1.1388 g/cm ³ (Mg/m ³)	1.1389 g/cm ³ (Mg/m ³)	
Stnd Dev Btw Labs	0.0028 g/cm ³ (Mg/m ³)	0.0025 g/cm ³ (Mg/m ³)	
Statistics based on 65 of 73 reporting participants			

Samples D61-D62: Polyisoprene compound, batch #1 & D63-D64: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #621

- 4XD343 (X) - Data for all samples are high. Possible Systematic Error.
- 8C2JE6 (X) - Data for sample group D61-D62 are low. Inconsistent within the determinations of both sample groups.
- FNZEQ4 (X) - Data for sample group D63-D64 are low.
- KHYR3J (X) - Inconsistency in testing between Sample groups. Data for sample group D63-D64 are low.
- M34ZJU (X) - Inconsistency in testing between Sample groups. Data for sample group D63-D64 are high.
- NBTYKZ (X) - Data for sample group D61-D62 are low. Inconsistent within the determinations of sample group D61-D62.
- PAD8W2 (X) - Inconsistency in testing between Sample groups.
- VQHQAT (X) - Inconsistency in testing between Sample groups.



Rubber Interlaboratory Testing Program

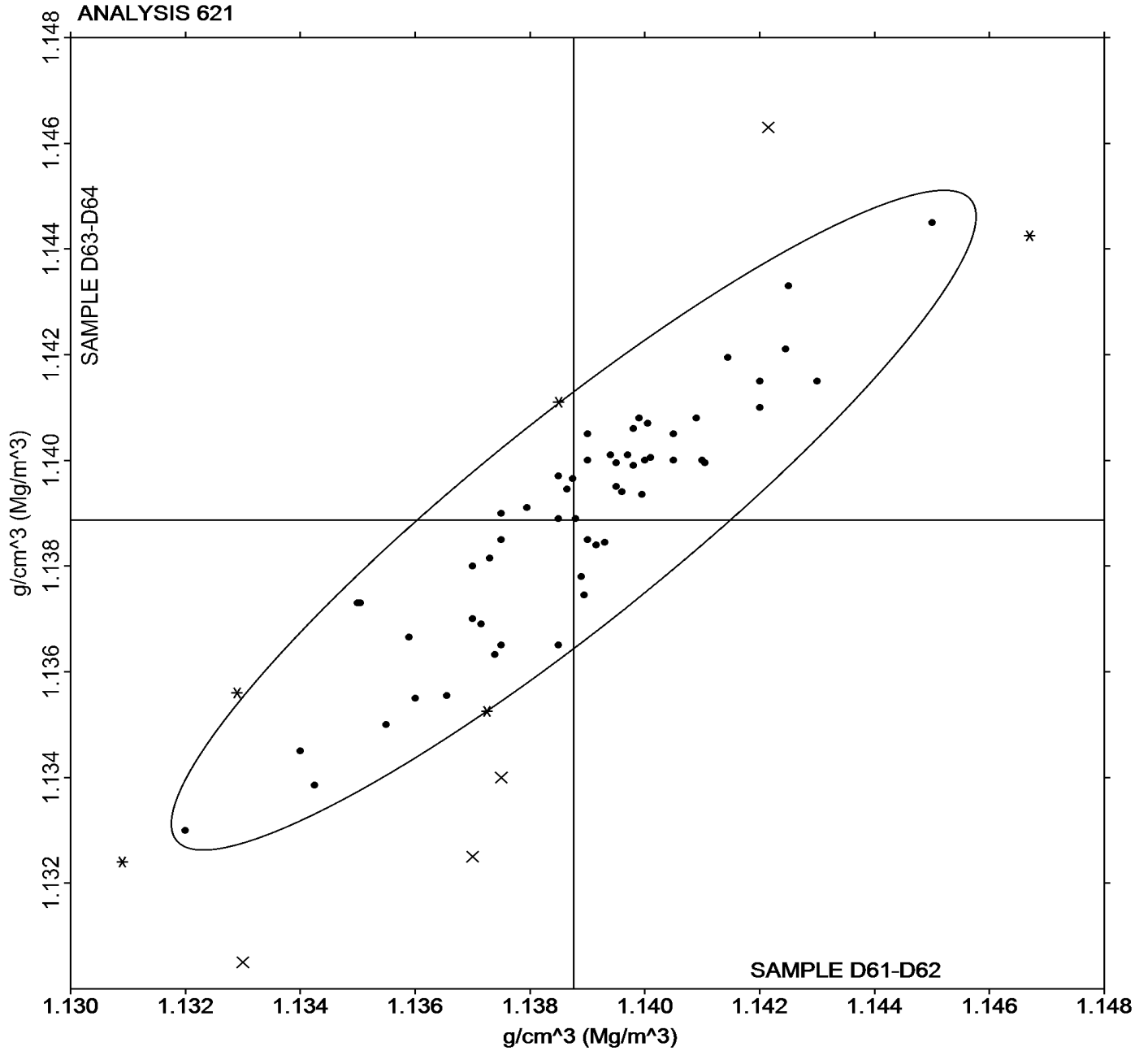
Analysis 621

Density

Report #190
4th Qtr 2016

Grand Mean Sample **D61-D62** = 1.1388 g/cm³
(Mg/m³)

Grand Mean Sample **D63-D64** = 1.1389 g/cm³
(Mg/m³)





Rubber Interlaboratory Testing Program

Report #190

Analysis 630

4th Qtr 2016

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

WebCode	Data Flag	Sample D61-D62			Sample M61-M62		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3FH7C9		3,595.0	305.8	2.07	3,384.8	184.4	1.05
4KBRGG		3,088.6	-200.7	-1.36	3,092.5	-107.9	-0.61
6CQV8Z		3,049.7	-239.5	-1.62	3,075.7	-124.7	-0.71
7Y29K6		3,357.5	68.2	0.46	3,421.4	221.0	1.26
86MLXC		3,344.0	54.7	0.37	3,134.0	-66.4	-0.38
ARL4RU		3,099.5	-189.8	-1.28	2,828.5	-371.9	-2.12
BHB7GV		3,414.0	124.7	0.84	3,179.0	-21.4	-0.12
BRY3HW		3,366.5	77.2	0.52	3,434.0	233.6	1.33
BU8APW		3,231.5	-57.8	-0.39	2,902.0	-298.4	-1.70
BUVACA		3,488.2	198.9	1.34	3,132.8	-67.6	-0.38
CDZ79B		3,229.7	-59.6	-0.40	2,842.9	-357.5	-2.03
CRZ8KC		3,153.2	-136.0	-0.92	3,034.6	-165.8	-0.94
D23M7B		3,312.5	23.2	0.16	3,055.5	-144.9	-0.82
DKCVWA		3,292.4	3.1	0.02	3,171.3	-29.1	-0.17
EDDEAB		3,605.7	316.4	2.14	3,531.7	331.3	1.89
EFFFA8		3,190.9	-98.4	-0.66	3,125.6	-74.8	-0.43
F7BP7C		3,193.8	-95.5	-0.65	3,168.4	-32.0	-0.18
GA8V2T		3,050.0	-239.3	-1.62	3,094.0	-106.4	-0.61
GLDXCP		3,381.5	92.2	0.62	3,103.5	-96.9	-0.55
H66JBL		3,398.7	109.5	0.74	3,411.1	210.7	1.20
K6YTFM		3,318.8	29.6	0.20	3,449.3	248.9	1.42
LNQA63		3,199.5	-89.8	-0.61	3,221.4	20.9	0.12
LT4WWL		3,127.0	-162.3	-1.10	3,136.5	-63.9	-0.36
MF7DVL		3,150.5	-138.8	-0.94	2,981.0	-219.4	-1.25
MGLPHW		3,556.1	266.8	1.80	3,348.1	147.7	0.84
NBTYKZ		3,214.8	-74.5	-0.50	3,256.4	56.0	0.32
NZRMEX		3,234.5	-54.8	-0.37	3,234.0	33.6	0.19
PGDGFM	X	3,370.9	81.6	0.55	2,667.2	-533.2	-3.03
QH4ZWE		3,285.1	-4.1	-0.03	3,067.6	-132.8	-0.76
RWX2TC		3,448.8	159.5	1.08	3,389.3	188.9	1.07
TEEDEB		3,196.0	-93.3	-0.63	3,161.5	-38.9	-0.22
U7XFMA		3,466.4	177.2	1.20	3,256.1	55.7	0.32
UAYE39		3,398.0	108.7	0.73	3,376.5	176.1	1.00
UREN3A		3,178.0	-111.3	-0.75	3,288.0	87.6	0.50
WJD7MN		3,261.6	-27.7	-0.19	3,363.6	163.2	0.93
WTLMC9		3,246.1	-43.2	-0.29	3,361.6	161.2	0.92



Rubber Interlaboratory Testing Program

Report #190

Analysis 630

4th Qtr 2016

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

		Summary Statistics	
Grand Means			
	3,289.25 psi		3,200.40 psi
Stnd Dev Btwn Labs			
	148.04 psi		175.73 psi
Statistics based on 35 of 36 reporting participants			

		Summary Statistics in SI Units	
Grand Means			
	22.678 MPa		22.07 MPa
Stnd Dev Btwn Labs			
	1.021 MPa		1.21 MPa
Statistics based on 35 of 36 reporting participants			

Samples D61-D62: Polyisoprene compound, batch #1 & M61-M62: Polyisoprene compound, batch #1

Comments on Assigned Data Flags for Test #630

PGDGM (X) - Data for sample group M61-M62 are low.



Rubber Interlaboratory Testing Program

Report #190

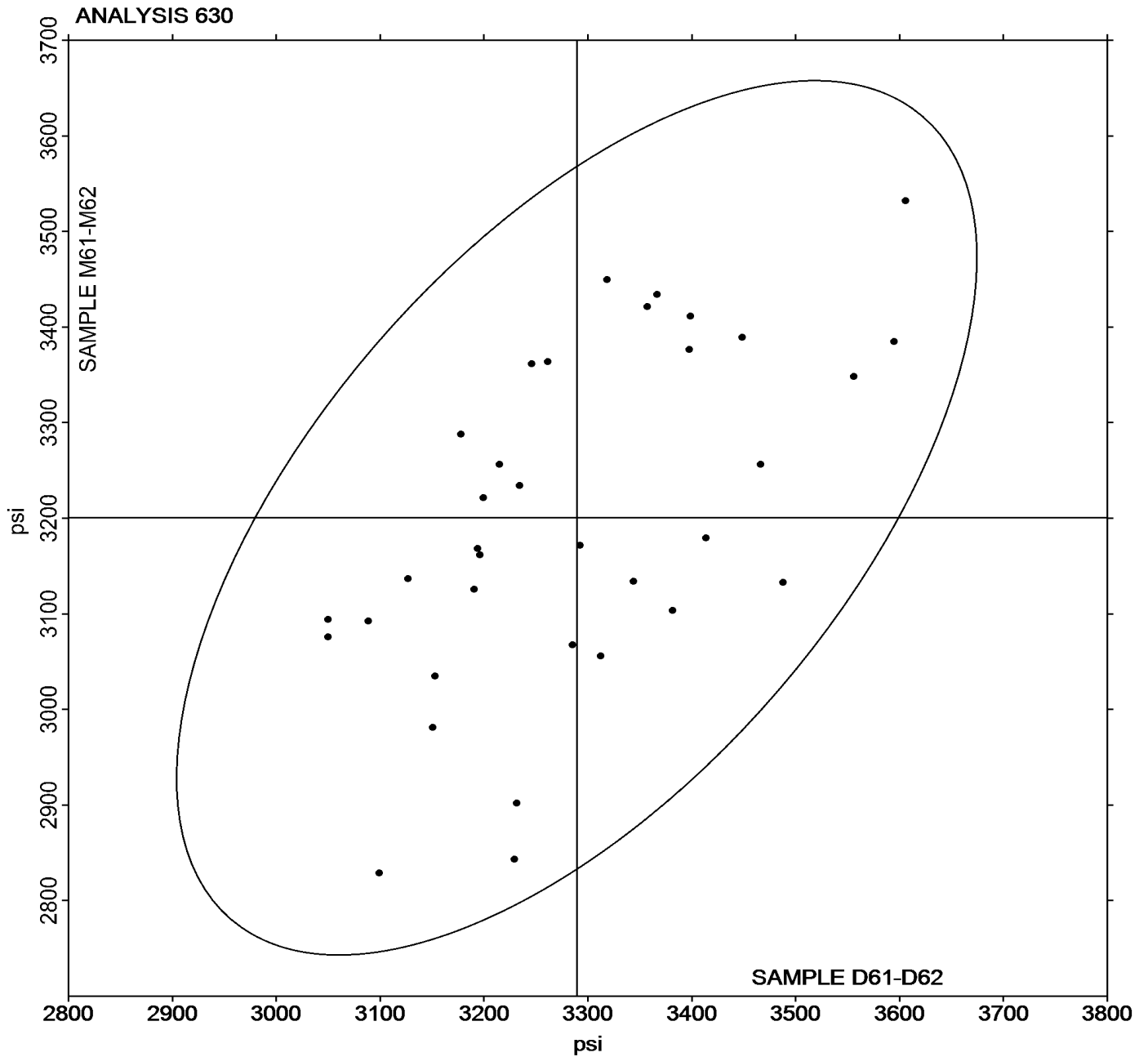
Analysis 630

4th Qtr 2016

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

Grand Mean Sample **D61-D62** = 3,289.25 psi

Grand Mean Sample **M61-M62** = 3,200.40 psi





Rubber Interlaboratory Testing Program

Report #190

Analysis 631

4th Qtr 2016

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

WebCode	Data Flag	Sample D61-D62			Sample M61-M62		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3FH7C9		633.0	25.0	0.83	616.7	20.6	0.61
4KBRGG		572.0	-36.0	-1.19	548.0	-48.1	-1.43
6CQV8Z		582.2	-25.8	-0.85	577.1	-19.1	-0.57
7Y29K6		616.6	8.6	0.28	612.5	16.4	0.49
86MLXC	*	620.0	12.0	0.40	651.0	54.9	1.63
ARL4RU		599.0	-9.0	-0.30	593.5	-2.6	-0.08
BHB7GV		641.5	33.5	1.10	659.5	63.4	1.89
BRY3HW		611.5	3.5	0.12	603.0	6.9	0.20
BU8APW		599.5	-8.5	-0.28	599.0	2.9	0.09
BUVACA		672.5	64.5	2.13	652.0	55.9	1.66
CDZ79B		612.2	4.2	0.14	597.7	1.5	0.04
CRZ8KC		611.0	3.0	0.10	616.0	19.9	0.59
D23M7B		654.0	46.0	1.52	624.5	28.4	0.84
DKCVWA		591.5	-16.5	-0.54	597.3	1.1	0.03
EDDEAB		595.0	-13.0	-0.43	583.0	-13.1	-0.39
EFFFA8		595.0	-13.0	-0.43	590.5	-5.7	-0.17
F7BP7C	*	693.0	85.0	2.80	690.0	93.9	2.79
GA8V2T		578.5	-29.5	-0.97	566.5	-29.6	-0.88
GLDXCP		582.0	-26.0	-0.86	555.0	-41.1	-1.22
H66JBL		603.0	-5.0	-0.16	582.0	-14.1	-0.42
K6YTFM		576.4	-31.6	-1.04	563.7	-32.5	-0.97
LNQA63		604.3	-3.7	-0.12	581.3	-14.9	-0.44
LT4WWL		594.8	-13.2	-0.43	593.6	-2.6	-0.08
MF7DVL		604.5	-3.5	-0.11	596.5	0.4	0.01
MGLPHW		561.0	-47.0	-1.55	539.0	-57.1	-1.70
NZRMEX		618.5	10.5	0.35	595.5	-0.6	-0.02
PGDGF M		621.5	13.6	0.45	604.8	8.6	0.26
QH4ZWE		598.2	-9.8	-0.32	577.1	-19.0	-0.57
RWX2TC		601.4	-6.6	-0.22	572.5	-23.7	-0.70
TEEDEB		587.5	-20.5	-0.67	543.5	-52.6	-1.57
U7XFMA		626.5	18.5	0.61	606.5	10.4	0.31
UAYE39		568.0	-40.0	-1.32	553.0	-43.1	-1.28
UREN3A		578.5	-29.5	-0.97	589.5	-6.6	-0.20
WJD7MN		600.6	-7.4	-0.24	599.1	2.9	0.09
WTLMC9	*	674.2	66.2	2.18	634.8	38.6	1.15



Rubber Interlaboratory Testing Program

Report #190

Analysis 631

4th Qtr 2016

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

		Summary Statistics	
Grand Means	607.97 percent		596.14 percent
Stnd Dev Btwn Labs	30.35 percent		33.61 percent
Statistics based on 35 of 35 reporting participants			

Samples D61-D62: Polyisoprene compound, batch #1 & M61-M62: Polyisoprene compound, batch #1



Rubber Interlaboratory Testing Program

Report #190

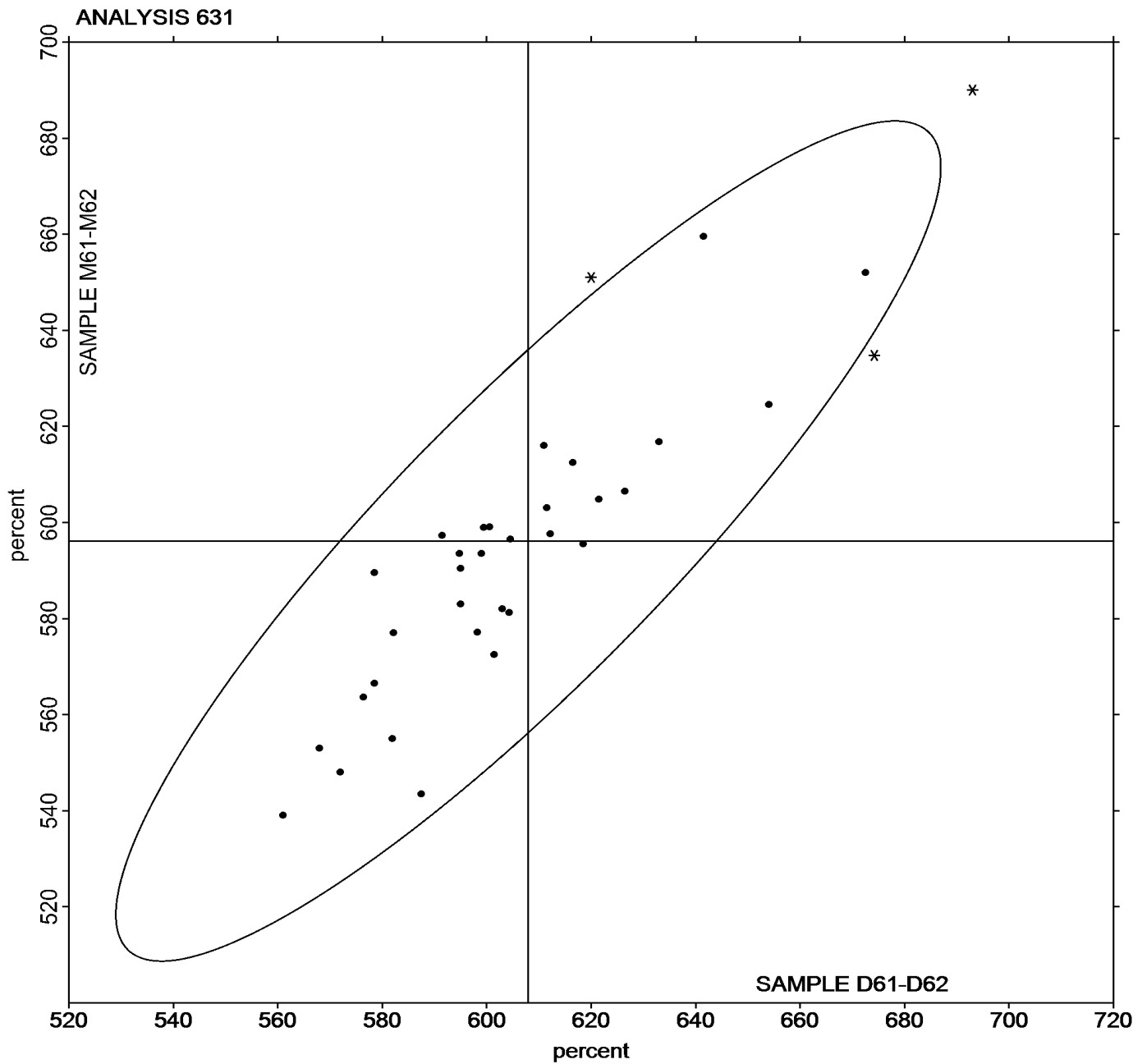
Analysis 631

4th Qtr 2016

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

Grand Mean Sample **D61-D62** = 607.97 percent

Grand Mean Sample **M61-M62** = 596.14 percent





Rubber Interlaboratory Testing Program

Report #190

Analysis 632

4th Qtr 2016

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

WebCode	Data Flag	Sample D61-D62			Sample M61-M62		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3FH7C9		1,085.7	28.8	0.49	1,015.9	-33.9	-0.28
4KBRGG		1,092.8	35.8	0.61	1,179.6	129.8	1.08
6CQV8Z		1,052.2	-4.8	-0.08	1,117.6	67.8	0.56
7Y29K6		1,110.9	53.9	0.92	1,148.5	98.7	0.82
86MLXC		1,041.0	-16.0	-0.27	809.5	-240.3	-2.00
ARL4RU		1,019.0	-38.0	-0.65	943.5	-106.3	-0.88
BHB7GV		1,016.5	-40.5	-0.69	933.5	-116.3	-0.97
BRY3HW		1,095.0	38.0	0.65	1,161.5	111.7	0.93
BU8APW		1,020.5	-36.5	-0.62	901.5	-148.3	-1.23
BUVACA	*	899.2	-157.7	-2.69	841.2	-208.5	-1.73
CDZ79B		1,043.5	-13.4	-0.23	934.0	-115.7	-0.96
CRZ8KC		986.4	-70.5	-1.20	937.7	-112.0	-0.93
D23M7B		998.0	-59.0	-1.00	927.5	-122.3	-1.02
DKCVWA		1,111.7	54.8	0.93	1,014.5	-35.2	-0.29
EDDEAB		1,131.3	74.4	1.27	1,137.1	87.3	0.73
EFFFA8		1,079.1	22.1	0.38	1,098.7	48.9	0.41
F7BP7C		947.1	-109.8	-1.87	920.3	-129.5	-1.08
GA8V2T		1,014.5	-42.5	-0.72	1,069.5	19.7	0.16
GLDXCP		1,127.5	70.5	1.20	1,119.0	69.2	0.58
H66JBL		1,097.0	40.0	0.68	1,112.0	62.2	0.52
K6YTFM		1,142.1	85.2	1.45	1,187.1	137.4	1.14
LNQA63		1,004.8	-52.2	-0.89	1,145.3	95.5	0.79
LT4WWL		1,086.5	29.5	0.50	1,129.9	80.2	0.67
MF7DVL		1,018.5	-38.5	-0.65	997.0	-52.8	-0.44
MGLPHW		1,034.6	-22.4	-0.38	1,159.4	109.6	0.91
NZRMEX		1,013.5	-43.5	-0.74	1,086.5	36.7	0.31
PGDGF M		1,008.2	-48.8	-0.83	797.1	-252.7	-2.10
QH4ZWE		1,084.9	27.9	0.48	985.5	-64.2	-0.53
RWX2TC		1,072.0	15.0	0.26	1,176.4	126.6	1.05
TEEDEB		1,039.5	-17.5	-0.30	1,126.0	76.2	0.63
U7XFMA		1,139.3	82.3	1.40	1,145.1	95.3	0.79
UAYE39		1,171.5	114.5	1.95	1,286.0	236.2	1.96
UREN3A		1,094.5	37.5	0.64	1,081.5	31.7	0.26
WJD7MN		1,057.6	0.6	0.01	1,066.7	16.9	0.14
WTLMC9	X	870.3	-186.6	-3.18	1,079.1	29.4	0.24



Rubber Interlaboratory Testing Program

Report #190

Analysis 632

4th Qtr 2016

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

		Summary Statistics	
Grand Means	1,056.95 psi		1,049.77 psi
Stnd Dev Btwn Labs	58.73 psi		120.28 psi
Statistics based on 34 of 35 reporting participants			

		Summary Statistics in SI Units	
Grand Means	7.2874 MPa		7.24 MPa
Stnd Dev Btwn Labs	0.4049 MPa		0.83 MPa
Statistics based on 34 of 35 reporting participants			

Samples D61-D62: Polyisoprene compound, batch #1 & M61-M62: Polyisoprene compound, batch #1

Comments on Assigned Data Flags for Test #632

WTLMC9 (X) - Data for sample group D61-D62 are low.



Rubber Interlaboratory Testing Program

Report #190

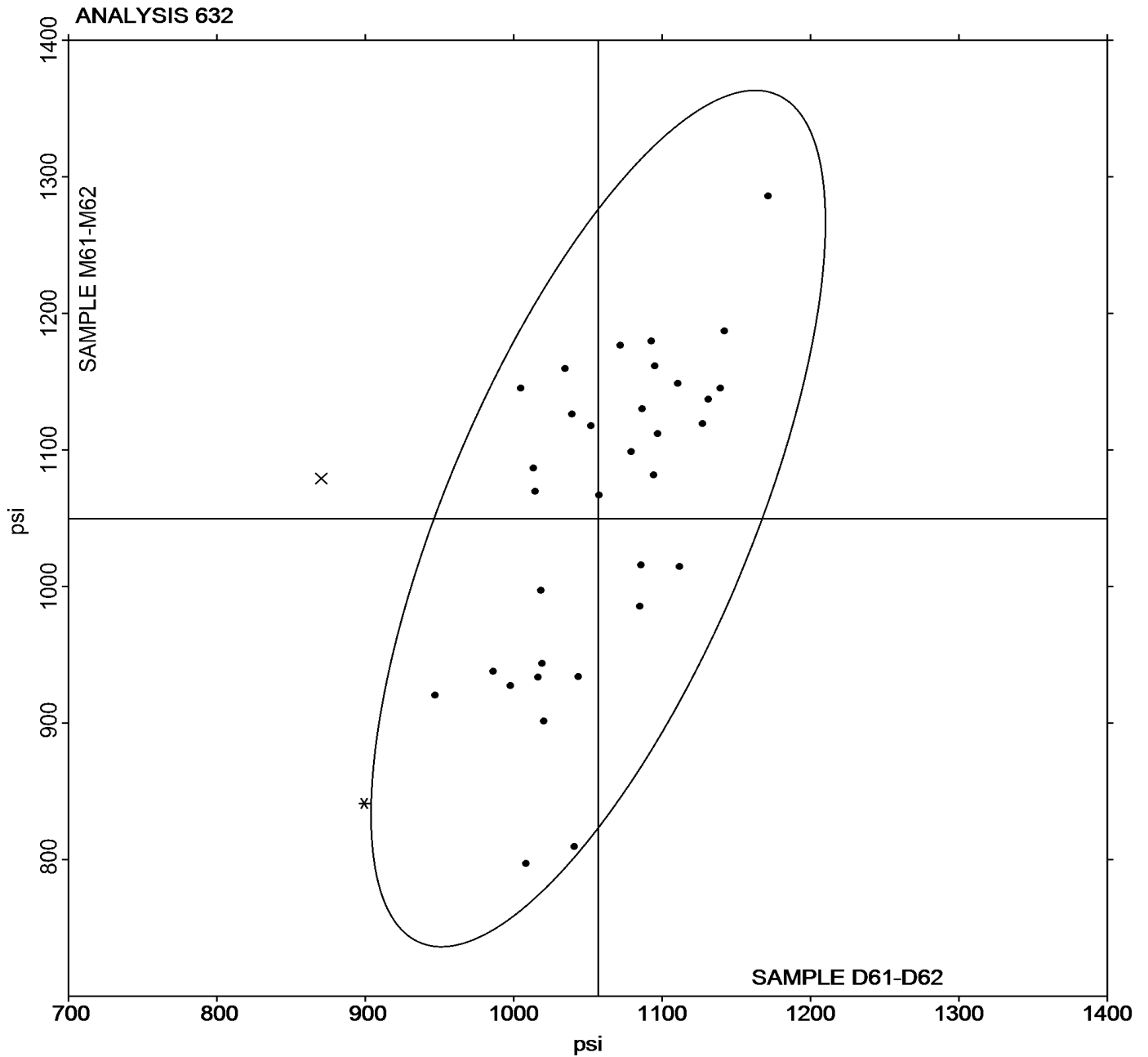
Analysis 632

4th Qtr 2016

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

Grand Mean Sample **D61-D62** = 1,056.95 psi

Grand Mean Sample **M61-M62** = 1,049.77 psi





Rubber Interlaboratory Testing Program

Report #190

Analysis 633

4th Qtr 2016

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

WebCode	Data Flag	Sample D61-D62			Sample M61-M62		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3FH7C9		236.9	5.6	0.51	227.9	-3.0	-0.12
4KBRGG		239.1	7.8	0.71	257.5	26.6	1.09
6CQV8Z		226.1	-5.2	-0.48	233.9	3.0	0.12
7Y29K6		247.4	16.1	1.47	235.6	4.6	0.19
86MLXC		227.5	-3.8	-0.35	187.0	-43.9	-1.81
ARL4RU		225.5	-5.8	-0.53	206.0	-24.9	-1.02
BHB7GV		240.5	9.2	0.85	226.5	-4.4	-0.18
BRY3HW		250.5	19.2	1.76	280.0	49.1	2.02
BU8APW		226.0	-5.3	-0.49	197.5	-33.4	-1.37
BUVACA		210.3	-21.0	-1.93	188.6	-42.4	-1.74
CDZ79B		219.0	-12.3	-1.13	192.5	-38.4	-1.58
CRZ8KC		220.3	-11.0	-1.01	218.6	-12.4	-0.51
D23M7B		227.5	-3.8	-0.35	209.0	-21.9	-0.90
DKCVWA		235.7	4.4	0.40	215.4	-15.5	-0.64
EDDEAB		243.7	12.4	1.14	248.0	17.1	0.70
EFFFA8		227.0	-4.3	-0.39	237.9	6.9	0.29
F7BP7C		235.7	4.4	0.40	221.2	-9.7	-0.40
GA8V2T		218.0	-13.3	-1.22	227.0	-3.9	-0.16
GLDXCP		230.0	-1.3	-0.12	234.5	3.6	0.15
H66JBL		236.5	5.2	0.48	240.0	9.1	0.37
K6YTFM		238.5	7.2	0.67	254.3	23.3	0.96
LNQA63		222.5	-8.8	-0.81	254.3	23.4	0.96
LT4WWL		244.8	13.5	1.24	223.1	-7.8	-0.32
MF7DVL		248.5	17.2	1.58	235.0	4.1	0.17
MGLPHW		223.9	-7.4	-0.68	256.3	25.3	1.04
NBTYKZ	X	553.4	322.1	29.56	600.6	369.6	15.20
NZRMEX		218.5	-12.8	-1.17	236.0	5.1	0.21
PGDGFM		229.1	-2.2	-0.20	191.7	-39.3	-1.61
QH4ZWE		235.0	3.7	0.34	210.3	-20.6	-0.85
RWX2TC		229.0	-2.3	-0.21	249.1	18.2	0.75
TEEDEB		223.0	-8.3	-0.76	247.5	16.6	0.68
U7XFMA	X	361.9	130.6	11.99	259.6	28.7	1.18
UAYE39		247.0	15.7	1.44	286.0	55.1	2.26
UREN3A		230.0	-1.3	-0.12	231.5	0.6	0.02
WJD7MN		243.3	12.0	1.10	239.3	8.3	0.34
WTLMC9	*	207.7	-23.6	-2.16	252.9	21.9	0.90



Rubber Interlaboratory Testing Program

Report #190

Analysis 633

4th Qtr 2016

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

		Summary Statistics	
Grand Means	231.29 psi	230.93 psi	
Stnd Dev Btwn Labs	10.89 psi	24.32 psi	
Statistics based on 34 of 36 reporting participants			

		Summary Statistics in SI Units	
Grand Means	1.5946 MPa	1.59 MPa	
Stnd Dev Btwn Labs	0.0751 MPa	0.17 MPa	
Statistics based on 34 of 36 reporting participants			

Samples D61-D62: Polyisoprene compound, batch #1 & M61-M62: Polyisoprene compound, batch #1

Comments on Assigned Data Flags for Test #633

NBTYKZ (X) - Extreme data for Sample group ??.

U7XFMA (X) - Extreme Data for sample group D61-D62.



Rubber Interlaboratory Testing Program

Report #190

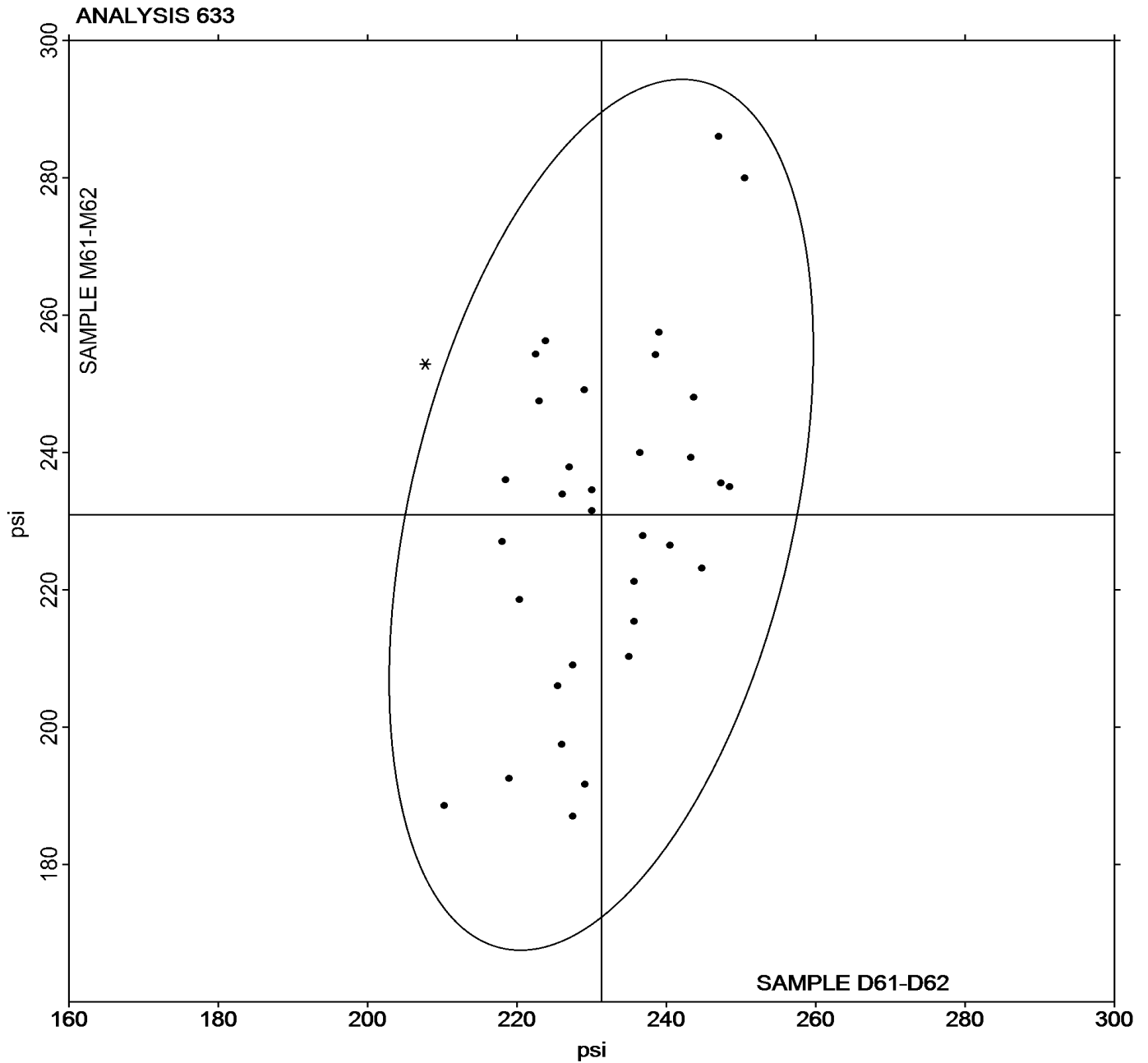
Analysis 633

4th Qtr 2016

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

Grand Mean Sample **D61-D62** = 231.29 psi

Grand Mean Sample **M61-M62** = 230.93 psi





Rubber Interlaboratory Testing Program

Report #190

Analysis 660

4th Qtr 2016

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

WebCode	Data Flag	Sample V61-V62			Sample V63-V64			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3FH7C9		46.74	0.89	0.96	55.32	1.02	1.02	MR
4KBRGG		45.70	-0.15	-0.17	54.50	0.21	0.21	MR
68BMJZ		45.69	-0.16	-0.17	53.72	-0.57	-0.57	MR
982RJD		45.48	-0.37	-0.40	55.17	0.88	0.87	MR
ACU2HH		46.89	1.03	1.11	55.18	0.89	0.88	MR
BHB7GV		44.85	-1.01	-1.09	53.07	-1.23	-1.22	XX
BUVACA		46.55	0.70	0.75	55.15	0.86	0.85	MR
CRZ8KC		47.47	1.61	1.74	55.10	0.81	0.80	MR
EDDEAB		44.43	-1.43	-1.54	52.95	-1.34	-1.33	MV
EFFFA8		44.32	-1.54	-1.66	52.65	-1.64	-1.63	MR
F7BP7C		46.63	0.78	0.84	55.57	1.28	1.27	MR
FDBA98		45.62	-0.24	-0.26	54.54	0.25	0.24	MR
GA8V2T		45.42	-0.44	-0.47	53.40	-0.89	-0.89	MR
GK6TPT		46.50	0.65	0.70	54.45	0.16	0.16	MR
GLDXCP		45.93	0.08	0.08	53.67	-0.62	-0.62	MR
H66JBL		46.30	0.45	0.48	54.83	0.54	0.54	MR
JYVRET		46.65	0.80	0.86	56.05	1.76	1.75	MR
K6YTFM		46.05	0.20	0.21	54.43	0.14	0.14	XX
LNQA63		45.81	-0.05	-0.05	54.45	0.16	0.16	MR
M34ZJU		45.42	-0.44	-0.47	53.25	-1.04	-1.03	MR
NRKU3H		45.65	-0.20	-0.22	54.43	0.14	0.14	MP
PGDGM		46.16	0.31	0.33	53.18	-1.11	-1.10	TV
PZPCVZ	*	43.35	-2.51	-2.71	51.44	-2.85	-2.83	XX
QH4ZWE		47.42	1.56	1.69	55.82	1.53	1.52	TA
TEDEB		45.83	-0.02	-0.02	53.83	-0.46	-0.45	MR
UF496G		46.28	0.43	0.46	54.00	-0.29	-0.29	MR
VQHQAT		46.64	0.79	0.85	54.57	0.28	0.28	MR
WJD7MN		44.65	-1.21	-1.31	54.27	-0.02	-0.02	TA
WTLMC9		46.07	0.21	0.23	54.77	0.48	0.47	MR
Y7HJN7	*	44.67	-1.19	-1.28	54.82	0.53	0.52	MR
ZF8UB7		46.35	0.50	0.53	54.43	0.14	0.14	MR

Summary Statistics	
Grand Means	45.855 ML 1 + 4 54.290 ML 1 + 4
Std Dev Btwn Labs	0.926 ML 1 + 4 1.006 ML 1 + 4
Statistics based on 31 of 31 reporting participants	



Rubber Interlaboratory Testing Program
Analysis 660
Mooney Viscosity: 4-minute readings (ML 1 + 4)

Report #190
4th Qtr 2016

Samples V61-V62: SBR & V63-V64: Butyl

Key to Instrument Codes Reported by Participants

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

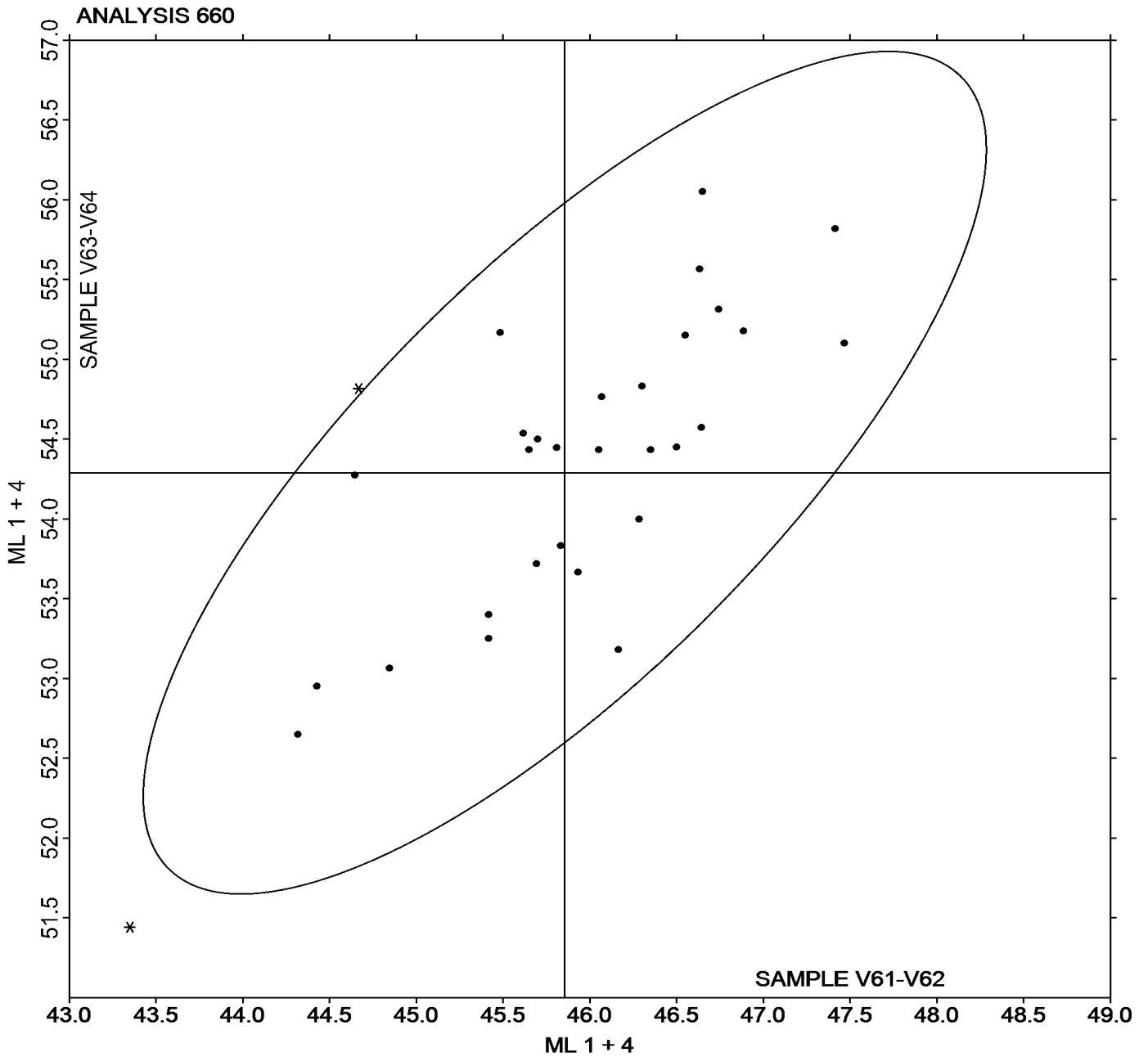


Rubber Interlaboratory Testing Program
Analysis 660
Mooney Viscosity: 4-minute readings (ML 1 + 4)

Report #190
4th Qtr 2016

Grand Mean Sample **V61-V62** = 45.855 ML 1 + 4

Grand Mean Sample **V63-V64** = 54.290 ML 1 + 4





Rubber Interlaboratory Testing Program

Report #190

Analysis 661

4th Qtr 2016

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

WebCode	Data Flag	Sample V61-V62			Sample V63-V64			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3FH7C9	X	46.74	0.94	1.20	58.55	6.88	8.25	MR
4KBRGG		45.70	-0.11	-0.14	52.12	0.46	0.55	MR
68BMJZ		45.69	-0.11	-0.15	51.89	0.23	0.27	MR
982RJD		45.48	-0.32	-0.41	50.70	-0.96	-1.15	MR
ACU2HH		46.89	1.08	1.38	52.43	0.77	0.92	MR
BHB7GV		44.85	-0.96	-1.23	49.78	-1.88	-2.26	XX
BUVACA		46.55	0.74	0.95	52.90	1.24	1.49	MR
CRZ8KC		47.47	1.66	2.12	52.08	0.42	0.51	MR
EDDEAB		44.43	-1.38	-1.77	50.90	-0.76	-0.92	MV
EFFFA8		44.32	-1.49	-1.91	50.62	-1.04	-1.25	MR
F7BP7C		46.63	0.83	1.06	52.67	1.01	1.21	MR
FDBA98		45.62	-0.19	-0.25	52.24	0.58	0.69	MR
GA8V2T		45.42	-0.39	-0.50	50.70	-0.96	-1.15	MP
GK6TPT		46.50	0.69	0.89	51.45	-0.21	-0.25	MR
GLDXCP		45.93	0.13	0.16	50.87	-0.79	-0.95	MR
H66JBL		46.30	0.49	0.63	52.42	0.76	0.91	MR
K6YTFM		46.05	0.24	0.31	53.08	1.42	1.70	XX
LNQA63		45.81	0.00	0.00	51.94	0.27	0.33	MR
M34ZJU		45.42	-0.39	-0.50	50.70	-0.96	-1.15	MR
NRKU3H		45.65	-0.16	-0.20	51.45	-0.21	-0.25	MP
PGDGFM		46.16	0.36	0.46	51.16	-0.50	-0.60	MZ
TEEDEB		45.83	0.03	0.03	51.32	-0.34	-0.41	MR
UF496G		46.28	0.48	0.61	51.12	-0.54	-0.65	MR
VQHQAT		46.64	0.83	1.07	51.79	0.13	0.15	MR
WJD7MN		44.65	-1.16	-1.49	51.95	0.29	0.34	TA
WTLMC9		46.07	0.26	0.33	52.38	0.72	0.87	MR
Y7HJN7		44.67	-1.14	-1.46	52.57	0.91	1.09	MR

Grand Means		Summary Statistics	
	45.807 ML 1 + 8		51.661 ML 1 + 8
Std Dev Btwn Labs	0.781 ML 1 + 8		0.834 ML 1 + 8
Statistics based on 26 of 27 reporting participants			

Samples V61-V62: SBR & V63-V64: Butyl



Rubber Interlaboratory Testing Program

Report #190

Analysis 661

4th Qtr 2016

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

Comments on Assigned Data Flags for Test #661

3FH7C9 (X) - Data for sample group V63-V64 are high. Inconsistent within the determinations of sample group V63-V64.

Key to Instrument Codes Reported by Participants

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



Rubber Interlaboratory Testing Program

Report #190

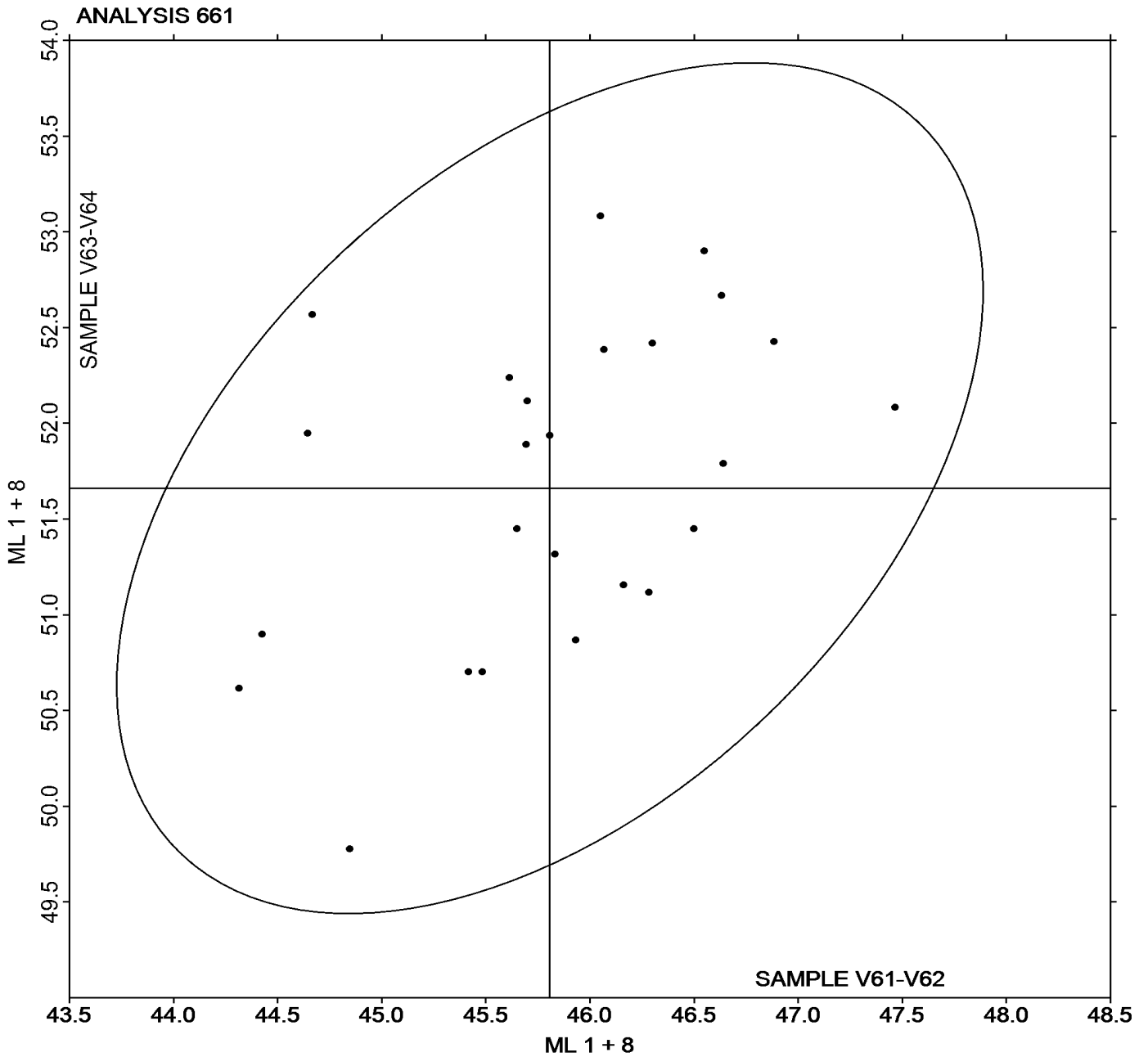
Analysis 661

4th Qtr 2016

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

Grand Mean Sample V61-V62 = 45.807 ML 1 + 8

Grand Mean Sample V63-V64 = 51.661 ML 1 + 8





Rubber Interlaboratory Testing Program

Report #190

Analysis 662

4th Qtr 2016

Mooney Stress Relaxation: t80 (seconds)

WebCode	Data Flag	Sample V61-V62			Sample V63-V64			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
BUVACA		11.747	1.902	0.88	9.567	1.726	1.06	XX
EDDEAB		5.142	-4.703	-2.17	5.130	-2.710	-1.67	MV
EFFFA8		11.720	1.876	0.86	8.553	0.713	0.44	MR
F7BP7C		10.825	0.981	0.45	8.048	0.208	0.13	MR
GLDXCP		10.007	0.162	0.07	7.487	-0.354	-0.22	MR
H66JBL		10.680	0.836	0.38	7.920	0.080	0.05	MR
LNQA63		10.035	0.191	0.09	6.858	-0.982	-0.60	MR
PGDGFMM		11.093	1.249	0.58	11.120	3.280	2.02	TV
QH4ZWE	X	249.533	239.689	110.43	249.233	241.393	148.52	TA
TEEDEB		9.893	0.049	0.02	7.393	-0.447	-0.28	MR
UF496G		10.483	0.639	0.29	7.700	-0.140	-0.09	MR
WJD7MN		5.113	-4.731	-2.18	5.125	-2.715	-1.67	TA
WTLMC9		10.640	0.796	0.37	8.023	0.183	0.11	MR
ZF8UB7		10.600	0.756	0.35	9.000	1.160	0.71	MR

Summary Statistics	
Grand Means	9.8445 seconds
Std Dev Btwn Labs	2.1705 seconds
	7.8404 seconds
	1.6253 seconds
	Statistics based on 13 of 14 reporting participants

Samples V61-V62: SBR & V63-V64: Butyl

Comments on Assigned Data Flags for Test #662

QH4ZWE (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

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		

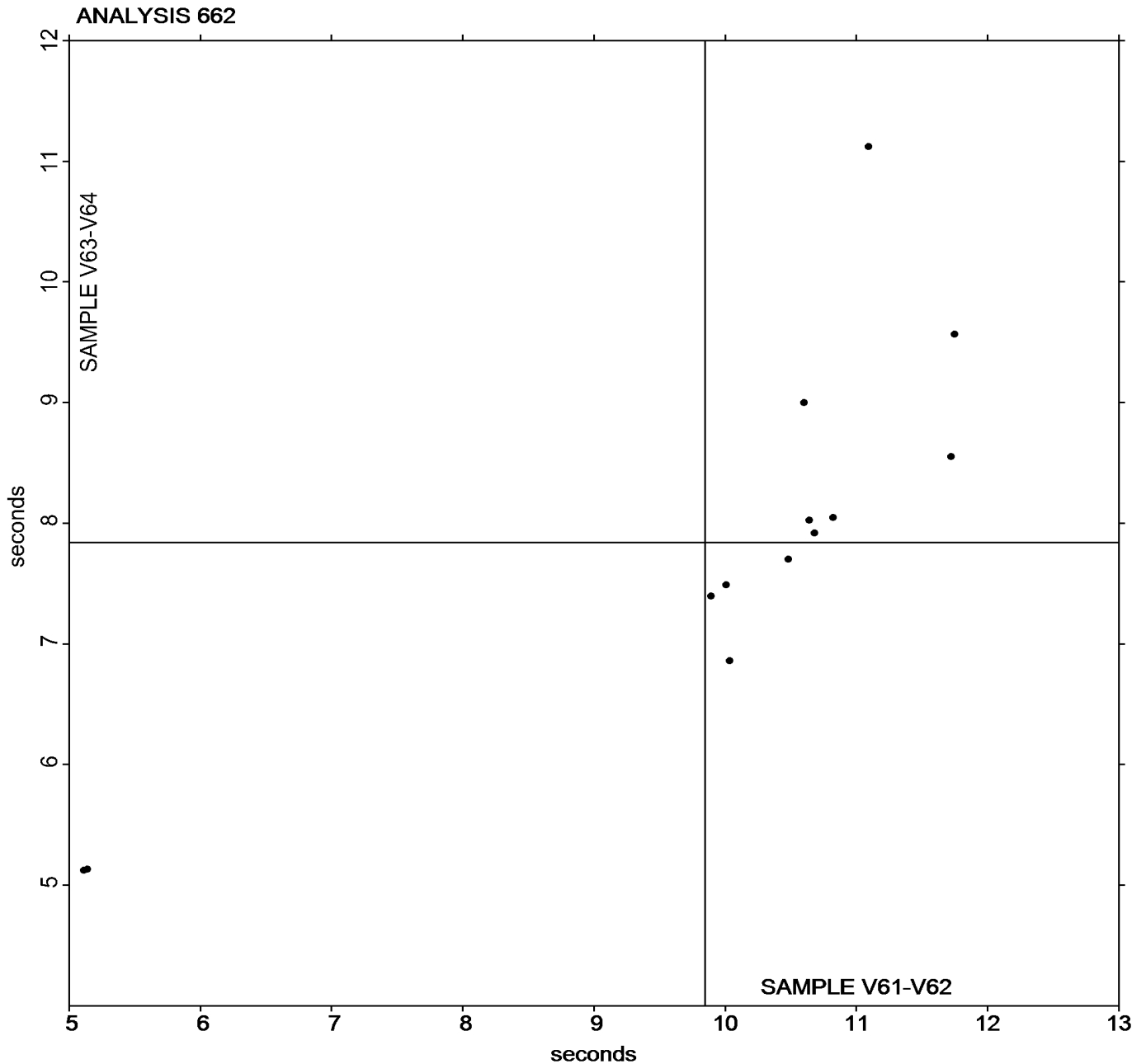


Rubber Interlaboratory Testing Program
Analysis 662
Mooney Stress Relaxation: t80 (seconds)

Report #190
4th Qtr 2016

Grand Mean Sample V61-V62 = 9.8445 seconds

Grand Mean Sample V63-V64 = 7.8404 seconds



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 663
Mooney Stress Relaxation: X30 (percent)

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample V61-V62			Sample V63-V64			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
BUVACA		85.75	-1.96	-1.17	89.53	-2.20	-2.11	XX
EDDEAB		88.54	0.83	0.50	91.90	0.16	0.16	MV
EFFFA8		86.27	-1.44	-0.86	91.23	-0.50	-0.48	MR
F7BP7C		86.64	-1.07	-0.64	91.13	-0.60	-0.57	MR
GLDXCP		87.42	-0.29	-0.17	92.13	0.40	0.38	MR
H66JBL		86.85	-0.87	-0.52	91.48	-0.25	-0.24	MR
LNQA63		87.30	-0.42	-0.25	92.42	0.69	0.66	MR
PGDGF M		90.72	3.00	1.80	92.43	0.69	0.67	TV
QH4ZWE		88.33	0.62	0.37	91.36	-0.37	-0.35	TA
TEEDEB		87.31	-0.40	-0.24	91.98	0.24	0.23	MR
UF496G		86.92	-0.79	-0.48	91.70	-0.03	-0.03	MR
WJD7MN		91.40	3.69	2.21	94.14	2.41	2.31	TA
WTLMC9		86.80	-0.92	-0.55	91.09	-0.64	-0.62	MR

Summary Statistics			
Grand Means	87.710 percent	91.733 percent	
Std Dev Btwn Labs	1.669 percent	1.044 percent	
Statistics based on 13 of 13 reporting participants			

Samples V61-V62: SBR & V63-V64: Butyl

Key to Instrument Codes Reported by Participants

- | | |
|--|--|
| 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 | |

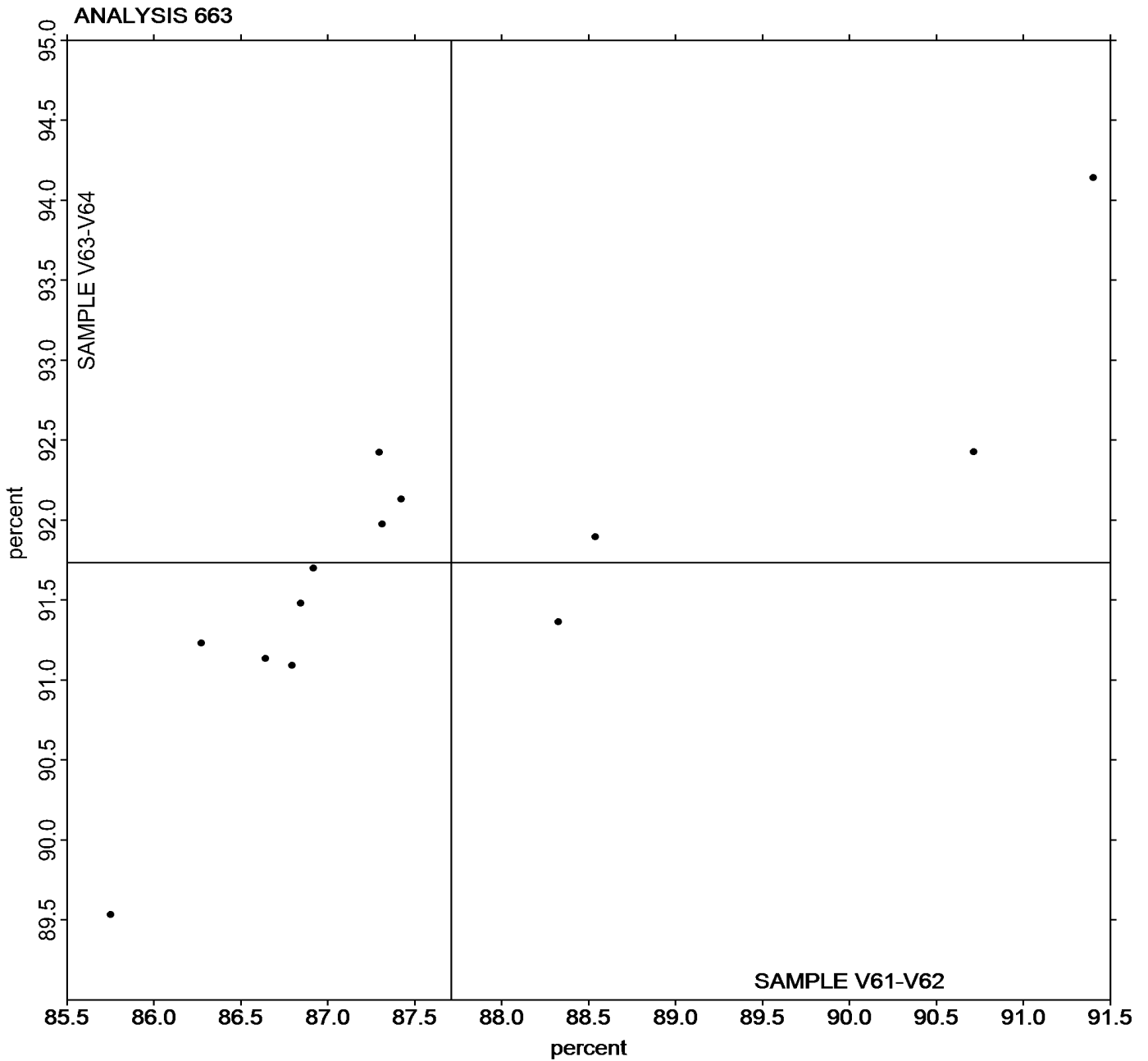


Rubber Interlaboratory Testing Program
Analysis 663
Mooney Stress Relaxation: X30 (percent)

Report #190
4th Qtr 2016

Grand Mean Sample V61-V62 = 87.710 percent

Grand Mean Sample V63-V64 = 91.733 percent



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 #190

Analysis 664

4th Qtr 2016

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

WebCode	Data Flag	Sample V61-V62			Sample V63-V64			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
BUVACA		721.8	132.0	1.19	649.2	173.7	2.34	XX
EDDEAB		540.1	-49.6	-0.45	465.6	-10.0	-0.13	MV
EFFFA8		661.7	71.9	0.65	502.3	26.8	0.36	XX
F7BP7C		672.5	82.8	0.75	525.9	50.4	0.68	MR
GLDXCP		616.5	26.8	0.24	452.5	-23.0	-0.31	MR
H66JBL		655.6	65.8	0.59	499.7	24.1	0.33	MR
LNQA63		631.0	41.3	0.37	446.2	-29.4	-0.40	MR
PGDGFM		411.0	-178.7	-1.61	429.9	-45.6	-0.62	TV
QH4ZWE		435.5	-154.3	-1.39	424.4	-51.1	-0.69	TA
TEEDEB		629.0	39.3	0.35	464.8	-10.7	-0.14	MR
UF496G		652.7	62.9	0.57	474.3	-1.2	-0.02	MR
WJD7MN		381.8	-207.9	-1.87	323.3	-152.3	-2.06	TA
WTLMC9		657.4	67.6	0.61	523.9	48.4	0.65	MR

Grand Means		Summary Statistics	
	589.73 M-s		475.54 M-s
Stnd Dev Btwn Labs	110.94 M-s		74.07 M-s
Statistics based on 13 of 13 reporting participants			

Samples V61-V62: SBR & V63-V64: Butyl

Key to Instrument Codes Reported by Participants

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

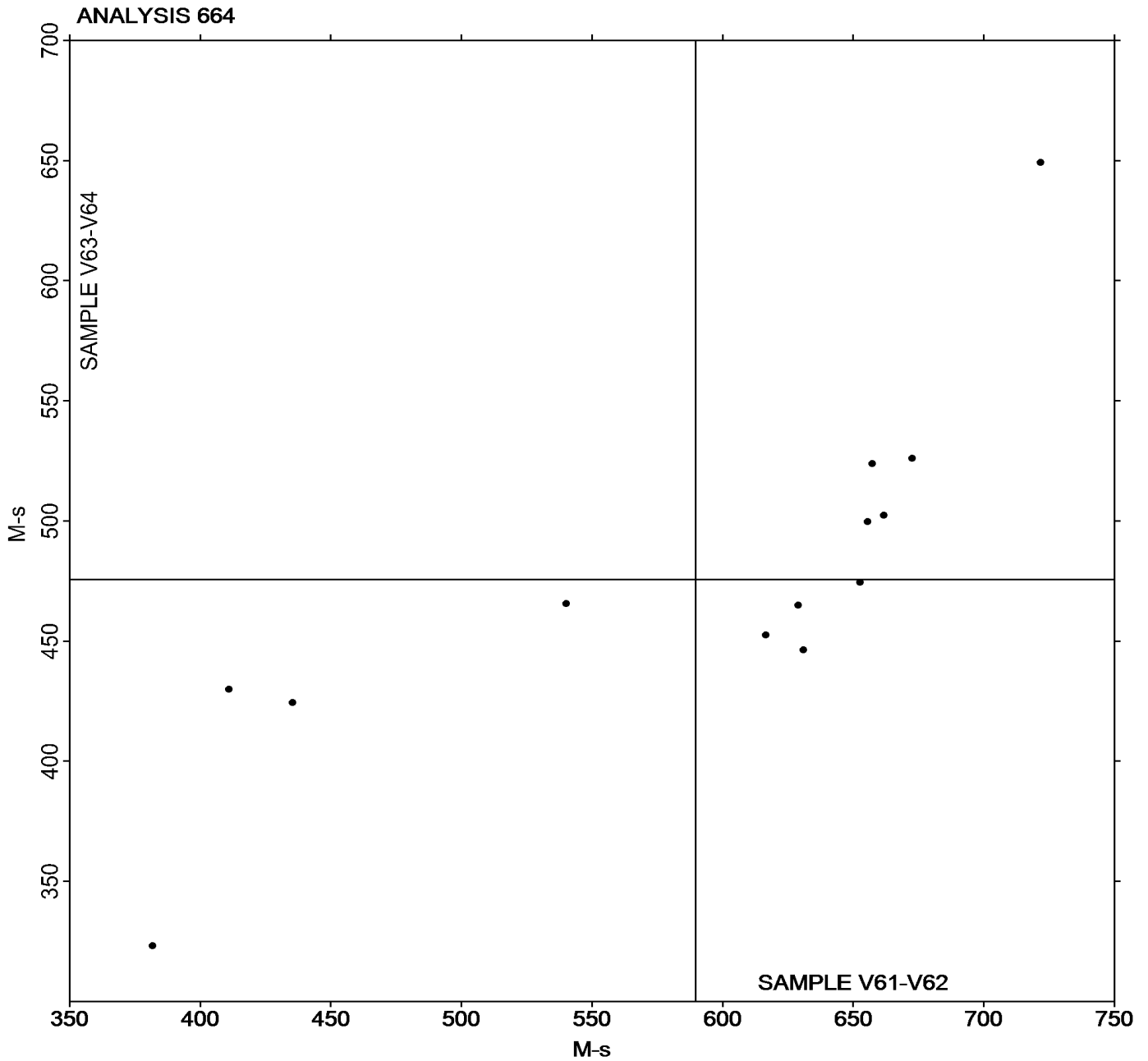


Rubber Interlaboratory Testing Program
Analysis 664
Mooney Stress Relaxation: Area under curve (M-s)

Report #190
4th Qtr 2016

Grand Mean Sample **V61-V62** = 589.73 M-s

Grand Mean Sample **V63-V64** = 475.54 M-s



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 669
ODR Vulcanization-Cure Time 10% (minutes)

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample Z61-Z62			Sample Z63-Z64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
BUVACA		0.9567	0.0133	0.41	3.070	0.252	1.82
CDZ79B		0.8967	-0.0467	-1.42	2.723	-0.094	-0.68
CRZ8KC		0.9950	0.0517	1.57	2.895	0.077	0.56
FDBA98		0.9467	0.0033	0.10	2.712	-0.106	-0.76
GA8V2T		0.9067	-0.0367	-1.11	2.857	0.039	0.28
LNQA63		0.9517	0.0083	0.25	2.803	-0.014	-0.10
PGDGFM		0.9500	0.0067	0.20	2.663	-0.154	-1.11

		Summary Statistics	
Grand Means		0.94333 minutes	2.8176 minutes
Std Dev Btwn Labs		0.03290 minutes	0.1386 minutes
Statistics based on 7 of 7 reporting participants			

Samples Z61-Z62: EPDM compound #1 & Z63-Z64: EPDM compound #2

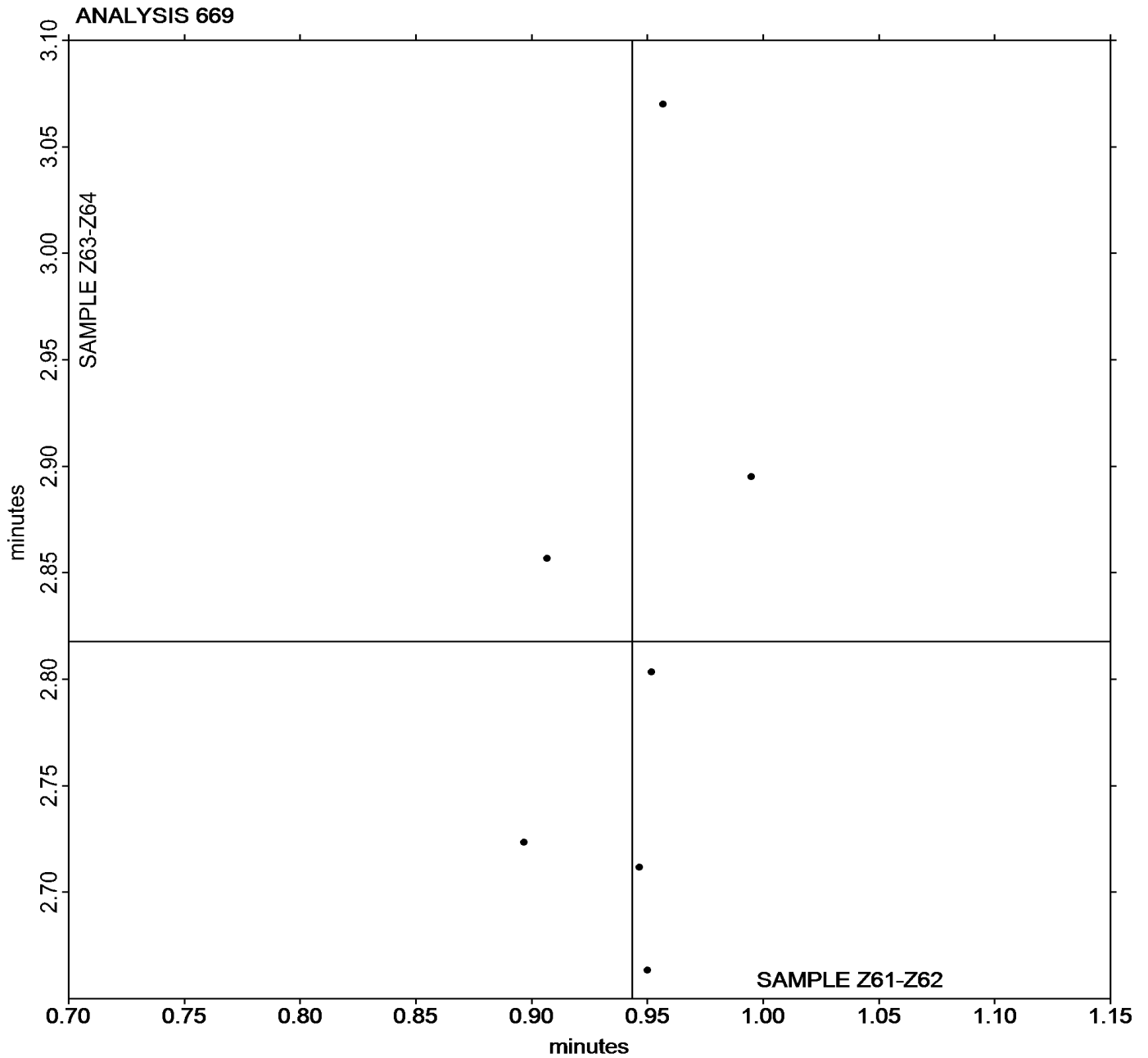


Rubber Interlaboratory Testing Program
Analysis 669
ODR Vulcanization-Cure Time 10% (minutes)

Report #190
4th Qtr 2016

Grand Mean Sample Z61-Z62 = 0.94333 minutes

Grand Mean Sample Z63-Z64 = 2.8176 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 #190
4th Qtr 2016

WebCode	Data Flag	Sample Z61-Z62			Sample Z63-Z64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
BUVACA		0.6417	-0.0048	-0.19	2.050	0.136	1.55
CDZ79B		0.6200	-0.0264	-1.07	1.893	-0.021	-0.24
CRZ8KC		0.6733	0.0269	1.09	1.865	-0.049	-0.56
FDBA98		0.6350	-0.0114	-0.46	1.775	-0.139	-1.58
GA8V2T		0.6200	-0.0264	-1.07	1.968	0.054	0.62
LNQA63		0.6517	0.0052	0.21	1.888	-0.026	-0.29
PGDGFM		0.6833	0.0369	1.49	1.958	0.044	0.50

		Summary Statistics	
Grand Means		0.64643 minutes	1.9140 minutes
Std Dev Btwn Labs		0.02471 minutes	0.0878 minutes
		Statistics based on 7 of 7 reporting participants	

Samples Z61-Z62: EPDM compound #1 & Z63-Z64: EPDM compound #2

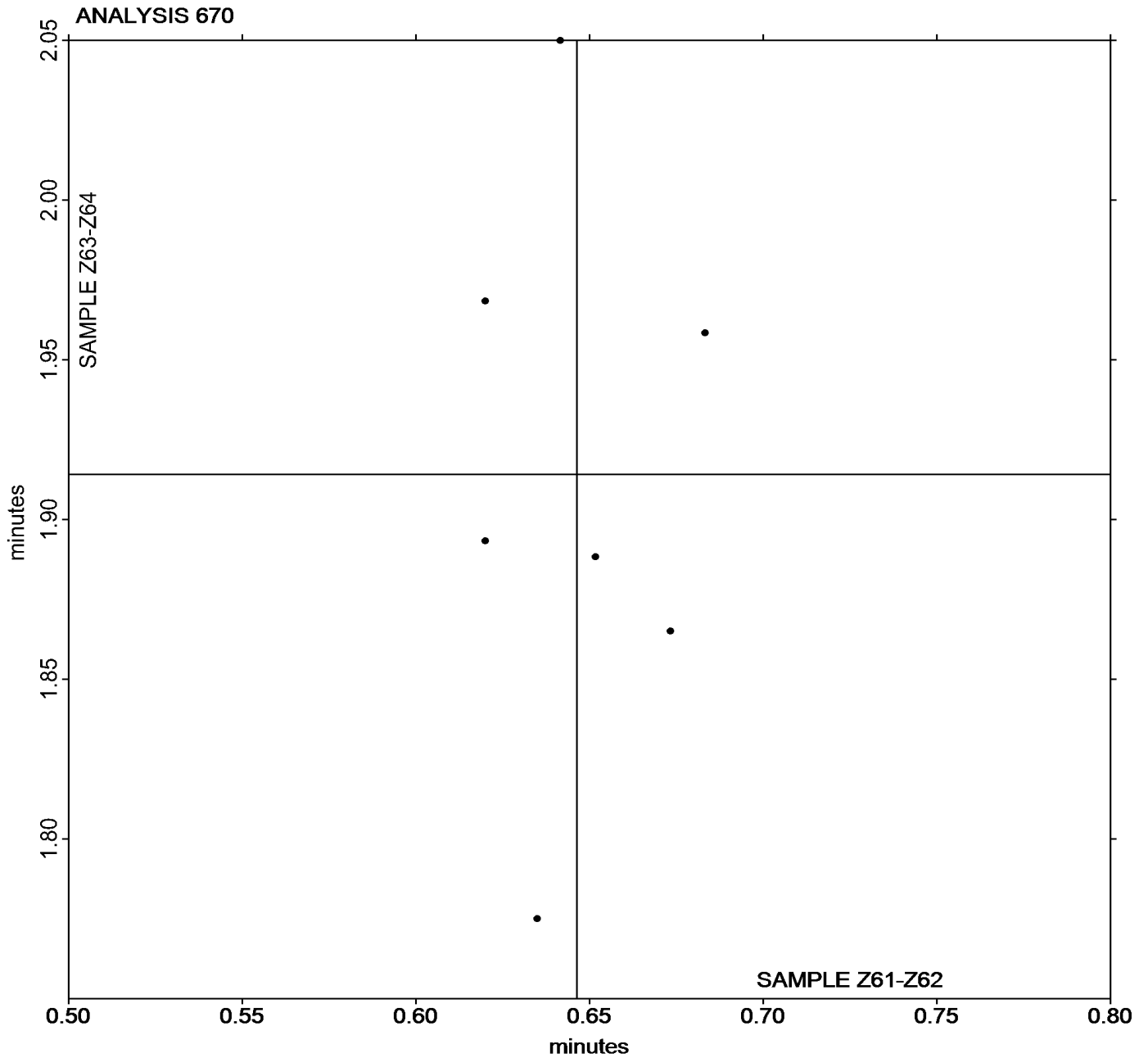


Rubber Interlaboratory Testing Program
Analysis 670
ODR Vulcanization-Scorch Time, Ts1 (minutes)

Report #190
4th Qtr 2016

Grand Mean Sample Z61-Z62 = 0.64643 minutes

Grand Mean Sample Z63-Z64 = 1.9140 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 #190
4th Qtr 2016

WebCode	Data Flag	Sample Z61-Z62			Sample Z63-Z64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
BUVACA		2.667	0.114	0.79	5.767	0.201	0.84
CDZ79B		2.320	-0.233	-1.61	5.567	0.001	0.00
CRZ8KC		2.662	0.109	0.75	5.718	0.153	0.64
FDBA98		2.445	-0.108	-0.74	5.507	-0.059	-0.25
GA8V2T		2.497	-0.056	-0.39	5.648	0.083	0.35
LNQA63		2.548	-0.004	-0.03	5.690	0.124	0.52
PGDGFM		2.730	0.177	1.23	5.063	-0.502	-2.10

		Summary Statistics	
Grand Means		2.5526 minutes	5.5657 minutes
Std Dev Btwn Labs		0.1445 minutes	0.2387 minutes
Statistics based on 7 of 7 reporting participants			

Samples Z61-Z62: EPDM compound #1 & Z63-Z64: EPDM compound #2

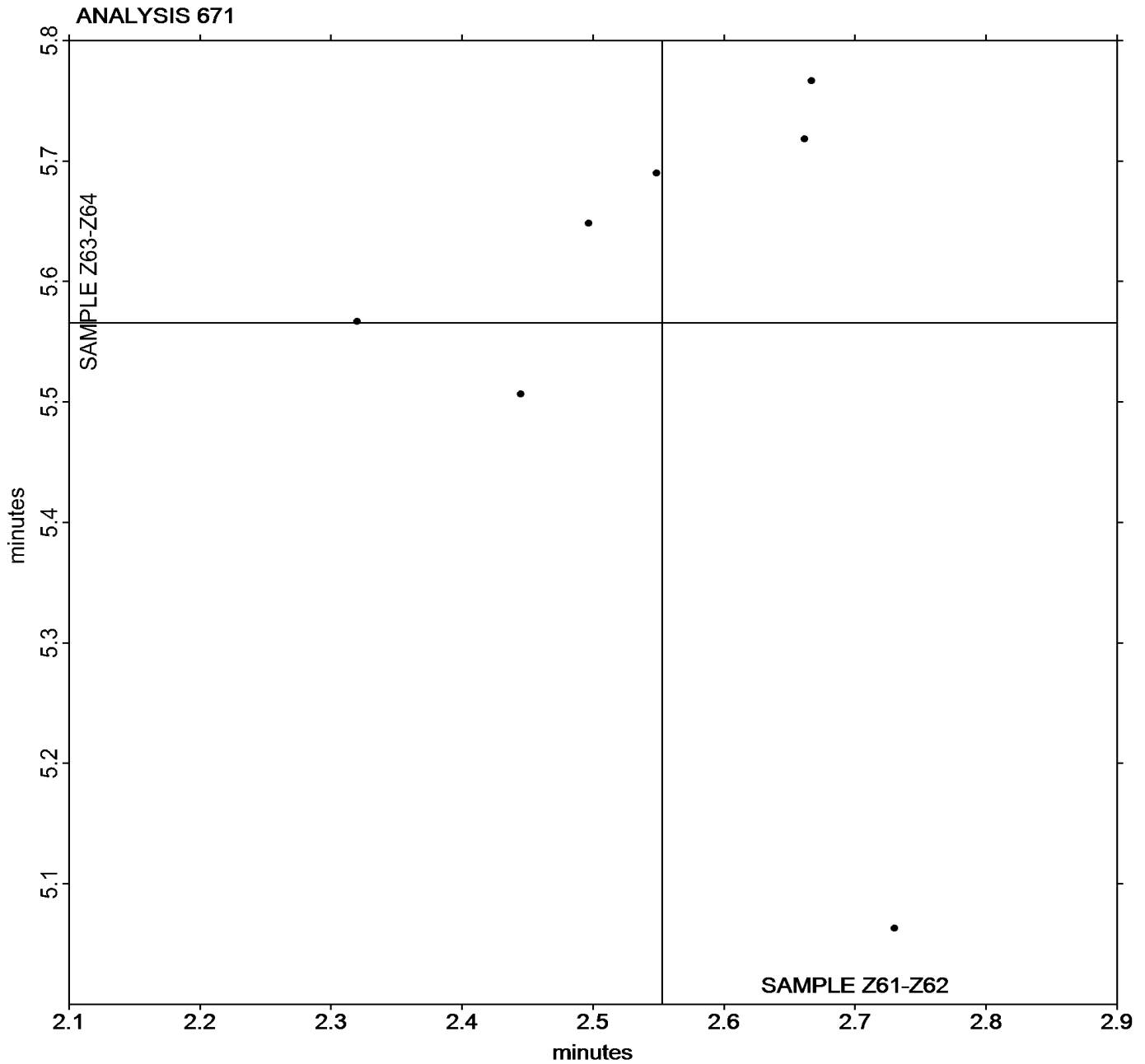


Rubber Interlaboratory Testing Program
Analysis 671
ODR Vulcanization-Cure Time 50% (minutes)

Report #190
4th Qtr 2016

Grand Mean Sample **Z61-Z62** = 2.5526 minutes

Grand Mean Sample **Z63-Z64** = 5.5657 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 #190
4th Qtr 2016

WebCode	Data Flag	Sample Z61-Z62			Sample Z63-Z64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
BUVACA		12.57	-0.26	-0.17	9.95	-0.75	-1.07
CDZ79B		11.71	-1.12	-0.73	10.22	-0.48	-0.69
CRZ8KC		14.35	1.52	0.99	10.82	0.12	0.16
FDBA98		11.66	-1.16	-0.76	10.05	-0.65	-0.93
GA8V2T		12.33	-0.50	-0.33	11.14	0.44	0.62
LNQA63		11.64	-1.19	-0.78	10.81	0.10	0.14
PGDGFM		15.54	2.71	1.78	11.94	1.23	1.75

		Summary Statistics	
Grand Means		12.827 minutes	10.704 minutes
Std Dev Btwn Labs		1.527 minutes	0.703 minutes
Statistics based on 7 of 7 reporting participants			

Samples Z61-Z62: EPDM compound #1 & Z63-Z64: EPDM compound #2

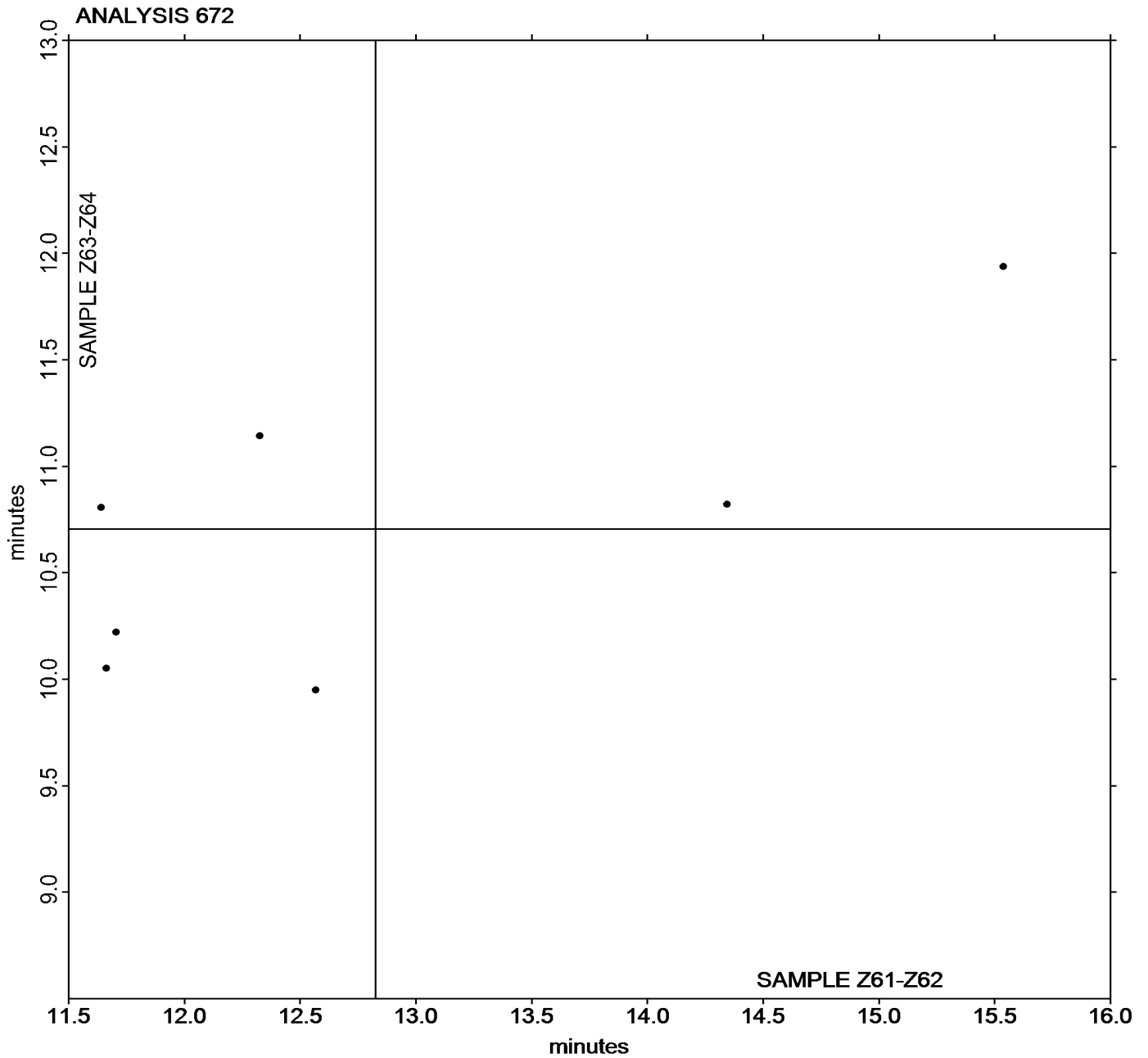


Rubber Interlaboratory Testing Program
Analysis 672
ODR Vulcanization-Cure Time 90% (minutes)

Report #190
4th Qtr 2016

Grand Mean Sample Z61-Z62 = 12.827 minutes

Grand Mean Sample Z63-Z64 = 10.704 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 #190
4th Qtr 2016

WebCode	Data Flag	Sample Z61-Z62			Sample Z63-Z64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
BUVACA		12.45	-0.21	-0.14	7.217	0.044	0.03
CDZ79B		11.70	-0.97	-0.66	6.132	-1.041	-0.63
CRZ8KC		10.55	-2.11	-1.44	4.967	-2.206	-1.33
FDBA98		11.90	-0.76	-0.52	5.763	-1.410	-0.85
GA8V2T		14.41	1.75	1.19	9.205	2.032	1.23
LNQA63		13.03	0.37	0.25	7.740	0.567	0.34
PGDGM		14.60	1.93	1.32	9.187	2.014	1.22

		Summary Statistics	
Grand Means		12.662 lbf.in	7.1729 lbf.in
Std Dev Btwn Labs		1.469 lbf.in	1.6556 lbf.in
Statistics based on 7 of 7 reporting participants			

		Summary Statistics in SI Units	
Grand Means		14.306 dN.m	8.1042 dN.m
Std Dev Btwn Labs		1.659 dN.m	1.8706 dN.m
Statistics based on 7 of 7 reporting participants			

Samples Z61-Z62: EPDM compound #1 & Z63-Z64: EPDM compound #2

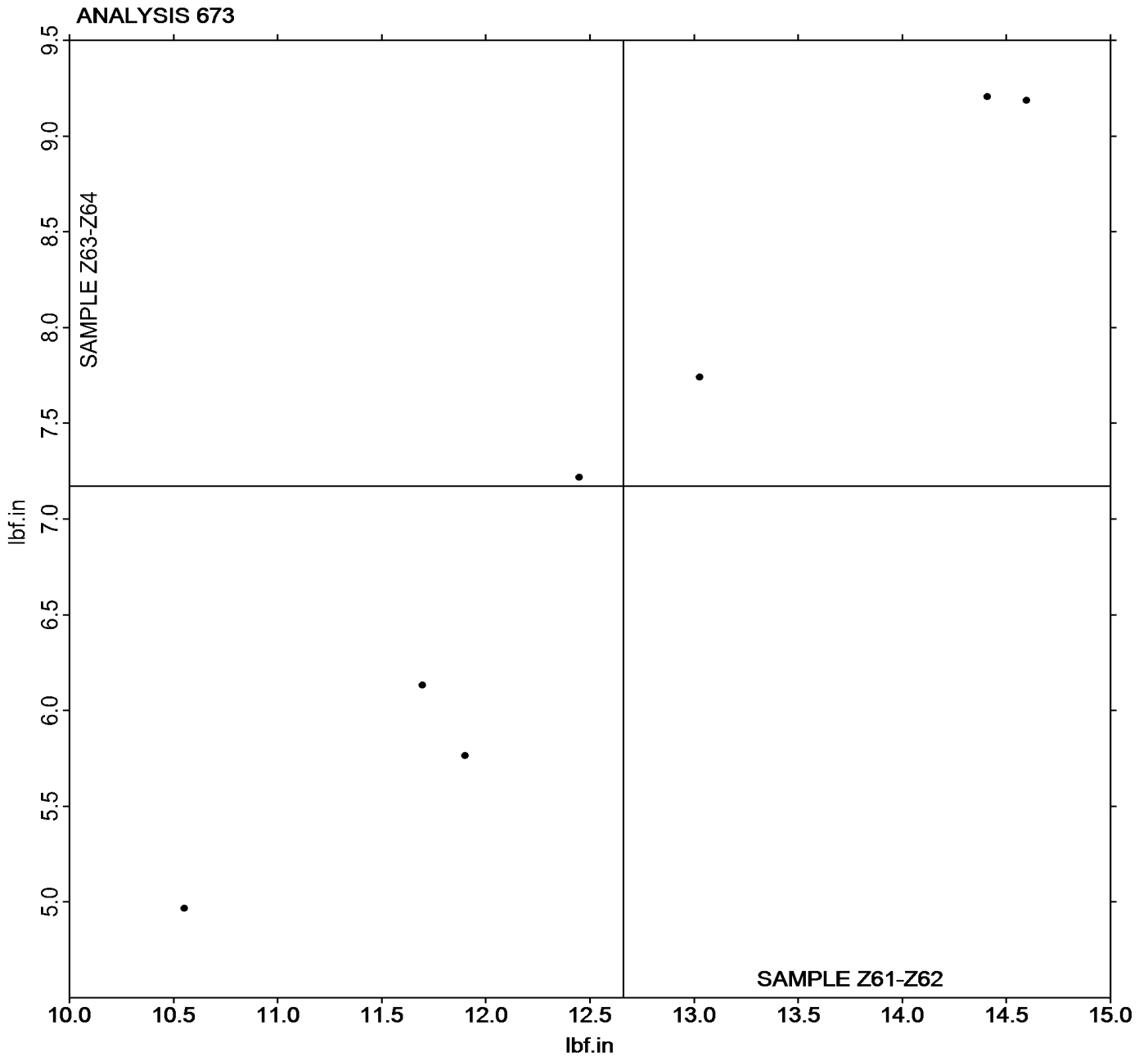


Rubber Interlaboratory Testing Program
Analysis 673
ODR Vulcanization: Minimum Torque (lbf.in)

Report #190
4th Qtr 2016

Grand Mean Sample **Z61-Z62** = 12.662 lbf.in

Grand Mean Sample **Z63-Z64** = 7.1729 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 #190
4th Qtr 2016

WebCode	Data Flag	Sample Z61-Z62			Sample Z63-Z64		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
BUVACA		48.15	1.77	0.67	35.82	0.31	0.17
CDZ79B		42.21	-4.18	-1.59	32.55	-2.96	-1.60
CRZ8KC		44.82	-1.56	-0.59	33.43	-2.08	-1.12
FDBA98		49.76	3.38	1.28	35.97	0.46	0.25
GA8V2T		48.75	2.37	0.90	37.63	2.12	1.15
LNQA63		45.51	-0.87	-0.33	36.12	0.61	0.33
PGDGM		45.48	-0.90	-0.34	37.05	1.54	0.83

		Summary Statistics	
Grand Means		46.383 lbf.in	35.509 lbf.in
Std Dev Btwn Labs		2.633 lbf.in	1.856 lbf.in
Statistics based on 7 of 7 reporting participants			

		Summary Statistics in SI Units	
Grand Means		52.406 dN.m	40.119 dN.m
Std Dev Btwn Labs		2.975 dN.m	2.097 dN.m
Statistics based on 7 of 7 reporting participants			

Samples Z61-Z62: EPDM compound #1 & Z63-Z64: EPDM compound #2

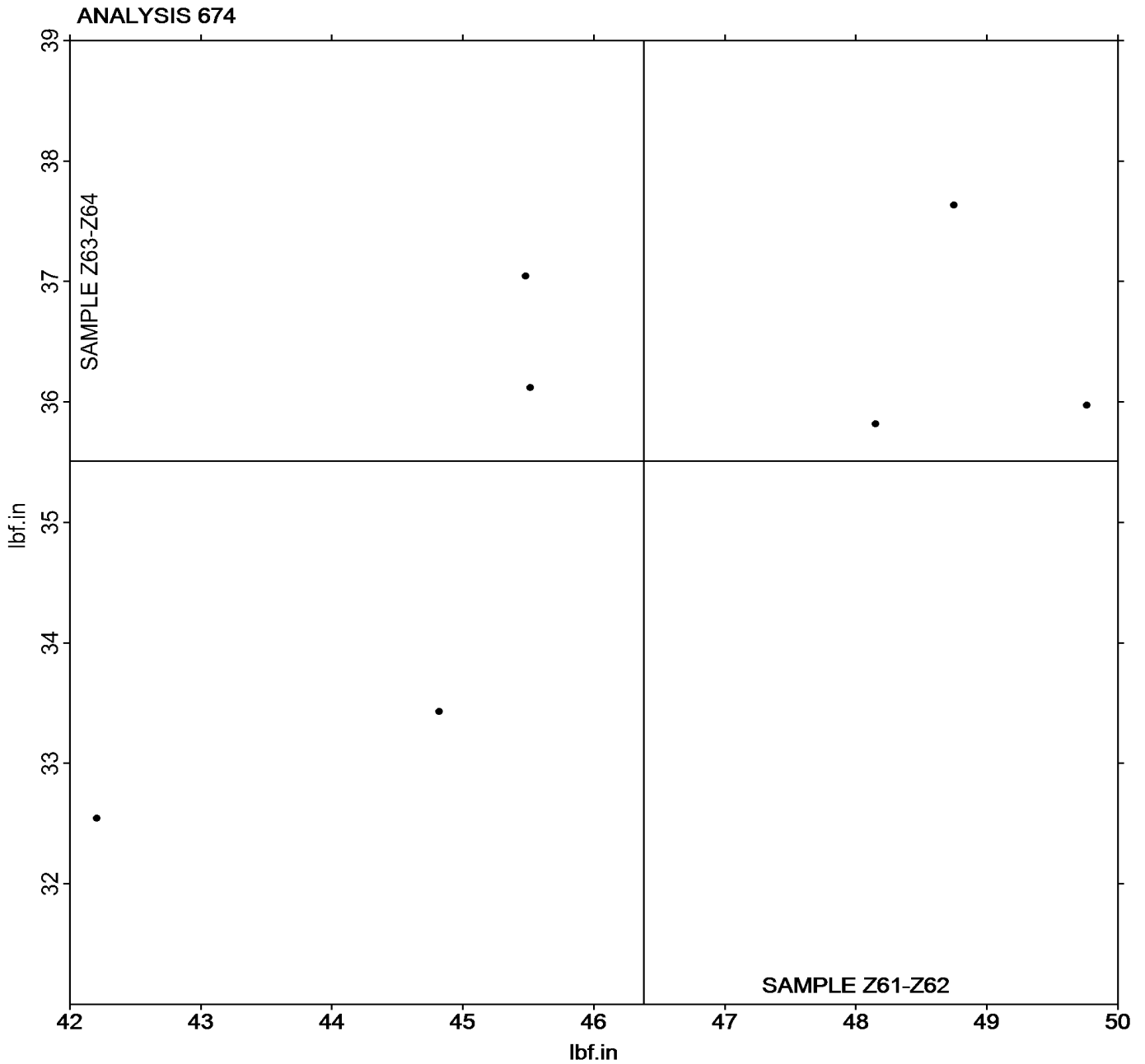


Rubber Interlaboratory Testing Program
Analysis 674
ODR Vulcanization: Maximum Torque (lbf.in)

Report #190
4th Qtr 2016

Grand Mean Sample **Z61-Z62** = 46.383 lbf.in

Grand Mean Sample **Z63-Z64** = 35.509 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 #190

Analysis 684

4th Qtr 2016

MDR Vulcanization-Cure Time 10% (minutes)

WebCode	Data Flag	Sample Z65-Z66			Sample Z67-Z68			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3FH7C9		1.912	-0.109	-1.20	0.9667	0.0040	0.04	MC
68BMJZ	*	1.805	-0.215	-2.39	0.7267	-0.2360	-2.22	MC
7Y29K6		2.017	-0.004	-0.04	0.9967	0.0340	0.32	MC
ARL4RU		2.080	0.060	0.66	0.9883	0.0257	0.24	MC
BHB7GV		2.108	0.088	0.98	0.8767	-0.0860	-0.81	MC
BRY3HW		1.905	-0.115	-1.28	0.8767	-0.0860	-0.81	MC
BU8APW		2.008	-0.012	-0.13	1.0550	0.0923	0.87	TP
C8A3P8		2.097	0.076	0.85	0.9600	-0.0027	-0.03	MC
DKCVWA		2.140	0.120	1.33	1.0483	0.0857	0.80	MP
EDDEAB		2.152	0.131	1.46	0.9200	-0.0427	-0.40	MR
F7BP7C		2.105	0.085	0.94	1.0467	0.0840	0.79	MC
FDBA98		2.130	0.110	1.22	0.8533	-0.1093	-1.03	MC
FFWXLT		2.040	0.020	0.22	0.9050	-0.0577	-0.54	MC
GLDXCP		2.073	0.053	0.59	1.0067	0.0440	0.41	MC
H66JBL		2.024	0.004	0.04	1.0313	0.0686	0.64	MM
H9N8FR		1.867	-0.154	-1.70	0.9900	0.0273	0.26	MC
JGGY2Q		2.022	0.001	0.02	1.0533	0.0907	0.85	ME
JYVRET		2.020	0.000	0.00	1.0900	0.1273	1.20	MP
K6YTFM		1.983	-0.037	-0.41	0.7933	-0.1693	-1.59	XX
LNQA63		1.872	-0.149	-1.65	1.0167	0.0540	0.51	TP
M34ZJU		1.922	-0.099	-1.09	1.0250	0.0623	0.59	MC
MGLPHW		2.055	0.035	0.39	0.8167	-0.1460	-1.37	MC
NBTYKZ		1.965	-0.055	-0.61	1.2100	0.2473	2.32	MC
QH4ZWE		2.097	0.076	0.85	0.8550	-0.1077	-1.01	MD
TEEDEB		2.043	0.023	0.26	0.9350	-0.0277	-0.26	MC
U7XFMA		2.147	0.127	1.41	1.1084	0.1457	1.37	MC
UAYE39		2.006	-0.015	-0.16	1.0111	0.0485	0.46	MC
VQHQAT		2.000	-0.020	-0.22	0.8300	-0.1327	-1.25	MC
WTLMC9		1.993	-0.027	-0.30	0.9250	-0.0377	-0.35	MD

Grand Means		Summary Statistics	
	2.0202 minutes		0.96267 minutes
Std Dev Btw Labs	0.0902 minutes		0.10642 minutes
Statistics based on 29 of 29 reporting participants			

Samples Z65-Z66: EPDM compound, batch #1 & Z67-Z68: EPDM compound, batch #2



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

Report #190
4th Qtr 2016

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	MR	MonTech D-RPA 3000
TP	Tech Pro MDR model MDPT	XX	Instrument model not specified by lab

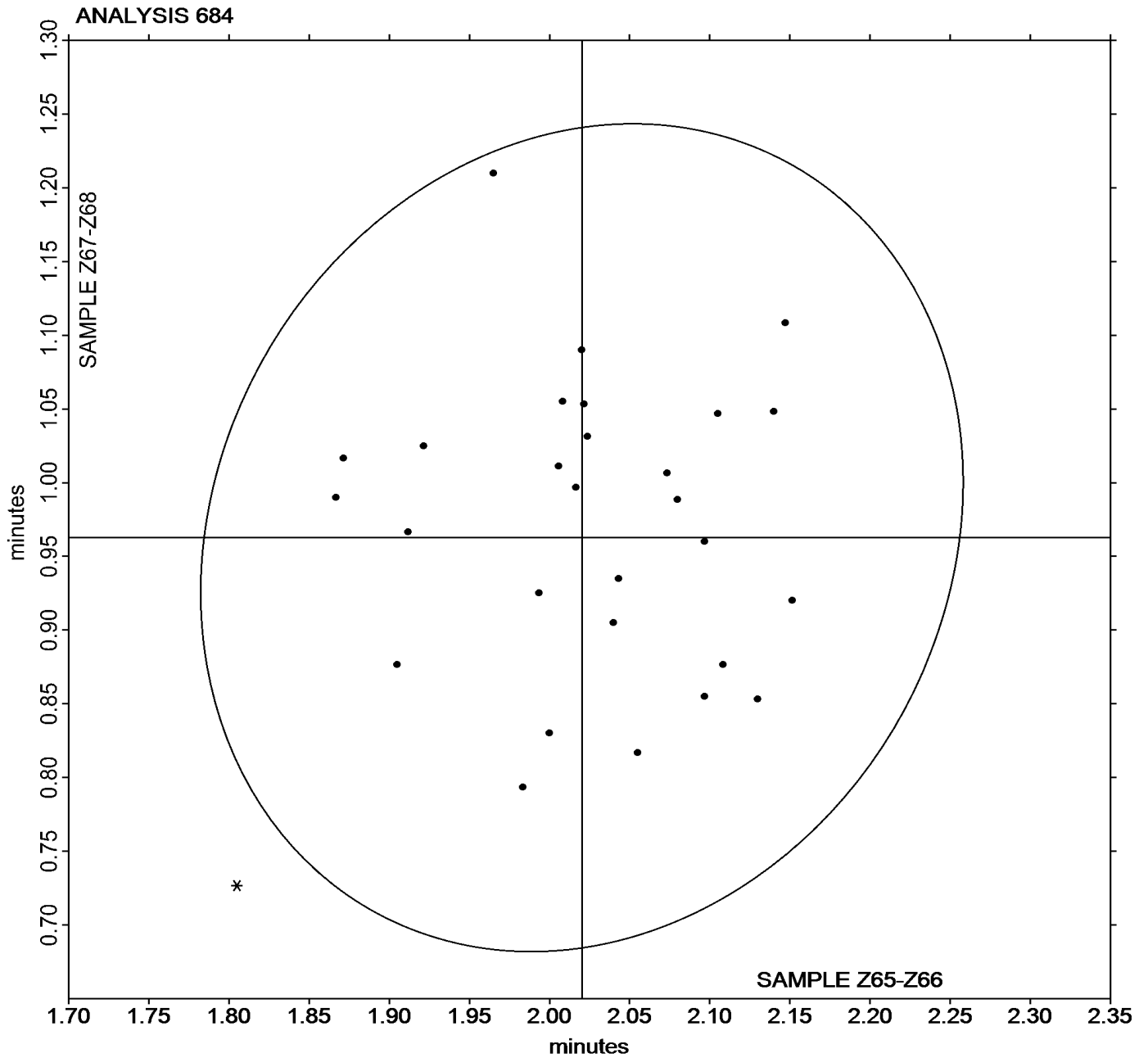


Rubber Interlaboratory Testing Program
Analysis 684
MDR Vulcanization-Cure Time 10% (minutes)

Report #190
4th Qtr 2016

Grand Mean Sample Z65-Z66 = 2.0202 minutes

Grand Mean Sample Z67-Z68 = 0.96267 minutes





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

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample Z65-Z66			Sample Z67-Z68			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3FH7C9		1.760	-0.052	-0.40	0.9267	-0.0180	-0.11	MC
4XD343		1.805	-0.007	-0.05	1.0217	0.0770	0.48	MC
68BMJZ		1.525	-0.287	-2.23	0.5833	-0.3613	-2.26	MC
7Y29K6		1.788	-0.024	-0.18	0.9500	0.0053	0.03	MC
ARL4RU		1.925	0.113	0.88	0.9517	0.0070	0.04	MC
BHB7GV	*	2.090	0.278	2.17	0.9043	-0.0403	-0.25	MC
BRY3HW		1.558	-0.254	-1.98	0.7990	-0.1457	-0.91	MC
BU8APW		1.928	0.116	0.91	1.0650	0.1203	0.75	TP
C8A3P8		1.930	0.118	0.92	0.9567	0.0120	0.08	MC
DKCVWA		1.867	0.055	0.43	0.9750	0.0303	0.19	MP
EDDEAB		1.695	-0.117	-0.91	0.8067	-0.1380	-0.86	MR
EFFFA8		1.583	-0.229	-1.78	0.7868	-0.1578	-0.99	MC
F7BP7C		1.742	-0.070	-0.55	1.1050	0.1603	1.00	MC
FDBA98		1.908	0.096	0.75	0.7867	-0.1580	-0.99	MC
FFWXL T		1.730	-0.082	-0.64	0.8450	-0.0997	-0.62	MC
GLDXCP		1.960	0.148	1.15	1.0683	0.1237	0.77	MC
H66JBL		1.851	0.039	0.31	1.0379	0.0932	0.58	MM
H9N8FR		1.733	-0.079	-0.61	0.9900	0.0453	0.28	MC
JGGY2Q		1.840	0.028	0.22	1.0133	0.0687	0.43	ME
JYVRET		1.677	-0.135	-1.05	1.0100	0.0653	0.41	MP
K6YTFM		1.825	0.013	0.10	0.7583	-0.1863	-1.17	XX
LNQA63		2.063	0.251	1.96	1.2483	0.3037	1.90	XX
M34ZJU		1.772	-0.040	-0.31	1.0467	0.1020	0.64	MC
MGLPHW		1.823	0.011	0.09	0.7367	-0.2080	-1.30	MC
NBTYKZ		1.900	0.088	0.69	1.3033	0.3587	2.25	MC
QH4ZWE		1.763	-0.049	-0.38	0.7650	-0.1797	-1.13	MD
TEEDEB		1.758	-0.054	-0.42	0.9000	-0.0447	-0.28	MC
U7XFMA		1.922	0.110	0.86	1.1306	0.1859	1.16	MC
UAYE39		1.803	-0.009	-0.07	0.9639	0.0192	0.12	MC
VQH QAT		1.738	-0.074	-0.57	0.7417	-0.2030	-1.27	MC
WTLMC9		1.810	-0.002	-0.01	0.8800	-0.0647	-0.41	MD
ZF8UB7		1.905	0.093	0.73	1.1717	0.2270	1.42	MC



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

Report #190
4th Qtr 2016

		Summary Statistics	
Grand Means	1.8118 minutes	0.94466 minutes	
Stnd Dev Btwn Labs	0.1284 minutes	0.15966 minutes	
Statistics based on 32 of 32 reporting participants			

Samples Z65-Z66: EPDM compound, batch #1 & Z67-Z68: EPDM compound, batch #2

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	MR	MonTech D-RPA 3000
TP	Tech Pro MDR model MDPT	XX	Instrument model not specified by lab

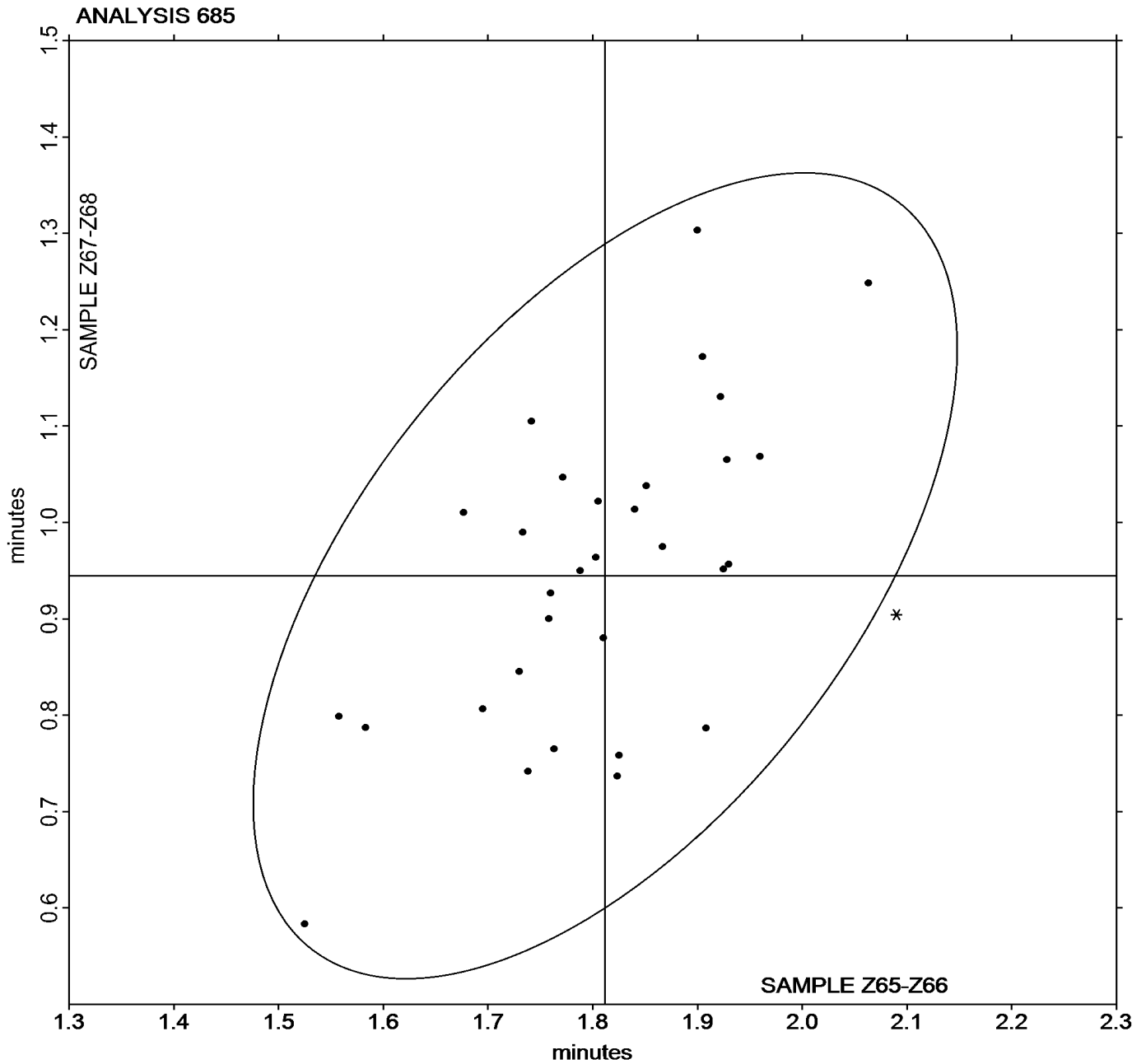


Rubber Interlaboratory Testing Program
Analysis 685
MDR Vulcanization-Scorch Time, Ts1 (minutes)

Report #190
4th Qtr 2016

Grand Mean Sample Z65-Z66 = 1.8118 minutes

Grand Mean Sample Z67-Z68 = 0.94466 minutes





Rubber Interlaboratory Testing Program

Report #190

Analysis 686

4th Qtr 2016

MDR Vulcanization-Cure Time 50% (minutes)

WebCode	Data Flag	Sample Z65-Z66			Sample Z67-Z68			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3FH7C9		4.517	-0.236	-1.18	2.505	-0.056	-0.68	MC
4XD343		4.452	-0.301	-1.50	2.448	-0.112	-1.36	MC
68BMJZ		4.740	-0.013	-0.06	2.528	-0.032	-0.39	MC
7Y29K6		4.827	0.074	0.37	2.572	0.011	0.13	MC
ARL4RU		4.893	0.140	0.70	2.603	0.043	0.52	MC
BHB7GV		4.615	-0.138	-0.69	2.567	0.006	0.07	MC
BRY3HW		4.492	-0.261	-1.30	2.457	-0.104	-1.26	MC
BU8APW	X	4.865	0.112	0.56	2.327	-0.234	-2.84	TP
C8A3P8		4.785	0.032	0.16	2.568	0.008	0.09	MC
DKCVWA		5.077	0.324	1.61	2.710	0.149	1.81	MP
EDDEAB		5.205	0.452	2.25	2.650	0.089	1.08	MR
EFFFA8		4.859	0.105	0.53	2.552	-0.009	-0.11	MC
F7BP7C		4.937	0.184	0.92	2.647	0.086	1.04	MC
FDBA98		5.028	0.275	1.37	2.612	0.051	0.62	MC
FFWXL T		4.780	0.027	0.13	2.520	-0.041	-0.49	MC
GLDXCP		4.813	0.060	0.30	2.593	0.033	0.40	MC
H66JBL		4.804	0.051	0.26	2.678	0.118	1.43	MM
H9N8FR		4.340	-0.413	-2.06	2.487	-0.074	-0.90	MC
JGGY2Q		4.710	-0.043	-0.21	2.610	0.049	0.60	ME
JYVRET		4.718	-0.035	-0.17	2.560	-0.001	-0.01	MC
K6YTFM		4.622	-0.131	-0.66	2.418	-0.142	-1.73	XX
LNQA63		4.475	-0.278	-1.39	2.417	-0.144	-1.75	TP
M34ZJU		4.518	-0.235	-1.17	2.517	-0.044	-0.53	MC
MGLPHW		4.797	0.044	0.22	2.493	-0.067	-0.82	MC
NBTYKZ		4.513	-0.240	-1.20	2.553	-0.007	-0.09	MC
QH4ZWE		4.700	-0.053	-0.26	2.493	-0.067	-0.82	MD
TEEDEB		4.742	-0.011	-0.06	2.477	-0.084	-1.02	MC
U7XFMA		4.945	0.192	0.96	2.747	0.187	2.26	MC
UAYE39		4.861	0.108	0.54	2.628	0.067	0.81	MC
VQHQAT		5.023	0.270	1.35	2.593	0.033	0.40	MC
WTLMC9		4.773	0.020	0.10	2.523	-0.037	-0.45	MD
ZF8UB7		4.783	0.030	0.15	2.653	0.093	1.12	MC



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

Report #190
4th Qtr 2016

		Summary Statistics	
Grand Means	4.7530 minutes	2.5607 minutes	
Stnd Dev Btwn Labs	0.2004 minutes	0.0825 minutes	
Statistics based on 31 of 32 reporting participants			

Samples Z65-Z66: EPDM compound, batch #1 & Z67-Z68: EPDM compound, batch #2

Comments on Assigned Data Flags for Test #686

BU8APW (X) - Data for sample group Z67-Z68 are low. Inconsistent within the determinations of sample group Z67-Z68.

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	MR	MonTech D-RPA 3000
TP	Tech Pro MDR model MDPT	XX	Instrument model not specified by lab

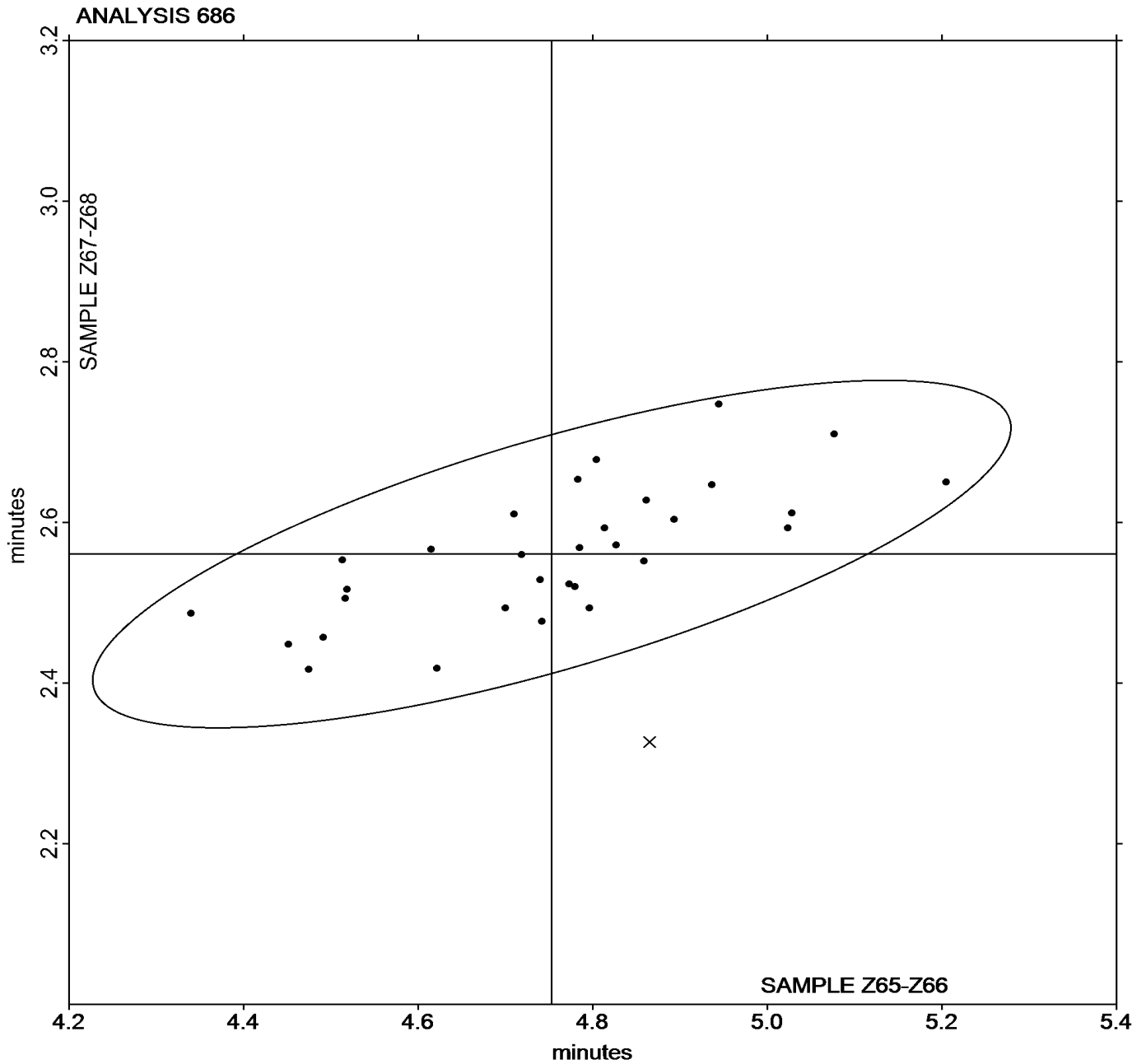


Rubber Interlaboratory Testing Program
Analysis 686
MDR Vulcanization-Cure Time 50% (minutes)

Report #190
4th Qtr 2016

Grand Mean Sample Z65-Z66 = 4.7530 minutes

Grand Mean Sample Z67-Z68 = 2.5607 minutes





Rubber Interlaboratory Testing Program

Report #190

Analysis 687

4th Qtr 2016

MDR Vulcanization-Cure Time 90% (minutes)

WebCode	Data Flag	Sample Z65-Z66			Sample Z67-Z68			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3FH7C9		7.655	-0.982	-1.81	5.913	-0.191	-0.81	MC
4XD343		7.942	-0.696	-1.28	5.885	-0.220	-0.93	MC
68BMJZ		8.280	-0.357	-0.66	6.185	0.080	0.34	MC
7Y29K6		8.620	-0.017	-0.03	6.063	-0.041	-0.18	MC
ARL4RU		8.753	0.116	0.21	6.190	0.085	0.36	MC
BHB7GV		8.203	-0.434	-0.80	6.032	-0.073	-0.31	MC
BRY3HW		8.490	-0.148	-0.27	5.917	-0.188	-0.80	MC
BU8APW		8.550	-0.087	-0.16	5.883	-0.221	-0.94	TP
C8A3P8		8.873	0.236	0.43	6.145	0.040	0.17	MC
DKCVWA		9.712	1.074	1.98	6.437	0.332	1.41	MP
EDDEAB		9.773	1.136	2.09	6.560	0.455	1.93	MR
EFFFA8		8.898	0.261	0.48	6.153	0.048	0.20	MC
F7BP7C	X	9.050	0.413	0.76	7.910	1.805	7.66	MC
FDBA98		9.155	0.518	0.95	6.198	0.094	0.40	MC
FFWXL		9.175	0.538	0.99	6.075	-0.030	-0.13	MC
GLDXCP		8.932	0.294	0.54	6.332	0.227	0.96	MC
H66JBL	*	8.911	0.274	0.50	6.738	0.633	2.69	MM
H9N8FR		7.423	-1.214	-2.24	6.017	-0.088	-0.37	MC
JGGY2Q		8.473	-0.164	-0.30	6.197	0.092	0.39	ME
JYVRET		8.745	0.108	0.20	5.928	-0.176	-0.75	MP
K6YTFM		8.260	-0.377	-0.69	5.867	-0.238	-1.01	XX
LNQA63		7.678	-0.959	-1.77	5.502	-0.603	-2.56	TP
M34ZJU		8.033	-0.604	-1.11	6.157	0.052	0.22	MC
MGLPHW		8.602	-0.036	-0.07	5.878	-0.226	-0.96	MC
NBTYKZ		8.548	-0.089	-0.16	6.172	0.067	0.28	MC
QH4ZWE		9.185	0.548	1.01	6.173	0.069	0.29	MD
TEDEB		8.738	0.101	0.19	5.833	-0.271	-1.15	MC
U7XFMA		8.728	0.091	0.17	6.281	0.176	0.75	MC
UAYE39		8.559	-0.079	-0.14	6.156	0.051	0.22	MC
VQHQAT		9.040	0.403	0.74	6.197	0.092	0.39	MC
WTLMC9		8.622	-0.016	-0.03	5.938	-0.166	-0.71	MD
ZF8UB7		9.197	0.559	1.03	6.247	0.142	0.60	MC



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

Report #190
4th Qtr 2016

		Summary Statistics	
Grand Means	8.6372 minutes	6.1047 minutes	
Stnd Dev Btwn Labs	0.5429 minutes	0.2358 minutes	
Statistics based on 31 of 32 reporting participants			

Samples Z65-Z66: EPDM compound, batch #1 & Z67-Z68: EPDM compound, batch #2

Comments on Assigned Data Flags for Test #687

F7BP7C (X) - Data for sample group Z67-Z68 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	MR	MonTech D-RPA 3000
TP	Tech Pro MDR model MDPT	XX	Instrument model not specified by lab

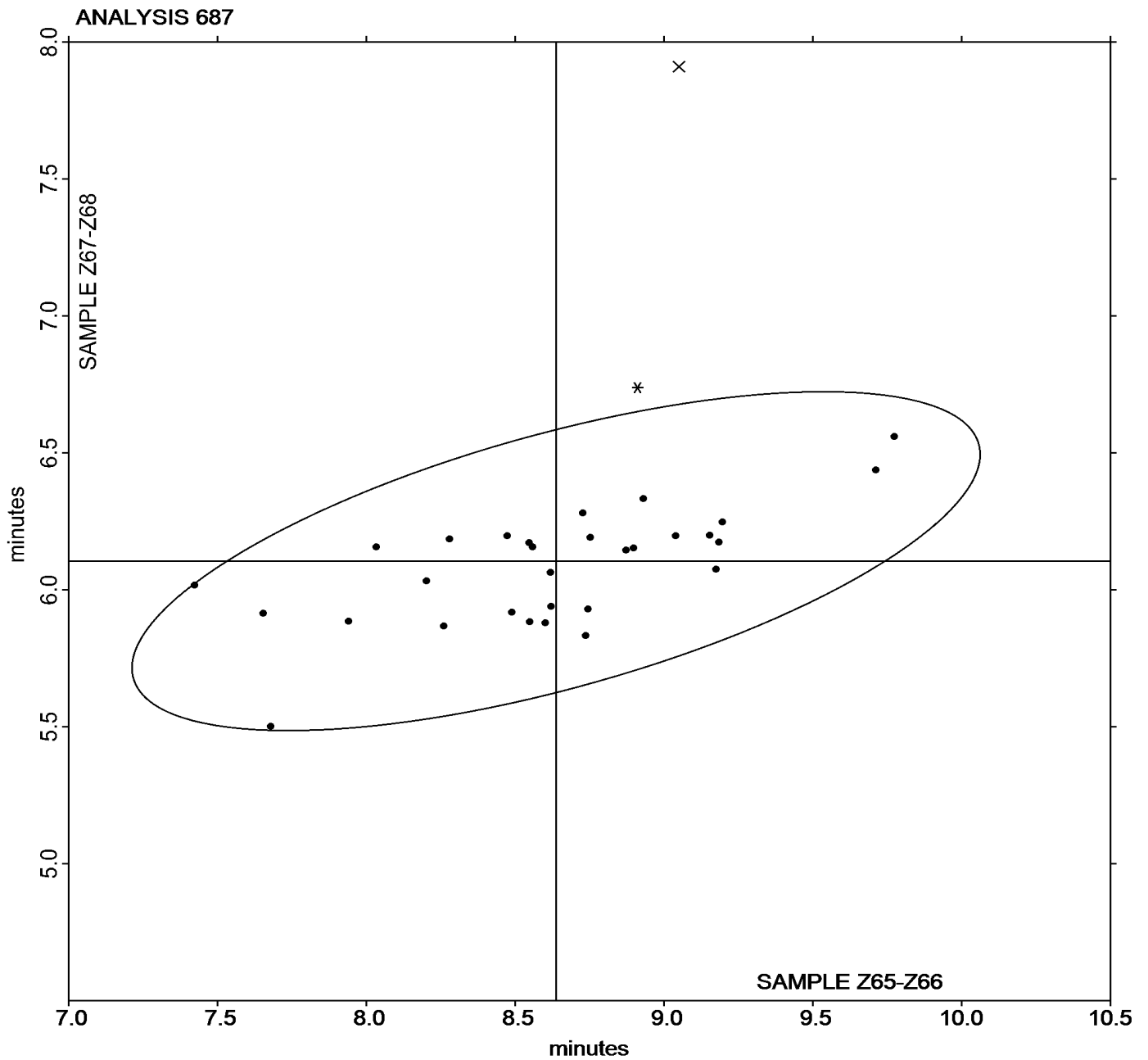


Rubber Interlaboratory Testing Program
Analysis 687
MDR Vulcanization-Cure Time 90% (minutes)

Report #190
4th Qtr 2016

Grand Mean Sample **Z65-Z66** = 8.6372 minutes

Grand Mean Sample **Z67-Z68** = 6.1047 minutes





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

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample Z65-Z66			Sample Z67-Z68			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3FH7C9		1.832	0.050	0.17	5.847	0.739	1.19	MC
4XD343		2.062	0.280	0.94	6.248	1.140	1.83	MC
68BMJZ		1.708	-0.074	-0.25	5.142	0.034	0.05	MC
7Y29K6		1.650	-0.132	-0.44	5.043	-0.065	-0.10	MC
ARL4RU		1.351	-0.431	-1.45	4.555	-0.553	-0.89	MC
BHB7GV		2.210	0.428	1.44	5.403	0.295	0.47	MC
BRY3HW		2.098	0.316	1.06	4.830	-0.279	-0.45	MC
BU8APW		1.497	-0.285	-0.96	5.445	0.337	0.54	TP
C8A3P8		2.167	0.385	1.29	5.030	-0.078	-0.13	MC
DKCVWA		1.543	-0.239	-0.80	4.860	-0.248	-0.40	MP
EDDEAB		1.643	-0.139	-0.47	5.087	-0.021	-0.03	MR
EFFFA8		1.717	-0.065	-0.22	4.743	-0.366	-0.59	MC
F7BP7C		1.570	-0.212	-0.71	5.361	0.253	0.41	MC
FDBA98		1.527	-0.255	-0.86	4.303	-0.805	-1.29	MC
FFWXL T		1.702	-0.080	-0.27	4.719	-0.389	-0.62	MC
GLDXCP		1.830	0.048	0.16	4.378	-0.730	-1.17	MC
H66JBL		1.909	0.127	0.43	4.756	-0.352	-0.57	MM
H9N8FR	*	2.668	0.886	2.98	6.172	1.064	1.71	MC
JGGY2Q		1.808	0.026	0.09	5.833	0.725	1.16	ME
JYVRET		1.589	-0.193	-0.65	5.660	0.552	0.89	MP
K6YTFM		1.927	0.145	0.49	4.575	-0.533	-0.86	XX
LNQA63	*	1.273	-0.509	-1.71	3.433	-1.675	-2.69	TP
M34ZJU		2.230	0.448	1.51	5.575	0.467	0.75	MC
MGLPHW		1.610	-0.172	-0.58	4.615	-0.493	-0.79	MC
NBTYKZ		2.018	0.236	0.79	5.538	0.430	0.69	MC
QH4ZWE		1.969	0.187	0.63	5.111	0.003	0.00	MD
TEEDEB		1.593	-0.189	-0.63	4.765	-0.343	-0.55	MC
U7XFMA		1.875	0.093	0.31	5.962	0.854	1.37	MC
UAYE39		1.507	-0.275	-0.93	5.198	0.090	0.14	MC
VQHQAT		1.542	-0.240	-0.81	4.482	-0.626	-1.01	MC
WTLMC9		1.464	-0.318	-1.07	4.781	-0.327	-0.53	MD
ZF8UB7		1.937	0.155	0.52	6.010	0.902	1.45	MC



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

Report #190
4th Qtr 2016

		Summary Statistics	
Grand Means			
	1.7820 lbf.in		5.1081 lbf.in
Stnd Dev Btwn Labs			
	0.2975 lbf.in		0.6227 lbf.in
Statistics based on 32 of 32 reporting participants			

		Summary Statistics in SI Units	
Grand Means			
	2.0134 dN.m		5.7714 dN.m
Stnd Dev Btwn Labs			
	0.3362 dN.m		0.7035 dN.m
Statistics based on 32 of 32 reporting participants			

Samples Z65-Z66: EPDM compound, batch #1 & Z67-Z68: EPDM compound, batch #2

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	MR	MonTech D-RPA 3000
TP	Tech Pro MDR model MDPT	XX	Instrument model not specified by lab

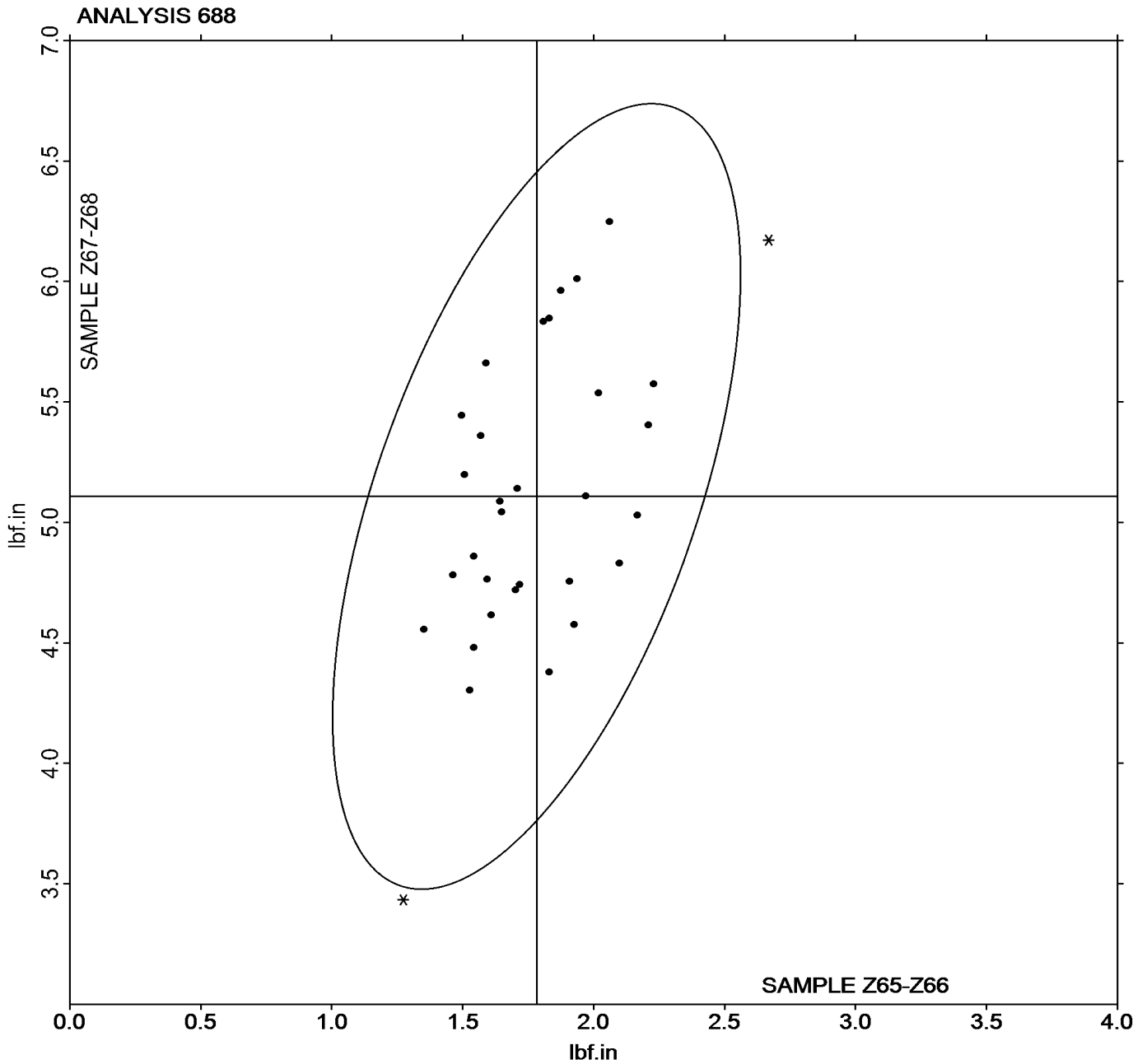


Rubber Interlaboratory Testing Program
Analysis 688
MDR Vulcanization: Minimum Torque (lbf.in)

Report #190
4th Qtr 2016

Grand Mean Sample **Z65-Z66** = 1.7820 lbf.in

Grand Mean Sample **Z67-Z68** = 5.1081 lbf.in





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

Report #190
4th Qtr 2016

WebCode	Data Flag	Sample Z65-Z66			Sample Z67-Z68			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3FH7C9		13.20	-0.40	-0.44	16.58	0.96	0.88	MC
4XD343		13.16	-0.44	-0.48	16.36	0.74	0.68	MC
68BMJZ		14.40	0.80	0.87	18.09	2.47	2.25	MC
7Y29K6		13.78	0.18	0.19	15.91	0.30	0.27	MC
ARL4RU		11.42	-2.18	-2.38	13.99	-1.63	-1.48	MC
BHB7GV		12.38	-1.22	-1.33	13.50	-2.12	-1.93	MC
BRY3HW		14.40	0.80	0.87	15.32	-0.29	-0.27	MC
BU8APW		12.22	-1.38	-1.51	15.29	-0.32	-0.29	TP
C8A3P8		13.80	0.20	0.22	15.14	-0.47	-0.43	MC
DKCVWA		14.01	0.41	0.45	15.89	0.28	0.25	MP
EDDEAB	*	16.11	2.51	2.74	17.81	2.19	2.00	MR
EFFFA8		14.51	0.91	0.99	15.95	0.34	0.31	MC
F7BP7C		13.71	0.11	0.12	15.93	0.32	0.29	MC
FDBA98		13.53	-0.07	-0.08	15.54	-0.07	-0.07	MC
FFWXLT		14.00	0.40	0.43	15.74	0.13	0.11	MC
GLDXCP		12.87	-0.73	-0.80	13.42	-2.20	-2.01	MC
H66JBL		13.58	-0.03	-0.03	14.76	-0.86	-0.78	MM
H9N8FR		14.08	0.48	0.52	16.12	0.51	0.46	MC
JGGY2Q		13.54	-0.06	-0.06	16.64	1.03	0.94	ME
JYVRET		13.70	0.10	0.11	15.75	0.13	0.12	MC
K6YTFM		13.53	-0.07	-0.07	15.27	-0.35	-0.32	XX
LNQA63	X	9.78	-3.82	-4.17	10.02	-5.60	-5.11	TP
M34ZJU		13.66	0.06	0.06	15.36	-0.26	-0.24	MC
MGLPHW		13.94	0.34	0.37	16.05	0.44	0.40	MC
NBTYKZ	*	11.43	-2.17	-2.37	12.82	-2.79	-2.55	MC
QH4ZWE		14.33	0.73	0.80	15.90	0.28	0.26	MD
TEDEB		14.62	1.02	1.11	15.57	-0.05	-0.05	MC
U7XFMA		13.99	0.39	0.42	15.66	0.05	0.04	MC
UAYE39		13.10	-0.50	-0.55	16.12	0.51	0.46	MC
VQHQAT		13.84	0.24	0.26	16.11	0.49	0.45	MC
WTLMC9		13.14	-0.46	-0.50	15.72	0.11	0.10	MD
ZF8UB7		13.67	0.07	0.07	15.76	0.14	0.13	MC



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

Report #190
4th Qtr 2016

		Summary Statistics	
Grand Means	13.601 lbf.in	15.615 lbf.in	
Stnd Dev Btwn Labs	0.917 lbf.in	1.096 lbf.in	
Statistics based on 31 of 32 reporting participants			

		Summary Statistics in SI Units	
Grand Means	15.367 dN.m	17.643 dN.m	
Stnd Dev Btwn Labs	1.036 dN.m	1.238 dN.m	
Statistics based on 31 of 32 reporting participants			

Samples Z65-Z66: EPDM compound, batch #1 & Z67-Z68: EPDM compound, batch #2

Comments on Assigned Data Flags for Test #689

LNQA63 (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	MR	MonTech D-RPA 3000
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 #190
4th Qtr 2016

Grand Mean Sample Z65-Z66 = 13.601 lbf.in

Grand Mean Sample Z67-Z68 = 15.615 lbf.in

